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STAFF REPORT

Date: March 17, 2021

To: TRPA Regional Planning Implementation Committee

From: TRPA Staff

Subject: 1) Amending the existing nitrate deposition threshold standard (AQ14) to a per capita VMT standard to reduce reliance on the automobile, reduce GHG emissions, and promote mobility;
2) Amendments to the implementing Goals and Policies of the Regional Plan Chapters 3 (Transportation Element) and 7 (Implementation Element) to attain the per capita VMT standard and implement the Regional Transportation Plan;
3) Amendments to revise the thresholds, transportation project impact assessment and air quality mitigation fee (Code Chapter 65.2), including related amendments to Chapters 2, 3, 22, 34, 39, 50, 82, and 90

Staff Recommendation:

Staff recommends that the Regional Planning Implementation Committee (RPIC) consider this staff report, staff presentation, and public input on the items summarized below and direct staff to finalize the package of agenized Threshold, Regional Plan and Code of Ordinances amendments, including any specific areas requiring additional discussion and work, for final recommendation by the RPIC at its April 28, 2021 meeting.

Required Motion: In order to provide direction on the proposed project, the Committee may make the following motion, based on the staff report and evidence in the record:

1. A motion to direct staff to finalize an adoption package for recommendation of the full Governing Board the agenized Threshold, Regional Plan and Code of Ordinances amendments as set forth in the staff report [add any specific direction here to identified areas needing additional work].

For the motions to pass, an affirmative vote of a majority of the quorum of the Committee is required.

Summary :

Since its adoption 40 years ago, the Tahoe Regional Plan has set out strategies for an integrated land use and transportation vision for the Tahoe Region. A comprehensive update in 2012 strengthened the land use strategies to better incentivize compact sustainable communities with walkable, bikeable, transit-oriented land use patterns. Now in 2021, TRPA is proposing changes to the foundations for planning, managing, and implementing the Region's integrated

transportation system to better align to the sustainable communities aspirations of the updated 2012 Regional Plan.

Three actions are presented today to strengthen the ongoing implementation of the regional transportation system. At the top of the regulatory pyramid is an updated new transportation and sustainable communities threshold standard to codify the shared aspiration for a more walkable, bikeable, transit-oriented Tahoe as a regional goal. The next actions implement the new threshold standard, first at the Plan level and also at the project level. At the plan level, we propose to adopt amended goals and policies for the 2020 update to the Regional Transportation Plan (and conforming amendments to the Transportation Element of the Regional Plan) as well as enhancements to the Regional Transportation Plan's project list that address and accelerate implementation of the new threshold standard. The third action proposes replacing the current project level transportation impact analysis methodology with a new analytical tool to better assess whether a redevelopment project will have a significant effect on transportation and how projects will mitigate those potential effects. These changes -- a threshold update with plan and project level amendments to implement the new threshold -- when taken together align regional goals, plans, programs, and projects to achieve the complete transportation and sustainable communities vision of the Tahoe Regional Plan.

In a Region where growth and development is capped and the Region is nearly at build out, these proposed changes are primarily in response to expanding outdoor recreation visitation pressures that grow as population within a short travel distance of the Region grows. To create the first class transportation system needed to serve more out of basin visitors, the small regional population of permanent residents, and commuters alike, the proposals link success to interim milestones for accelerated investment in and implementation of Tahoe's transportation vision in the RTP.

Background:

The Tahoe Region is poised to bring its transportation system into the 21st Century with updates to its outdated 40-year old transportation regulatory, planning, and implementation structure. Fifty years ago, the Compact established a goal 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.” TRPA adopts standards, plans, Code, and implementing programs and projects to achieve the Compact's broad goals.

The RP and RTP encompass the Tahoe Region's comprehensive integrated land use and transportation vision: The groundwork for today's proposals has been developing for at least a decade. Bringing the land use elements of the Regional Plan current started with the update of the Tahoe Regional Plan (RP) and Regional Transportation Plan (RTP) eight years ago in 2012, the first comprehensive update of the Region's land use vision in 25 years. The 2012 Regional Plan Update strengthened development policies and implementation incentives to spur walkable, bikeable, small community centers that would favor reduced traffic and affordable and workforce housing near transit to reduce vehicle miles traveled (VMT) and use of the auto. That Plan did so by incorporating 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).

Tahoe's 2012 Regional Plan Update put teeth behind integrating land use and transportation because TRPA is the only Metropolitan Planning Organization (MPO) whose 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. Unlike other areas of California and Nevada, Tahoe is effectively not growing because the Region is nearly at buildout, with little to no new development within the Region. What little development occurs is metered out at about 1% a year through limited remaining housing allocations (about 130 new housing units a year regionwide). Most 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 further revisions to the development rights system of the Regional Plan. All development types in Tahoe remain capped but now can be converted from one use to another more readily to achieve the mixed use that is the foundation for creating the 2012 Regional Plan's goals for sustainable communities, where housing can be located in proximity to community services and alternative modes of travel that reduce auto reliance.

Having strengthened the land use side of the Regional Plan, starting in 2015, the Region's priorities shifted more to strengthening the transportation side of the Compact's mandates. In TRPA's role as the Tahoe Region's MPO (TMPO), we are charged with transportation planning for the Region and producing an updated RTP every 4 years, as well as overseeing RTP funding and implementation. The RTP encompasses myriad performance measures, but has never been associated with a measure reflecting a successfully integrated transportation and sustainable communities desired end state.

Adopting a new VMT per capita standard to replace the outdated total VMT standard: The Compact's success is measured by a system of adopted environmental standards the vast majority of which are 40 years old, with many only remotely grounded in the most current science, circumstances, or policy. In 2015, recognizing prior failed attempts, the TRPA Governing Board identified a top strategic priority for TRPA to update its outdated threshold standard system -- bring it current with today's science, policy, and best approach for monitoring and evaluation. The Board directed staff to work with the newly established Tahoe Bi-state Science Advisory Council to develop an updated system of measures grounded in best practices.

At that time in 2015, the TRPA Governing Board prioritized and made the update of a dated air quality standard for nitrogen emissions (the current total VMT standard) among the top priorities. Those nitrogen emissions were measured through a cap on VMT that is no longer needed for the purpose for which it was established. Many of the early threshold standards adopted in the 1980s were designed to arrest the decline in water clarity. In 1981 increased algal growth because of elevated nutrient inputs (phosphorus and nitrogen) was thought to be the primary driver of Lake Tahoe's clarity loss. Threshold standard (AQ14) was established in 1982, and set a goal of reducing in-basin nitrogen emissions by 10% from 1981 levels, and benchmarked its performance to total regional VMT.

Since 1982 a number of developments have occurred that have functionally rendered the original intent of the nitrate reduction threshold standard (AQ14) moot. First, improvements in tailpipe emissions controls have reduced nitrogen emissions by more than 66%, far greater than the 10% objective of the adopted standard. In other words, the nitrogen reduction goal has

been accomplished. Second, the Total Maximum Daily Load (TMDL) scientific research established that fine particles were the principal driver of clarity loss. Each of the last four threshold evaluations have recommended that the 1982 VMT nitrogen deposition threshold standard (AQ14) be reviewed and updated.

Some initial resistance to changing the 1982 VMT threshold standard arose because, for years, Tahoe stakeholders have relied upon the total VMT standard for nitrate reduction as an indirect and poor proxy for the effectiveness and efficiency of the Region's transportation system. It's not. Notably, this air quality threshold standard was never set as a standard to measure the success of Tahoe's transportation system. But that 40-year old VMT cap is today being applied as though it was set as a transportation standard. It is not now and has never been related to or scientifically tied in any way to the implementation of Tahoe's RTP. Therefore, nearly three years ago, with Board direction, TRPA started working on how we might update the current VMT standard in a way that converted it from an air quality standard to control nitrogen emissions to instead a transportation standard that would tie to the desired end state goals of Tahoe's transportation vision, the accelerated implementation of the RTP, as well as the contemporary transportation policies the Compact states.

The proposal before the Committee is to replace the total VMT standard with a 6.8% reduction in per capita VMT to reduce reliance on the automobile, support GHG emission reduction, and increase mobility through modes other than the automobile. While VMT is a measure of the total volume of travel, VMT per capita is a measure of the efficiency of a transportation system in moving individuals between the places they need to be and so better measures the experience with and use of the various parts of the transportation system by individual travelers. Higher VMT per capita regions are those where individuals are traveling farther distances and are generally reliant on the automobile to move between their destinations. Lower VMT per capita regions are those that are characterized by complete neighborhoods consistent with the RP's sustainable communities goals with individuals travelling shorter distances and having multiple transportation options (e.g. bike paths, transit systems) other than the personal automobile to take those trips.

Adopting updates to the RTP to implement the new VMT per capita threshold standard: Once a threshold standard is set, TRPA is required to maintain adopted plans to achieve and maintain the standard. The second set of proposals before the Committee today are amendments updating the RTP (and identical conforming amendments to the Transportation Element of the RP) to achieve and maintain the new VMT per capita threshold standard. The foundation for the RTP update began in 2016 when the two States, through the two cabinet secretaries of the California Natural Resources Agency (CNRA) and Nevada Department of Conservation & Natural Resources (DCNR) convened a transportation policy forum to clarify Tahoe's transportation project and program priorities as well as needed implementation funding given growing pressures on Tahoe's transportation system. The States convened cross-sector public and private stakeholders to identify and align on the highest and most impactful priorities for transportation implementation in Tahoe that would reduce reliance on the personal auto, manage out-of-basin outdoor recreation visitation, and accelerate integration of transportation with land use (CA SB 375) and reduction of GHG emissions from mobile sources (AB 32). Essentially, the two States were asking the Region to accelerate Tahoe's RTP implementation.

The consultation acknowledged the Tahoe Region's greatest transportation challenge. Tahoe is an iconic outdoor recreation destination with both the Lake and 90 percent of its surrounding land base held as publicly accessible federal, state, and local forests, parks, and wilderness areas. Out-of-basin visitation traffic, which is about 50% of Tahoe's in-basin VMT, clogs the Tahoe Region's public roadways at peak times. The states asked regional transportation partners to identify the highest priority regional projects and programs to manage that out of basin visitation, the primary escalator of VMT. The consultation's recommendations are now included in the 2020 RTP update: e.g., adding transit to popular destinations, out of basin park and ride and transit connections, and more transportation choices once in the Region, like bicycle, pedestrian, and parking management systems. The 2020 RTP updates are changes needed to now implement the new VMT per capita threshold standard as well as other required transportation performance measures of the MPO. The 2020 RTP has been available for public review since October and is now being finalized for decision concurrent with the VMT threshold update proposal. It redoubles the reliance on transportation strategies designed to address visitation congestion, reduce auto reliance, and implements California state policy SB 375 and now parallel Nevada state policy on GHG emissions policies.

Strategies for funding the 2020 RTP Update: Implementing the RTP comes with a hefty price tag, a \$2.7 billion plan of transportation and sustainable communities investments with a long list of capital projects and other implementing programs over 25 years. Increasing investment in transportation is the single most effective way to accelerate RTP implementation.

To make sure the Region secures the monies needed to implement the RTP, the two states through the cabinet secretaries for CNRA and DCNR have engaged two rounds of ongoing transportation consultation among implementing partners across all sectors -- federal, two states, local government, and private sector. The first consultation in 2017-2018 produced a final report that identified the RTP's highest priorities (i.e., what new transportation funds will be used to accomplish) that will make the most difference in reducing reliance on the auto and address the Tahoe Region's greatest challenge -- out of basin visitation traffic that clogs Basin roads at peak times. A second convening of the bi-state transportation consulting parties is now underway and has made securing new sources of transportation funding to accelerate implementation of the RTP its highest priority. A legislative report is due by the end of 2021 laying out a widely supported bi-state and stakeholder consensus on approach to new funding sources for Tahoe's transportation system implementation.

Code of Ordinance Amendments implement the new VMT per capita threshold standard at the project-level: At the base of TRPA's regulatory pyramid is the Code of Ordinances, which implement the plans, programs, and projects designed to achieve and maintain threshold standards. The third proposal before the Committee looks at how to apply the updated VMT per capita threshold standard to development and redevelopment projects. Although development (mostly redevelopment) projects are only a small increment of RTP implementation, accounting for only about 7% of regional VMT, they are nonetheless a necessary part of transportation implementation system. The proposed Code of Ordinances amendments will establish a consistent project review method oriented to the new VMT standard and implementation of the RTP priority projects.

The current Code evaluates projects based on the total number of trips generated. The proposed Code of Ordinance amendments will convert the present project trip analysis (daily

vehicle trip ends or DVTE) to a framework that is instead tethered to VMT. The new method assesses a development project's significance to the new VMT threshold at the project level, and how therefore each project will be required to mitigate those VMT generated impacts. The project level impact assessment is coupled with a proposed framework for updating the existing Air Quality Mitigation Fee to a mobility mitigation fee that mitigates project level transportation system effects of development projects.

The proposed project level assessment has the benefit of being consistent with recently enacted California state law SB 743 (which updated the state's CEQA Guidelines to require VMT-based transportation impact assessment rather than Level of Service) so that Tahoe project applicants will have a streamlined analysis at the regional level and local level in California. The Tahoe RTP shares common goals with the state law -- reducing greenhouse gas emissions, promoting the development of a multimodal transportation system, and providing clean, efficient access to destinations -- so that TRPA, by working closely with Placer County and its transportation consultant Fehr & Peers, was able to conform both the regional and state level assessment methodology. As a result, the project level transportation impact assessment and mitigation fee updates provide a streamlined, transparent, and predictable process for projects that result in additional vehicle miles traveled. Certain classes of projects, although exempt from additional project impact assessment (because these classes of projects would likely not lead to a substantial or measurable increase in VMT, e.g., bicycle, pedestrian, transit, and affordable housing projects), will be required to pay the mobility impact fee. More complex projects will require detailed analysis of significance and mitigation options tailored to the project impacts.

The comprehensive package of transportation system changes is more coherent, more progressive, and far superior to the system in place today: The threshold standard change, RTP update, code changes, and transportation funding initiative to accelerate RTP implementation now underway, when taken together, create a far more holistic, coherent, aggressive, and integrated system for achieving the sustainable communities and transportation vision for Tahoe.

Proposed today is a new transportation threshold standard together with the 2020 RTP Update that not only encompasses contemporary and current California state policies and approaches -- AB 32, SB 375, and now SB 743 -- but also achieves implementation over and above those policies because the goal it sets for the Region will effectively result in little to no change in net VMT over the next 25 years. It achieves this by anchoring to regional implementation of interim RTP project and program targets as the most effective means of controlling the growth of regional VMT 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 VMT within the Basin. California policy (SB743) allows VMT growth. The 2020 RTP is designed to limit that VMT growth to near zero and reduces the per capita figure by 6.8%, a more progressive policy than other California MPOs and other regions.

A few advocates have suggested the Region retain an absolute cap on regional VMT as a means to further control development in Tahoe and so with it VMT for Tahoe. The current VMT cap (i.e., tied to NOx air emissions) purports to control VMT by stopping release of residential allocations when the transportation model shows that we are exceeding the cap on VMT. Because we are nearly at buildout under the Regional Plan's growth control system, development in Tahoe accounts for a miniscule portion of VMT (7%). Limiting new allocations is

an ineffective strategy where all new development accounts for only a fraction of overall regional VMT and stopping all remaining allocations would reduce total VMT by an insignificant amount. The greatest effect on VMT will come from funding the transportation programs and projects of the RTP -- transit, trails, technology, parking management, Transportation Demand Management -- all the programs and projects not directly connected to development projects but instead that come from public commitment of dollars to transportation.

As this staff report reveals, today's proposed comprehensive framework ties to all the necessary objectives to accelerate and achieve the Region's transportation system goals. The proposals tie:

- to the integrated land use and transportation vision for the Region,
- to the ongoing Bi-State and Tahoe Partnership transportation funding initiative,
- to interim implementation goals of the updated 2020 RTP, and
- tie to, are consistent with, and are more progressive than related California statutory goals require for climate adaptation, GHG emissions reduction (AB 32), sustainable communities (SB375), affordable housing (EO N-06-19), and transportation project assessment (SB743).

Taken together, the recommended proposals will bring Tahoe's transportation and land use systems fully up to date with the needs of the 21st Century.

Project Description:

The converging of three initiatives includes an update to the existing Nitrate Deposition VMT threshold standard and project impact assessment approach, an update to the Regional Transportation Plan Goals and Policies and an update to the Project Impact Analysis and mitigation fee framework.

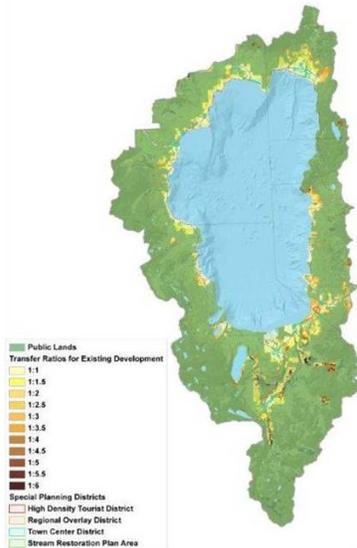
VMT Threshold Standard Update Summary: The proposed update to the VMT threshold standard proposes a 6.8% reduction in VMT per capita by 2045 and interim reduction targets to assess progress. The proposed implementation framework for the updated standard will reduce the distance traveled in automobiles for both visitors and residents, and result in nearly zero growth in VMT over the next 25 years. The proposed standard is grounded in 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 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.

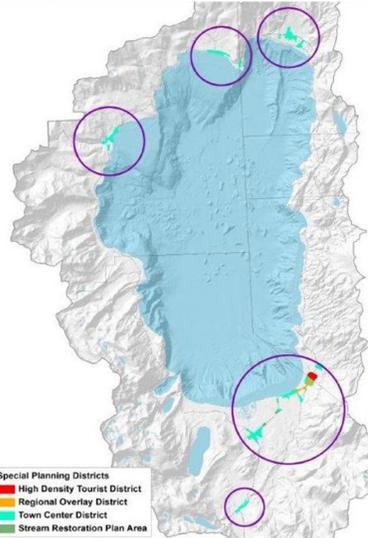
Reduced Auto Dependency Component: The proposed threshold standard recognizes this Bi-State Compact objective by targeting a reduction in VMT per capita. Roadway capacity in Tahoe is limited (i.e., new roads or lanes are unlikely due to geographic and environmental constraints) so increasing mobility requires a transportation system that improves connectivity and mobility through implementing new trails and transit service, adapting existing roadway for transit priority and/or reversible travel lanes during busy traffic periods, and travel demand management strategies, like 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 RP and RTP are consistent with these underlying concepts and work in a complementary fashion to address many of the Region's goals, as shown in the RP and RTP maps that follow.

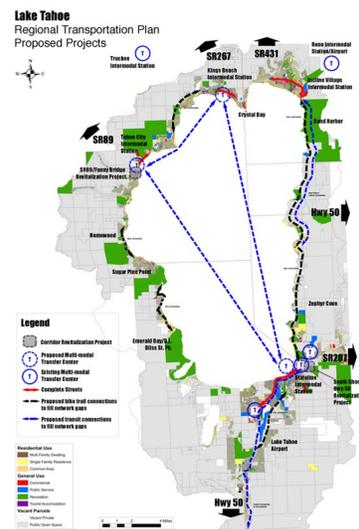
Development Rights Sending Areas and Transfer Ratios



Centers and Development Rights Receiving Areas



Proposed Transportation Projects



Regional Plan Amendment Recommendations: To effectuate the new per capita VMT threshold standard requires amending the Regional Plan Goals and Policies. The proposed amendment adds a new goal in the Development and Implementation Priorities sub-element and six associated policies. See attachments C and D for proposed amendments. The amendments include a suite of actions to achieve the new VMT reduction standard:

- o Establishing a technical advisory body to provide guidance on attaining and maintaining the new threshold standard
- o 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
- o Establishing a schedule of milestones to measure progress towards the per capita VMT reduction goal
- o Implementing identified adaptive management responses if scheduled milestones are not met
- o Obtaining regional funding sources for transportation projects and programs per scheduled milestones

Regional Transportation Plan Update: Visitation from outside the Region is the main driver of the Lake Tahoe Region’s \$5 billion annual economy, based largely on seasonal tourism and outdoor recreation. But it also puts metropolitan-level travel demands on the Region’s limited and largely rural transportation system. During peak times of visitation, Tahoe’s roads clog with traffic and parking demands exceed capacity at recreation sites. This seasonal influx of motorists has consequences for the environment, for local communities and their mobility, and for air and

water quality. As neighboring cities from Reno and Carson City to Sacramento and San Francisco continue to grow, transportation pressures and challenges at Tahoe will only increase.

There is broad consensus that to meet the growing travel demand the Tahoe Region needs a transportation system transformation. Improvements are needed to help people travel to, from, and around the Region more efficiently. Improvements will also strengthen initiatives underway to conserve and restore Tahoe's environment; revitalize communities; improve quality of life for residents and quality of experience for visitors; improve mobility and safety for people walking and biking; improve recreation access and sustainability; and reduce emissions of greenhouse gases and build a resilient system in response to climate change.

Regional goals and policies: Goals and policies establish the organizing framework for transportation planning at Lake Tahoe. The 2020 RTP (Attachment F) proposes an update to the policies to implement the new VMT per capita threshold standard along with the goals. The changes will strengthen support of the goals, support a reduction in VMT and improve the livable environment with expanded transit services and a robust network of trails, sidewalks, and bike lanes that ensure every Tahoe resident has safe, reliable, and convenient alternatives to travel throughout the region to homes, workplaces, schools, commercial areas, and recreation sites.

The plan's focus to create a transportation system that allows for travel without having to drive, making it easier for recreation and vacation visitors to arrive without a car or leave their cars parked while exploring everything Tahoe has to offer. The plan includes new technologies to improve how roads, traffic signals, and parking areas are operated and puts real-time information about road conditions and the most convenient travel options at the fingertips of everyone planning a trip in the Region. The Communities focus area includes changes so that all corridors in Tahoe have more travel options than just the automobile — and roadways are maintained to ensure safe and efficient movement of people and goods.

The new VMT standard is now tied directly to the implementation and funding of the RTP, the plan that sets the goals and policies for bringing the transportation system into the 21st Century.

RP and RTP share six major goals for the transportation system that the 2020 RTP is not proposing to change; Environment, Connectivity, Safety, Operations and Congestion Management, Economic Vitality & Quality of Life, and System Preservation.

Recommended changes: To date over 50 public meetings (both in person and virtual), online webinars drawing 483 participants, and outreach videos reaching 2,383 people all provided valuable input to help shape the Final Draft Plan. A full list of comments received is included in Attachment J. The plan was developed to reflect an envisioned regional system that represents the priorities of local and regional implementors, state interests, environmental and NGO groups, and public feedback. The proposed policy additions reflect outreach and support the new VMT standard, its GHG reductions and proposed projects and programs:

Environment	New Policy: Implement greenhouse gas reduction strategies in alignment with federal, state, and regional requirements and goals.
	New Policy: Prioritize projects and programs that enhance non-automobile travel modes.
Connectivity	New Policy: Collaborate with nearby communities that share transportation to and from the Tahoe Basin, including the Town of Truckee, <u>the Resort Triangle</u> , and the Carson/Minden valley.
	New Policy: Ensure all transportation projects, programs, and policies meet the transportation needs and minimize negative impacts for disadvantaged communities and people with special needs.
	New Policy: Ensure all transit is Americans with Disabilities Act (ADA) compliant, Universally Accessible, and consistent with Coordinated Human Services Transportation Plans.
	New Policy: Support, where feasible, the implementation of on-demand, dynamically routed transit shuttles.
	New Policy: Coordinate and maintain parking maximums and shared parking standards that support goals and policies of the Regional Plan.
	New Policy: Paid parking revenues should benefit infrastructure and services for transit, pedestrians, and bicyclists within areas that funds are generated.
Safety	New Policy: Encourage appropriate agencies to use traffic incident management performance measures.
Operations & Congestion Management	New Policy: Enable growth of shared and on-demand shared ride mobility services (i.e., ride-, car-, and bike-sharing, e-hailing, etc.).
	New Policy: Work to ensure that new transportation services and technologies utilize electric vehicles as feasible.
	New Policy: Invest resources in marketing and outreach campaigns to promote the use of non-auto travel options.
	New Policy: Coordinate policies across multiple partners that support the use of electric assisted, low-speed devices on paths and trails to serve travel needs in Tahoe.
Economic Vitality & Quality of Life	New Policy: Ensure access to public transit in identified Priority Communities.
System Preservation	New Policy: Improve winter transit access by providing shelters, cleared sidewalks and paths around stops, winter accessible bike racks, and warm shelters at mobility hubs and major transit stops.

	New Policy: Advance transportation planning through public participation and collaboration.
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Additional edits include restating policies for clarity and alignment with agency goals related to VMT. For example, Environment policy 1.4 states: “Mitigate the regional and cumulative traffic impacts of new, expanded, or revised developments or land uses by prioritizing projects and programs that enhance non-automobile travel modes.” The proposed policy language is: “Develop and implement project impact analysis, mitigation strategies and fee programs to *reduce Vehicle Miles Travelled and auto_trips.*” The revision is for clarity and emphasis on reducing VMT. Edits were also done for relevance to new plans recently adopted like the Main Street Management Plan, such as the Operations & Congestion Management policy 4.13 which states: “Require the development of traffic management plans for major temporary seasonal activities, including the coordination of simultaneously occurring events.” The revised policy proposes: “Require the development of traffic management plans for major temporary seasonal activities, *including streetscape flexibility within urban centers,* and the coordination of simultaneously occurring events.”

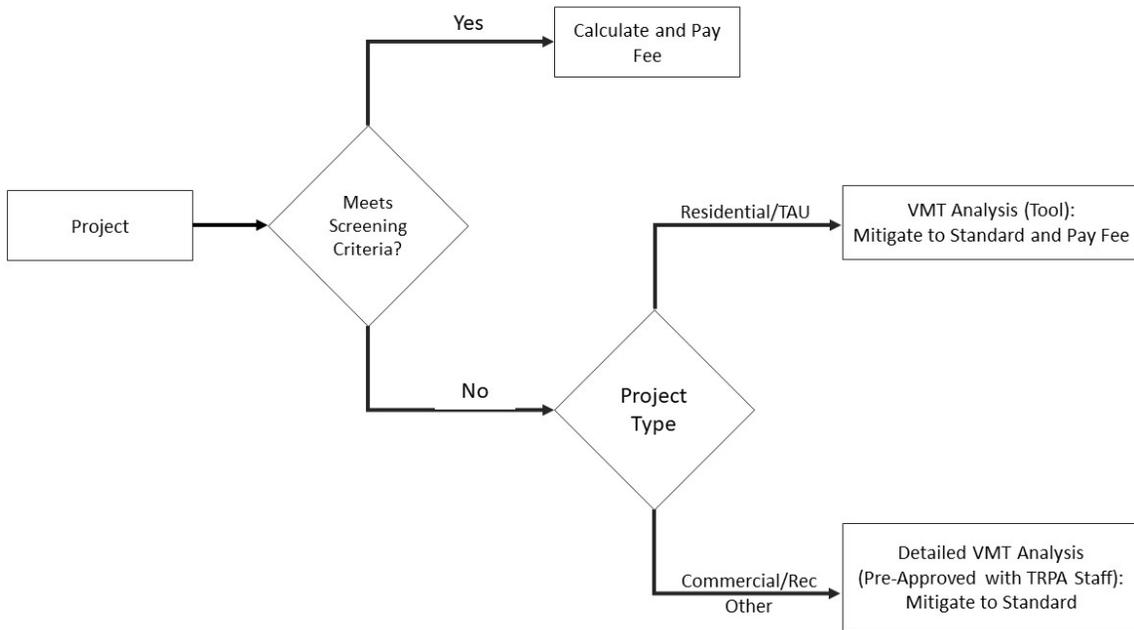
The new VMT standard is now tied directly to the implementation and funding of the RTP, the plan that sets the goals and policies for bringing the transportation system into the 21st Century. The proposed changes necessary for adoption of RP Chapter 3 Transportation goals and policies are included in Attachment D.

Project Impact Assessment Summary: To fully implement the new VMT per capita threshold standard, the Code should specify how the new threshold measure will apply to development projects. The proposed Code changes specify the framework to assess whether a development project would have a significant impact with VMT at the project level and how projects would be required to mitigate those impacts. The proposed Project Impact Assessment (PIA) framework for this update is presented in more detail in Attachment G (Project Impact Assessment and Air Quality Mitigation Fee Update). Consistent with previous RPIC direction, TRPA has been working closely with Placer County as it has updated its project impact assessment processes using VMT for California Environmental Quality Act (CEQA) transportation impact assessments, as required by SB 743.

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 PIA process improvements include advancing screening from additional analysis for of projects that reflect important regional planning objectives (e.g., 100% deed restricted affordable, moderate, and achievable housing), incorporating incentives for development in or within a half mile buffer of town and regional centers to advance land use and transportation objectives of the RP, consistent VMT levels for different types of projects, development of an online assessment tool which also computes mitigation fees. These were identified in coordination with Placer County, as they developed their project assessment approach, consultant, Fehr & Peers, who was partially funded by TRPA for TRPA products, input

from the Transportation Technical Advisory Committee, individual stakeholder discussions, and research and guidance provided by the State of California’s Office of Planning and Research. The proposed revised process is illustrated in the following figure.



Online Tool: The use of an online PIA tool 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. TRPA is developing a PIA tool with Placer County and consultant, Fehr and Peers. The tool will be driven by data from the TRPA Travel Demand model according to the framework detailed here and for California jurisdiction impact assessment to comply with CA SB 743. The tool will be available to the public, consultants, developers, and others to assist in the screening process; to assess whether projects meet screening criteria; to evaluate VMT for non-screened residential, tourist accommodation, and public service projects; to incorporate appropriate VMT mitigations into projects determined to have a significant impact (i.e., those that exceed the standards of significance); and to calculate mobility mitigation fee(s).

Screening Criteria: Screening criteria are based on the size, general location, and project type. The main goal of screening is to streamline VMT impact assessment by removing projects that are 1) expected to have a minor impact to transportation by producing less VMT than the adopted standard of significance or by providing a beneficial outcome (e.g., affordable housing); or 2) are simple enough that their impacts can be determined without undergoing a complex analysis. Any new VMT from screened projects would be mitigated through payment of the mobility mitigation fee(s).

Projects that are screened most effectively mitigate their impacts with VMT through paying mobility mitigation fees, which help fund implementation of projects and programs designed to mitigate anticipated future VMT in the region. Non-screened projects are of a size that can meaningfully mitigate VMT at the project level through implementation of mitigation strategies and paying fees that support regional VMT mitigations.

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 G).

When a project is screened, it is not required to mitigate to the standard of significance for the project type. Screened projects are required to calculate VMT and pay the mobility mitigation fee(s) associated with the project to offset the net additional VMT it generates. Screening approaches include affordable housing, active transportation, previously analyzed projects, and low-VMT. See Attachment G (Project Impact Assessment and Air Quality Mitigation Fee Update) for screening for approaches to these categories.

The low-VMT screen adjusts VMT calculations for projects in or within a one-half mile buffer of a Town Center or Regional Center if it also uses parking rates that do not exceed local jurisdiction minimum parking rates. These centers, and their half-mile buffers, produce less VMT than all other zones in the region because of the proximity of a mix of land uses and non-personal automobile transportation options. This approach advances the Regional Plan goals for a more walkable, bikeable, and transit served region through improved land use and transportation solutions by moving development into and near to town and regional centers.

Projects will be screened based on their location and VMT using the following adjustment factors:

- Regional Centers and the half-mile buffer: A 35% reduction in VMT calculation based on the greater number of pedestrian, bicycle, and transit trips in Regional Centers.¹
- Town Centers, and the half-mile buffer: A 20% reduction in VMT calculation based on trip lengths in Town Centers averaging about 80% of the basin wide average.¹

Standards of Significance: Projects that are not screened from further review will be evaluated by land use type. 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. (see Table 2 in Attachment G for detail):

- 15% below the sub-regional² average VMT for residential uses; e.g., VMT/Resident for Residential and VMT/Tourist Accommodation Unit, and 15% below the sub-regional² average VMT for Public Service projects
- No-net increase in unmitigated VMT for commercial, recreation and transportation projects
- Other projects will be determined on a case-by-case basis

The framework uses sub-regional (i.e., jurisdictional²) standards of significance for residential, tourist accommodation uses, and public service uses. These standards of significance are

¹ Per the 2018 Summer TRPA Travel Mode Share Survey

² Jurisdictions include Carson City, City of South Lake Tahoe, Douglas County, El Dorado County, Placer County, and Washoe County

designed to encourage applicants to reduce VMT by locating projects in the most efficient parts of each jurisdiction.

Fee Update: The Air Quality Management (AQM) fee is being updated and renamed to the Mobility Mitigation Fee. Fees are used by the region's jurisdictions and implementing agencies to provide the transportation infrastructure necessary to implement the policies and achieve the goals of the RTP.

Each trip that produces VMT has an origin and a destination. The origin is the production of the trip and the destination is the attraction of the trip, with each being responsible for a proportional share of the trip's associated VMT. Since 1987, TRPA has weighted the origin/production of a vehicle trip at 90 percent, and the destination/attraction end of the trip at 10 percent. Within this framework, "beds" account for the origins/productions (e.g., houses, hotel/motel rooms, campgrounds) and commercial, recreation, public service, and other uses as the destinations/attractions, meaning Residential and Tourist Accommodation Units are charged 90% of the AQM fee and Commercial, Recreation, Public Service, and Other land use projects are charged 10% of the AQM fee.

The current approach to apportioning fees based on the land use type of the project is continued under the mobility mitigation fee.

The "per VMT" fee amount will be calculated using significant projects identified in the adopted RTP constrained project list, including costs and anticipated funding, that address new VMT in the region from development and redevelopment projected in the TRPA model, as modified by applicable constitutional principles and the policy considerations used to generate the existing Air Quality Management (AQM) fee. A project's fees will be determined through a two-step process: 1) a regional mobility mitigation fee charged to all development and redevelopment projects that generate net VMT and 2) projects with unmitigated VMT may pay a fee for VMT that is unable to be mitigated through on or offsite strategies. This work will be completed in consultation with jurisdictions, stakeholders, and the development community, and in consideration of current transportation fees in the region and in nearby communities.

The fee program will recognize additional funding sources, such as local fee program revenues, when calculating the TRPA mobility mitigation fee. It is anticipated that the updated program will collect roughly the same amount of fees as the existing AQM fee program.

Monitoring: TRPA is committed to monitoring the efficacy of the updated program. However, 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 Regional Plan and TRPA Code of Ordinances. A draft of those changes is included in Attachments D and E.

Public Participation:

As discussed above, this proposal encompasses much needed improvements to transportation including 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 update to Transportation policies and a Regional Plan amendment and framework for updating the project impact assessment and fee used as one of the implementing mechanisms. The summarized transportation regulatory, planning, and implementation proposals are designed to improve the transportation system and environment in the Lake Tahoe Region. Significant input has been received over many years . RPIC first met on the outlines of the proposals beginning in July 2020. Added input came in from three public TTAC meetings, the Environmental Improvement Transportation and Public Outreach Committee of the Governing Board, and the Tahoe Transportation Commission, as well as hundreds of meetings with various stakeholders. Comments, formal and informal, from a wide range of stakeholders have been received, considered, and incorporated wherever appropriate. Before finalizing the necessary Code of Ordinances amendments, updates to the Rules of Procedure for the updated mobility mitigation fee, advancing the environmental documentation, developing a monitoring approach, and any other components of the final package for consideration, staff is requesting that the APC discuss this proposal, and provide feedback.

Environmental Review:

For the 2020 RTP/SCS, the TRPA/TMPO issued on September 10, 2020 a Notice of Intent and Notice of Availability (NOI/NOA) and a joint environmental document consisting of an Initial Study/Mitigated Negative Declaration and Initial Environmental Checklist/Finding of No Significant Effect, referred to hereafter as the Initial Study/Initial Environmental Checklist (IS/IEC). The IS/IEC was developed in compliance with the California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.), CEQA Guidelines, and TRPA Compact, Code of Ordinances and Rules of Procedures. A final draft of the IS/IEC is now available at trpa.org/rtp/.

The 2020 RTP/SCS IS/IEC examines updates to the policies and project list from the 2017 RTP/SCS and incorporates the proposed update to the threshold standards and the mitigation from the 2012 RTP/SCS EIR/EIS. For the majority of impact topic areas, the changes in policy and the project list create no impacts beyond those already disclosed by the 2017 and 2012 environmental review. Environmental impact topic areas where regulations have changed, therefore more detailed discussion is included, are: Transportation, Greenhouse Gases, Air Quality, and Recreation. The IS/IEC discloses no unmitigated significant impact and TRPA therefore intends to rely on the IS/IEC to support a Negative Declaration/Finding of No Significant Effect (Attachment H).

For the update to the Threshold Standards, Regional Plan, and Project Impact Analysis, the TRPA prepared an Initial Environmental Checklist (IEC) (Attachments I and K-N) in accordance with the TRPA Compact, Code of Ordinances, and Rules of Procedure. The analysis in the checklist is focused on those environmental resource areas that could be affected by the change to the threshold standard, implanting Regional Plan amendments and project level impact analysis program. The analysis disclosed how the revised threshold standard and framework would better measure transportation and air quality impacts and result in no adverse environmental impacts. The IEC supports a Finding of No Significant Effect.

Contact Information:

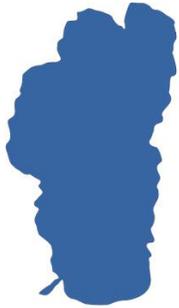
For questions regarding the VMT Threshold Standard and Regional Plan amendment please contact Dan Segan at (775) 589-5233 or dsegan@trpa.org. For questions on the RTP please contact Michelle Glickert at (775) 589-5204 or mglickert@trpa.org. For questions on the project impact assessment and fee update please contact Melanie Sloan at (775) 589-5208 or msloan@trpa.org.

Attachments:

- A. VMT Threshold Update: Standard Recommendation and Implementation
- B. Threshold Indicators and Compliance Measures Checklist
- C. Threshold Update (strikethrough)
- D. Regional Plan Amendments Chapter 2, 3, and 7 (strikethrough)
- E. Code of Ordinance Changes (strikethrough)
- F. [Final Draft 2020 RTP/SCS](#)
- G. Project Impact Analysis Update: Project Impact Assessment and Fee Framework
- H. [IEC 2020 RTP/SCS](#)
- I. [IEC for VMT Update/PIA.pdf](#)
- J. 2020 RTP/SCS Comment Matrix
- K. Draft Findings – Threshold Amendments
- L. Draft Findings - Regional Plan Amendments & Code Changes
- M. Draft Findings – 2020 RTP/SCS
- N. Draft Adopting Ordinances
 - 1. Threshold Amendments
 - 2. Regional Plan Amendments & Code Changes
 - 3. RTP

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 2.1

MARCH 17, 2021

1

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SUMMARY OF RECOMMENDATIONS

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

Recommendation: Establish a new threshold standard category “Transportation and Sustainable Communities”, and threshold standard “TSC1 – Reduce Annual Daily Average VMT Per Capita by 6.8% from 12.48, the 2018 baseline, to 11.63 in 2045.” The goal of the standard is to reduce dependence 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 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.”

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).

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 Tahoe². 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 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

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

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 policies 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.

To establish the baseline for tracking threshold standard progress, staff recommends that the 3-year HPMS average centered on the 2018 base year be used. The VMT baseline for the standard is 1,483,050.

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 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.

Application of the TEPM to the 2018 base year produced an estimated annual average effective daily population for the Region of 118,856. Full documentation for the approach and the base year estimate can be found in appendix C.

The conceptual approach can be applied at a variety of time scales ranging from a single day to an annual estimate. 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

Using the recommended VMT (1,483,050) and effective population (118,856) from the above sections, yields a baseline VMT per capita of

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 TRAVEL DEMAND MODEL FORECAST REDUCTION IN PER CAPITA VMT (2018-2045)

	2018	2035	2045
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 forecasted change in population and VMT from the Tahoe travel demand model, were applied to the TEPM estimated effective population and the HPMS estimated VMT to develop the forecast for The recommended target is currently formulated as a percent reduction from the baseline VMT and Population for 2020.

TABLE 4: TAHOE REGION EFFECTIVE POPULATION AND VMT ESTIMATES (2018-2045)

	2018	2035	2045
Effective Population (TEPM)	118,856	125,236	129,002
Total Average Daily VMT (HPMS)	1,483,050	1,477,014	1,500,293
VMT per Capita	12.48	11.79	11.63
Percent Reduction from 2018 VMT per Capita		5.5%	6.8%

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 region'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" estimates in Table 5 are higher than the "per Capita" estimates in Table 4, the percentage reduction is what is relevant for the comparison.

TABLE 5: 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 than 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.

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TABLE 6: EXPECTED VMT PER CAPITA REDUCTION SCHEDULE

Year	VMT /Per Capita	Annual Reduction	Cumulative Reduction	3 year Average	3 year Average Reduction	3 year Average % to Target
2018	12.48	0.03				
2019	12.45	0.03	0.03			
2020	12.41	0.03	0.06	12.45	0.25%	3.70%
2021	12.38	0.03	0.09	12.41	0.50%	7.41%
2022	12.35	0.03	0.13	12.38	0.75%	11.11%
2023	12.32	0.03	0.16	12.35	1.01%	14.81%
2024	12.29	0.03	0.19	12.32	1.26%	18.52%
2025	12.26	0.03	0.22	12.29	1.51%	22.22%
2026	12.23	0.03	0.25	12.26	1.76%	25.93%
2027	12.20	0.03	0.28	12.23	2.01%	29.63%
2028	12.16	0.03	0.31	12.20	2.26%	33.33%
2029	12.13	0.03	0.35	12.16	2.52%	37.04%
2030	12.10	0.03	0.38	12.13	2.77%	40.74%
2031	12.07	0.03	0.41	12.10	3.02%	44.44%
2032	12.04	0.03	0.44	12.07	3.27%	48.15%
2033	12.01	0.03	0.47	12.04	3.52%	51.85%
2034	11.98	0.03	0.50	12.01	3.77%	55.56%
2035	11.94	0.03	0.53	11.98	4.03%	59.26%
2036	11.91	0.03	0.57	11.94	4.28%	62.96%
2037	11.88	0.03	0.60	11.91	4.53%	66.67%
2038	11.85	0.03	0.63	11.88	4.78%	70.37%
2039	11.82	0.03	0.66	11.85	5.03%	74.07%
2040	11.79	0.03	0.69	11.82	5.28%	77.78%
2041	11.76	0.03	0.72	11.79	5.54%	81.48%
2042	11.72	0.03	0.75	11.76	5.79%	85.19%
2043	11.69	0.03	0.78	11.72	6.04%	88.89%
2044	11.66	0.03	0.82	11.69	6.29%	92.59%
2045	11.63	0.00	0.85	11.66	6.54%	96.30%
2046	11.63	0.00	0.69	11.64	6.71%	98.77%
2047	11.63	0.00	0.69	11.63	6.79%	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 Policies is proposed. The proposed amendment adds a new goal in the Development and Implementation Priorities sub-element and six associated policies. The proposed amendments are included in attachment D of the packet.

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 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 be 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

NO_x 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, NO_x 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 NO_x 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 NO_x) for cars and light duty trucks in 1975 (EPA 1999). Since that time, NO_x emissions standards per mile have become increasingly strict (Figure 3). 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).

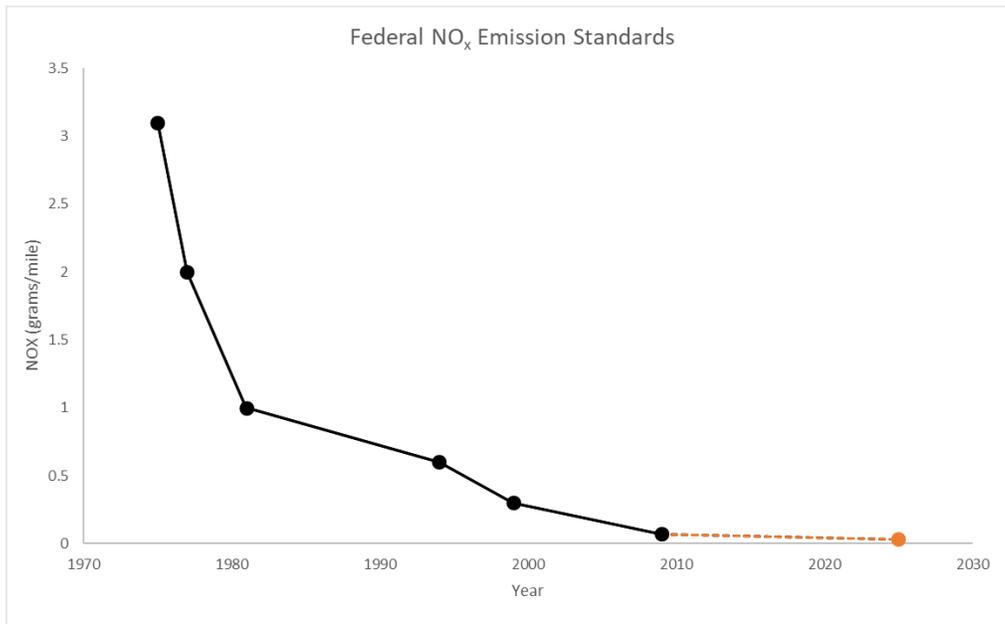


FIGURE 2: NO_x EMISSIONS PER MILE EMISSIONS STANDARDS (1975-2025)

As a result of increasingly strict emission standards, the California Air Resources Board estimates that NO_x 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 NO_x 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 NO_x emissions will continue to decrease to 0.6 tons per day by 2030 (CARB 2016).

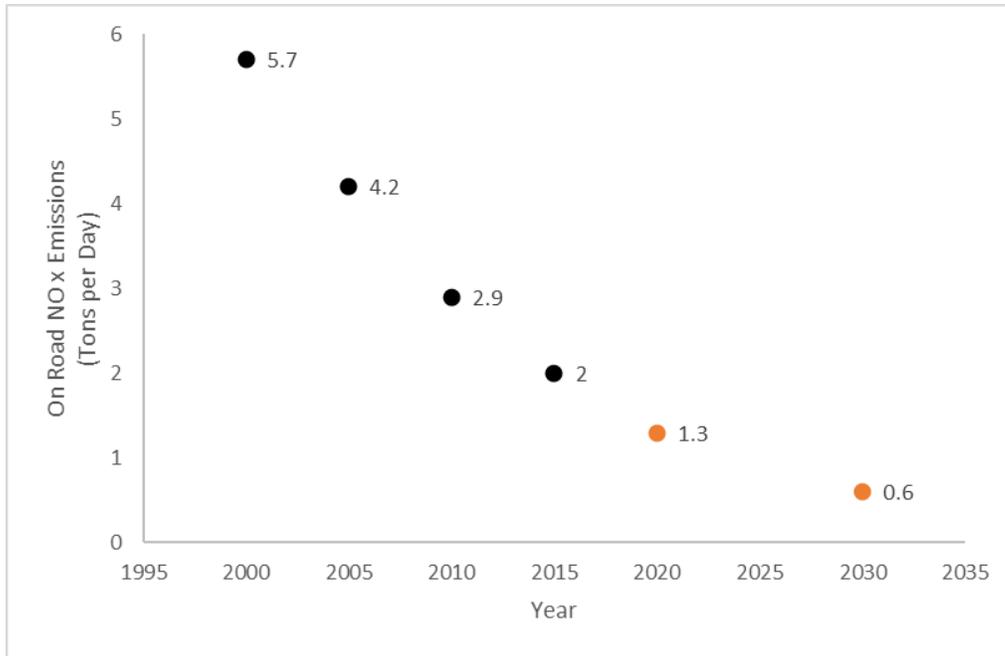


FIGURE 1: ON ROAD DAILY NO_x EMISSIONS IN THE TAHOE BASIN. SOURCE: CARB 2016

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 NO_x 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 NO_x 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 NO_x 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 2). CARB forecasts suggest that NO_x 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 NO_x 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 NO_x 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 today's 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).

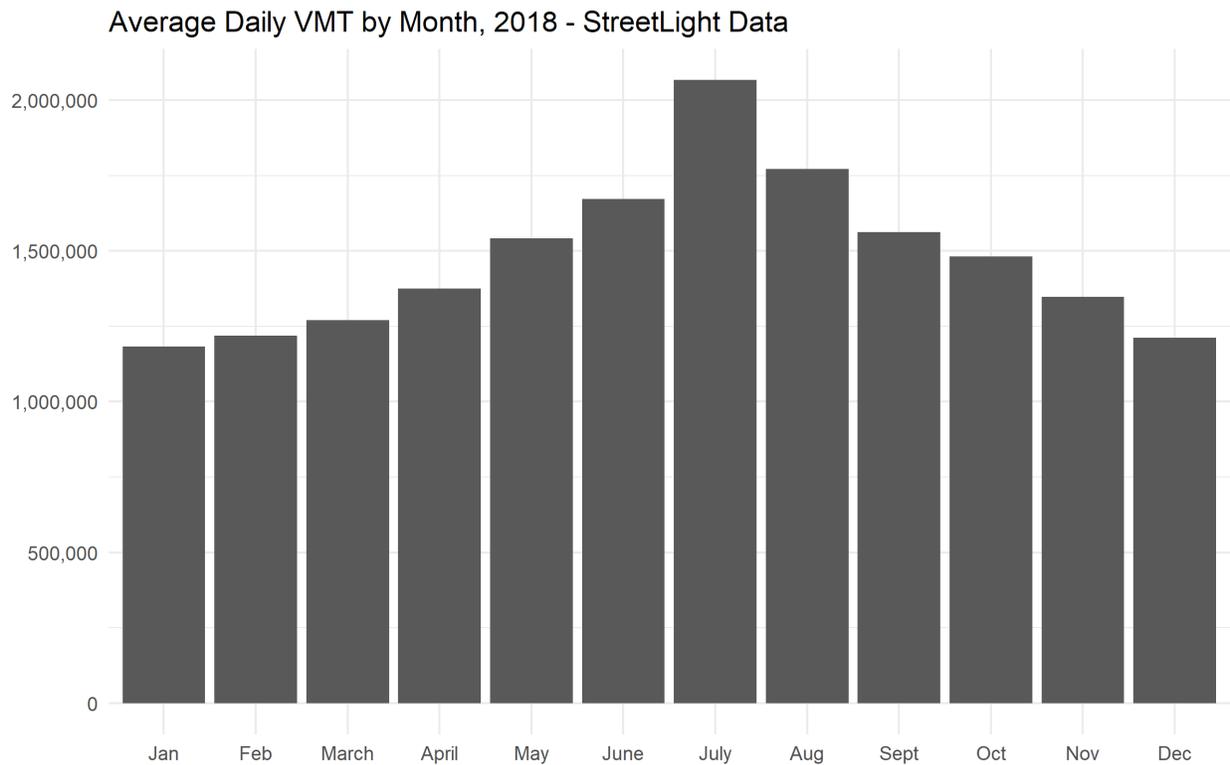


FIGURE 3:TAHOE REGION MONTHLY VMT (2018) SOURCE: STREETLIGHT DATA

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 PM₁₀ (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	NO _x Per mile (2003)	NO _x Per mile (2020)	% VMT	NO _x 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%

DRAFT

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).

Estimation of the Effective Traveling Population of the Lake Tahoe Region

Draft revised March 2021

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Acknowledgements:

This work was funded by a generous grant from the Nevada Division of State Lands of the Department of Conservation and Natural Resources. The University of California - Davis and University of Nevada-Reno conducted the work on behalf of the Tahoe Science Advisory Council. The Tahoe Science Advisory Council was established in December 2015 by a memorandum of understanding between the Secretary of the California Natural Resources Agency, and the Director of the Nevada Department of Conservation and Natural Resources. The Tahoe Science Advisory Council (Council) is an independent group of scientists who work together in an advisory capacity to identify and promote the use of the best available scientific information on matters of interest to both California and Nevada. The Council offers expert, objective perspectives on pressing science issues and provides a venue for communication between research partners and land management agencies.

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EXECUTIVE SUMMARY

Resident population size is a core building block for transportation and land use planning. In regions with large variations in seasonal population that include high visitation rates, resident population estimates provide only a partial picture of the number of people that are in or traveling around the region

The Lake Tahoe region's resident population has never exceeded 65,000 people, according to U.S. Census estimates, but prior analysis has indicated that the number of people in the Tahoe Region on days of peak visitation may exceed 200,000. For more than 50 years, stakeholders and planners in region have been evaluating ways to mitigate high automobile usage of both residents and visitors, who are reliant on their vehicles due to limited alternative transportation options.

Effective planning efforts that can address this issue require first accounting for the number of travelers in the region at any given point. This accounting effort must necessarily include visitors, short and long-term residents and workers, commuters, and anyone else traveling in the Region, which represents the effective population of interest. Confounding the issue is that visitors can include day and overnight visitors, second homeowners and their guests, all of which travel in different ways. While some regular data collection and estimation efforts provide reasonable estimates of some of these various types of visitors, others such as the number of day visitors or the number of second home owners in the Basin at a given time are more difficult to determine. Using multiple publicly available data sources and estimation procedures, the framework we develop here helps to provide a more detailed estimate of the total effective population of the Tahoe Region that considers these differences in population types and classifications.

This document describes the development and parameterization of the Tahoe Effective Population Model (TEPM). TEPM is a bottom-up approach to estimating the annual average daily effective population of the Tahoe Region based on observed traffic counts, visitation records, data provided by the U.S. Census and American Community Survey (ACS), and information on employment and commuters. Applying the TEPM to the most recent year for which all necessary data was available (2018) the daily average effective population for Tahoe Region is estimated to be 118,856 which is comprised of roughly 52,000 full time residents, 5,000 commuters, 15,000 day visitors, 36,000 overnight visitors, and 10,000 second home owners.

The TEPM, like most mathematical models, provides an estimate of the effective number of traveling individuals to the last individual. The precision should not be confused with confidence that the average number of individuals in the region can actually be estimated to the last person. There is uncertainty in many of the input parameters, and we urge caution in treating the estimate as precise of the number of individuals.

DRAFT

TAHOE EFFECTIVE POPULATION MODEL (TEPM)

The Tahoe Effective Population Model (TEPM) is an approach to estimating the annual average daily effective population of the Tahoe Region using a variety of available datasets, in conjunction with information about travel and visitation behavior of residents and visitors derived from surveys and previous studies. 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, which includes three distinct sub-populations (Figure 1).

Total Effective Population of the Tahoe Region:

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

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 are residents, visitors, and commuters. The size of individual sub-populations is then summed to arrive at the effective population. To estimate each individual sub-population, the TEPM approach is adapted from the conceptual framework used by 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 estimated 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 daily to an annual estimate. Application of the approach should acknowledge that the uncertainty in the estimate of the

Effective Population



FIGURE 4: SUB-POPULATIONS OF TAHOE'S EFFECTIVE POPULATION
individual parameters of the model increases with narrowing of the estimation window. That is, annual average estimates are likely to be more accurate than estimates for an individual day.

OVERNIGHT POPULATION

Resident Population - The resident population is derived directly from data provided by the US Census. The US Census Bureau provides a complete estimate every 10 years through the decennial census, and annual estimates every year as part of the ACS. The more recent estimates from the ACS are presented here.

Overnight Visitors – The overnight visitor population is comprised of three different sub-populations, 1) visitors staying at accommodations that collect Transient Occupancy Tax (TOT), 2) visitors staying in campgrounds, and 3) visitors staying in residences where TOT is not collected. The size of each is estimated independently as described below.

- 1) *Overnight Visitors Paying TOT* – The population of overnight visitors staying in accommodations that collect TOT, including casinos, hotels, motels, and resorts, as well as short-term vacation rentals (STRs), can be estimated using information sourced from local jurisdiction's TOT collection reports or data from third party vendors that aggregate the information. TOT reports generally include both the dollar value collected and the number of nights in which accommodations were

occupied. This data reflects the number of hotel/motel/casino/STR units that are rented in the region on an annual basis.

2) *Overnight Visitors at Campgrounds* – Overnight visitors at campgrounds within the region.

Campground occupancy is reported separately by individual campground operators and added to produce the total number of occupied “units” in the Region.

3) *Overnight Visitors in Accommodations where TOT is not collected.* The number of residences where *TOT is not collected* is estimated using data on the total number of residences in the region, and data from the US Census American Community Survey (ACS), which identifies the number of “vacant” units and the number of units occupied on a “Seasonal/Recreational/ Occasional” basis. Such visitors may include second homeowners, guests staying with friends, or seasonal renters (i.e., anyone who has a primary residence outside of the region). Because this category ostensibly includes some short-term rentals (STR), which are included in the above overnight visitor estimate, the known STR units are subtracted from the total number of units used to calculate occupancy for the category. With the remaining units, an estimated annual occupancy is assigned to determine the number of second home units that are occupied on an average day. Lastly, similar to the overnight visitor estimate, the approach relies on a suite of parameters related to visitor behavior, including the average number of vehicles per unit, length of stay, and vehicle occupancy to reach the final population estimate.

Overnight Visitors in Accommodations where TOT is not collected:

(1) Number of Seasonal Residential Units = Total residential units – Units occupied by residents – Number of STRs – Vacant Units

(2) Overnight Seasonal Visitors = Number of Seasonal Residential Units * % occupied * Individuals per unit

After estimating the number of occupied units of each type, the number of visitors at each type is calculated by using an estimate of the average party size staying at each accommodation type.

Overnight Visitors in the Region:

(1) Number overnight visitors = Number of Occupied Units * Average Party Size

POPULATION ENTERING THE REGION

The population entering the region during a day consists of six sub-populations: 1) non-resident incoming commuters, 2) resident outgoing commuters who then return at the end of the day, 3) day visitors, 4) overnight visitors arriving, 5) resident day trips and 6) overnight visitors making day trips to destinations outside the region and returning for their overnight stay. Estimation of the total number of cars entering the region on a daily basis is considered the most reliable variable of the equation to estimate the

$$(1) \text{ Total Entry Trips} = \text{Day Visitors} + \text{Incoming commuters (Non-residents who work inside)} + \text{Outgoing commuters (Residents who work outside)} + \text{Overnight Visitors Arriving} + \text{Overnight Visitor Discretionary trips} + \text{Resident Discretionary Trips}$$

population entering the region on a day, and is used as a limiting factor to balance the individual sub-population sizes. That is, if there are 30,000 trips entering the region on an average day, the total number of trips of the contributing subpopulation trips cannot exceed 30,000. Because sub-population sizes are balanced against observed traffic counts, augmentation of the size of a sub-population reduces the size another sub-population in the traveling into the region. This means that if traffic counts stay constant, and the number of commuters increases, there needs to be an equal size reduction in trips made by the other sub-populations.

The overall approach involves using the best available data on known population sizes and movements. The approach first allocates trips to known parties and the remaining trips are then allocated to day trips into the region, which are considered the least well-known variable.

Overnight Visitors Arriving:

$$(1) \text{ Overnight Visitor Entering} = (\text{Number Overnight Units Occupied} / \text{Length of Stay}) * \text{Party Size}$$

$$(2) \text{ Overnight Visitors Cars} = \text{Overnight Visitors Entering} / \text{Visitors Per Car}$$

Overnight Visitors Arriving- The number of occupied units (paying TOT, not paying TOT, and campgrounds) is used in conjunction with assumptions about the average number of individuals per unit.

The total number of occupied units is divided by the average length of stay to arrive at the number of overnight visitor parties arriving or leaving on an average day. The number of visitor parties is then multiplied by the average party size for accommodation units to estimate the total number of individuals entering the Region. Finally, the number of individuals entering is dividing by the average vehicle occupancy for entry trips to estimate the number of overnight visitor entry car trips. StreetLight data are used in a supplemental fashion to help estimate the number of vehicles attributable to overnight visitors.

Commuters – The commuter population can be directly estimated from data provided by several US Census data programs such as Census Transportation Planning Products (CTPP) and Longitudinal Employer-Household Dynamics (LEHD), or through the use of StreetLight data. Two regional reports, one for the north shore and one for the south shore also estimate the number of commuters (TTCF 2016; Sullivan et al. 2019).

Day Visitors – The population of day visitors is estimated using observed entry traffic volumes, in conjunction with assumptions about vehicle occupancy derived from past surveys. The TEPM approach apportions the total entry vehicles to each of these party types using information from several data sources including StreetLight Data, as well as assumptions about the average length of overnight visitor stay. In the end, the number of day visitor vehicle entry trips are estimated, and a vehicle occupancy assumption is applied to conclude the total day visitor population. Trips that enter the region through one external station and exit through a different location (thru trips) are incorporated in the estimation of day visitors. Because TEPM is based upon trips that enter the region, the entry portion of the thru trip is accounted for in the same manner as day visitors.

ENTRY/EXIT STATION TRAFFIC VOLUMES

Traffic volumes for the entry/exit stations are sourced from big data provided StreetLight Data. Streetlight allows users to place “gates” at any point along the roadway network and to assess the volume of cars passing through the identified point. Points were placed along regional boundary at all seven roadways

(1) Day visitation trips = Total Entry Trips – Overnight Entry Trips – Commute Entry Trips

– Discretionary Entry Trips

(2) Day visitors = Day visitation trips X vehicle occupancy

leading into the region. Estimated AADT, for those points is included in the table below.

Table 7: Streetlight Entry/Exit AADT estimates (2018)

Source	Route	Location	AADT	AADT - Entry
Streetlight	SR431	Mt Rose	6,186	3,093
Streetlight	US50	Spooner	14,044	7,022
Streetlight	SR207	Kingsbury	6,860	3,430
Streetlight	267	Brockway	9,314	4,657
Streetlight	89	Truckee River	9,098	4,549
Streetlight	Hwy 50	Echo	7,632	3,816
Streetlight	89	Luther	1,860	930
	Total		54,994	27,497

Although traffic volume data is collected by the California and Nevada departments of transportation (DOTs), StreetLight Data was used. StreetLight volume estimates are calibrated with DOT data and provide continuous measurement at all entry exits to the region. DOT traffic volume data is currently not collected at all seven of the entry stations. While some DOT count stations are located near entry/exit points, there are several stations where data is collected several miles away from the TRPA boundary (thus potentially including/excluding trips that never enter the region) and other stations where no reliable data is available at all. Moreover, for several of the traffic stations on the California side, the data is not collected on a continuous basis and is less reliable. StreetLight Data’s 2018 volumes methodology is the most reliable available data for this time period. Moving forward, as the TEPM inputs are updated over time, it may be necessary to integrate StreetLight Data with DOT counts – or other data sources – to produce comparable volume estimates to 2018. There are known issues with comparing StreetLight Data year to year due to changes to their algorithm methodology. In the future, TRPA will vet new StreetLight volume estimates with DOT data to ensure consistency and accuracy.

RESIDENT POPULATION

The US Census Bureau’s American Community Survey (ACS) continuously gathers economic and demographic data to compliment the decennial census. The population data reported in the 2014-2018 ACS 5-year estimate is a total population of 51,577 in the Lake Tahoe Region.

While the ACS is not a complete count, like the decennial census it addresses some of the shortcomings of the decennial census data. The decennial census uses a date of April 1st to establish residency for the purpose of the count. For regions with seasonal fluxes in population this represents a potentially biased estimate of population, and the continuous ACS sampling may provide a more accurate estimate of the population of the region (Van Auken et al. 2006). ACS population estimates for areas with populations under 65,000 use between 3-5 years of monthly sample data (Van Auken et al. 2006). Differences

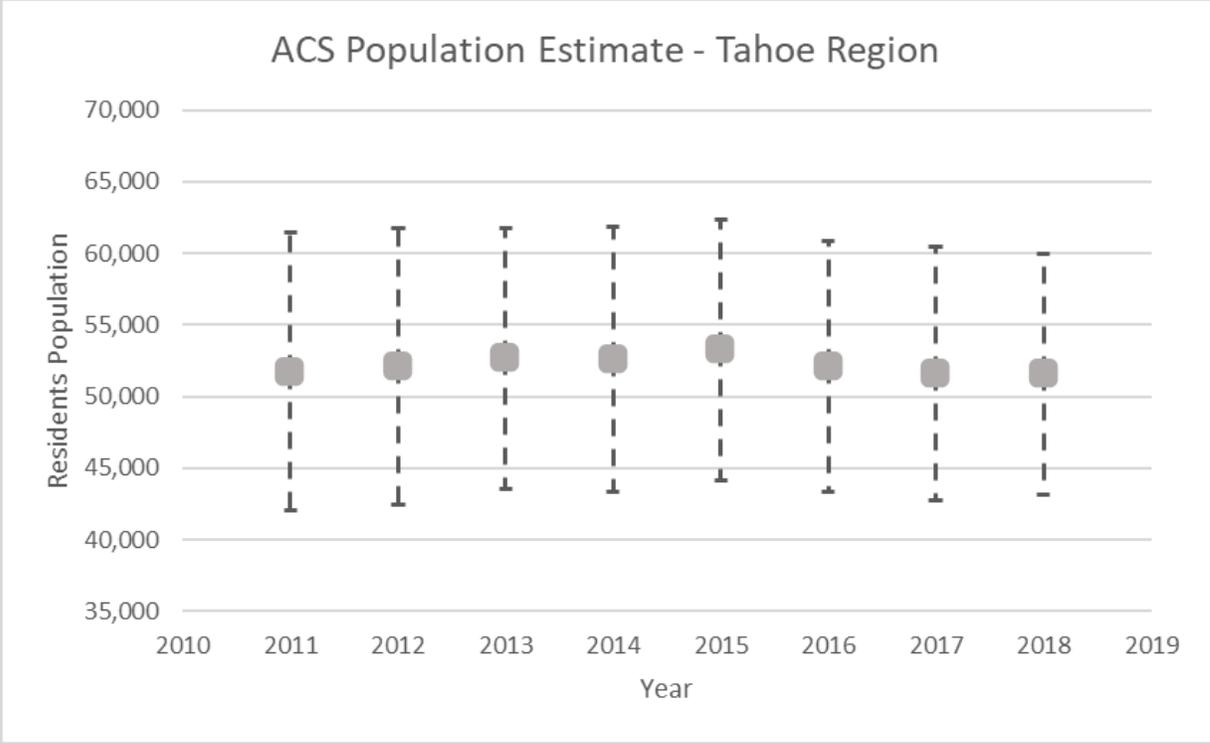


Figure 5: Resident Population of Lake Tahoe Region (American Community Survey 2010-2018) between ACS and Decennial census estimates have been shown to be larger in communities where larger fractions of the housing stock is seasonal (Van Auken et al. 2006).

The 2014-2018 American Community Survey (ACS) 5-year U.S. census estimate suggests that the population for the Region has been relatively stable, having declined only slightly between 2010 and 2018. We rely on these statistics cautiously because the margin of error is larger than the estimated change. The decline in resident population in the Tahoe Region between 2010 and 2018 was in stark contrast to the growth in the states of California and Nevada (US Census Bureau 2019)

COMMUTERS

Commuters are defined as individuals that live in the region and commute out of the region for work, or individuals that live outside the region and commute into the region for work. Because the attribution of entry trips is a zero-sum exercise, if the number of annual average daily commuters is on the higher end of the expected range, the number of day visitors would be reduced. And, because resident populations are already accounted for, the total effective population is also lower. Estimates of the number of commuters in the region from different sources vary greatly and range from 3,500 a day to nearly 10,000 a day, although very few if any estimates exist detail both incoming and out-going commuters for the Tahoe region (TRPA boundary) only. Individual estimates of the commuting population from various sources are discussed in further detailed below as well as the final estimate that is embedded within TEPM.

2017 Corridor Connection Plan

At the lower end of the spectrum for the number of commuters in the region is the estimate of the 2017 corridor connection plan estimate of just under 2,000 incoming commuter trips a day (Albright 2016; TTD 2017). The estimate was developed by Stantec, who was engaged by the Tahoe Transportation District to analyze travel patterns in the region using anonymous cell phone data from AirSage (Albright 2016; TTD 2017). AirSage Analytics is a firm that specializes in processing anonymous cell phone to better understand movement in the transportation system. Using information about device home location, Stantec estimated that 6% of trips entering the region were commuter trips and that there were a total of 21.8 million vehicles trips into or out of the Region annually (TTD 2017). Using the assumption that half of the vehicle volume flows in each direction, there would be 10.9 million trips into the region annually, 29,863 daily, and 1,792 commuters daily. The estimate was treated with some caution because of the low resident trip attribution rate in the Stantec AirSage analysis. The analysis attributed just over 8.8 million trips to residents in the region annually. With an estimated resident population of 55,000, this works out to less than half a trip per day per resident. The national average is about 4 trips a day per person (USDOT-BTS 2017). If residents of the Tahoe region took trips at a similar rate to the national average, that would result in 80 million resident trips a year, nearly ten times the amount estimated in the AirSage analysis.

2020 Regional Transportation Plan

For the 2018 base year analysis for TRPA's 2020 Regional Transportation Plan, and using travel survey, census data, employment data and the Streetlight data, TRPA and WSP estimated that 13% of basin

entry/exit trips were commuter trips (WSP 2020). This estimate includes the entire region and includes individuals residing in the Tahoe Region and commuting to a job outside of the region.

StreetLight Data

The number of commuters can also be estimated directly using Streetlight Data. Streetlight classifies trips in part based on the “home” location of the device that made the trip. One of the classes of trip types StreetLight identifies is “home-based work” trips, which are defined as trips that are taken on a semi-regular basis from the overnight location of the device (home) to daytime location of the device “work.” Streetlight estimates there are 3,000 home based work trips entry the region on an average day. The Streetlight estimate likely underestimates the actual number of home based work trips, because Streetlight’s trip classification identifies a new trip after a five minute stop. Thus if a commuter stopped for gas on the way to a job in the region, and the stop lasted for more than five minutes, the trip would not be identified as a home based work trip.

Housing Needs Assessments

The 2019 South Shore Region Housing Needs and Opportunities assessment estimated that there between 4,480 - 5,555 people commuting into work in the South Tahoe region (Sullivan et al. 2019). The assessment found the average commuter traveled to the region 4.4 times a week; that puts 63% of these trips on any given day (there is a 63% chance that any given commuter is travelling on a particular day; or on average, 63% of commuters are travelling on each day of the week). Taking 63% of 4,480 and 5,500, results in 2,816 and 3,457 commute trips into the south shore area of basin on an average day.

Analyzing a region that included part of the north and west shore of Tahoe, and neighboring areas in Truckee, the Truckee North Tahoe Regional Workforce Housing Needs Assessment (TTCF) estimated that in 2013 that there were 9,271 people living outside the region that commuted into the area for work, and that 5,723 Residents of the region that were commuting out of the region for work (TTCF 2016). Here, we focus on the 9,271 people who were commuting into the area, since we do not have “out commuters” for the south shore area. While the Truckee – North Tahoe study area extends outside the Tahoe region, the estimated percentage of the commuting population may provide insight. The report indicates a total of 15,841 jobs in the study area. TRPA estimates that of these jobs approximately 5,419 are in the Tahoe basin (in Placer County). This means that about 34% of the jobs counted in the TCCP report are within the basin. This amounts to 34% of 9,271, or 3,152 commuters. And, as above, if each commuter makes 4.4 trips per week, and we use a 7-day work week, on average 63% of workers are

commuting on any given day. Thus, on an average 1,985 (63% of 3,152) commuters travelling into the North Tahoe portion of the basin each day.

Utilizing a Streetlight to analyze intraregional commuting between the Tahoe portion of TCCF study region and other portions of the Tahoe Region, we found there are approximately 750 home-based-work trips daily between the two areas. These 750 trips account for only 60% of these trips, and thus we remove a total of 1,250 trips, and estimate 735 commuters enter the northern areas of the basin on an average day.

The housing needs assessments described above cover all portions of the Tahoe region except for Washoe county. We also add another 1,270 commuters, travelling into Washoe County, which is not represented in either of the housing needs reports. Applying the average of 4.4 commute days per week or 63% commuting each day to the Washoe County portion, this adds 63% of 1,270 or 800 commute trips each day. With 2,816 trips into the south shore area, and 735 commute trips into the north area, and these 800 trips into the Washoe County portion of the region, there are 4,351 commuter trips coming into the Basin, each day.

To refine the estimate to only those commuters that travel into the Tahoe Region for work, we utilize Streetlight analysis for an average day in 2019 that estimated intraregional commuting between the north and south shore areas at approximately 140 home-based work trips on an average annual day; if we again assume this represents only 60% of the actual work trips, 140 is 60% of 233 trips. From this we infer that around 233 of the commute trips are made by people who commute between the two areas on an average day. So, we remove these trips from the sum of 4,351 and have a final rough estimate of 4,117 commute trips per day into the basin.

We also add the estimate of 1,973, based on the most recent TRPA resident travel survey This results in a total of for a total of 6,090 commuters going in both directions on an average day. This accounts for 21% of the 29,000 daily trips.

The commute trip estimation based on the NHTS data was derived by identifying travelers within the 2017 NHTS data that had any travel within, into or out of the Tahoe Basin. The Basin was defined using the zip codes and cities within the area. Each trip was evaluated to determine if it was a work trip or not and whether it started and ended inside or outside of the Tahoe Basin. All trips that included more than

one member of the same household were counted as a single trip (though they were reported by every traveler), so as not to double count any trips. There were a total of 600 trips in this subset. Of these, 108 were trips into or leaving from the Basin (the remaining 492 trips were entirely within or entirely outside of the Basin). Only 20 of the 108 trips, or 18% were work trips made by residents and non-residents. Applying this 18% to the total of 27,497 trips into the basin results in an estimate of 4,949 trips.

TABLE 8: TEPM SUMMARY OF DAILY AVERAGE COMMUTE ENTRY TRIPS ESTIMATES

Total Entry Trips (2018)	Commute Trips	% of Total	Commute direction
25,281	4,949	19.6%	Inbound
25,281	1,800	7.1%	Outbound
25,281	6,749	26.7%	Total (both directions)

OVERNIGHT VISITORS

NUMBER OF ANNUAL HOTEL/MOTEL/STR ROOMS RENTED

For the 2018-2019 fiscal year, we estimate 1,754,130 occupied room nights in hotel and motels room basin-wide. In addition to the estimated 482,940 VHR unit rentals, we estimate a grand total of 2,237,070 annual rentals.

Data sources included TOT reports and data from Douglas County, the City of South Lake Tahoe, El Dorado County, Placer County, and Washoe County’s “District B”, which includes North Lake Tahoe properties in Incline Village and Crystal Bay. Estimates and procedures used to derive them for each of the four spatial sub-units vary according to reporting practices of each of the five subregions, and are detailed in Appendix A. Table 3 provides the total estimated rentals by type for each geographic subregion throughout the Basin.

Table 3. Estimated Hotel/Motel Rooms and VHR Units Rented, FY 2018-2019, Tahoe Basin.

Geographic Area	Hotel & Motel Rooms	VHR Units	Total
Douglas County (NV)	805,695	37,488	843,183
South Lake Tahoe (CA)	717,336	110,693	828,029
Placer County (CA)	105,880	233,620	339,500
Washoe County (NV)	125,219	70,072	195,291

El Dorado County (CA) ^a	--	31,067	31,067
TOTAL	1,754,130	482,940	2,237,070

^a Data from the unincorporated area of county within the Basin, but outside of the City of South Lake Tahoe municipal boundary

CAMPGROUNDS

Campsites in the Region are managed by numerous public and private entities including the United States Forest Service (USFS), California State Parks, the City of South Lake Tahoe, and Tahoe City Public Utilities District. Reporting by campground operator varies, as does the reliability of the estimates for the average number of individuals at each site. Campgrounds in the region generally operate from late May through September. The last year for which complete data is available from all operators is 2018, when 99,284 campsite nights were booked within the region (Table 4).

The average number of visitors per campsite is not always captured in reporting. California State Parks currently estimates total visitation based on 4.5 persons per campsite, but suggests it likely represents an underestimate of the total number of visitors served. This is used to generate the estimate for State Parks occupants, based on the reported 32,879 occupied sites. The remaining data on units and estimated occupants were provided by the various reporting agencies. In total, there were 381,857 estimated person nights at campgrounds in the Tahoe Region in 2018, leading to an estimate of 3.8 occupants per site.

Another important element of TEPM is estimating the number vehicles per campsite. This data point was estimated by first estimating the number of vehicles by dividing the number of total occupants by the average vehicle occupancy, which was obtained from the TRPA travel surveys (381,857/3.26in). The number of total vehicles is then divided by the number of campgrounds to estimate the number of vehicles per campsite at 1.8.

Table 4. Campground Unit and Occupancy Estimates, Lake Tahoe Basin (2018)

	USFS	CA State Parks	TCPUD	City of South Lake Tahoe	TOTAL
Units	48,004	32,879	1,331	17,070	99,284
Occupants	173,551	147,956	2,110	58,240	381,857

Occupants/Units	3.6	4.5	1.6	3.4	3.8
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VISITOR LENGTH OF STAY

The 2018 and 2020 TRPA travel surveys showed an average length of stay of 4.28 for overnight visitors staying in short term rentals and 3.44 days for overnight visitors staying in hotels/motels/casino/resorts. Moreover, the survey showed that second homes are occupied on average for 29% of the year.

The 2004 TRPA summer visitor travel survey found the average overnight visitor spent 6.0 days in Tahoe, with longer stays on the north shore (6.6 days) than on the south shore (5.5 days) (NuStats 2004b). Winter survey results revealed similar north-south patterns, with shorter overall lengths of stay (NuStats 2004a). The winter survey found the average overnight visitor spent 4.9 days in Tahoe, 5.3 days for north shore visitors and 4.7 days for visitors to the south shore.

In 2017, Dean Runyon and Associates (DRA) completed a comprehensive review of the economic impacts of visitation on the California side of North Lake Tahoe region for the North Lake Tahoe Resort Association (NLTRA) (DRA 2017). The study area included Tahoe region from Tahoma north and east within the Tahoe region to the Nevada state line. In 2017, NLTRA estimated there were 1,275,000 visitors to the region (NLTRA 2018). The report estimated that there were 3,233,000 visitor days at overnight accommodations in the region (NLTRA 2018). The visitation estimates of the report utilized estimates of both the number of persons per accommodation type (Table 6) and the average length of stay by accommodation type (Table 7). The average length of stay of all overnight visitors to the Region was estimated by the study to be 4.3 nights (DRA 2017).

TABLE 9: PERSON PER UNIT BY ACCOMMODATION TYPE (DRA 2017)

	Hotel/Motel/B&B	Rented Condo/Home	Private/Vacation Home	Campground
Persons per Unit	2	3	2.5	3

TABLE 10: AVERAGE LENGTH OF STAY BY ACCOMMODATION TYPE (DRA 2017)

	Hotel/Motel/B&B	Rented Condo/Home	Private/Vacation Home	Campground

Length of Stay	3.4	3.5	10.4	3.5
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NUMBER OF VEHICLES PER UNIT

NUMBER OF VEHICLES PER SECOND HOME

The number of second homes was estimated using a combination of US Census ACS data, in conjunction with observed STR data from local jurisdictions. The ACS estimates the total number of “seasonal/recreation/occasional” housing units. We can then subtract out the number of known STR units that were reported from local jurisdiction to estimate the number of second homes in the Tahoe region.

We estimate that there are 1.27 vehicles per second home. This estimate is derived using the total estimate of second homes in the basin (20,580), the estimated occupancy rate for the year from recent TRPA surveys (19%), an estimate of 2.5 occupants per occupied second home, and the traveling party size from the most recent TRPA intercept travel survey (1.97). Using the 19% occupancy estimate, that means that 3910 second homes are occupied by 9776 people staying in them. Dividing the occupants per second home estimate by the average occupancy of 1.97 seasonal residents per vehicle (per the travel survey), this translates to 1.27 vehicles per occupied second home.

NUMBER OF VEHICLES PER HOTEL OR MOTEL ROOM RENTED

Throughout the Lake Tahoe Basin, we estimate that an average of 1.08 vehicles accompany visitors for each hotel or motel room rented for FY 2018-2019. Specifically, this is an estimate for the number of vehicles that enter each property where hotel or motel rooms are rented each day throughout the course of a year, attributable to those staying overnight in a rented unit.

There is no existing dataset that reports the number of vehicles attributable to each hotel or motel room rented. While some properties collect this data when a customer reserves a room or checks in at the property, such data are not made available in any centralized way. This should be explored as a future

data collection effort in order to better understand vehicle travel attributable to those who come to stay in the Basin's hotels or motels.

To generate our estimate, we relied on a combination of 1) the hotel and motel rooms reported in the section entitled: "Number of Annual Hotel/Motel/STR Rooms Rented", 2) StreetLight data, and 3) an existing dataset of known hotel and motel properties in the basin provided by TRPA, which includes data on total available units at each property. The estimation procedure is described in full detail in Appendix A.

In short, we created polygon datasets in GIS to represent the 183 known hotel and motel properties throughout the basin that encompassed the structures and adjacent parking areas. Using StreetLight's built-in ability to extract the average number of daily vehicle entries into the 183 polygons in GIS, we could get estimates for four unique volumes of interest. The first is an overall total of inbound vehicles per day. Then, three subtotals that comprise the total inbound vehicles are provided. These are as follows: HBW (home-based work), HBO (home-based other), and NHB (non-home based). These breakdowns are essential to providing a more refined estimate attributable to visitors, as not all vehicles that enter a hotel or motel property each day are those driven by people staying there. To more accurately account for external visitors, we specifically identify trips that enter each property that pass through the seven entry points (Tahoe City, Brockway Summit, Echo Summit, Kingsbury Grade, Luther Pass, Mt Rose Highway, Spooner Summit) to the Lake Tahoe Basin that reach the properties.

Full details, explanations, and justifications about assumptions used to assign inbound vehicle entries to overnight visitors within each of the three subcategories are provided in Appendix A. Briefly, we exclude all HBW trips, then include the following: 95% of the HBO trips that pass through the seven entry points, 90% of NHB trips that pass through the seven entry points, and 20% of NHB trips with origins somewhere in the Lake Tahoe Basin.

After summing each of these three trip type volumes for each property (95% external HBO + 90% external NHB + 20% internal NHB), we produce the estimate of vehicles attributable to a room rental as follows:

- 1) Sum the total estimated daily vehicle entries for all 183 properties, attributable to visitors
- 2) Multiply the daily vehicle entries by 365, then
- 3) Divide this total by the 1,754,130 total annual hotel/motel rooms rented

The final estimated values are presented in Table 5.

Table 5. Analysis Vehicle of Entries to Hotel/Motel Properties.

Trip Type	All Trips	All Internal Trips	All External Trips	Estimated Visitation Trips
HBO Trips/Day (StreetLight)	10,488	9,202	1,286	1,222
NHB Trips /Day (StreetLight)	14,377	12,839	1,538	3,952
<i>Notes on Inclusion Estimates</i>	--	<i>20% NHB</i>	<i>95% HBO, 90% NHB</i>	
Vehicle Entry Trips/Day (95% external HBO + 90% external NHB + 20% internal NHB)				5,174
Annual Vehicle Entries (Vehicle Entry Trips/Day * 365)				1,888,510
Annual Vehicle Entries/Rooms Rented (1,754,130 for FY 18-19)				1.08
Estimated guests per Room (3.2 visitors/vehicle, per visitation survey)				3.45

NUMBER OF VEHICLES PER STR RENTED

The number of vehicles per STR was estimated using information about the size of STRs and the vehicle occupancy entering the region. Detailed information on the size and frequency individual STRs are is not available for the region. In the absence of that data, information on the STRs available for rent in the region was used to establish the likely number of individuals staying in STRs in the region. To estimate the size of STRs information was source from AirDNA on October 15, 2020. AirDNA provides information and market research on vacation rentals nationally. Within Tahoe information on units is available for 11

areas. The total number of estimated STRs is consistent estimates provided by the local jurisdictions. Information on the number of rentals, and average guest capacity of rentals was compiled. The average guest capacity region was 8.3 individuals. Using the conservation assumption that each rental accommodates the full capacity of guests for each visit, and average occupancy of cars entering the basin carrying overnight visitors (3.92), yields a regional estimate of 2.07 (8.13/3.92) cars per STR.

TABLE 11: ESTIMATED SIZE AND OCCUPANCY OF SHORT TERM RENTALS IN THE TAHOE REGION (AIRDNA 2020)

Area	Rentals	Rooms	Guests
Carnelian Bay	355	3.3	8.1
Glenbrook	35	4.1	10.5
Homewood	245	3.4	8.5
Incline Village	681	3.2	7.9
Kings Beach	530	2.7	7.1
South Lake Tahoe	2803	3.1	8.3
Stateline	507	3	8
Tahoe City	903	3.3	8.1
Tahoe Vista	188	2.7	7.7
Tahoma	256	3.1	8.2
Zephyr Cove	303	3.4	8.9
Total	6806	3.13	8.13

VEHICLE OCCUPANCY

Vehicle occupancy is an important TEPM input, as it converts observed vehicle volumes to population and informs several other model estimates. Vehicle occupancy data was sourced from the last two TRPA travel surveys (summer 2018 & winter 2020), which showed an average vehicle occupancy of 2.62 for day visitors, 1.59 for residents, 3.26 for overnight visitors staying in hotel/motel/casino, 3.92 for overnight visitors staying in short-term rentals (STRs) and 1.97 for seasonal residents. The average occupancy of the last two surveys were averaged together to represent both summer and winter time travel behavior. The TRPA travel surveys are intercept surveys where trained field surveyors traveled to popular sites around the Basin and asked people to voluntarily answer a series of survey questions about their travel behavior. The surveys are completed in dozens of different locations throughout the region and includes responses from all party types of interest to this study, such as day visitors, overnight visitors, seasonal residents,

and full-time residents. More information on these surveys can be found at monitoring.laketahoeinfo.org/TravelBehavior.

OTHER ENTRY/EXIT TRIPS

NUMBER OF DISCRETIONARY ENTRY TRIPS

Resident

Resident discretionary trips include trips residents make to destinations outside the region for purposes other than work or school. For example, this would include trips to Alpine Meadows or Kirkwood to ski, or trips to Reno or Carson City to shop, dine, or see a show. The National Household Travel Survey (NHTS) indicate that 23% of entry trips are resident discretionary, which equates to roughly 5,750 resident discretionary entry trips.

Visitor

Visitor discretionary trips include trips overnight visitors staying within the basin make to destinations outside the region. The TRPA travel demand model estimates that 7% of overnight visitors make a day trip out of the region. This 7% estimate is then applied to the total TEPM overnight visitor population to conclude the number of overnight visitor discretionary trips.

SHUTTLES

Shuttle services operate daily between Reno and the north and shore shores. Relative to the total number of individuals arriving in the region on a daily basis, the number that arrive on passenger shuttles is relatively small, and the total effective population estimate was not adjusted for shuttle arrivals. If the number of passengers arriving on shuttles substantially increases, they should be accounted for in future estimates.

TABLE 12: SOUTHSHORE PASSENGER SHUTTLE ARRIVALS (2017-2019)

Year	Total Passengers	Arriving Passengers	Daily Passenger Arrivals	Source

2017	62,033	31,017	85	Amador Stage Lines
2018	63,033	31,517	86	Amador Stage Lines
2019	64,477	32,239	88	Amador Stage Lines

FREIGHT

Freight trips account for roughly 3-5% of total entry/exit trips on any given day. Both StreetLight Data and Caltrans Traffic Census data indicate this magnitude of freight trips which equates to roughly 750 freight trips entering the region on an annual average day.

SUMMARY

In summary, the TEPM 2018 estimate is an effective population of 118,856 for the Tahoe region. This estimate is comprised of 52,000 full time residents, 5,000 commuters, 15,000 day visitors, 36,000 overnight visitors, and 10,000 second home owners.

For more information about the quantitative TEPM data inputs and to test out other assumptions, we've developed an interactive, web-based tool. You can visit the tool at trpa.shinyapps.io/effective_population. The tool displays all of the quantitative assumptions of the 2018 TEPM estimate and the final model outputs. Moreover, the tool allows the user to enter different quantitative inputs and observe how those assumptions impact the final population estimate. If stakeholders have additional information related to the TEPM inputs, they are able to enter this information to potentially refine the 2018 population estimate.

UNCERTAINTY

There are a number of elements of uncertainty that should be considered when evaluating these estimates. These can be classified as uncertainties inherent in the data sources, and uncertainty in their representativeness. We discuss these below, including some suggested ways to mitigate uncertainty where applicable.

Data Sources

The data found by or provided to the study team included either comprehensive counts (such as the TOT reports), and those that were themselves samples or estimates (such as the StreetLight data and the NHTS data). The estimates that carry the most uncertainty are: 1) those that attempt to account for the number of vehicles per visitor type, and 2) accounting for those occupying second homes at any given time in a year. Day visitation is estimated by the model, so while the estimate contains uncertainty, that uncertainty is consistent with the overall model uncertainty, not uncertainty associated with a specific data source. Each require compiling a number of different sources. As a general note, it is clear that day use visitation statistics are an area of uncertainty that need more targeted data collection efforts to better improve estimation precisions.

StreetLight data were necessary to generate estimates of vehicles attributable to those renting hotel or motel rooms, and as detailed above, required a number of assumptions to arrive at an estimate. StreetLight data themselves also carry their own elements of uncertainty. First, they represent a sample of travel collected from a subset of mobile devices that had location services enabled while in use in the study area. That means derivative data are reflections of those carrying such devices and may therefore be biased. Second, the way that StreetLight delineates separate trips (through the 5-minute of stationary activity), and the implications that carries for how trips are classified (as HBW, NHB, or HBO) are a real issue for delivering accurate estimates for visitor travel in the Lake Tahoe Region. Ultimately, a more robust value could most be generated by collecting vehicle count data when someone reserves a room at one of these properties. This may require developing and maintaining a central database that could be populated when a visitor reserves a hotel or motel room and indicates the number of vehicles that will accompany them. We do acknowledge, though, that those reserving rooms may not always be forthcoming about the numbers of accompanying vehicles.

The estimate of those in the region's second homes (and the vehicles accompanying them) also will require future attention and data collection efforts. In this report, we use a compilation of ACS data and survey data responses, such as those collected from Placer County second homeowners. It is possible that these are not reflective of second home use throughout the Lake Tahoe Region. There is no question this is a difficult population to collect information about, though we recommend distributing a future survey to second homeowners who have properties that are *not* registered STRs throughout the region that collects information generally on: 1) occupancy length and frequency over the past year, 2) number of occupants that are at the property over those times, and 3) the number of vehicles that accompany

them. Alternatively, local officials could drive past identified properties on a given day and record number of vehicles they see at these properties, though such an effort may be problematic for a number of reasons.

Finally, we also recognize that renting out rooms in residents' primary and secondary homes to those seeking shorter-term housing is a common practice, and that no data set reviewed or estimation procedure detailed in this study captures travel from this group. This is also a somewhat trickier topic to ask about, too, but does warrant an acknowledgment and future consideration in developing population estimates.

Representativeness. To generate our estimates, we relied on data collected from both 2018 and 2019. This was done so as not to include data that might reflect changes brought about by the COVID-19 pandemic. In some cases, these 2018-2019 data were the most recent available, but others included 2020 values. Indeed, finding a consistent time period across multiple datasets for efforts like this is not uncommon, though we note that we are fortunate to have consistent data as recent as 2018 for all relevant estimates. In addition, some data were provided at the both the annual and fiscal year levels, so adjustments were required to ensure consistency, as outlined in Appendix A.

However, to what extent visitation in 2018-2019 is representative of that of a "normal" year is also a consideration that should be evaluated in the future. Still, the methods and estimation techniques outlined here could be applied to other years, assuming similar datasets are available. Should formats or availability change in the future, adjustments will need to be made to the procedures developed here.

It should also be noted that the TEPM approach presents a daily annual average estimate, and that daily, weekly, monthly, or seasonal variation certainly is present in these relative volumes throughout the year. A day in July may show markedly different relative volumes than a day in April or October. Special events, particularly good (or bad) ski conditions, wildfires, or other causes of unusually high or low travel to the region can dramatically change the balance of the varying subpopulations considered in the model. Future data collection efforts should consider better ways to consistently collect and report information at finer time scales across these groups to gain a better understanding of these fluctuations.

FUTURE DATA NEEDS

The TEPM approach is predicated around knowledge of the total number of entry trips into the region on each day. As previously mentioned, the current model relies upon StreetLight Data for 2018 volumes. Although StreetLight data is currently the best available source of data, it is still an estimate and not an observed count. This creates uncertainty given potential changes to StreetLight’s algorithm over time. In the future, sourcing the data from actual traffic counters at all seven entry/exit points would provide the most reliable data. Out of the seven stations, there are currently 3 which have reliable, continuous data collected by the state DOTs. The four other stations either have non-continuous counter, and counter located near but not at the desired location, or not counter at all. Continuous and reliable counter data at all seven entry/exit stations would ensure the most accurate and precise TEPM estimates in the future.

Route	Location	Continuous counter	Data Quality
SR431	Mt Rose	Needed	NA
US50	Spooner	Existing	Good
SR207	Kingsbury	Needed	NA
267	Brockway	Existing	Good
89	Rampart	Existing	Poor
Hwy 50	Echo	Existing	Poor
89	Luther	Needed	NA

APPENDIX A: VISITATION DATA ESTIMATES AND METHODS

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Introduction.

The research team from the Department of Geography at the University Of Nevada, Reno (UNR) collected and generated estimates for four primary parameters for Tahoe Effective Population Model (https://trpa-shiny-apps.shinyapps.io/effective_population/), all of which were related to various components of visitation. These four are:

1. Number of Annual Hotel/Motel/VHR Rooms Rented
2. Second Home Occupancy
3. Average Number of Vehicles per Lodging Room Rented
4. Number of Occupied Campgrounds and Visitors per Campground

This document provides detailed information about the methods and assumptions used to generate the estimates in the overall document. It also lists relevant data sources, so that these estimates may be reproduced in the future. Each of the four estimates are individually described in their own sections below.

Number of Annual Hotel/Motel/VHR Rooms Rented

Summary

For the 2018-2019 fiscal year, we estimate that there were **1,754,130** occupied room nights in hotel and motel rooms throughout the Tahoe Basin. In addition to the estimated **482,940** VHR unit rentals during the same time period, we estimate a grand total of **2,237,070** nights in paid overnight accommodations (Table 1).

Data sources used to produce these estimates primarily include transient occupancy tax (TOT) reports, and where necessary, supplementary data, from Douglas County, the City of South Lake Tahoe, Placer County, and Washoe County's District B, which includes North Lake Tahoe properties in Incline Village and Crystal Bay. Estimates and procedures used to derive total rentals for each of the subregions that comprise the grand total are described below. Table 1 provides the total estimated rentals by type for each geographic subregion throughout the Basin.

Table 1. Estimated Hotel/Motel Rooms and VHR Units Rented, FY 2018-2019, Tahoe Basin.

Geographic Area	Hotel & Motel Rooms	VHR Units	Total
Douglas County (NV)	805,695	37,488	843,183
South Lake Tahoe (CA)	717,336	110,693	828,029
Placer County (CA)	105,880	233,620	339,500
Washoe County (NV)	125,219	70,072	195,291
El Dorado County (CA) ^a	n/a	31,067	31,067
TOTAL	1,754,130	482,940	2,237,070

^a Data from the county within the basin but outside of South Lake Tahoe
Douglas County

Douglas County, Nevada, provides room tax revenue data on an annual (fiscal year) basis. The County categorizes these data into two geographic regions (“Lake”, and “Valley”, the former of which corresponds with properties in the Lake Tahoe Basin), and into three distinct types: 1) Lake Casinos, 2) Vacation Homes, and 3) Other Lake-Not Casinos.

Casino rooms rented in Douglas County’s Lake region in FY 18-19 are **558,531**. For non-casino rooms, this total is **284,652** rooms, which includes VHR rentals.

Reporting on Vacation Home room sales, however, did not begin until FY 2019-2020. The challenge to using these data is that the COVID-19 outbreak overlapped with the last four months of the fiscal year in which data were reported, reflecting a precipitous drop in room rentals. Indeed, no rooms of any kind are reported rented in May or June 2020 in Douglas County. Between July 2019 and February 2020, which is the last month before COVID-19 related shutdowns began, **25,117** VHR rooms were reported as rented. To produce an estimate for VHR rentals in the county, we pro-rate data reported for the 8 months preceding the onset of COVID-related lockdowns and travel restrictions to a 12-month estimate of a “normal” year, bringing the total estimated VHR rooms in Douglas County to **37,488**. In absence of data for FY 2018-2019, we use this estimate for the year of interest.

Further complicating estimation is that in reporting years prior to FY 2019-2020, VHR rentals in the Lake Tahoe Basin in Douglas County were categorized as “non-casino rooms.” Therefore, reporting the non-casino rooms as-is from the FY 2018-2019 report in addition to the prorated VHR room estimate would double-count totals in the former category, so we remove 37,488 (the VHR estimate) from the 284,652 non-casino rooms estimate for FY 2018-2019. In total, then, we estimate **805,695** hotel and motel room rentals in the Basin (558,531 + 247,164) in FY 2018-2019 and **37,488** VHR rentals.

In total, then, we estimate a total of **843,183** rentals that include the estimated casino and non-casino rooms rented, and VHR units rented within the Lake region of Douglas County, Nevada.

Data Source: <https://www.douglascountynv.gov/cms/one.aspx?portalId=12493103&pageId=13612059>

South Lake Tahoe

The City of South Lake Tahoe provides TOT data and reports on a monthly basis, although they are organized on the city’s website on an annual basis that begins in October and runs through the following September. Each monthly report provides a wealth of information, though of most interest to this estimate is Page 2 of each report, which includes 1) room nights rented in hotels and motels, and 2) VHR units rented. Additional information provided includes total room nights, units available, occupancy percentage, average room price, and a comparison of each metric to that of the previous year.

To stay consistent with the Douglas County estimates, we reported totals for each month in FY 2018-2019 (July 2018-June 2019).

In total, **717,336** hotel and motel room nights were reported as rented in South Lake Tahoe. In addition, there were **110,693** VHR unit rentals between July 2018-June 2019. .

In total, then, we estimate a total of **828,029** rooms that include the estimated hotel and motel rooms, and VHR units within South Lake Tahoe, California.

Data Source: <http://www.cityofslt.us/588/TOT-Reports> (each month July 2018-June 2019)

Placer County (only within Tahoe Basin)

Placer County TOT data were provided directly to the research team from Placer County employees, and can be accessed on request from the county. The data provided to the team is the “Statistical YTD August 2020 dataset”, which includes data collected county-wide from FY 2016-2017 through FY 2020-2021. Data are provided on a quarterly basis for each of these fiscal years. To stay consistent with the other geographic subregions, we isolated data for the FY 18-19 fiscal year by selecting only records with records in the TOTQTR field of either: 18-19Q1, 18-19Q2, 18-19Q3, and 18-19Q4.

Since this was a county-wide dataset, we next had to isolate records for only the Lake Tahoe Basin, using the county-provided geographic designations. These included the following designations: Carnelian Bay, Kings Beach (plus O.P.A.), Tahoe City (plus O.P.A), Tahoe Miscellaneous, and West Shore. “West Shore” seems to be a catch-all for the other cities along the West Shore that do not have specific city-level geographic identifiers.

To estimate hotel and motel room rentals, we isolated records that had one of the following designations: hotel, motel, or bed and breakfast, and tabulated those rooms rented across each of the four quarters in the FY 18-19 period. In total, **105,880** hotel, motel, or bed and breakfast room rentals are recorded in the Lake Tahoe Basin within Placer County during FY 18-19.

To tabulate VHRs, we isolated all records that had the following designations: “Condo”, “CondoTel (or Condohotel)”, “Duplex”, “Home”, “Triplex”, “Timeshare”, or “Other.” There were a handful of quarterly records that were unreported for some records with these designations, while three of the other quarters were reported. In these cases, mean imputation for the category using the other three quarters’ records in the FY were used. In total, then, we estimate **233,620** VHR unit rentals during FY 18-19 in Placer County.

The estimated combined total of rentals, then, is **339,500** in the Placer County portion of the Lake Tahoe Basin during FY 18-19.

Washoe County

The geographic area of interest for occupancy estimates in the Lake Tahoe Basin in Washoe County, Nevada, includes both Incline Village and Crystal Bay on the North Shore of Lake Tahoe. Washoe County reports room occupancy statistics within various subregions of the county, which encompasses everything from the area adjacent to Lake Tahoe north to the Oregon border. It designates District B as that area within the Tahoe Basin that includes Incline Village and Crystal Bay, and its Monthly Hotel Statistics FY 18-19 document reports all rentals for this “North Lake Tahoe” area together.

However, the way it reports room occupancy differs from the other three counties (there are no tourist accommodations in Carson City portion of the Tahoe basin). A combination of the Monthly Hotel Statistics Document for FY 18-19 from Washoe County, Washoe County District B Occupancy & Revenue History document, and a discussion with Washoe County employees were used to generate the necessary estimates.

First, we used each month’s “North Lake Tahoe” hotel occupied records for each month between July 2018 and June 2019. This required recording both cash occupied rooms (“Cash Occ.”) and compensated

rooms (“Comp Occ”), noted in Table 2, which are fields in the Monthly Hotel Statistics Document for FY 18-19 from Washoe County. Using these records, which only report hotel room rentals, we estimate **121,531** hotel rooms rented during FY 2018-2019 (Table 2). The (“Total Occ”) comes from the Washoe County District B Occupancy & Revenue History document, which we use to isolate and estimate non-hotel rentals. Hotel rooms are reported as a separate category of all cash rooms in Washoe District B, in addition to the general term of “Cash Rooms,” which can include both motel rooms and VHR rentals.

Table 2. Washoe County, Nevada, Estimation of Occupied Hotel/Motel rooms and VHRs, FY 2018-2019.

Month	Cash Occ.	Comp Occ.	Hotels (Cash + Comp)	All Washoe B Cash Rooms	Non-Hotel Rentals (All - Hotels)	Motels (5% of non-hotel)	VHR (95% of non-hotel)
Jun-19	11,368	287	11,655	18,916	7,261	363	6,898
May-19	7,964	279	8,243	12,902	4,659	233	4,426
Apr-19	6,623	243	6,866	11,182	4,316	216	4,100
Mar-19	8,065	281	8,346	15,507	7,161	358	6,803
Feb-19	9,019	549	9,568	15,131	5,563	278	5,285
Jan-19	8,769	377	9,146	16,484	7,338	367	6,971
Dec-18	8,546	375	8,921	15,711	6,790	340	6,451
Nov-18	8,771	266	9,037	13,652	4,615	231	4,384
Oct-18	9,893	255	10,148	13,886	3,738	187	3,551
Sep-18	11,563	288	11,851	19,593	7,742	387	7,355
Aug-18	13,134	294	13,428	20,116	6,688	334	6,354
Jul-18	13,817	505	14,322	22,211	7,889	394	7,495
TOTALS	117,532	3,999	121,531	195,291	73,760	3,688	70,072

Specifically, we note that cash rooms include any rentals where TOT is paid, including 1) the aforementioned hotel-specific reporting, but also 2) motels, time share rentals, and VHR rentals registered with Washoe County. Hotel rooms, then, are the only ones clearly categorized in the reports. Subtracting the hotel rentals from all cash rooms throughout Washoe B provides a remainder of “non-hotel” rentals that ranged from a minimum of 3,738 in October 2018 to a maximum of 7,889 in July 2018. The exact breakdown of these non-hotel rentals in Washoe B was initially unclear, so a meeting with Washoe County Staff in November 2020 helped to finalize the estimation.

Based on statistics provided during this conversation, we estimate that 5% of the non-hotel rentals are motel room rentals, while the remaining 95% are VHR rentals. Adding these motel room estimates (3,688) to the hotel room rentals (121,531), we estimate a total of **125,219** hotel and motel room rentals in Washoe County in FY 2018-2019. Assuming that 95% of the non-hotel rentals in Washoe B were VHRs,

then, we estimate that there were **70,072** VHR rentals in FY 2018-2019. In total, then, we estimate **195,291** total rentals in the Washoe County portion of the Lake Tahoe Basin in FY 2018-2019.

5) El Dorado County

This final geographic subregion to account for is the unincorporated part of El Dorado County that does not include South Lake Tahoe. To estimate rentals for FY 2018-2019, we use TOT data collected by El Dorado County and provided by request to the research team. El Dorado County provided quarterly TOT income for all quarters, beginning from Q3 of 2015. These data did not include the number of units nights rented, but did include a breakdown of permitted units by type. Quarterly revenue figures includes TOT collected by platforms like AirBNB from both permitted and unpermitted units. The vast majority of permitted rentals in El Dorado county are vacation homes (Table 3). Because the majority of the units are VHRs, for the purposes of this estimate procedure, we treat all El Dorado County rentals as VHRs.

Table 3. Permitted Units by Type, Unincorporated El Dorado County in the Lake Tahoe Basin, FY 2018-2019.

Type	Number Permitted	Unit Type Proportion
Homes	895	97%
Rooms	20	2%
Other	2	0%
BNB	1	0%

The El Dorado County TOT rate is 10%, and this has been the case for the entire period of record. AirDNA estimates that the average unit cost in the Lake Tahoe portion of El Dorado County is currently \$355/night. To estimate the number of units rented in each quarter, the TOT reported collected was divided by the 10% TOT rate to arrive at the total amount spent on VHRs in the quarter. The total spent on VHRs was then divided by the average cost of a night in an VHR to arrive at the total unit nights rented. In the 2018 calendar year, there were 18,461 unit nights rented, and 43,673 in 2019. Because the vast majority of the units are VHRs, we treat all rentals as VHRs for the purpose of population estimation.

To transform these calendar year estimates into 2018-2019 FY estimates that are used throughout the document, we take half of each individual year total and sum each of these halves, producing a final estimate of **31,067** unit nights rented.

No hotel or motel rooms were reported as rented in the unincorporated part of the county within the Lake Tahoe Basin. Within the effective population estimation framework treating all rentals in El Dorado County as vacation rentals rather than hotel room rentals is likely to produce a slightly higher estimate of the number of overnight visitors in the County because average occupancy of a VHR is higher than a hotel room.

2) Percentage of Occupied Second Homes

This has remained one of the more difficult parameters to estimate and should be a priority of future data collection efforts. To generate an estimate with existing data, first, we identify all homes classified as those for seasonal or recreational use, per American Community Survey (ACS) 2014-2018 5 year estimates at the US Census Block Group level (Table 4), which shows these home comprise a substantial portion of

the housing stock in the Lake Tahoe Basin. This classification (seasonal or recreational home) identifies second homes. Table 4 also presents all units classified as vacant (unoccupied for at least 6 months out of the year), and all units in the housing stock in each county's portion within the basin. Most classified vacant units, unsurprisingly, are second homes.

Table 4. Summary Statistics for Vacant and Second Home Units for all geographic subregions of interest in the Lake Tahoe Basin.

County	All Units	Vacant Units	% Vacant (of all units)	Seasonal or Rec Use	% Seasonal or Rec Use (of Vacant)	% Seasonal or Rec Use (of all Units)
Douglas	4,809	2,312	48.1	1,944	84.1	40.4
El Dorado	25,298	13,815	54.6	12,273	88.8	48.5
Placer	12,331	8,903	72.2	8,434	94.7	68.4
Washoe	7,931	4,126	52.0	3,431	83.2	43.3
TOTAL	50,369	29,156	57.9	26,082	89.5	51.8

Source: ACS 5-yr estimates (2014-2018), for all units, vacant units, and units designated for seasonal or recreational use for all US Census Block Groups within Tahoe Basin

Next, we sought to quantify the number of these second homes that were *not* registered as VHRs, as these are likely occupied by a second home owner for a period of time at some point in the year. Additionally, VHR rentals have already been accounted for in the previous section. We acknowledge that the following estimates of non-VHR second homes may be unregistered VHRs and rented out to visitors anyway, but without data on such properties, we can only speculate as to the degree to which this occurs. Therefore, occupancy may in fact be higher than we can estimate.

To identify non-VHR second homes, we compiled data on units registered as VHRs within each county in the Lake Tahoe Basin. Using these totals and the totals of all homes designated for seasonal or recreational use within each county, we could produce an estimate of non-VHR second homes. Data on registered VHR units for each county are as follows:

Placer County (Lake Area): **3,344**

Source: MHC White Paper (https://www.mountainhousingcouncil.org/wp-content/uploads/2019/10/mhcstrwhitepaper_final.pdf)

This represents 39.6% of the 8,434 units designated as those for seasonal or recreational use, according to the ACS 2014-2018 estimates. Therefore, we estimate 5,090 non-VHR second homes (Table 5).

South Lake Tahoe: **1,861**

Source: Table 2.3, *Socioeconomic Impacts of Vacation Home Rentals in South Lake Tahoe* (https://cityofslt.us/DocumentCenter/View/7908/SLT-Vacation-Home-Rental_Final-Report_6-5-17?bidId=)

However, recent policy enacted by the City of South Lake Tahoe moved the maximum to **1,465**, which we use in this estimate, leaving 10,808 non-VHR second homes.

For both Douglas County and Washoe County, there are no publically-available data on registered VHRs as of this writing, so we assume the same proportion of registered units in each location as there are in Placer County (39.6%). This produces estimates of 771 and 1,360 such units, respectively, for each county. Further data collection efforts should prioritize gathering accurate tabluations of these totals.

Subtracting these registered VHRs units from the total of all designated for seasonal or recreational units produces the estimate of 19,335 non-VHR second homes in the Lake Tahoe Basin (Table 5).

Table 5. Estimates of Non-VHR Second Homes, Lake Tahoe Basin.

County	Seasonal or Rec Use	Registered VHR	Non VHR Second Homes
Douglas	1944	771	1,173
El Dorado	12273	1465	10,808
Placer	8434	3344	5,090
Washoe	3431	1167	2,264
			19,335

To estimate occupancy per day across the year, we used data collected from a survey distributed to 555 second home owners in Placer County in Spring 2018 (<https://www.flashvote.com/placer-ca/surveys/second-home-rental-program-ideas-04-18>). Table 6 shows the frequency that respondents indicated they were at their second home during the course of a given year. Complicating the estimate is that the survey prompted the respondent to choose one of the categorical answers in the survey (<1 month, 1-3 months, 3-6 months, 6 months or more). We convert these categories to days spent in their home across a given year, by using the midpoint of each category. For example, a respondent that answered they were in their home 1-3 months out of the year was treated as being in the 61 days a year (mid point between 1-3 months). Using the midpoint, we find 29.3% of second home owners reported presence in their homes 15 days a year, 33.8% are there 61 days a year, and 20.5% are there 137 days a year (Table 6). Out of the possible 1,095 possible occupancy days (365 days in each of the three categories), this means that 213 out of 1,095 (19.5%) of possible days are estimated to be occupied. We also estimate that this translates to 19.5% of occupied days over the course of a given average year. This is of course imperfect, as stays can overlap, so future research is needed to produce a more robust estimate. However, this value is close to that found in the Lake Tahoe visitation intercept survey effort.

Table 6. Second Home Occupancy Estimates, using Placer County survey responses

How Often are you there?	Survey %	Occupied Days of Year ^a	Occ. % of Year	Homes Occupied by Second Home Owners on an average day (out 19,335)
< 1 month	29.3	15	4.1	232
1-3 months	33.8	61	16.7	1091
3-6 months	20.5	137	37.5	1486
Remainder ^b	16.4	0	--	--
TOTALS		213		2810

%		19.5		15.0
---	--	------	--	------

^a for calculations, midpoint of range is used,

^b not occupied by non-VHR second home owner. Rented out to others, so would be short or long term rental, not evaluated here, not is considered occupied by non-VHR second home owner.

Our figures do not account for the survey response weights, which show that the highest frequency category is those who are in their second homes 1-3 months out of the year. To weight by survey responses, we first translate occupied days per year to the percentage of the year occupied. We then multiply the yearly occupied percentage by the total number of non-VHR second homes to estimate how many homes are occupied at any given point throughout the year by these home owners. This produces a total of 2810 of second homes occupied at any given point in the year out of 19,335, or a total of about 15%. This is the equivalent of use of the average second home on about 4.5 nights a month or just over two weekends a month.

3) Average Number of Vehicles per Lodging Room Rented

Basin-wide, we estimate that there is an average of **1.08 vehicles** accompany each hotel or motel room rented throughout the year. Specifically, this is an estimate for the number of vehicles that enter each property where hotel or motel rooms are rented each day throughout the course of a year, attributable to those staying overnight in a rented unit.

There is no existing dataset that reports the number of vehicles attributable to each hotel or motel room rented. While some properties collect this data when a customer reserves a room or checks in at the property, such data are not made available in any centralized way. This should be explored as a future data collection effort in order to better understand vehicle travel attributable to those who come to stay in the Basin’s hotels or motels.

To generate our estimate, we relied on a combination of 1) the hotel and motel rooms reported in the previous section: “Number of Annual Hotel/Motel/VHR Rooms Rented”, 2) StreetLight data, and 3) an existing dataset of known hotel and motel properties in the basin provided by TRPA, which includes data on total available units at each property. The estimation procedure is described below.

Geocoding and GIS work

First, we geocoded the 183 known hotel and motel properties in the Lake Tahoe Basin from the dataset provided by TRPA using ESRI’s API, based on the street address record associated with each property. This produced 183 points. Next, we digitized polygons in ArcGIS around each of these 183 points that represented the full hotel property. As a digitizing rule, polygons had to encompass both: 1) the buildings associated with the hotel or motel, 2) and any adjacent parking lots where customers could park. Parking lots were generally obvious in terms of association with certain hotel or motel properties simply by viewing aerial imagery, thus making the heads-up digitizing relatively straight-forward, but in some cases, it was less clear which parking lot was associated with which motel. In these cases, a known parking lot GIS dataset provided by TRPA that included parcel records was used to match against the APN of the hotel/motel and the associated parking lot. As an additional check, all digitized polygons were compared to the parking lot GIS dataset’s APN values to ensure they were matched with the correct property. Each of the 183 polygons were mutually exclusive (non-overlapping), and also digitized at such a scale so as not to overlap with busy roads adjacent to hotel properties, which would inflate traffic count estimates.

StreetLight Data Analysis

Next, we used StreetLight's built-in ability to extract the **average number of daily vehicle entries** (for calendar year 2018) into any user-defined zone of interest. We used each of the 183 hotel property polygons that are not used as full time residences as the zones of interest, allowing StreetLight's built-in analysis to produce an estimate of average daily vehicle entries for each polygon (which represented each hotel/motel property and its associated parking lot). The output produced by the StreetLight analysis is a useful starting point, but a number of steps were required to produce a reasonable final estimate of vehicle entries attributable to visitors staying at the property.

StreetLight's analysis provides four (4) different values in its output. First, an overall total of **inbound** vehicles per day is provided for any zone of interest: in other words, the zone (the hotel polygon) reports only daily vehicle entries. Then, the total trips are subcategorized as follows: HBW (home-based work), HBO (home-based other), and NHB (non-home based) vehicle entries, which together sum to the total trip entry value. These breakdowns are essential to providing a more refined estimate attributable to visitors, as not all vehicles that enter a hotel or motel property each day are those driven by people staying there.

One technique that helped our estimate was to leverage the limited number of entry points to the Tahoe Basin. There are seven such points along major roads, most of which are mountain passes. These include 1) 89 - Tahoe City, 2) Brockway Summit, 3) Echo Summit, 4) Kingsbury Grade, 5) Luther Pass, 6) Mt Rose Highway, and 7) Spooner Summit. For the Streetlight analysis, we set the "Origin" as each of the seven entry points, which carry a unique volume of traffic to the "Destination", which is each hotel property.

We then ran separate analyses for 1) all entries to hotel properties, which we refer to as "all trips", including all entries regardless of where the vehicle originated, and 2) all vehicle entries that had the seven basin entry points as origins, with the destinations as hotel properties. We refer to this second group of trips as "external" trips, as they travel through one of the passes to reach the property.

This allowed us to produce a balance of trips with greater spatial precision, as subtracting external trips from all trips leaves only those trips with origins inside the Basin (we refer to this group as "internal" trips), which is helpful for producing estimates for each of the trip types. Using the trip type designations (HBW, HBO, and NHB), and the all trips, external trips, and internal trips categorizations, we could produce the estimates summarized in Table 7 below. Each subsection contains an explanation of considerations, and concludes with a concise estimate assumptions statement to help with comprehension of Table 7.

Home-Based Work Trips

HBW trips are those where home is one end of the trip and work is the other. For our analysis, given that the hotel or motel property is one of the anchors, and unless someone lives at the property, is not a home location for anyone, we assume these are employees' trips that reach the property. Therefore, we assume **none** of these trips are attributable to visitors, and therefore not included in potential visitor estimates.

Estimation Assumptions: We do not include any of these trips in our visitor estimates.

Home-Based Other Trips

HBO trips are those where home is one end of the trip and a destination (besides work) is the other. Notably, for this analysis, StreetLight analysis only records vehicle *entries* to the property. Since home is one end of the trip and we know the hotel or motel property is the other, it is reasonable to assume these represent trips where someone begins their trip at home and ends at the hotel or motel property. Additionally, because of how StreetLight records trips, these trips include no intermediary stops between home and the property **that exceeded five minutes**. The only exception would be if someone lives at the property, exits, and re-enters after visiting a destination (that is not work), but this is too infrequent to consider for this analysis.

In total, we estimate there are 10,488 HBO trips to the hotel properties on an average day (all trips). Interestingly, only 1,286 are external trips, which require travel through one of the entry points to the Basin to reach the property. There are no other reasonable entry points into the basin beyond these seven entry points, so we conclude that the remainder must necessarily begin at a home location within the Basin, as the home-based trip did not move through one of the seven entry points. These trips, then, likely include resident vehicle entries to on-site restaurants, shops, resorts, or other on-site amenities shared with the hotel property. It also could be a reflection of locals using some of the larger hotel and resort property parking lots, which are free, as means to reach shopping, dining, or recreation. These could also include trips made to the properties by ride-hailing operators such as Uber or Lyft, where a driver left from a local home location and drove to the property to pick up a customer. These considerations should be further explored in future work in the area.

Estimation Assumptions: For visitor trips, we consider 95% of the 1,286 external HBO trips to be attributable to visitors. Given that these trips began at an external origin classified as a “home” location, went through one of the seven entry points, and reached the hotel property without any intermediary stop, it is reasonable to assume these are all visitors. It is possible that some stopped at this property before proceeding elsewhere, so reducing this total by 5% accounts for this possibility.

Non-Home Based Trips

This category of 14,377 trips (all trips) unquestionably contains the most uncertainty regarding attribution to overnight visitors for our analysis. First, by definition, these trips are those where home is neither the origin nor the destination. From a visitation standpoint, this could include vehicles entering the hotel property on a trip that began at nearby restaurants/bars, shops, recreation areas, etc., or any other of the kinds of locations that tourists would frequent while staying in the Tahoe Basin.

This brings up an additional consideration. StreetLight stops recording a trip when a device has **been stationary for five minutes**. When the device is in motion again after that point, **a new trip is recorded**. This has ramifications for our analysis, particularly for designation as one of three trip type categories (HBO, HBW, NHB). Consider a hypothetical visitor’s trip between the San Francisco Bay Area and the Tahoe Basin, where a visitor has a reservation at a hotel or motel. If that trip leaves from home, then they stop along the way for food, fuel, a rest, or some other purpose, and - if that stop is at least five minutes long and the device is stationary - the initial trip from home would thus end at this intermediary stop and be recorded as an HBO trip. When hypothetical travel resumes towards the Tahoe Basin, a new trip (per StreetLight) “begins” at that intermediary stop that is not home, and “ends” when they reach the hotel. This would be recorded as an NHB trip, even though travel ultimately began at the visitors’ home. From our standpoint, a scenario like this would reasonably be a trip attributable to a visitor.

These kinds of trips that include an intermediary stop at a non-home location prior to ultimately reaching the hotel property destination in the Tahoe Basin are not uncommon, though no data exist on exactly what distribution of trips meet this criteria, nor can the StreetLight data be used to determine this. Assumptions, then, are needed to generate an estimate, but will differ depending on whether the trip is external (intermediary stop was prior to Basin entry) or internal (intermediary stop was somewhere in the Basin after the traveling party went through one of the seven entries). Further data collection efforts are needed to better understand vehicle entries related to visitors.

The external NHB trips (1,538 total) of interest to our study include those that stopped outside of the basin on a trip that left from their home or a non-home location (such as one of the regional airports), or left from an external location without an intermediary stop, and then crossed one of these entry points and ended at the property. It would also include someone who started the day at the hotel, went skiing, hiking, climbing, fishing, etc. outside the basin, then came back that day directly from that location to the property. The former case is a trip type we would want to attribute to a visitor while the latter (while also

a visitor trip) would be a case of double-counting someone as reentering the region whom was already staying there.

Estimation Assumptions: We estimate that 90% of the 1,538 external trips are attributable to visitors staying at the properties, assuming that the other 10% are those where a vehicle is returning to and re-entering the property after spending the day recreating outside of the basin, those stopping at the property for some other purpose before eventually continuing to a final destination either elsewhere in the basin or externally, or freight deliveries.

The internal NHB trips (12,839 total) of interest to our study are those entered the basin from an external location, and then stopped at an intermediary location for at least 5 minutes, then went to the property. Those would be classified as an in-basin NHB trip per the StreetLight analysis, and examples would include those who stop at a gas station, restaurant, bar, grocery store, beach, store, etc., in the basin before then going to the property.

Estimation Assumptions: We estimate that 20% of the 12,839 "internal" NHB trips, are those that stopped somewhere in the basin first before going to stay overnight at the property. Again, this is a traveling party in a vehicle that stopped at a gas station, grocery store, bar, restaurant, beach, etc., in the basin, then went on to their hotel for the night. As has been well detailed before, the possibilities of these kinds of trips are endless, though it not at all unreasonable to think this kind of trip is unusual. The remaining 80% include the myriad other possible trip types that could be included in this count of 12,839 trips.

To reach out final estimate, we:

- 1) Sum the total estimated daily vehicle entries for all 183 properties, attributable to visitors
- 2) Multiply the daily vehicle entries by 365, then
- 3) Divide this total by the 1,754,130 total hotel/motel rooms rented

The final estimated values are presented in Table 7.

Table 7. Analysis Vehicle of Entries to Hotel/Motel Properties, Approach 1

Trip Type	All Trips	All Internal Trips	All External Trips	Estimated Visitation Trips
HBO Trips/Day (StreetLight)	10488	9202	1286	1,222
NHB Trips /Day (StreetLight)	14377	12,839	1538	3,952
<i>Notes on Inclusion Estimates</i>	--	<i>20% NHB</i>	<i>95% HBO, 90% NHB</i>	--
Vehicle Entry Trips/Day (HBO + NHB)				5,174
Annual Vehicle Entries (HBO + NHB) * 365				1,888,510
Annual Vehicle Entries/Rooms Rented (FY 18-19)				1.08
Estimated guests per Room (3.2 visitors/vehicle, per visitation survey)				3.45

4) Number of Occupied Campgrounds and Vehicles per Campground

There are four data sources regarding the volume and occupancy of campsites within the Tahoe Basin. Data from the United States Forest Service (USFS) shows there were 48,004 occupied campsites and 173,551 estimated occupants in the 2018 season (May-October). State Parks data indicate there are 32,879 sites and 147,956 estimated occupants. State Parks does not track total number of visitors to campgrounds, but suggests the use a multiplier of 4.5 occupants per site to estimate total occupants. According to the summary from the Tahoe City Public Utility District (TCPUD), in Year 2018, the total number of occupied sites was 1331 and 2,110 occupants. Finally, The City of South Lake Tahoe provided data on the number of campground sites (17,070) and total occupants (58,240) in 2018. In total then, the total number of occupied campground sites was 99,284 and the estimated number of people at campgrounds is 381,857, producing an estimate of people per site of 3.8 basin-wide.

Table 8. Campground Unit and Occupancy Estimates, Lake Tahoe Basin (2018)

	USFS	CA State Parks	TCPUD	City of South Lake Tahoe	TOTAL
Units	48,004	32,879	1,331	17,070	99,284
Occupants	173,551	147,956	2,110	58,240	381,857
Occupants/Units	3.6	4.5	1.6	3.4	3.8

APPENDIX B: VISITATION DATA ESTIMATES AND METHODS

Susie Pike, Institute of Transportation Studies, University of California-Davis

A robust estimate of the number of commute trips into and out of the Tahoe basin is an important step in the process of estimating per capita VMT in the basin. This document summarizes a method for estimating the number of daily commute trips for the Tahoe basin. This approach draws on two housing needs assessments for the Tahoe Region. The analyses in these assessments estimate the total number of commuters as a portion of the population in need of housing within their respective areas of the Tahoe Basin.

The estimate presented here is based on two reports detailing housing needs for the North and South areas of Tahoe. These two reports differ in their methodologies and other aspects, but both provide an estimate of commuters into their respective areas, and we use these values as a basis for the estimate of daily commute trips into and out of the Basin. Both reports count those who commute into their respective areas which can include north Tahoe commuters who work in the south shore and vice versa. Neither of which would be considered commuters for the purpose of this analysis, which is focused on commute patterns from inside to outside the Tahoe Region. This is addressed in the final adjustments made to the estimates in the final section of this write-up. In addition, TRPA estimates of the number of employees in each area of the basin are used in some of the estimates presented here.

Table 1 Count of Employees in Tahoe Basin by County

Jurisdiction	Employees
CSLT	9,660
DOUGLAS	6,999
EL DORADO	2,428
PLACER	5,419
WASHOE	4,098
Total	28,604

Source: TRPA Draft Regional Transportation Plan (2020)

Report 1. South Shore Housing Needs Assessment

The South Shore Housing Needs Assessment (Sullivan et al. 2019) covers the southern portion of the Tahoe Basin, and overlaps with the TRPA’s area of interest for the estimation of the effective commuter population. Much of the relevant information is from Section 2 of the report: Jobs, Seasonality, and Commuting. The total number of jobs is slightly different from TRPA’s internal estimate of 28,604 jobs in the South Shore area. This table from the report (Sullivan et al. 2019 p.31) shows the projected jobs in the South Shore area, out to 2026.

Table 2. Job Estimates and Projections: 2011 to 2026*

	Annual Growth Rate				
	2011	2019 (est.)	2026	2011- 2019	2019-2026
El Dorado County	70,450	79,820	86,610	1.6%	1.2%
Douglas County	24,780	28,680	30,880	1.8%	1.1%
South Shore Region⁷	23,340	26,880	29,110	1.8%	1.1%

*Reproduced from Sullivan et al. 2019

In the South Shore report, two values are used to estimate the number of commuters. First, an employer survey conducted for the report which found that 25% of employees commute. The second value, 31% is based on an adjustment of the US Census Longitudinal Employer-Household Dynamics to account for proprietors (see Sullivan 2019 p. 39). These two values; 25% and 31% are both used in the analysis in the report, and both are used in the calculations presented here.

Based on these two values, the estimates in the report are 4,480 and 5,500 commuters, accounting for 25% and 31% of employees, respectively. The report does not include information about where these employees commute from, though they do note that their employee survey results found that most of the commuters live outside of the basin in Carson City, and drive single-occupant vehicles an average of 4.4 days per week. This would equate to commuting approximately 229 days per year (52 weeks * 4.4 days a week).

If employees commute 4.4 days per week and are equally spread across the seven days of the week, that puts 63% of these trips on any given day (there is a 63% chance that any given commuter is travelling on a particular day; or on average, 63% of commuters are travelling on each day of the week) We assume that many commuters work in industries that are open on weekends such as ski areas, hotels, and other services.

Taking 63% of 4,480 and 5,500, results in 2,816 and 3,457 commute trips into the south shore area of basin on an average day. This value accounts for only commuters who commute into the south shore area *from other locations*; not those commuters who commute from within the south shore to other places.

Report 2. North Tahoe and Truckee

For the northern area of the Tahoe Basin, we looked at the North Tahoe Truckee MHC Housing Report (2016). This report includes a similar assessment of housing needs, based in part on the number of workers commuting into the area.

Based on table 10 of the report, in 2013 there were 9,271 people living outside the region who were commuting into the area for work, and 5,723 residents of the region were commuting out for work (TTCF 2016). Here, we focus on the 9,271 people who were commuting into the area.

**TABLE 10: COMMUTE FLOWS, TRUCKEE
NORTH TAHOE STUDY AREA, 2003 AND
2013^(A)**

	2003		2013		Percent Change
	Count	Share	Count	Share	
E m p l o y e d i n R e g i o n	14,266	100%	15,825	100%	10.9%
<i>L</i> <i>i</i> <i>v</i> <i>e</i> <i>O</i> <i>u</i> <i>t</i> <i>s</i> <i>i</i> <i>d</i> <i>e</i> <i>R</i> <i>e</i> <i>g</i> <i>i</i> <i>o</i> <i>n</i> <i>/</i> <i>I</i> <i>n</i> <i>-</i> <i>C</i> <i>o</i> <i>m</i> <i>m</i> <i>u</i> <i>t</i> <i>e</i> <i>r</i> <i>s</i>	7,875	55.2%	9,271	58.6%	17.7%
<i>L</i> <i>i</i> <i>v</i> <i>e</i> <i>W</i> <i>i</i> <i>t</i>	6,391	44.8%	6,554	41.4%	2.6%

<i>h i n R e g i o n</i>					
<i>L i v i n g i n R e g i o n</i>	1 0 , 3 2 6	100%	1 2 , 2 7 7	100%	18.9%
<i>W o r k O u t s i d e R e g i o n / O u t - C o m m u t e r s</i>	3 , 9 3 5	38.1%	5 , 7 2 3	46.6%	45.4%
<i>W o r k W i t h i n R e g i o n</i>	6 , 3 9 1	61.9%	6 , 5 5 4	53.4%	2.6%

<i>i o n</i>					
N e t i n f l o w / O u t f l o w	3 , 9 4 0		3 , 5 4 8		-9.9%

Note: (a) The Truckee North Tahoe Study Area is defined based on 2010 Census Block Groups, to approximate the area encompassed within the desired study area. For a complete listing of the included Census Block Groups, please refer to Appendix A. Sources: U.S. Census Bureau, LEHD Origin-Destination Employment Statistics, 2015; BAE, 2015.

The area covered in this study overlaps with the basin, but is not contained entirely within the basin, as a large portion of the area is in and around Truckee. We account for this through the following: the report indicates a total of 15,841 jobs in the study area. The TRPA estimates that there are approximately 5,419 jobs in the Placer County portion of the Tahoe basin (the only part of the study area in the Tahoe basin). This means that about 34% of the jobs counted in the TCCP report are within the basin. This amounts to 34% of 9,271 or 3,152 commuters.

And, as above, if each commuter makes 4.4 trips per week, and we use a 7-day work week, on average 63% of workers are commuting on any given day, resulting in 1,985 commuters travelling into the basin each day.

We also adjust for the commuters from other parts of the Tahoe Region into or out of the Tahoe portion of the TCCF study region. Utilizing a Streetlight analysis for an average day in 2019 to estimate intraregional commuting between the Tahoe portion of TCCF study region and other portions of the Tahoe Region, there are approximately 750 home-based-work trips daily between the two areas. The results of the most recent resident travel survey indicated that 60% of commuters travel directly to and from home on a given day, it would be mean that the 750 trips between the north and other parts of Tahoe represent only 60% of the total, and that there were actually 1,250 between region commute trips. This is because the Streetlight analysis identifies only home-based work trips, so we adjust to account for the non-home-based work trips. This would reduce the total number of commuters in the north to 735 commuters on an average day for the northern areas of the basin.

Commuters Leaving the Tahoe Basin

The estimates presented above only account for commute trips coming into the basin, and not those travelling out. In this section we present an estimate of the commute trips leaving the basin each day.

For the North Shore area, there is useful information contained in the housing assessment. Based on table 10 of the report, in 2013 there were 5,723 residents of the region commuting out for work (TCCF 2016). We apply the same methodology as above, for the North Shore area. That is, we take 34% of the 5,723 residents of the region who commute out. So, we have 1,945 commuters who commute out of the North Shore area. And, as above, if each commuter makes 4.4 trips per week, and we use a 7-day work

week, on average 63% of workers are commuting on any given day, resulting in 1,226 commuters travelling out of the northern portions of the basin each day.

For the South Shore areas there are no estimates of commuters leaving the region, but we may make reasonable estimates based on what we know about the North Shore area. If we assume the same level of out commuters per job, for the south as we do for the north, we can use a rough factor of the ratio of jobs in the north versus the south. That is there are 16,516 jobs in the northern three counties and 12,088 jobs in the southern two counties. The number of jobs in the south is 73% of the number of jobs in the north. If the rate of out commuters per job is approximately the same in the north and south areas, we calculate $0.73 \times 1,226$ or about 897 commuters out of the south area of the basin each day. Adding this to the 1,226 commuters out of the north shore area results in approximately 2,123 commuters out of the entire basin each day.

Alternatively, we can look at the ratio of in commuters to out commuters in the north portion of the basin and use the same ratio in the south area. In 2013 there were 9,271 people living outside the region who were commuting into the area for work, and 5,723 residents of the region were commuting out for work (TTCF 2016). That is, for every person commuting in, there were approximately 0.62 persons commuting out. We had between 2,816 and 3,457 commute trips into the south shore area of basin on an average day. We apply the ratio of 0.62 persons commuting out for each person commuting and we have a range of 1,738 and 2,143 commuters out of the South Shore areas. This estimate results in a total of 2,964 commuters out of the entire basin each day.

A third way to estimate the out commuters is to estimate out commuters for the entire region at once, using information about jobs in the region and the results of the recent resident travel survey. As shown in table 1, there are 28,604 jobs within the region, and we assume that 63% of commuters travel each day, using the 4.4 days per week for each commuter. That means there are approximately 18,020 commuters per day from within the basin and from outside of the basin; to get to these jobs.

From the analysis presented here, we estimate that there are 3,551 (2,816 + 735) incoming commuters each day, taking that away from the 18,000 total commuters leaves 14,469 Tahoe residents (as opposed to those who are residents elsewhere) each day that commute.

Results of the most recent travel survey found that 88% of the commute trips made by residents are within the basin; assuming that these 14,469 trips represent 88% of the commute trips made by residents there are a total of 16,442 commute trips made overall. The remaining 12% of these trips can be attributed to residents commuting out of the basin; or about 1,973 trips made by commuters leaving the basin.

Putting it Together

Taken together, the estimates based on each of these housing needs reports sum to 7,632 commuters (or 8,652 on the higher end). However, Washoe County in Nevada is not covered within either report, though Washoe County has a total of 4,098 jobs and accounts for approximately 14% of the jobs within

the Tahoe Basin. The other counties in the basin have a total of 24,506 jobs and 7,632 commuters (or 8,652 on the higher end). This means there are approximately 2.8 jobs within the area per commuter or that commuters fill between 31%-35% of jobs in the Region. We apply this to the 4,098 jobs in Washoe County, and estimate that there are 1,270 commuters into Washoe County. Adding this to 7,632 gives the new estimated population of commuters as 8,902 (or using the higher percentage and value, 1,434 added to 8,652, results in a commuter population of 10,086).

Applying the average of 4.4 commute days per week or 63% commuting each day to the Washoe County portion, this adds 63% of 1,270 or 800 commute trips each day. With 2,816 trips into the south shore area, and 735 commute trips into the north area, and these 800 trips into the Washoe County portion of the region, there are 4,351 commuter trips coming into the Basin, each day.

The housing needs assessments utilized to derive the above estimates of number of commuters classify North-South in Region travelers as commuters even if the entire trip is inside the Tahoe Region. For example, individuals that live in Incline Village and travel to South Lake Tahoe for work. To refine the estimate to only those commuters that travel into the Tahoe Region for work, we utilize Streetlight analysis for an average day in 2019 that estimated intraregional commuting between the north and south shore areas at approximately 140 home-based work trips on an average annual day; if we again assume this represents only 60% of the actual work trips, 140 is 60% of 233 trips. From this we infer that around 233 of the commute trips are made by people who commute between the two areas on an average day. So, we remove these trips from the sum of 4,351 and have a final rough estimate of 4,117 commute trips per day into the basin.

We also add the estimate of 1,973, based on the most recent TRPA resident travel survey. This results in a total of for a total of 6,090 commuters going in both directions on an average day. This accounts for 21% of the 29,000 daily trips.

Alternative Estimates of Commute Trips

StreetLight Data

Other methods have been used to estimate the effective commuter population and the total number of daily commute trips entering and leaving the basin. One estimate, based on analysis of StreetLight data, is approximately 3,000 home-based work trips on an average day. This accounts for about 12-13% of trips included in the data (as opposed to estimates of total trips from other daily trip/vehicle counts). The estimate includes only home-based work trips, and likely underestimates commute trips, since not all work trips start at home. A correction factor could be worked out and applied to the non-home-based trips in the StreetLight data to account for those work trips that do not start at home. This correction factor would also provide a means to attribute some trips originating or ending outside of the basin to and from hotel locations to employees. Currently all of the non-home-based trips that originate or end outside of the basin with travel to/from a hotel are counted as hotel visitors.

2017 National Household Travel Survey (NHTS)

Another estimate of commute trips is based on analysis using the 2017 National Household Travel Survey (NHTS) data in the California Add-on sample. Isolating households that made any trips in the Tahoe area, non-resident commute trips accounted for 18% of total entry and exit trips, which equates to 5,220 one way trips, using the total estimate of 29,000 one way trips. The primary limitation of this analysis is the small, and likely unrepresentative sample. A detailed discussion of this analysis is found in the document NHTS TRPA Analysis.

Next Steps

Based on their own household and employee survey, the south shore area report notes that in-commuters travel an average of 29.3 miles in their commutes; useful information for later estimates of VMT for the different groups in the population.

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APPENDIX C: EXPLORING THE NATIONAL HOUSEHOLD TRAVEL SURVEY DATA FOR THE TAHOE BASIN

Susie Pike, Institute of Transportation Studies, University of California-Davis

This is a summary of the trips into, out of and within the basin using data from the National Household Travel Survey (NHTS). The data was collected in 2017, and in addition to the national sample collected for the NHTS, an extra sample of 24,000 households was collected in California. The subset of households used here include all households with a *location* within the Tahoe Basin (basin). For most of the households this means that they had a trip that started or ended within the basin, regardless of where their home is (there a few households with no trips – see below). The goal of this exercise is to help determine the proportion of trips coming into and out of the basin that fall into these categories:

- Commute trips from outside of the basin, ending within the basin – and their return trips
- Visitor trips from outside of the basin, ending within the basin – and whether these trips have a return trip to somewhere outside of the basin or not
- Commute trips from inside of the basin, ending outside – and the returns
- Recreational trips from inside of the basin, ending outside – and the returns
- Trips of all types for households within the Basin
- Vehicle occupancy and other characteristics by trip type

To identify locations within the basin, the data was subset to include any household that had a location associated with the following:

- Seven zip codes: 96150, 96142, 96141, 96145, 96140, 96148, and 96143
- Five cities: Crystal Bay, Stateline, Zephyr Cove, Incline Village, and Lake Tahoe

Using the location data, all households with any location in the basin were identified. Note that a location is any place associated with a household; the household location, work and school locations and any other place household members traveled to. The location and household information were merged with the trip data to produce a final dataset that included all trips for all households with any location within the basin. There are 113 households with locations in the basin. The number of households in the sample used here is reduced to 101 as there are 12 households that do not have trips or were removed from the trip data for another reason. These 101 households made a total of 719 trips, and these are broken down below.

Trips are categorized by their start and end location. A trip that enters the basin originates outside of the basin area delineated above and ends within the area. A trip within the basin starts and ends within the basin and so on. Residents are members of households that are located within the basin.

Table 1: Trips by residents and non-residents (including visitors)

Type of trip	Resident	Non-resident and visitor
Enter basin	20	24
Leave basin	20	24
One way in	4	19

One way out	4	18
Entirely outside of basin	44	190
Entirely within basin	215	137
Total	307	412

Looking at only the trips made by residents, and excluding those that are entirely outside of the basin, there are 263 trips, and 48 of those trips, approximately 18%, are into or out of the basin.

Notably, there are not many trips that go into the basin or leave the basin, and non-residents and visitors travel much more within the basin once they are there, than residents do while outside of the basin. Residents account for approximately 43% of the trips and non-residents and visitors the remaining 57%.

The type of trip is further broken down by type of activity at the trip destination, and in some cases the origin, i.e. all trips that start or end at a work location are considered work trips (details below). Trips are designated as resident or non-resident. For the purposes of this exploration, any trip originating outside of the basin and made by a non-resident, that cannot be classified as a work trip is a visitor trip.

Table 2: Trip types by residents, non-residents and visitors

Trip type	Definition	count	percent
nonresident outside	Home location not in basin; origin and destination outside of basin	190	26.54%
nonresident work enter	Home location outside, activity is work, origin outside, destination inside	2	0.28%
nonresident work out	Home location outside, origin activity is work, origin outside, destination inside	2	0.28%
resident one way in	Home in basin, O outside, D inside; no/not apparent return trip	4	0.56%
resident one way out	Home in basin, O inside, D outside; no/not apparent return trip	4	0.56%
resident other in	Home in basin, non-work activity, O outside, D inside	11	1.54%
resident other out	Home in basin, non-work, O inside, D outside	11	1.54%
resident outside	Home in basin, O and D outside basin	44	6.15%
resident within	Home in basin, O and D in basin	215	30.03%
resident work enter	Home in basin, work activity at O, O outside, D inside	8	1.12%

resident work out	Home in basin, work activity, O inside, D outside	8	1.12%
visitor in	Home outside basin, O outside, D inside	21	2.93%
visitor one way in	Home outside basin, O outside, D inside; no/not apparent return trip	19	2.65%
visitor one way out	Home outside basin, O inside, D outside; no/not apparent return trip	18	2.51%
visitor out	Home outside basin, non-work, O inside, D outside	22	3.07%
visitor within	Home outside basin, O and D inside basin	137	19.13%
Total	---	716*	---

* 3 trips remain to be classified; didn't catch them with current coding

Most trips are either within or outside of the basin, however if we examined these trips as tours, this would likely shift. This would also change if the non-resident trips that take place outside of the Tahoe area, or outside of the basin were removed from the data. Resident trips entering and leaving the basin account for approximately 4% of trips overall, while visitors account for approximately 9%, and commuters (residents and non) slightly less than 3%.

Looking only at the trips that enter or leave the basin area, commute trips by residents and non-residents make up about 15% of the trips. Other travel by residents, accounts for 23% of the trips, with visitors making up the remaining 63%.

Table 3: Trips entering and leaving the basin

Trip type	count	percent
nonresident work enter	2	1.5%
nonresident work out	2	1.5%
resident one way in	4	3.1%
resident one way out	4	3.1%
resident other in	11	8.5%
resident other out	11	8.5%
resident work enter	8	6.2%
resident work out	8	6.2%
visitor in	21	16.2%
visitor one way in	19	14.6%
visitor one way out	18	13.8%

visitor out	22	16.9%
Total	130	100%

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Turning to some of the characteristics of these trips, this table shows the mean vmt, hour of day that the trip was started, and vehicle occupancy according to the type of trip. Unsurprisingly, the number of occupants is greatest for trips made by visitors. The higher VMT for one way trips is likely because these trips involve staying at (or returning from) a destination overnight.

Table 4: Trip characteristics by trip type

trip type	Sample (N = 716)	mean distance	start hour	Occupants
nonresident outside	190	9.65	13.94	1.88
nonresident work enter	2	19.38	7.00	1.00
nonresident work out	2	19.27	16.00	1.00
resident one way in	4	99.09	13.50	1.00
resident one way out	4	36.91	12.50	2.00
resident other in	11	18.27	16.27*	1.60
resident other out	11	12.93	14.55	1.91
resident outside	44	8.76	15.39	1.43
resident within	215	2.45	13.26	1.57
resident work enter	8	10.11	15.88	1.13
resident work out	8	10.15	8.50	1.25
visitor in	21	21.03	13.67	2.29
visitor one way in	19	69.24	13.90	2.53
visitor one way out	18	40.66	15.06	2.89
visitor out	22	24.91	14.41	2.23
visitor within	137	1.61	14.61	3.05

*trip start hour not reported for one resident other in trip; n = 10

For the tables above, trips taken by household members traveling together are in effect, double counted. The next section addresses this issue by collapsing multiple trips made by more than one household member traveling together into single trips. Analyses similar to those above are presented for this reduced set of trips.

Trips with multiple household members were collapsed by aggregating the data by the household, the trip origin and destination and the hour the trip was made. The assumption is that there would not be two trips made by two household members starting and ending at the same locations if they were not traveling together. There are some situations where this could happen – such as meeting up with a family member on the way home from work, and then both driving home in separate vehicles. This can be explored in future steps.

All trips made by bicycle, walk, and transit are counted as unique trips; even if two household members travel together, each person trip is counted, since we care about travelers for these modes, while we care about vehicle trips for personal vehicle travel in cars, vans, SUVs, etc.

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Table 5: Proportions of Trips for Unique Set of HH Trips

Trip type	Count	percent	Percent – in/out only
nonresident outside	151	25.2%	---
nonresident work enter	2	0.3%	1.9%
nonresident work out	2	0.3%	1.9%
resident one way in	4	0.7%	3.7%
resident one way out	3	0.5%	2.8%
resident other in	10	1.7%	9.3%
resident other out	9	1.5%	8.3%
resident outside	39	6.5%	---
resident within	194	32.3%	---
resident work enter	8	1.3%	7.4%
resident work out	8	1.3%	7.4%
visitor in	17	2.8%	15.7%
visitor one way in	15	2.5%	13.9%
visitor one way out	12	2.0%	11.1%
visitor out	18	3.0%	16.7%
visitor within	108	18.0%	---
Total	600*	100%	108 trips ~ 18.5% of total unique trips

*trip start hour not reported for one resident other in trip

Taking this smaller sample of trips, does not result in substantial differences in the proportions of trips of different types. Resident trips (including work trips) make up about one third of the trips that enter and leave the basin; work trips by residents and non-residents account for 18% of these trips.

Table 6: Characteristics of Unique Set of HH Trips

trip type	Sample (n = 600)	mean distance	start hour	Occupants
nonresident outside	151	11.94	14.09	1.69
nonresident work enter	2	19.38	7.00	1.00
nonresident work out	2	19.27	16.00	1.00
resident one way in	4	99.09	13.50	1.00
resident one way out	3	49.54	13.33	2.00

resident other in	10	18.71	15.70	1.56
resident other out	9	13.69	14.89	1.89
resident outside	39	9.53	15.41	1.36
resident within	194	2.28	13.41	1.45
resident work enter	8	10.11	15.88	1.12
resident work out	8	10.15	8.50	1.25
visitor in	17	25.88	13.71	2.35
visitor one way in	15	81.20	13.73	2.53
visitor one way out	12	61.49	15.25	2.75
visitor out	18	30.30	14.44	2.28
visitor within	108	1.53	14.56	2.95

Representativeness of the NHTS sample

The NHTS sample differs from the population in terms of socio-demographics in a number of areas. First, the average household size is smaller for the NHTS sample in the reference year of 2017.

Table 7: Average household size:

Estimate	Margin of Error	Year & Source
2.3212	0.3284	2010 ACS 5-year Estimate
2.3132	0.3352	2011 ACS 5-year Estimate
2.354	0.3268	2012 ACS 5-year Estimate
2.364	0.3304	2013 ACS 5-year Estimate
2.37	0.3148	2014 ACS 5-year Estimate
2.3828	0.3092	2015 ACS 5-year Estimate
2.386	0.2896	2016 ACS 5-year Estimate
2.26375	0.2425	2017 ACS 5-year Estimate
2.0956	SD = 0.748	2017 NHTS Data for the Tahoe area
2.325	0.299286	2018 ACS 5-year Estimate

The distribution of income differs, though not for every income category.

Figure 1: Income for NHTS sample and ACS sample

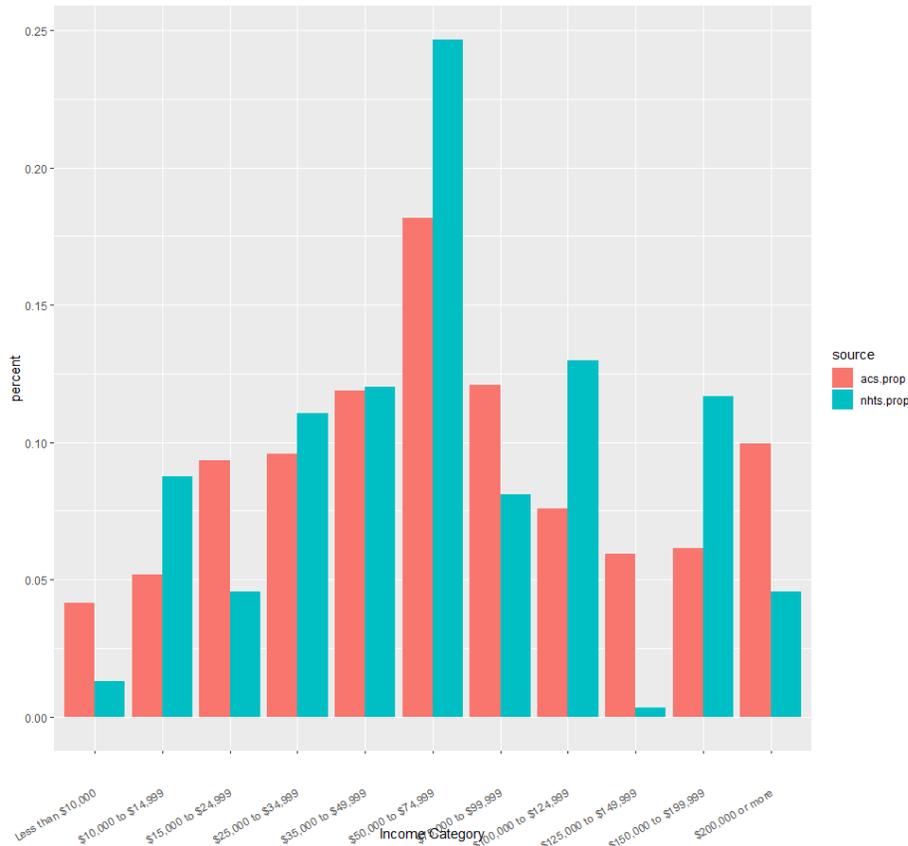


Table 8: Race

Variable Name	Population Count (Source: 2010 Decennial Census) (%)	NHTS data Count (%)
American Indian and Alaska Native alone	389 (0.7%)	---
Asian alone	1,820 (3.3%)	2 (.6%)
Black or African American alone	346 (0.62%)	---
Native Hawaiian and Other Pacific Islander alone	80 (0.14%)	---
Some Other Race alone	4,849 (0.87%)	3 (1.0%)
Two or More Races	1,613 (0.29%)	14 (5.0%)
White alone	46,510 (83.6%)	279 (91.0%)
Regional Population	55,607	307

There are a number of race groups that are not represented in the NHTS data for the Tahoe area. The other proportions are also therefore slightly higher? The total sample for race is 307, so the proportions shown do not add up to 100, since there are some who refused to answer.

Additional variables may be reviewed, and weighting could be applied for some demographic characteristics; probably best to do so for income but we could add age and gender information when available (or when processed).

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APPENDIX 4: FORECAST SUMMARY

Introduction

As part of the 2020 TRPA Regional Transportation Plan (RTP), TRPA prepared regional development and transportation forecasts for the years 2035 and 2045. The regional development forecast includes changes in development, population, demographics, and visitation. The transportation forecast includes the RTP project list, as well as the transportation strategies. The regional development forecast and the transportation forecast are implemented in the Tahoe travel demand model and the Trip Reduction Impact Analysis (TRIA) tool to allow planners to assess the efficacy of policies and projects that promote the goals of the Regional Plan and the RTP.

Development Forecast Summary

The 2035 and 2045 forecast years build upon the 2018 model base year, which was developed during the fall of 2019. More information about the 2018 base year can be found on the Tahoe [model website](#). The forecasts include a variety of projections related to land use and the characteristics of the Regions' traveling population in the forecast years; this population includes residents, visitors, and commuters. The forecast years of 2035 and 2045 were selected to meet specific regulatory requirements of the California Sustainable Communities Strategy (SCS) and Federal RTP requirements.

Residents— The forecast projects Lake Tahoe's full-time residential population to increase slightly. The forecasted increase is a deviation from the declines in the Region's population observed over the last 20 years and is influenced by a suite of factors. First, the number of regional housing units will increase as residential allocations are distributed and workforce housing/affordable housing programs are implemented using residential bonus units (which restrict units from being used as second homes or vacation rentals). Similarly, the residential occupancy rate – the proportion of homes occupied by residents – is expected to increase due to the increase in housing supply available for residents from implementation of workforce and affordable housing initiatives as local and regional efforts to increase the housing supply for local residents take effect. The downward trend in regional population in the last 20 years was likely influenced by the declines in gaming and associated job loss. The precipitous declines in gaming revenues observed in the early part of the century following the opening of casinos in northern California have not continued into the second decade as revenues appear to have stabilized. The income distribution of the residential population will remain steady as increased provision of workforce and affordable housing counteract recent upward trends in household income. School enrollment will increase slightly because of overall population growth. Employment will also increase slightly as

additional Commercial Floor Area (CFA) and Tourist Accommodation Units (TAU) are constructed throughout the Region.

Visitation – The forecast projects both day and overnight visitation to the Lake Tahoe Region to increase during the forecast years. This forecasted increase is based upon the projected population growth in the mega-region (Bay Area/Sacramento/Reno), forecasted increases in traffic counts in adjacent areas, and the increasing popularity of the outdoor recreation experience. This increase in visitation will result in an increase in the number of occupied overnight lodging units, short-term rentals, and seasonal homes.

Table 1: 2045 Forecast Data Summary

Forecast Data Summary				
	Base Year 2018	Forecast 2045	change (#)	change (%)
Residential Units and Population				
Residential Population	51,624	58,041	+ 6,417	12.4 %
Occupied Units	21,624	24,315	+ 2,691	12.4 %
Unoccupied Units	26,031	28,056	+ 2,025	7.8 %
Total Residential Units	47,655	52,252	+ 4,597	9.6 %
Income of Occupied Residential Units				
Low Income Units	10,463	11,886	+ 1,423	13.6 %
Medium Income Units	4,891	5,437	+ 546	11.2 %
High Income Units	6,254	6,843	+ 589	9.4 %
Total Overnight Visitor Units				
Short Term Rentals	6,005	5,931	-74	-1.2 %
Seasonal Units	17,129	18,544	+ 1,415	8.3 %
Campground Spots	2,120	2,120	0	0 %
Total Lodging Units	11,107	12,052	+ 945	8.5 %
Occupied Overnight Visitor Units				
Occupied Short Term Rentals	2,227	2,240	+ 13	0.6 %
Occupied Seasonal Units	6,396	6,911	+ 515	8.1 %
Occupied Camping Spots	1,278	1,278	0	0 %
Occupied Lodging Units	6,190	7,086	+ 896	14.5 %
Other Key Data Points				
Commercial Floor Area	6,327,319	6,533,869	+ 206,550	3.3 %
Employment	28,604	29,462	+ 858	3 %
School Enrollment	8,887	9,992	+ 1,105	12.4 %

Forecast Methodology

The overall approach to forecast development was to apply the best available information and data. The development rate forecast was informed by a review of historical development rates, and an assessment of the performance of past forecasts. The forecast differs from past forecasts in at least two ways:

1. More rational development rates – Prior forecasts have generally assumed that full build out of the Region would occur by 2035 but historic development rates have not kept pace with those forecasts. This forecast refines past methodologies by placing greater weight on observed development rates.
2. Recent overhaul of development rights system - This is the first forecast since significant changes were made to the development rights system to accelerate attainment of threshold standards and Regional Plan goals and policies. The changes enable easier conversion between types and facilitates the attainment of State housing mandates.

The forecasts contained in this document represent a conservative yet realistic view of the continued build out of the Lake Tahoe Regional Plan. Prior forecasts by TRPA had projected significantly faster growth and a faster consumption of the remaining development rights. The annual rate of consumption for commercial floor area and tourist accommodation units were adjusted to align with observed trends more accurately since the adoption of the 2012 Regional Plan update. Additionally, the forecast assumes that not all the remaining development potential for commercial floor area and tourist accommodation units will be constructed by 2045.

Staff anticipates that by 2045 the unknown but likely time-limited economic impacts from the COVID pandemic will be replaced by more normal economic forces.³

RESIDENTIAL UNITS

The number of housing units in the Region is influenced by market conditions as well as TRPA's development rights system, which caps the total development potential for the Region. The residential occupancy rate of the housing stock is influenced by economic factors, the number of residents, second home ownership, and visitors that frequent the Region.

There are currently 47,655 residential units in the Region (based on TRPA records); according to the occupancy rates published by the U.S. Census Bureau 2018 American Community Survey (ACS), an estimated 21,624 residential units (45%) are occupied by full-time residents and 26,031 units (55%) are

³ Additional detail on the considerations related to COVID-19 are included in an addendum at the end of this document.

not occupied by full-time residents (ACS 2018). Currently, approximately 20% of existing residential units in the Region are multi-family units (approximately 9,530 units) and 80% of existing units (38,125) are single family units. By 2045, an additional 4,597 units are expected to be constructed, bringing the total number of residential units in the Region to 52,252, a 9% increase. This includes the construction of 1,823 additional single-family residential units (40% of additional units) and 2,774 additional multi-family residential units (60% of additional units). Forecasts of residential projects in the three California jurisdictions are sufficient to accommodate the Regional Housing Needs Assessment (RHNA) Cycle 5 (2013-2021) and Cycle 6 (2022-2029). The forecast includes a continuation of the RHNA requirements beyond 2029. These requirements were linearly extrapolated to 2045 based on requirements established to date and are accommodated in the forecasts.

All remaining residential allocations (2,234) are allocated and constructed in the forecast. This includes the award and construction of all residential bonus units (1,609), and all currently banked residential units (204) by 2045. The forecast also includes the conversion of 100,000 square feet of CFA and 130 TAUs to residential units, which will generate an additional 290 multi-family and 260 single-family units. The projected conversions are consistent with conversion trends since the adoption of the conversion programs and observed development rights utilization rates. The observed trends indicate a net conversion from CFA and TAUs and towards Residential.

Several key assumptions informed the spatial distribution of residential development in the forecast. First, new residential units were allocated to projects known to be in the pipeline, including multi-family and affordable-/moderate-income projects on public lands. This included 580 units expected to be built on California Tahoe Conservancy (CTC) asset lands⁴, redevelopment successor agency parcels⁵ and other publicly-owned parcels where large multi-family and affordable/moderate-income housing projects are likely to be constructed⁶. For multi-family development on private properties, where the exact number of units to be constructed was not fully known, a computer-generated random selections to distribute units to vacant buildable multi-family and existing underbuilt residential parcels throughout the Region. For these parcels, the number of units allocated was 60% of the maximum allowable buildout based on current zoning, coverage constraints, and density restrictions. This assumption is consistent with

⁴ See <https://tahoe.ca.gov/programs/tahoe-livable-communities/asset-land-sales/> for more details about potential housing development opportunities that have been identified by the California Tahoe Conservancy.

⁵ See <https://www.placer.ca.gov/3396/Housing> for information about potential housing development project opportunities in Placer County.

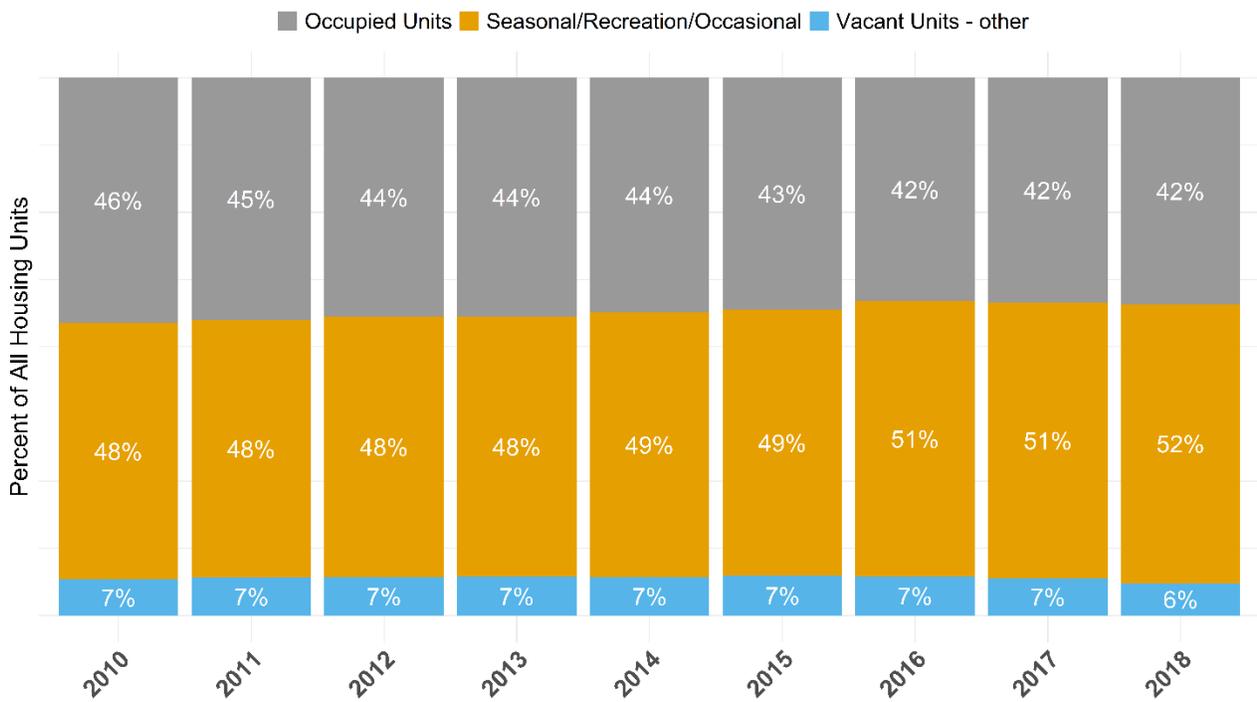
⁶ Includes housing commitments made by the Tahoe Transportation District as part of the Highway 50 Community Revitalization Project, see <https://www.tahoetransportation.org/us50>.

observed buildout patterns, and conservative in that it distributes new residential development throughout the Region (rather than modeling the most compact possible pattern). Multi-family units were only assigned to parcels that are currently zoned for multi-family residential, meet density requirements, and that have remaining coverage available to support additional units. Finally, the remaining private residential units were constructed as single-family units through random assignment to vacant buildable properties throughout the Region.

RESIDENTIAL OCCUPANCY RATE

The U.S. Census American Community Survey (ACS) estimates that, since 2010, the proportion of occupied housing units in the Tahoe Region has dropped from 46% to 42% in 2018 (U.S. Census Bureau 2020). The remaining 58% of the regional housing supply not occupied by full time residents is classified by the ACS as vacant (ACS classifies houses as “vacant” if they are permanently unoccupied, periodically occupied by seasonal residents, used as a second homes, or rented by visitors, including short-term rentals). In recent years, the total number of seasonal or short-term housing units increased by 24%, from 21,000 in 2010 to 26,000 units in 2018.

Figure 1: Housing Occupancy (2010-2018)



SOURCE: AMERICAN COMMUNITY SURVEY (ACS)

Despite these trends over the past several years, the forecast includes an increase in the proportion of residential units occupied by full-time residents (owner-occupied and renter-occupied). Three factors are expected to contribute to the shift: 1) Housing Initiatives to promote construction of new workforce, achievable, and affordable housing in the Region, 2) Housing initiatives to promote the transition of the existing stock of residential units from second homes and short term rentals to resident-occupied units, and 3) Measure T in the City of South Lake Tahoe. Additional detail on each factor is provided below.

1. *Housing initiatives to promote new workforce and income-restricted housing:* The development forecast includes construction of all the remaining 1,609 residential units from the TRPA residential bonus unit pool. Residential Bonus Units are awarded as transfer incentives for relocating remote development into town centers, and for the construction of affordable/moderate/achievable housing. New housing constructed with Residential Bonus Units is required by TRPA Code to be deed-restricted to prohibit these housing units from being used for second homes or vacation rentals.
2. *Housing initiatives to transition existing housing stock:* There are several initiatives underway to transition second homes, vacation rentals, and vacant house into residential units for full time residents. The forecast includes significant level of success for these initiatives (and other initiatives unknown at this time) that results in 700 additional units (~1.5% of the 2018 housing stock) occupied by residents in 2035 and 2045. The increase is independent of the forecasted increases described in and 1 and 3.
3. *Measure T in the City of South Lake Tahoe:* Voters passed Measure T in the City of South Lake Tahoe in November 2018 (see <https://www.cityofslt.us/453/Vacation-Home-Rentals>). The measure includes broad restrictions on short term rentals (STRs) outside select areas in the city. The restrictions go into effect on December 31, 2021. As a result of the measure, approximately 1,372 currently permitted VHRs will not be renewed. The market value of the existing VHR stock skews higher than median values in the Region, so a conservative, but optimistic forecast is that 15% of the units will be transitioned to be occupied by residents (rented or owned); other units are expected to become part of the second home market. A recent study on the economic impact of VHRs in South Lake Tahoe suggested that 10% of existing VHR owners would likely rent to full time if they could no longer use the property as VHR (MBI 2017).

COMMERCIAL FLOOR AREA (CFA)

There are currently 556,796 square feet of un-used commercial floor area in TRPA and local jurisdiction community/area plan pools. Since 2013, a total of 41,928 square feet of CFA has been allocated to projects: an average rate of 6,988 square feet of CFA per year. The forecast includes the construction of an additional of 130,067 square feet of CFA by 2035 and 206,550 square feet by 2045. The forecasted rate of development - 7,650 square feet - is just higher than the observed rate since the 2012 Regional Plan, but lower than rates used in prior regional forecasts. For the forecasts, CFA was allocated to known

projects that have been permitted or are in the planning phase, but not constructed; remaining CFA was allocated to town centers and area plans using the observed proportions from recent allocations.

The forecast includes the conversion of 100,000 square feet of CFA to residential units, consistent with conversion trends since the adoption of the conversion program; recent trends indicate the net conversion from CFA and TAUs towards Residential. The converted CFA is forecasted to result in the construction of 400 additional residential units --200 multifamily units, and 200 single family units. At the end of the forecast period, 250,246 square feet of CFA remains unallocated and thus unconstructed.

TOURIST ACCOMMODATION UNITS (TAU)

The forecast includes the construction of an additional 629 TAUs by 2035 and 945 TAUs by 2045. The forecast includes the completed construction of all currently permitted projects using 807 banked TAUs and the use of all 138 awarded TAU bonus units. Not all TAUs allowed in the Regional Plan are forecast to be constructed by 2045; an estimated 230 TAUs will remain undeveloped through 2045 (74 TAU bonus units and 156 banked TAUs). The TAU development rights pool is not exhausted within the forecast horizon, because of the slow rate of TAU right utilization and construction over the past 30 years. No TAUs have been allocated to projects and constructed since adoption of the 2012 Regional Plan, and only 58 TAUs have been allocated since the adoption of the 1987 Regional Plan. TAUs were allocated to projects that are permitted but not yet constructed (Homewood, Boulder Bay, Edgewood Casitas, Tahoe City Lodge, and Chateau/Project 3), and the forecast includes the removal and banking of some existing units. Bonus TAUs were assigned to permitted projects (Homewood, Boulder Bay, Tahoe City Lodge) and no additional allocations other than existing permits were included.

The forecast also includes the conversion of 130 TAUs to residential units, consistent with recent conversion trends since the adoption of the conversion programs; observed trends indicate the net conversion from CFA and TAUs and towards Residential.

Development Rights Forecast Summary

Total development in the Tahoe Region is capped by the Regional Plan. The type and rate of that development is further controlled by a complex system governing development rights in the Region.

Development rights are land use units someone must acquire before a property is developed.

Development rights include tourist accommodation units (TAUs), single and multi-family residential units of use (RUUs), and commercial floor area (CFA). Residential units of use (RUUs) are formed by combining a potential residential unit of use (PRU) and a residential allocation. The forecast differentiates between when a development right is allocated from TRPA or another jurisdiction's pool and the final use of that development right. Development rights can be utilized in one of two ways; they can be used to construct

a project (e.g. a house) or converted to a different type of development right. The forecast is grounded in projections about the utilization, transfer, conversion, and construction of development rights. Tables 2-4 summarize the fate of development rights in the forecast period.

- Table 2 summarizes new construction which influences land use in the future scenarios. Tables 3 and 4 provide background detail on the underlying accounting that enabled the development.
- Table 3 summarizes the expected utilization of development rights in their current type.
- Table 4 summarizes the expected conversion of development rights between types.

The forecast includes the annual construction of 172 residential units, 7,650 square feet of commercial floor area and 35 tourist accommodation units (Table 2).

Table 2: Construction Forecast Summary

Development Right Construction	Annual Construction Rate	2035 Net Change	2045 Net Change
Residential Units			
Total Development of Residential Units	+172	+2,924	+4,597
Commercial Floor Area (in Square Feet)			
Total Utilization of CFA	+7,650	+130,067	+206,550
Tourist Accommodation Units			
Total Development of TAUs	+35	+629	+945

The forecast includes the utilization of allocation pools held by TRPA and local jurisdictions in the area plan, community plan, or plan area statement pools, as well as the use of bonus and incentive pools, special projects pools, and banked development rights (Table 3).

Table 3: Development Rights Utilization Forecast Summary

Development Right Utilization	Annual Utilization Rate	2035 Net Change	2045 Net Change
Residential Units			
Residential Allocations	+83	+1,411	+2,234

Development Right Utilization	Annual Utilization Rate	2035 Net Change	2045 Net Change
Residential Bonus Units	+60	+1,020	+1,609
Banked Residential Development	+8	+136	+204
Total Development of Residential Units	+151	+2,567	+4,047
Commercial Floor Area (in Square Feet)			
Commercial Floor Area Allocations	+6,413	+109,021	+173,142
Commercial Floor Area Allocations (TRPA special projects pool)	+2,963	+50,371	+80,000
Banked Commercial Development	+1,979	+33,643	+53,408
Total Utilization of CFA	+11,355	+130,067	+306,550
Tourist Accommodation Units			
TAU Allocations	+5	+85	+130
TAU Bonus Allocations	+6	+102	+138
Banked TAU Development	+31	+527	+807
Total Development of TAUs	+42	+714	+1075

The forecast includes the conversion of development rights between the various types of development (Table 4). TRPA approved a comprehensive update to Tahoe’s development rights system in 2018. This allows conversions between different types of development rights using environmentally neutral exchange rates and makes development rights simpler to transfer around the Basin, keeping limits on Tahoe’s total development potential. The changes make it easier for the private sector to invest in redevelopment projects that benefit Tahoe’s environment and communities and provide needed workforce housing. The projected conversions are consistent with conversion trends since the adoption of the conversion programs and observed development rights utilization rates. The observed trends indicate a net conversion that reduces CFA by 3,700 square feet and 5 TAUs and creates an additional 21 residential units each year.

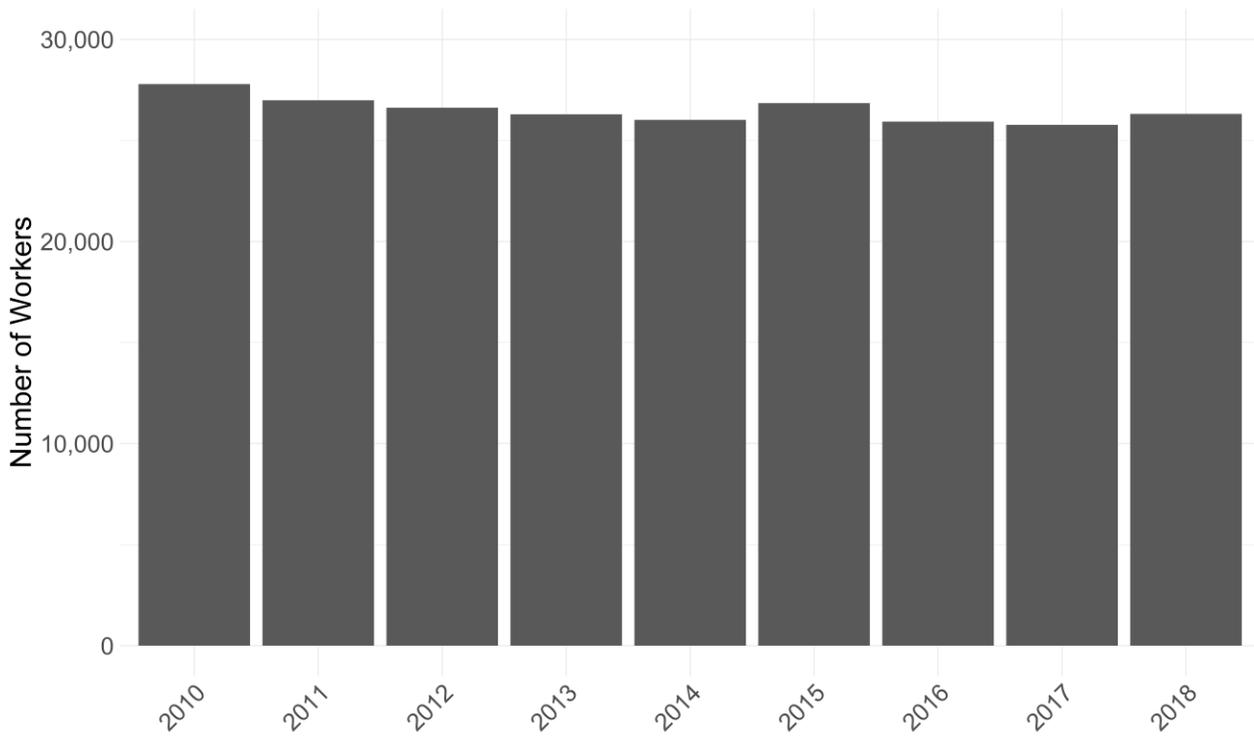
Table 4: Development Rights Conversion Summary

Development Right Conversion	Annual Change as a Result of Conversion	2035 Net Change	2045 Net Change
Residential Units			
Net Development Right Conversions to Residential	+21	+357	+550
Commercial Floor Area (in Square Feet)			
Net Development Right Conversions from CFA to RUU	-3,704	-62,968	-100,000
Tourist Accommodation Units			
Net Development Right Conversions from TAUs to RUU	-5	-85	-130

EMPLOYMENT

The most recent region-wide data estimates that summer-time work opportunities in the Tahoe Region increased by 5% between 2014 and 2018, from 26,637 to 28,053 jobs. While employment increased, the number of workers estimated to be living in the Region decreased by 6%, from 27,785 in 2010 to 26,314 in 2018 (ACS, 2018). This indicates that an increasing number of workers may be commuting into the Region for employment.

Figure 2: Number of Workers (2010-2018)

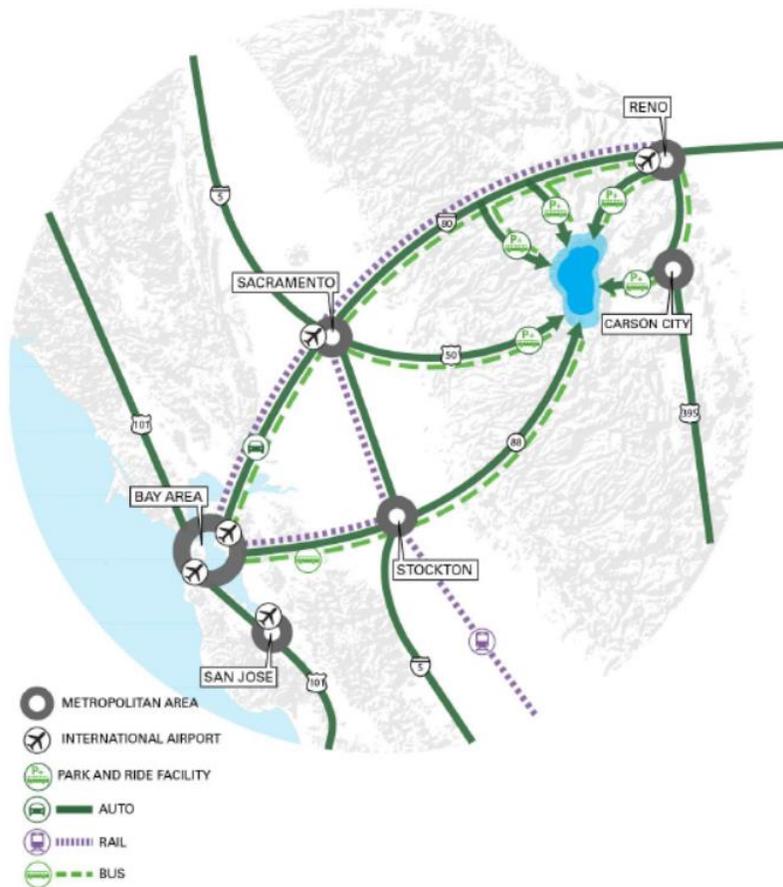


SOURCE: AMERICAN COMMUNITY SURVEY (ACS)

The forecast projects a small increase in employment in the Region as a result of increased visitation, construction of new CFA and TAUs, and population growth. In the 2018 model base year there are an estimated 28,604 workers in the Tahoe Region (some residents hold jobs outside the Region). The forecast projects continued growth of jobs in the Region, with 572 (+2%) and 858 (+3%) new jobs in the Region by 2035 and 2045, respectively. The number of external workers (those commuting into the Region for work) is not expected to grow because more workers are expected to find housing locally as a result of the regional housing initiatives.

VISITATION

Figure 3: Tahoe Mega-Region



The forecast includes an increase in visitation which is influenced by several factors. The Tahoe Region is located near and draws visitors from several regions that are projected to experience between 20% and 40% growth in the coming

decades (Figure 3, Table 5). The Sacramento Council of Governments (SACOG), predicts that population in the greater Sacramento region⁷ will grow 26% by 2045. SACOG models traffic volumes on Interstate-80 and US Highway-50 leading into the Tahoe Region, and forecasts between 18% and 22% increases in volume in the next two decades (SACOG 2019). Farther west, but still within the Tahoe Mega-Region, the Association of Bay Area Governments (ABAG)⁸ forecasts 27% population increase by 2040 (MTC & ABAG 2017). To the north and east of Tahoe, RTC-Washoe predicts a 27% growth in population in the Reno/Sparks Metropolitan area⁹ by 2040 and the Carson Area MPO¹⁰ predicts a 28% growth in

⁷ The Sacramento Area Council of Governments (SACOG) includes the counties of El Dorado, Placer, Sacramento, Sutter, Yolo, Yuba and the 22 cities within this six-county region.

⁸ The Association of Bay Area Governments (ABAG) region encompasses Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma counties

⁹ Regional Transportation Commission (RTC) of Washoe County, Nevada serves the Reno and Sparks areas along with unincorporated areas of Washoe County.

¹⁰ The Carson Area Metropolitan Planning Organization (CAMPO) covers the Carson City urbanized area, which consists of Carson City, northern Douglas County, and western Lyon County.

population (CAMPO 2016; RTC-Washoe 2018). Population growth in the mega-region is likely to create increased demand for the recreation opportunities and the unique experience that Tahoe provides.

Table 5: Mega-Region Growth Forecasts

Location	Metric	Growth	Forecast Year	Source
Sacramento Region	Population	+26%	2045	SACOG 2020 MTP/SCS
Sacramento Region	Employment	+25%	2045	SACOG 2020 MTP/SCS
Interstate-80	Traffic Volumes	+22%	2040	SACOG 2020 MTP/SCS
US Highway-50	Traffic Volumes	+18%	2040	SACOG 2020 MTP/SCS
Reno/Sparks Metro	Population	+27%	2040	RTC-Washoe 2040 RTP, 2018
Reno/Sparks Metro	Employment	+37%	2040	RTC-Washoe 2040 RTP, 2018
Carson City Region	Population	+28%	2040	CAMPO 2040 RTP, 2018
San Francisco Region	Population	+27%	2040	ABAG 2040 RTP, 2017

Table 6: Sacramento and Reno Population Growth

Location	Metric	Growth	Between	Source
Sacramento Region	Population	+32% (+1.4% per year)	2000-2020	SACOG
Reno–Sparks Metro	Population	+36% (1.7% per year)	2000-2018	Nevada Regional Economic Analysis Project

Population growth outside the Region over the last 20 years has not translated to a linear increase in visitation to the Region. Over the past 20 years (Table 6), the population in the SACOG region surrounding Sacramento has increased by 32% overall, or 1.4% per year compounded. The population of the Reno-Sparks Metropolitan region increased by 36%, or 1.7% per year compounded. Therefore, the forecast does not project increases in visitation in proportion to the projected growth in the mega-region. The mega-region is forecast to add another two million people over the next 20 years. The primary challenge in forecasting future visitation is in establishing the relationship between future population growth in the mega-region and visitation to the Tahoe Region. Looking at how historic growth in the mega-region has influenced travel into the Region through, we find that since 1990, the mega-region populations on the

California side have grown by 32%, while AADT at the California entry stations has grown by 15%. Put another way, the populations of San Francisco, Sacramento, and San Jose have grown by over two million people, which translated into 5,500 more trips through the entry or exits on the California side. The mega-region is forecast to add another two million people over the next 20 years. The challenge is further complicated by the impact of macro-economic conditions that affect visitation.

Despite the population growth outside the Region, the number of rooms rented in the Region is lower today than it was at the turn of the century. The recent observed trends in overnight lodging occupancy show generally flat or increasing occupancy in recent years, depending on location. Between 2013 and 2018, the number of hotel/motel rooms rented in the city of South Lake Tahoe increased by 37%. On the other hand, Douglas county casino occupancy (South Shore) has declined over the last two decades (Douglas County Room Tax Reports, 18-19); total rooms sold in the 2018-2019 fiscal year was 80% of the number sold in 2001-2002. The majority of the decline in Casino occupancy occurred between 2000-2010, and more recently occupancy has been relatively stable. Occupancy in Washoe county has varied between years over the last 20 years but overall is generally flat.

It is uncertain why past population growth has not translated in a linear fashion to increased visitation, but working theories include the decline in popularity of the local casinos as the gaming experience has become more widely available, limited tourist accommodation capacity, the limited roadway capacity into the Region and associated willingness to travel to the Region given the longer travel times.

The visitation forecast is comprised of related but independent projections regarding the expected characteristics of both the number and occupancy of overnight lodging accommodations types, and day visitation. The visitation forecast can be broken down into overnight visitors (staying in Hotels/Motels/Casinos/STRs/Private homes) and day visitors. The number of occupied overnight visitor units is forecast to grow by 9% by 2045.

Overnight Visitors in Hotels/Motels/Casinos – In the 2018 model base year, 6,190 of the Region's 11,107 TAUs are occupied (56%) during the modeled day. The forecast includes the construction of an additional 945 TAUs by 2045, an 8.5% increase in tourist accommodation units. Forecasted occupancy of TAUs was increased slightly to account for the impact of Measure T in the City of South Lake Tahoe, which is expected to affect where visitors to the city can stay but not the overall demand (MBI 2017). The forecast estimates that 50% of the visitor parties that may have previously stayed overnight in STRs within the City of South Lake Tahoe would now stay in TAUs, because of the expected lower supply of STRs in the City. As a result, the regional overnight lodging occupancy rate (in TAUs) increases from 56% to 59% in the forecast years. As a result of both additional unit availability from new TAU construction and the

higher occupancy rate, the actual number of occupied Hotel/Motel/Casino units increases by 14.5% in 2045.

Overnight Visitors in STRs – In 2018, TRPA estimated that there were 6,005 permitted STRs in the Tahoe Region, which comprised approximately 13% of all existing residential units and 23% of the vacant housing units. On the model day, 37% of the units (2,227) are occupied. The forecast projects that both the total number and occupancy of STRs is relatively flat in the forecast years. This projection is highly influenced by the City of South Lake Tahoe’s Measure T, which eliminates STRs within most of the City’s jurisdiction. Measure T will reduce the number of available STRs in the City of South Lake Tahoe but is unlikely to reduce the overall regional demand for the home-based stay experience in Tahoe. As a result, the forecast includes the displacement of STRs from the city to other jurisdictions in the Region. The result will be more STRs (in absolute and proportional terms) in other jurisdictions in the Region and in areas of the City where STRs are still allowed. As a result of Measure T, approximately 1,372 STRs within the City of South Lake Tahoe but located outside of the Tourist Core area will not have their licenses renewed. During the model analysis period (model day), 508 of those 1,372 STRs were occupied. The forecast assumes that all 508 visitor parties will still visit the Region and find overnight accommodations elsewhere. Of the visitor parties that would have been staying at one of the STRs impacted by Measure T, half are forecasted to find accommodations in STRs in the Tourist Core areas within the City of South Lake Tahoe, where STRs remain allowed, or in STRs in other jurisdictions, and half of visitor parties are forecast to shift to accommodations in the casinos, hotels, motels, and resorts in the Region.

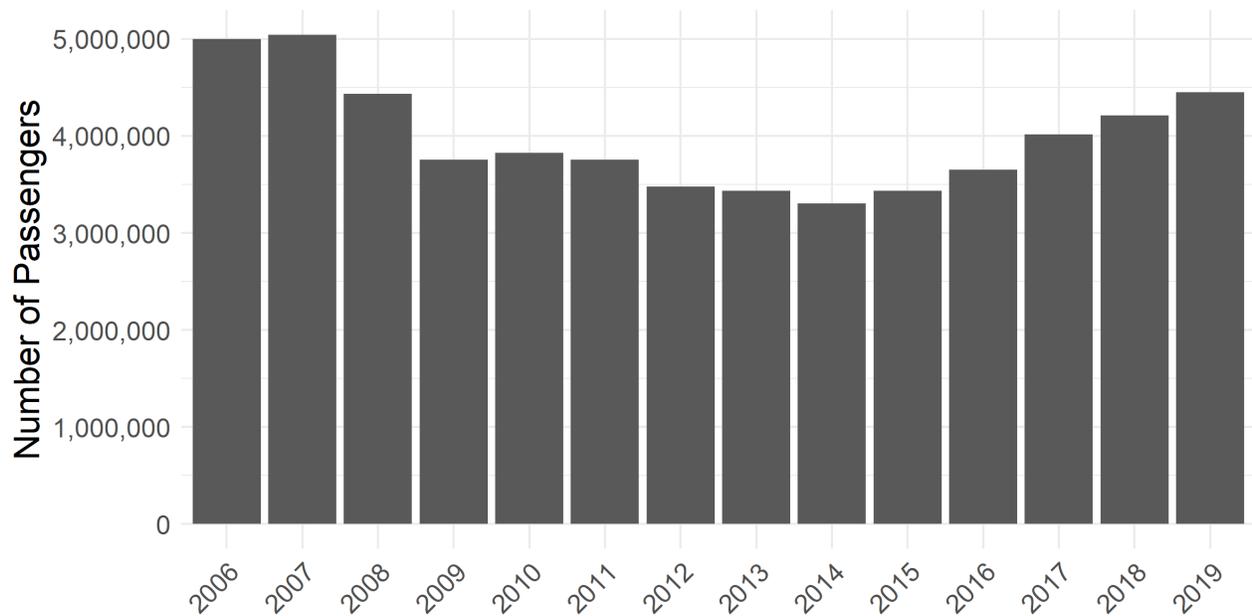
Overnight Visitors in Seasonal Units – Seasonal units are residences within the model that are not claimed as the primary residence for the owner. Within the model they could be occupied by the owner, friends of the owner, time-shares, informally rented, but are not accounted for included in the total of STRs. These units comprise approximately 36% of the total housing market in the Region, of which 37% were estimated to be occupied on modeled day in the 2018 base year. The forecast maintains these percentages into the forecast years. The proportion of seasonal units in the Region has grown in the last 10 years. The proportion of seasonal units is not forecast to continue to increase in the forecast, due to three factors: 1) the construction of additional workforce housing units which cannot be used for second homes, and 2) initiatives focused on making the existing housing more affordable for workers and residents, and 3) the conversion of some existing vacation rentals in the City of South Lake Tahoe to resident housing because of the Measure T requirements. The forecast projects the occupancy rate of second units will remain the same, maintaining the 37% occupancy of the base year in 2035 and 2045. As

a result of the increase in the total number of homes in the Region the number of seasonal units increases by 8% in 2045.

Day Visitors – Day visitation is forecast to increase as a result of population growth in the mega-region, at a similar rate as overnight visitation. Day visitors are one of the more challenging travel parties to forecast. The model assumes the factors that drive overnight visitation are positively correlated with factors driving day visitation. The relationship between these two types of visitors was established as part of the calibration and validation for the 2018 base year and is not expected to change in the forecast years.

Passenger Traffic at Reno Tahoe International Airport - TRPA staff also analyzed the total passenger data from the Reno Tahoe International Airport (Figure 4), which shows that passenger traffic has increased in each of the past 5 years, but remains below the passenger volumes in the mid-2000s. Between 2014 and 2019, annual growth in passengers ranged from +4% to +10%, with the average annual growth from 2014 to 2019 of +6%.

Figure 4: Reno-Tahoe International Airport: Total Passengers 2006-2019



Source: The Reno-Tahoe Airport Authority, Reno-Tahoe International Airport: Passengers and Cargo Statistics Reports 2008 through 2019, Retrieved May 25, 2020 from

<https://www.renoairport.com/airport-authority/facts-figures/statistics>.

Sensitivity of Visitation Forecasts

In meetings with the TRPA Governing Board, Tahoe Model Working Group and other stakeholders, TRPA staff were asked to test and report on the sensitivity and impact of higher or lower than expected changes in visitation and different scenarios that might change the forecast assumptions. In response, staff assessed the sensitivity of VMT forecasts to a range of visitation assumptions. performed additional validation and testing for changes in visitation and the resultant effect on VMT.

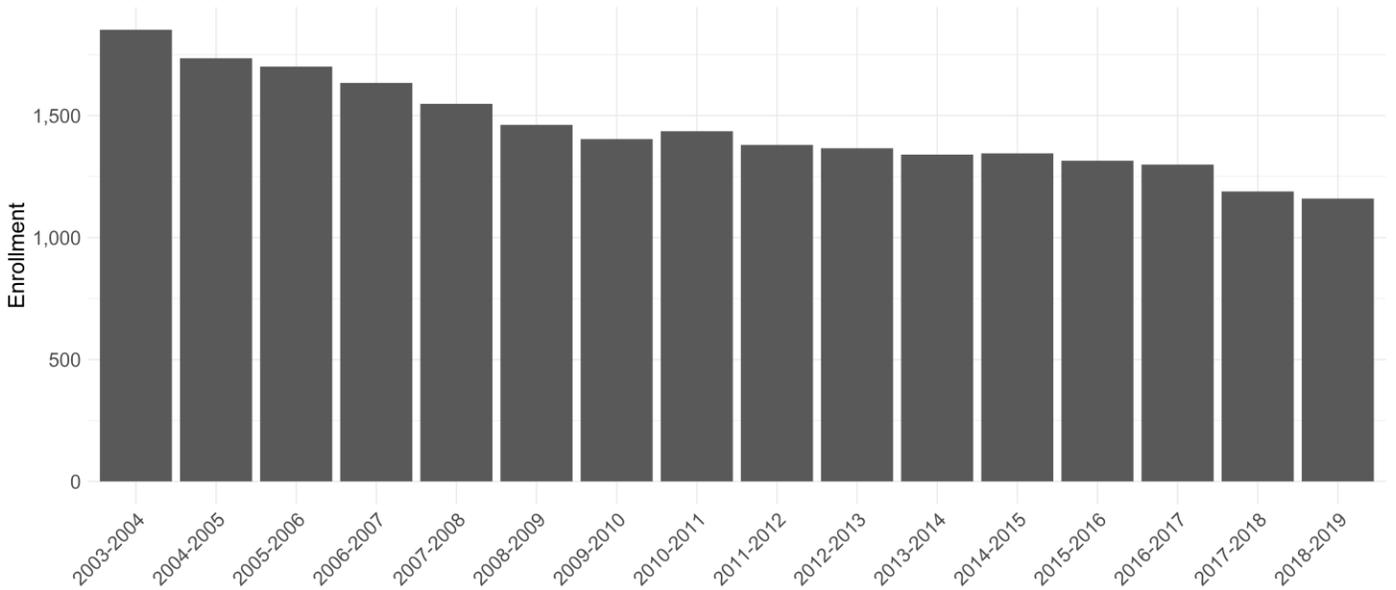
All visitors in the base year model (including day, overnight, second homeowners, and thru-travelers) average 7.9 in-region VMT a day. So, for every 100 additional (or fewer) visitors, Regional VMT would change by 790 VMT. At a high level, Visitors make up 47.3% of the VMT in the model, so if total visitation increased by 10%, regional VMT would increase by approximately 4.7% increase in regional VMT. If each of these visitor types were adjusted independently, the results would be as follows:

- A 10% increase in the number of day visitors would result in a 1.8% increase in regional VMT
- A 10% increase in overnight visitors would result in a 1.8% increase in regional VMT
- A 10% increase in second homeowners would result in a 0.9% increase in regional VMT

School Enrollment

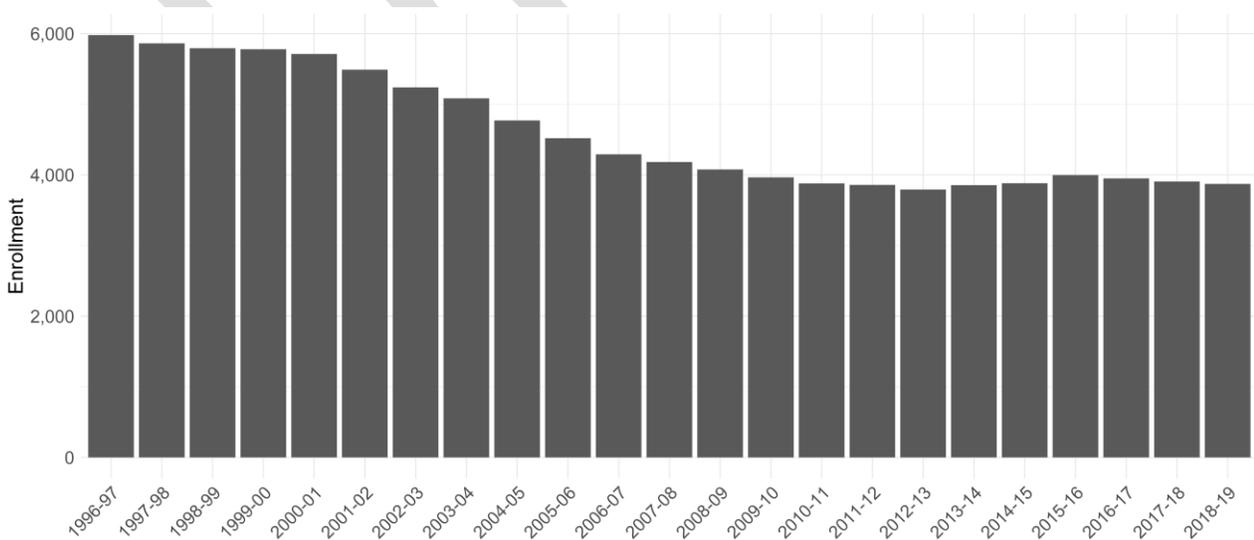
Like the overall population, school enrollment in the Region has decreased in the last two decades, but in most recent years has been relatively steady. Between 1996 and 2018, enrollment in the Lake Tahoe Unified School district in South Lake Tahoe, California decreased by 35%, while enrollment on the Nevada side decreased by 37%, from 1,852 in 2003 to 1,160 in 2019. The forecast projects that school enrollment will increase by 12.4% as new employment (858 additional jobs) and residents (6,417 additional full-time residents) are added to the Region.

Figure 5: Tahoe - Nevada School Enrollment (2003-2019)



SOURCE: [HTTP://NEVADAREPORTCARD.NV.GOV/DI/MAIN/DEMO PROF](http://nevadareportcard.nv.gov/di/main/demoprof)

Figure 6: Lake Tahoe Unified School District Enrollment (1996-2018)

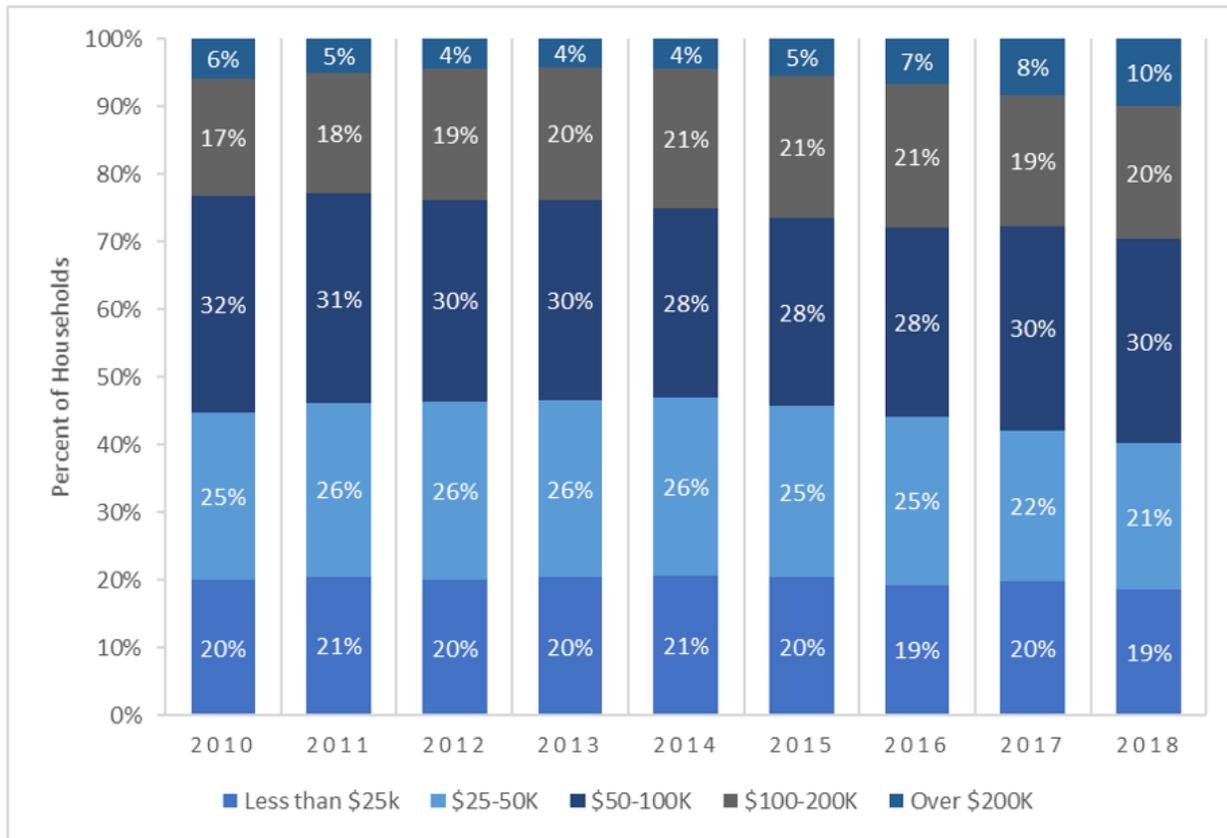


SOURCE: DQ.CDE.CA.GOV

HOUSEHOLD INCOME

Household income is a key characteristic of the residential population, which influences travel behavior. Census data over the last nine years show that household income in the Region is trending upwards towards higher incomes (ACS 2010-2018). Annual median income for households nationally rose to \$61,937 in 2018, within California it is \$75,277, and in Nevada it is \$58,646 (Guzman 2019). Median income in the Tahoe Region has grown over the last five years as the Region emerged from the Recession and is now close the national average. However, the proportion of households earning less than \$25,000/year annually has remained at relatively stable, at about 20% of households. Between 2010 and 2018 the number of households earning over \$200,000/year grew by 67% and those earning between \$100,000 and \$200,000 increased by 11%. Despite these gains, households earning less than \$100,000/year outnumber households earning more than \$100,000/year by two to one. Some have suggested the decline in lower-income households has been driven by workers leaving the Region in search of more affordable housing. The forecast projects that the relative distribution of household incomes will be maintained at the current level. Initiatives to provide workforce and affordable housing are expected to increase the regional housing availability at the lower end of income distribution.

Figure 7: Household Income Categories (% of Households 2010-2018)



SOURCE: AMERICAN COMMUNITY SURVEY (ACS)

Addendum

COVID-19

The research and majority of the forecasts for the 2020 Regional Transportation Plan were developed prior to the impact of COVID-19 on our community and the world. The immediate impact of COVID-19 on our community has been severe. Both states issued stay-at-home orders and the casinos, ski resorts and many other businesses closed in March 2020, furloughing or laying off thousands of employees. The Lakeside Inn and Casino announced that it would not reopen. The hotels, motels, restaurants, bars, and many of the recreation areas, beaches and parks that are the lifeblood of our tourism-based economy were closed for weeks. The impacts on transportation were apparent in the traffic volumes around the Region. In early May, VMT in the counties that make up the Tahoe Region was estimated to be down 30-50% from levels observed in the same period in prior years.

The long-term impacts of COVID-19 on the Region are uncertain. Some believe that the job losses, business closures, and economic hardship will continue. Others think that urban flight will result in a

mass movement from cities to rural areas, as remote work continues and people seek to escape crowded cities for open spaces, resulting in massive population shifts and increased housing needs in the Region.

Given this uncertainty, staff recommends maintaining the above assumptions for the forecast scenarios even considering the COVID -19 pandemic and associated economic downturn. The Harvard Business Review (HBR) recommends that in “moments of unprecedented uncertainty”, one must “know when not to make a forecast” (Saffo, 2007). HBR suggests that “even in periods of dramatic, rapid transformation, there are vastly more elements that do not change than new things that emerge” (Saffo,2007).

Transportation Projects & Strategies Forecast Summary

TRANSPORTATION PROJECTS & STRATEGIES

The second element of the RTP/SCS forecast was the transportation forecast. The transportation projects and strategies were forecasted using both the Tahoe travel demand model and the Trip Reduction Analysis Tool (TRIA). All fixed-route transit projects were directly incorporated into the travel demand model; the route locations, fares, and headways were directly forecasted within the model network. In terms of roadway capacity, the plan does not include many changes. As a result, the Highway 50 Revitalization project was the only roadway project directly represented in the travel demand model. The rest of projects and strategies were incorporated in the forecast using TRIA; these include microtransit, bike/ped projects, ITS, TDM, parking, and others.

TRIA 2.0

The Tahoe Regional Planning Agency developed and maintains a Trip Reduction Impact Analysis (TRIA) spreadsheet tool to evaluate the trip and VMT reduction impacts of various transportation policies and programs under consideration as part of the Sustainable Communities Strategy (SCS) effort. The TRIA spreadsheet tool captures the strategies that can have a significant effect on travel demand such as parking policies, traveler information systems, new transit operations, or construction of new bike trails and sidewalks but which cannot be accurately captured in the TRPA travel demand model. The purpose of the TRIA is to provide planning-level, order-of-magnitude, comparative estimates of the quantitative vehicle trip reductions in the travel demand modeling process to inform expected total trips, vehicle miles traveled (VMT), and greenhouse gas (GHG) emissions based on the combined impact of the capital improvement projects, operational enhancements, policies, and programs considered in the TRPA 2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

As noted above, the TRIA 2.0 tool provides a way to make comparisons between different policy alternatives and their ultimate effect on vehicle trips, VMT, and GHG emissions. The tool is integrated as a step in the travel demand modeling process in order to allow TRPA to understand the impact of

policies, programs, and other investments tailored to the Tahoe area that will help the Region meet the GHG emissions reduction targets set by the California Air Resources Board under California’s Senate Bill 375, the VMT reduction targets under California’s Senate Bill 743, and trip reduction goals.

As much as possible, the TRIA 2.0 used estimates based on current conditions in the Tahoe Basin, or existing trip reduction estimates developed locally, particularly in the case of new transit services and new active transportation facilities such as bike trails and sidewalks. For policies or projects for which there are no local studies, the trip reduction impacts were estimated based on a review of the current (2020) literature and studies of locations where similar policies, programs, or investments have been implemented. Where research shows that a policy might vary in effectiveness a more conservative approach will be chosen, so as not to overstate the trip and VMT reduction potential.

The TRIA 2.0 is built around the main modes of transportation and analysis of how the land use plan and transportation strategies and policies proposed in the RTP will impact these modes. The main categories previously considered in the model are:

- ▶ Active transportation (bicycling and walking)
- ▶ Public transit service
- ▶ Intelligent Transportation System (ITS) technologies
- ▶ Transportation demand management (TDM) measures
- ▶ Parking policy changes

As well as updating the existing categories in TRIA, the update also includes the addition of the following categories:

- ▶ Shared Micromobility services (i.e., E-scooters)
- ▶ Microtransit Services

The model is structured in such a way as to estimate the potential growth for each mode, where relevant (e.g. the potential for new transit riders who were previously vehicle riders), and estimate a vehicle trip reduction as a result of the strategy. See Table for an overview of the strategies analyzed and their individual estimated trip reduction potential in the 2035 and 2045 RTP/SCS scenarios.

ANALYSIS BY MODE

The approach taken in TRIA 2.0 for the strategies considered are summarized below. The table that follows lays out the full details on trip reduction by strategy, sources used and overall reduction.

ACTIVE TRANSPORTATION

The following describes the three active transportation-related trip reduction strategies.

BIKE AND PEDESTRIAN FACILITIES

The vehicle trip reductions for bicycle and pedestrian trips were developed using the bicycle and pedestrian monitoring data collected by TRPA for the past three years (the data used for this analysis and ongoing monitoring data is available at <http://www.trpa.org/transportation/monitoring/>). The monitoring data was used to develop an understanding of how walking and biking trips vary by different facility types (e.g., sidewalk, bike lanes, and shared-use paths) in different contexts (e.g., town centers, recreation corridors, campgrounds, etc.) to establish a relative classification of usage. New bicycle and pedestrian improvements were then classified into one of the facility and context types to estimate the number of walking and biking trips expected based on the new facility. These usage estimates are then used to estimate a vehicle trip reduction associated with the new walking and biking facilities. The TRIA assumes that the implementation of the bicycle and pedestrian network will happen at a uniform rate across the timeframe of the plan, therefore by 2035 only a portion of the network will have been completed, and therefore the VMT reduction is not as great in 2035 (1.12%) as in 2045, at 1.19%. This trip reduction is applied to all trips in the Region.

ELECTRIC BICYCLES

The prevalence of electric bicycles, or “e-bikes”, was introduced in the 2020 TRIA update to calculate trip reductions associated with programs and policies to encourage the safe use of e-bikes. E-bikes are gaining prevalence in many locations around the world through individual ownership, rental programs, and bikeshare services. A literature review was conducted to determine how e-bikes affect travel behavior and patterns. The primary finding of the literature was people are willing to travel nearly twice as far using an e-bike than a regular bicycle. To account for this impact, the TRIA tool estimates increases in the bicycle mode share based on the potential for longer bike trips using e-bikes. The reduction in vehicle trips based on the adoption of e-bikes (0.79%) was applied to all trips in the Tahoe Basin based on an expected bicycle mode share by trip length for both the 2035 and 2045 scenario.

SHARED MICROMOBILITY

Trip reductions associated with shared micromobility services were included in the TRIA 2.0 update. Shared micromobility services include shared e-scooters and e-bikes, that are accessed and paid for via applications and allow trips within a defined service area. Overall trips reduction factors associated with shared mobility services were calculated using 2018 and 2019 trip data and survey data from South Lake Tahoe’s implementation of the Lime e-scooter program which showed that 48% of e-scooter trips replaced an automobile trip. The trip reduction is calculated using trips in the areas expected to provide shared micromobility service in the future: Tahoe City, Kings Beach, and South Lake Tahoe areas. The

regional trip reduction percentage (0.53%) is calculated by dividing the total trips reduced in micromobility areas by regional trips. The resulting trip reduction factor was corroborated through review of e-scooter trip research from Portland and Chicago and is applied to all trips in the Region.

TRANSIT SERVICES AND FACILITIES

The following four strategies describe the trip reductions calculated in TRIA associated with new or improved transit services not captured by the TRPA travel demand model.

TRANSIT SERVICE AND CAPITAL PROJECTS

The transit portion of the trip and VMT reductions are based on ridership projections for new or improved transit routes included in the RTP's constrained project list for 2035 and 2045. The model currently accounts for transit ridership for all transit trips internal to the TRPA's travel demand model network (e.g., the Tahoe Basin). Therefore, the transit portion of the trip reductions in TRIA is only based on trips that either originate or end external to the Tahoe Basin. Additionally, trip reductions associated with circulator, ferry taxi, and other non-route-based services that cannot be represented in the travel demand model are also estimated in the TRIA 2.0 transit service calculations. The name and description of the new or improved transit routes included in the trip reduction calculations are listed below:

- ▶ Year 2035:
 - TTD 20 and 19x (long)- Stateline TC to Carson (interlined)
 - TTD 21x - Stateline TC to Carson via Spooner
 - TART 89 (long) - Tahoe City TC to Truckee Depot
 - TART 267 (long) - Stateline to Truckee Depot
 - Event Center Circulator - Tourist Core to Round Hill
 - South Shore Ferry Taxi - Round Hill Pines to Camp Richardson
 - STS - STS Medical Transportation
- ▶ Year 2045:
 - TTD 20 and 19x (long) - Stateline TC to Carson (interlined)
 - TTD 21x - Stateline TC to Carson via Spooner
 - TART 89 (peak) - Tahoe City TC to Truckee Depot
 - TART 89 (off-peak) - Tahoe City TC to Truckee Depot
 - TART 267 - Stateline to Truckee Depot
 - TART 3 - Incline Village to Reno
 - Trans Sierra 1 - Meyers to Stockton
 - Trans Sierra 2 - Meyers to Sacramento
 - Event Center Circulator - Tourist Core to Round Hill
 - South Shore Ferry Taxi - Round Hill Pines to Camp Richardson

- North Shore Ferry Taxi - Sand Harbor to Tahoma
- STS - STS Medical Transportation

Trip reduction calculations associated with these additional transit services results in trip reductions of 0.51% and 1.61% in 2035 and 2045, respectively. This trip reduction is applied to regional trips (including external trips).

INTERCEPT LOTS

Additionally, a strategy implementing intercept parking lots to allow visitors or residents to park in designated lots and transfer to transit services was also evaluated in the updated TRIA calculations. The strategy targets reducing visitor vehicle trips into the Tahoe Basin and the impact was estimated based on a study by the Alameda County Transportation Commission estimating drive-to-transit mode shares. The estimated impact of the intercept lots was adjusted down from 8% to 4% to conservatively estimate the number of visitors that would be willing to use the intercept lots. Based on the percentage of external traffic generated by visitors (70%), the calculated trip reduction for was 2.8%. This trip reduction factor is only applied to external trips entering or leaving the Region.

MICROTRANSIT SERVICE AREAS

Trip reductions associated with microtransit services were also included as a new strategy in the TRIA update. Microtransit services are on-demand transit services that typically provide flexible routes within a defined service area using lower-capacity transit vehicles. Microtransit services can be funded by public agencies, private agencies, or through public-private partnerships. Overall trip reduction factors associated with microtransit were calculated using 2019 and 2020 trip data from the Squaw Valley and Alpine Meadows' Mountaineer microtransit service. User survey data from Aspen's Downtowner microtransit service was used to calculate the percentage of microtransit trips that replace vehicle trips. Vehicle trip reductions associated with microtransit service areas are calculated based on the total number of trips in areas where microtransit services are planned as part of the RTP/SCS: Tahoe City, Kings Beach, and South Lake Tahoe. The reduced vehicle trips are then used to calculate regional trip reduction factors of 0.28% and 0.45% in 2035 and 2045, respectively. The trip reduction factor is then applied to all trips in the Region.

INTELLIGENT TRANSPORTATION SYSTEM (ITS) TECHNOLOGIES

Several strategies to increase the functionality and usability of transit based on ITS technology improvements were included in the TRIA 2.0. These included:

- ▶ Improved transit coordination between local and regional providers, through simplified trip planning (e.g. Google Transit). This strategy is associated with trip reduction percentages of 0.68% and 0.66% of trips to or from Town Centers in 2035 and 2045, respectively. For external trips, this strategy is associated with trips reductions of 0.43% and 0.42% in 2035 and 2045, respectively.
- ▶ Improved transit coordination between local and regional providers, through the elimination or shortened wait time of transfers, as well as improvements to ticketing structure and agency cooperation to eliminate "transfer anxiety". This strategy is associate with trip reduction percentages of 0.08% and 0.10% of trips to or from Town Centers in 2035 and 2045, respectively.
- ▶ Real-time arrival information at transit stops, online, and/or via web-enabled mobile devices. The trip reduction factor for this strategy is 0.04% and is applied to trips to or from Town Centers.
- ▶ Dynamic ridesharing for inter-regional trips. This strategy introduces services and/or subsidies to encourage commuters to rideshare. Examples include through carpool matching services and vanpools. The TRIA tool calculates the expected reduction in trips with the introduction of these services as 1.00% and is this reduction is applied to internal-external and external-internal trips only.

TRANSPORTATION DEMAND MANAGEMENT (TDM) MEASURES

The TRIA 2.0 TDM calculations were updated with current employer data. The businesses are categorized by size with 19 small (less than 100 employees), three medium (between 100 and 200 employees) and four large employers (more than 200 employees) included in the data set. TRIA 2.0 compares the effect of improving the participation rate of the existing Employer Trip Reduction ordinance through improved enforcement and/or updating policies and programs. Target participation rates for small, medium, and large employers were established and compared to an assumed 50% existing participation rate. The change in participation is then used to calculate reduced trips based on expected TDM policies impacts based on the current literature and average local employer size data. The TDM measures trip reduction is calculated for new development (1.86%) and existing development (0.82%). New development is estimated to be 3% of all new trips in the Region and is used to weight the potential trip reduction of TDM measures. The TDM measures trip reductions are only applied to trips going to or from a Town Center.

PARKING MANAGEMENT

TRIA 2.0 evaluates the expected reduction in vehicle trips associated with parking pricing and parking management strategies in select parking management zones in the Tahoe Basin. This includes demand-responsive pricing in commercial areas with residential permits to prevent parking spillover into residential areas, changes to parking standards, shared parking arrangements, etc. This trip reduction percentage is calculated relative to regionwide trips based on the trips reduced in areas implementing

parking strategies. The trip reduction calculation methodology was updated to simplify the overall calculation method and account for a wider range of parking strategies in an inclusive calculation based on an updated literature review on the latest research into parking impacts on vehicle trip reductions. A parking management trip reduction percentage from the current literature (2.7%) was halved to 1.35% to reflect the lower potential impact of parking management policies based on the high recreational travel demand for the Region. This trip reduction was applied to trips in areas across the Region that were expected to implement parking management strategies to calculate the total number of vehicle trips reduced. These trip reductions were then recalculated as a trip reduction factor that is applied to all regional trips (1.2%).

TRIP REDUCTIONS SUMMARY

Table presents a summary of the trip reductions by individual strategy described above. The summary table provides a brief description of the vehicle trip reduction strategy, the primary source of reduced vehicle trips, the type of vehicle trips impacted, employer type, and the individual 2035 and 2045 percent reductions.

Trip reductions are classified into one of three vehicle trip type groupings:

- ▶ **Regional Trips:** This grouping applies the vehicle trip reduction to all trips in the Region.
- ▶ **Town Center Trips:** This grouping only applies the vehicle trip reduction to trips that are going to or from a designated Town Center.
- ▶ **External Trips:** This grouping only applies the vehicle trip reduction to trips that are entering or exiting the Region.

For the TDM strategy, reductions are calculated for new and existing employers. Given some employers are already participating in employer trip reduction programs, the impact on existing employers is lower than for new employers. This is the only strategy for which the employer type is considered.

TABLE 7: TRIP REDUCTION IMPACT ANALYSIS (TRIA) ESTIMATES – 2045 FORECAST

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
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%
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%
Promotion of electric bicycle use	Reduced vehicle trips due to the widespread use of electric bicycles	Regional Trips	--	0.79%	0.79%
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%
Inter-regional transit service that extends outside the Tahoe Basin.	Reduced commuter and recreational trips.	External Trips	--	0.51%	1.64%
Intercept lots at entrances to the Tahoe Basin providing frequent shuttle service into the Region.	Reduced visitor trips.	External Trips	--	2.80%	2.80%
Microtransit service areas	Reduced trips for all types served by Microtransit service areas.	Regional Trips	--	0.28%	0.45%
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%
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%
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%
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%
Regionally implemented dynamic ridesharing (conservative implementation).	Reduced commuter and recreational trips.	External Trips	--	1.00%	1.00%
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%
		Town Center Trips	Existing Employers	0.82%	0.82%
Parking Management					

<p>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.</p>	<p>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.</p>	<p>Town Center Trips</p>	<p>--</p>	<p>1.22%</p>	<p>1.22%</p>
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Source: TRPA, Kittelson & Associates, Inc., 2020.

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CUMULATIVE EFFECT

While the effect of each policy or project type is analyzed individually, the cumulative effect of these strategies was estimated to apply to the TRPA travel demand model. The cumulative effect of each individual strategy is not simply the sum of the individual strategy effects. The impact of some strategies depends on the origin and destination trip type – for example whether they affect trips that start in Tahoe but end outside the Region, or if the entire trip takes place within the Tahoe Basin.

Where there are several reduction measures that are not mutually exclusive, the total cumulative reduction does not equal Measure A + Measure B. Once Measure A has been applied, Measure B will be applied to a base that has already been reduced by Measure A. For example, if two trip reduction measures would each give a 10% trip reduction, the total cumulative reduction is not 20%. Rather, it would be equal to 100% - (90%*90%) = 19%. This process continues for each additional strategy considered for a grouping.

Table 13 summarizes the cumulative impact by trip area type impacted. These cumulative impacts for each of the three trip area types (Town Center, Non-Town Center, and Internal-External) are calculated using the method described above. The strategies applied to trip each area type are combinations of the vehicle trip types noted for each individual strategy in Table . These combinations are summarized below:

- ▶ **Town Centers:** all “Regional Trips” and “Town Center Trips” strategies are combined in this trip area type.
- ▶ **Non-Town Centers:** only “Regional Trips” strategies are combined for these trip types.
- ▶ **Internal-External:** only “External Trips” strategies are combined for this trip area type.

TABLE 13. CUMULATIVE IMPACT BY TRIP AREA TYPE IMPACTED

Trip Area Type	Employer Type	2035 Percent Reduction in Vehicle Trips	2045 Percent Reduction in Vehicle Trips
Town Centers	Existing employers	5.92%	7.21%
	New employers	6.91%	8.18%
	Overall	5.95%	7.28%
Non-Town Centers	--	3.20%	4.53%
Internal-External	--	4.67%	5.75%

Source: TRPA, Kittelson & Associates, Inc., 2020.

For Town Centers, the TDM measures strategy distinguishes between new and existing employers. As a result, a vehicle trip reduction percentage is calculated for each scenario and employer type. These are then combined into overall trip reductions by year using a weighted average based on the assumption that new employer trips represent 3% of all travel consistent with the 2017 RTP/SCS assumptions. The cumulative impacts by trip area type are then applied to the TRPA travel demand model as described below.

FILENAME: [HTTPS://TAHOEREGIONALPLANNING.SHAREPOINT.COM/SITES/TRANSPORTATION/SHARED/DOCUMENTS/TTAC/RP/C/MARCH_RECOMMENDATIONS/STAFF_SUMMARY_ATTACHMENTS/ATTACH_A_2021.3.16.THRESHOLDPACKAGE.DOCX](https://TAHOEREGIONALPLANNING.SHAREPOINT.COM/SITES/TRANSPORTATION/SHARED/DOCUMENTS/TTAC/RP/C/MARCH_RECOMMENDATIONS/STAFF_SUMMARY_ATTACHMENTS/ATTACH_A_2021.3.16.THRESHOLDPACKAGE.DOCX)

TRAVEL DEMAND MODEL INTEGRATION

An additional component of the 2020 TRIA 2.0 update was to integrate the overall trip reductions directly into the TRPA travel demand modeling process rather than relying on off-model reductions using the TRIA tool to post-process vehicle trips. As part of this integration, the TRIA trip reduction factors for each traffic analysis zone (TAZ) in the travel demand model is calculated based on the strategies that are applicable to a trip starting or ending in that zone using the trip area types described above. The trip reduction factors vary based on whether trips are within the Tahoe Basin, travel to a Town Center, or start or end external to the Tahoe Basin. The TRIA 2.0 trip adjustment factor model script is run for each RTP/SCS scenario and the travel demand model's trip table is adjusted to account for the reduction in vehicle trips for each origin-destination pair (e.g., Kings Beach to Tahoe City, or South Lake Tahoe to Carson City). These reduced trips are then reassigned to the travel demand model network to obtain an estimate of trips and vehicle miles traveled for the entire model roadway network. The resulting trip and VMT data can then be used to calculate RTP/SCS performance metrics and impacts based on the expected number of trips after considering the strategies included in the TRIA.

Table 8: Total Proportion of Vehicle Trip Reductions

Parking	TDM	Transit	Rideshare	Ped/Bike	Micromobility
9.8%	22.1%	32.9%	4.3%	24.0%	6.8%

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Attachment B

Threshold Indicators and Compliance Measures Checklist

2020 REGIONAL TRANSPORTATION PLAN/SUSTAINABLE

Impact of Project on Air Quality Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to Air Quality and found impacts to be less than significant. The analysis found that the plan is in conformance with federal and state air quality regulations. Furthermore, the 2020 RTP/SCS implements projects and programs that are designed to reduce air pollutant emissions. Greenhouse gas emissions were also analyzed and impacts were found to be less than significant. The combination of improved vehicle fuel efficiency, which would reduce per vehicle GHG emissions and the travel efficiency offered by the transportation projects included in the RTP would result in an overall reduction in GHG emissions. AQ 14, below, has been removed and will be replaced with Transportation and Sustainable Communities indicator TSCI. If adopted, this change would be reflected in the 2023 Threshold Evaluation.
Impact of Project on Water Quality Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to Water Quality and found that majority of impacts would be less than significant as a result of implementation of the Plan. Beneficial water quality impacts would also result due to the upgraded stormwater infrastructure and other site specific improvements.
Impact of Project on Soil Conservation Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to soils and found that the impacts would be less than significant as a result of implementation of the plan. The RTP does not include provisions to alter or revise regulations pertaining to grading and soil disturbance. Furthermore, implementation of transportation infrastructure projects would improve conditions related to soil retention on project site.
Impact of Project on Vegetation Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to vegetation and found that the impacts would be less than significant. The RTP/SCS does not include provisions to alter or revise regulations pertaining to native vegetation protection during construction, vegetation removal or groundwater management, new vegetation, unique, rare, or endangered species of plants, stream bank or backshore vegetation, or tree removal.
Impact of Project on Fisheries Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to biological resources, including fisheries, and found impacts to be less than significant. Projects contained within the 2020 RTP/SCS would not affect fisheries, and for sites where infrastructure projects include stormwater retention improvements, the water quality would be improved for receiving water bodies that provide fish habitat.
Impact of Project on Wildlife Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to biological resources, including wildlife, and found the impacts would be less than significant. The RTP/SCS does not include provisions to alter or revise regulations related to wildlife habitat, monitoring and disturbance during construction.
Impact of Project on Recreation Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to recreation and found the impacts would be less than significant. Projects in the 2020 RTP/SCS would further result in improved capacity of the recreational system through more frequent transit, traffic management and information technology, as well as pedestrian and bicycle amenities that will enable residents and visitors to more easily access and connect to recreation locations and experiences.
Impact of Project on Scenic Resources Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts to scenic resources and found the impacts would be less than significant. The RTP/SCS does not include provisions to alter or revise regulations related to design standards and scenic attainment. Furthermore, the 2015 Threshold Evaluation found that scenic resources at a regional scale were shown to improve as a result of development of recreation and bike trails. Construction and operation of new transportation projects would be required to comply with design, shielding, and lighting standards.

Impact of Project on Noise Indicators/Targets/Other Factors (Y/N)	N	Comments	The 2020 RTP/SCS IS/IEC analyzed potential impacts related to noise and found the impacts to be less than significant, although the IS/IEC estimated minor increases in traffic noise levels. Because implementation of the 2020 RTP/SCS would not result in substantially louder traffic noise levels in 2045 than the baseline levels and 2035 levels presented in the 2012 RTP/SCS EIR/EIS, this would not be a significantly more severe impact.
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UPDATE TO AIR QUALITY THRESHOLD STANDARD (AQ14) AND ASSOCIATED

Impact of Project on Air Quality Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IEC analyzed potential impacts to Air Quality and found impacts to be less than significant. The analysis found that the proposed changes are consistent with best practice and in conformance with federal and state air quality regulations. Furthermore, the 2020 RTP/SCS implements projects and programs that are designed to reduce air pollutant emissions. Greenhouse gas emissions were also analyzed and impacts were found to be less than significant. The combination of improved vehicle fuel efficiency, which would reduce per vehicle GHG emissions and the travel efficiency offered by the transportation projects included in the RTP would result in an overall reduction in GHG emissions. AQ 14, below, has been removed and will be replaced with Transportation and Sustainable Communities indicator TSCI, which will be reflected in the 2021 Threshold Evaluation.
Impact of Project on Water Quality Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts to Water Quality and found that the impacts would be less than significant, and would not impact the Regions ability to achieve the Lake Tahoe Total Mximum Daily Load targets.
Impact of Project on Soil Conservation Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts to soils and found that the impacts would be less than significant as a result of implementation of the plan. Niether the updated standard nor implementation framework would alter or revise regulations pertaining to grading and soil disturbance.
Impact of Project on Vegetation Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts to vegetation and found that the impacts would be less than significant. Niether the updated standard nor implementation framework include provisions to alter or revise regulations pertaining to native vegetation protection during construction, vegetation removal or groundwater management, new vegetation, unique, rare, or endangered species of plants, stream bank or backshore vegetation, or tree removal.
Impact of Project on Fisheries Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts to biological resources, including fisheries, and found impacts to be less than significant. Niether the updated standard nor implementation framework would affect fisheries or biological resources.
Impact of Project on Wildlife Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts to biological resources, including wildlife, and found the impacts would be less than significant. Niether the updated standard nor implementation framework include provisions that alter or revise regulations related to wildlife habitat, monitoring and disturbance during construction.
Impact of Project on Recreation Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts to recreation and found the impacts would be less than significant. The updated standard and implementation framework emphasize greater locational efficiency in the placement of new development, that coupled with the projects in the 2020 RTP/SCS would further result in improved modal accesss to the region's recreational amenities.
Impact of Project on Scenic Resources Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts to scenic resources and found the impacts would be less than significant. Niether the updated standard nor implementation framework include provisions that alter or revise regulations related to design standards and scenic attainment.
Impact of Project on Noise Indicators/Targets/Other Factors (Y/N)	N	Comments	The Threshold Standard (AQ14) Update IS/IEC analyzed potential impacts related to noise and found the impacts to be less than significant, although the IS/IEC estimated minor increases in traffic noise levels. Niether the updated standard nor implementation framework include provisions that alter or revise regulations related to noise.

THRESHOLD ATTAINMENT STATUS

<u>Category</u>	<u>Reporting Category</u>	<u>Standard Type</u>	<u>Name of Standard</u>	<u>Adopted Standard</u>	<u>2015 Status</u>	<u>Status (2015)</u>	<u>Trend (2015)</u>	<u>Confidence (2015)</u>	
WATER QUALITY									
WATER QUALITY	DEEP WATER (PELAGIC) LAKE TAHOE	WQ1	NUMERICAL STANDARD	Disk	Annual Average Secchi Disk The annual average deep water transparency as measured by Secchi disk shall not be decreased below 29.7 meters (97.4 feet), the average levels recorded between 1967 and 1971 by the University of California, Davis.	Non-Attainment	Somewhat Worse Than Target	Little or No Change	Moderate

WATER QUALITY	DEEP WATER (PELAGIC) LAKE TAHOE	WQ2	NUMERICAL STANDARD	Primary Productivity	Maintain annual mean phytoplankton primary productivity at or below 52gmC/m2/yr	Non-Attainment	Considerably Worse Than Target	Rapid Decline	High
WATER QUALITY	LITTORAL LAKE TAHOE	WQ3	NUMERICAL STANDARD	Littoral Turbidity	Attain turbidity values not to exceed three NTU. Turbidity shall not exceed one NTU in shallow waters of the Lake not directly influenced by stream discharges.	Attainment	At or Somewhat Better Than Target	Insufficient Data to Determine Trend	Moderate
WATER QUALITY	LITTORAL LAKE TAHOE	WQ4	NUMERICAL STANDARD	Littoral Turbidity - non-stream zone		Attainment	At or Somewhat Better Than Target	Insufficient Data to Determine Trend	Moderate
WATER QUALITY	LITTORAL LAKE TAHOE	WQ5	NUMERICAL STANDARD	Littoral phytoplankton primary productivity	Attain 1967-71 mean values for phytoplankton primary productivity in the littoral zone.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	LITTORAL LAKE TAHOE	WQ6	NUMERICAL STANDARD	Littoral periphyton	Attain 1967-71 mean values for periphyton biomass in the littoral zone.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	LITTORAL LAKE TAHOE	WQ7	MANAGEMENT STANDARD	Attached Algae	Support actions to reduce the extent and distribution of excessive periphyton (attached) algae in the nearshore (littoral zone) of Lake Tahoe	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	AQUATIC INVASIVE SPECIES	WQ8	MANAGEMENT STANDARD	AIS Prevention	Prevent the introduction of new aquatic invasive species into the region's waters.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	AQUATIC INVASIVE SPECIES	WQ9	MANAGEMENT STANDARD	AIS Abundance	Reduce the abundance of known aquatic invasive species.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	AQUATIC INVASIVE SPECIES	WQ10	MANAGEMENT STANDARD	AIS Distribution	Reduce the distribution of known aquatic invasive species.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	AQUATIC INVASIVE SPECIES	WQ11	MANAGEMENT STANDARD	AIS ecological impacts	Abate harmful ecological impacts resulting from aquatic invasive species.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	AQUATIC INVASIVE SPECIES	WQ12	MANAGEMENT STANDARD	AIS economic impacts	Abate harmful economic impacts resulting from aquatic invasive species.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	AQUATIC INVASIVE SPECIES	WQ13	MANAGEMENT STANDARD	AIS social impacts	Abate harmful social impacts resulting from aquatic invasive species.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	AQUATIC INVASIVE SPECIES	WQ14	MANAGEMENT STANDARD	AIS public health impacts	Abate harmful public health impacts resulting from aquatic invasive species	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	TRIBUTARIES	WQ15	NUMERICAL STANDARD	Nitrogen Concentration - streams	Attain applicable state standards for concentrations of dissolved inorganic nitrogen	3 of 7 tributaries in attainment	Somewhat Worse Than Target	Little or No Change	Moderate
WATER QUALITY	TRIBUTARIES	WQ16	NUMERICAL STANDARD	Phosphorus concentration - streams	Attain applicable state standards for concentrations of dissolved phosphorus.	3 of 7 tributaries in attainment	Somewhat Worse Than Target	Little or No Change	Moderate
WATER QUALITY	TRIBUTARIES	WQ17	NUMERICAL STANDARD	Iron concentration streams	Attain applicable state standards for dissolved iron.	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	TRIBUTARIES	WQ18	NUMERICAL STANDARD	Suspended Sediment concentration streams	Attain a 90 percentile value for suspended sediment concentration of 60 mg/1.	No Status Determination	No status determination	N/A	N/A

WATER QUALITY	SURFACE RUNOFF	WQ19	NUMERICAL STANDARD	Dissolved inorganic nitrogen concentrations - stormwater	Achieve a 90 percentile concentration value for dissolved inorganic nitrogen of 0.5 mg/1 in surface runoff directly discharged to a surface water body in the Basin.	No Status Determination
WATER QUALITY	SURFACE RUNOFF	WQ20	NUMERICAL STANDARD	Phosphorus concentration -	Achieve a 90 percentile concentration value for dissolved	No Status Determination
WATER QUALITY	SURFACE RUNOFF	WQ21	NUMERICAL STANDARD	Iron concentration - stormwater	Achieve a 90 percentile concentration value for dissolved iron of 0.5 mg/1 in surface runoff directly discharged to a surface water body in the Basin.	No Status Determination
WATER QUALITY	SURFACE RUNOFF	WQ22	NUMERICAL STANDARD	Suspended Sediment concentration - stormwater	Achieve a 90 percentile concentration value for suspended sediment of 250 mg/1 in surface runoff directly discharged to a surface water body in the Basin.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ23	MANAGEMENT STANDARD	Surface Discharge - nitrogen	Surface Discharge: Total Nitrogen Maximum concentration 0.5 mg/l.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ24	MANAGEMENT STANDARD	Surface Discharge - phosphorus	Surface Discharge: Total phosphate Maximum concentration 0.1 mg/l.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ25	MANAGEMENT STANDARD	Surface Discharge - iron	Surface Discharge: Total iron Maximum concentration 0.5 mg/l.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ26	MANAGEMENT STANDARD	Surface Discharge - turbidity	Surface Discharge: Turbidity Maximum concentration 20 JTU.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ27	MANAGEMENT STANDARD	Surface Discharge - grease and oil	Surface Discharge: Grease and Oil Maximum concentration 2.0 mg/l.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ28	MANAGEMENT STANDARD	Discharge to groundwater - nitrogen	Runoff Discharged to Groundwater: Total Nitrogen Maximum concentration 0.5 mg/l.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ29	MANAGEMENT STANDARD	Discharge to groundwater - phosphorus	Runoff Discharged to Groundwater: Total Phosphate Maximum concentration 1 mg/l.	No Status Determination
WATER QUALITY	GROUNDWATER	WQ30	MANAGEMENT STANDARD	Discharge to groundwater - iron	Runoff Discharged to Groundwater: Total iron Maximum concentration 4.0 mg/	No Status Determination
WATER QUALITY	GROUNDWATER	WQ31	MANAGEMENT STANDARD	Discharge to groundwater - turbidity	Runoff Discharged to Groundwater: Turbidity Maximum concentration 200 JTU.	No Status Determination

No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A

WATER QUALITY	GROUNDWATER	WQ32	MANAGEMENT STANDARD	Discharge to groundwater- grease and oil Attain existing water quality standards.	Runoff Discharged to Groundwater: Grease and Oil Maximum concentration 40.0 mg/l. Attain existing water quality standards.	No Status Determination
WATER QUALITY	OTHER LAKES	WQ33	NUMERICAL STANDARD			No Status Determination
WATER QUALITY	LOAD REDUCTIONS	WQ34	MANAGEMENT STANDARD	Load - Fine Sediment Particles	Reduce fine sediment particle (inorganic particle size < 16 micrometers in diameter) load to achieve long-term pelagic water quality standards (WQ1 and WQ2).	No Status Determination
WATER QUALITY	LOAD REDUCTIONS	WQ35	MANAGEMENT STANDARD	Load - total annual phosphorus	Reduce total annual phosphorus load to achieve long-term pelagic water quality standards (WQ1 and WQ2) and littoral quality standards (WQ5 and WQ6).	No Status Determination
WATER QUALITY	LOAD REDUCTIONS	WQ36	MANAGEMENT STANDARD	Load - total annual nitrogen	Reduce total annual nitrogen load to achieve long-term pelagic water quality standards (WQ1 and WQ2) and littoral quality standards (WQ5 and WQ6). Decrease total annual suspended sediment load to achieve littoral turbidity standards (WQ3 and WQ4).	No Status Determination
WATER QUALITY	LOAD REDUCTIONS	WQ37	MANAGEMENT STANDARD	Load - total annual suspended sediment		No Status Determination
WATER QUALITY	LOAD REDUCTIONS	WQ38	MANAGEMENT STANDARD	Load - dissolved phosphorus	Reduce the loading of dissolved phosphorus to achieve pelagic water standards (WQ1 and WQ2) and littoral quality standards (WQ5 and WQ6).	No Status Determination
WATER QUALITY	LOAD REDUCTIONS	WQ39	MANAGEMENT STANDARD	Load - iron	Reduce the loading of iron to achieve pelagic water standards (WQ1 and WQ2) and littoral quality standards (WQ5 and WQ6). Reduce the loading of other algal nutrients to achieve pelagic water standards (WQ1 and WQ2) and littoral quality standards (WQ5 and WQ6).	No Status Determination
WATER QUALITY	LOAD REDUCTIONS	WQ40	MANAGEMENT STANDARD	Load - other algal nutrients		No Status Determination

No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A

				The most stringent of the three dissolved inorganic nitrogen load reduction targets shall apply: i. Reduce dissolved inorganic nitrogen loads to pelagic and littoral Lake Tahoe from: a) surface runoff by approximately 50 percent of the 1973-81 annual average, b) groundwater approximately 30 percent of the 1973-81 annual average, and c) atmospheric sources approximately 20 percent of the 1973-81 annual average. ii. Reduce dissolved inorganic nitrogen loading to Lake Tahoe from all sources by 25 percent of the 1973-81 annual average. iii. To achieve littoral water quality standards (WQ5 and WQ6).	No Status Determination	No status determination	N/A	N/A
WATER QUALITY	LOAD REDUCTIONS	WQ41	MANAGEMENT STANDARDS	Load - dissolved nitrogen	WQ6).			

SOIL CONSERVATION

SOIL CONSERVATION	IMPERVIOUS COVER	SC1	MANAGEMENT STANDARDS	Bailey Land Coverage Class 1a	Allowable percent of impervious cover in Land Capability subclass 1a - 1%. Attainment	Considerably Better Than Target	Little or No Change	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC2	MANAGEMENT STANDARDS	Bailey Land Coverage Class 1b	Allowable percent of impervious cover in Land Capability subclass 1b - 1%. Non-Attainment	Considerably Worse Than Target	Moderate Improvement	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC3	MANAGEMENT STANDARDS	Bailey Land Coverage Class 1c	Allowable percent of impervious cover in Land Capability subclass 1c - 1%. Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC4	MANAGEMENT STANDARDS	Bailey Land Coverage Class 2	Allowable percent of impervious cover in Land Capability class 2 - 1%. Non-Attainment	Somewhat Worse Than Target	Little or No Change	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC5	MANAGEMENT STANDARDS	Bailey Land Coverage Class 3	Allowable percent of impervious cover in Land Capability class 3 - 5%. Attainment	Considerably Better Than Target	Little or No Change	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC6	MANAGEMENT STANDARDS	Bailey Land Coverage Class 4	Allowable percent of impervious cover in Land Capability class 4 - 20%. Attainment	Considerably Better Than Target	Little or No Change	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC7	MANAGEMENT STANDARDS	Bailey Land Coverage Class 5	Allowable percent of impervious cover in Land Capability class 5 - 25%. Attainment	Considerably Better Than Target	Little or No Change	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC8	MANAGEMENT STANDARDS	Bailey Land Coverage Class 6	Allowable percent of impervious cover in Land Capability class 6 - 30%. Attainment	Considerably Better Than Target	Little or No Change	Moderate
SOIL CONSERVATION	IMPERVIOUS COVER	SC9	MANAGEMENT STANDARDS	Bailey Land Coverage Class 7	Allowable percent of impervious cover in Land Capability class 7 - 30%. Attainment	Considerably Better Than Target	Little or No Change	Moderate

SOIL CONSERVATION	STREAM ENVIRONMENT ZONES	SC10	NUMERICAL STANDARD	Preserve SEZ function	Preserve existing naturally functioning SEZ lands in their natural hydrologic condition.	Non-Attainment	Implemented	Little or No Change	Moderate
SOIL CONSERVATION	STREAM ENVIRONMENT ZONES	SC11	NUMERICAL STANDARD	Restore undeveloped SEZ	Restore all disturbed SEZ lands in undeveloped, unsubdivided lands. Restore 25 percent of the SEZ lands that have been identified as disturbed, developed or subdivided.	Non-Attainment	No status determination	Insufficient Data to Determine Trend	N/A
SOIL CONSERVATION	STREAM ENVIRONMENT ZONES	SC12	NUMERICAL STANDARD	Restore 25% disturbed SEZ	Restore 25% disturbed SEZ	Non-Attainment	Considerably Worse Than Target	Moderate Improvement	Moderate
SOIL CONSERVATION	STREAM ENVIRONMENT ZONES	SC13	NUMERICAL STANDARD	5% increase SEZ function	Attain a 5 percent total increase in the area of naturally functioning SEZ lands.	Non-Attainment	At or Somewhat Better Than Target	Moderate Improvement	Moderate

AIR QUALITY

AIR QUALITY	CARBON MONOXIDE	AQ1	NUMERICAL STANDARD	8-hour Carbon Monoxide	Maintain carbon monoxide concentrations at or below 6 parts per million (7 mg/m3) averaged over 8 hours.	Attainment	Considerably Better Than Target	Moderate Improvement	Moderate
AIR QUALITY	CARBON MONOXIDE	AQ2	MANAGEMENT STANDARD	Winter Traffic Volume	Reduce traffic volumes on the U.S. 50 Corridor by 7 percent during the winter from the 1981 base year between 4:00 p.m. and 12:00 midnight, provided that those traffic volumes shall be amended as necessary to meet the respective state standards.	Attainment	Considerably Better Than Target	Moderate Improvement	Moderate
AIR QUALITY	OZONE	AQ3	NUMERICAL STANDARD	1-hour Ozone	Maintain ozone concentrations at or below 0.08 parts per million averaged over 1 hour.	Attainment	At or Somewhat Better Than Target	Moderate Improvement	High
AIR QUALITY	OZONE	AQ4	NUMERICAL STANDARD	Oxides of Nitrogen	Maintain oxides of nitrogen (NOx) emissions at or below the 1981 level.	Attainment	Considerably Better Than Target	Moderate Improvement	Moderate
AIR QUALITY	REGIONAL VISIBILITY4	AQ5	NUMERICAL STANDARD	Bliss State Park 50%	Achieve an extinction coefficient of 25 Mm-1 at least 50 percent of the time as calculated from aerosol species concentrations measured at the Bliss State Park monitoring site (visual range of 156 kilometers, 97 miles).	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
AIR QUALITY	REGIONAL VISIBILITY4	AQ6	NUMERICAL STANDARD	Bliss State Park 90%	Achieve an extinction coefficient of 34 Mm-1 at least 90 percent of the time as calculated from aerosol species concentrations measured at the Bliss State Park monitoring site (visual range of 115 kilometers, 71 miles).	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate

AIR QUALITY	SUBREGIONAL VISIBILITY5	AQ7	NUMERICAL STANDARD	South Lake 50%	Achieve an extinction coefficient of 50 Mm-1 at least 50 percent of the time as calculated from aerosol species concentrations measured at the South Lake Tahoe monitoring site (visual range of 78 kilometers, 48 miles).	No Status Determination	No status determination	N/A	N/A
AIR QUALITY	SUBREGIONAL VISIBILITY5	AQ8	NUMERICAL STANDARD	South Lake 90%	Achieve an extinction coefficient of 125 Mm-1 at least 90 percent of the time as calculated from aerosol species concentrations measured at the South Lake Tahoe monitoring site (visual range of 31 kilometers, 19 miles).	No Status Determination	No status determination	N/A	N/A
AIR QUALITY	RESPIRABLE AND FINE PARTICULATE MATTER	AQ9	NUMERICAL STANDARD	PM10 24-hour	Particulate Matter10 24-hour Standard: Maintain Particulate Matter10 at or below 50µg/m3 measured over a 24-hour period in the portion of the Region within California, and maintain Particulate Matter10 at or below 150 µg/m3 measured over a 24-hour period in the portion of the Region within Nevada. Particulate Matter10 measurements shall be made using gravimetric or beta attenuation methods or any equivalent procedure which can be shown to provide equivalent results at or near the level of air quality standard.	Non-Attainment	Somewhat Worse Than Target	Little or No Change	Moderate

AIR QUALITY	RESPIRABLE AND FINE PARTICULATE MATTER	AQ10	NUMERICAL STANDARD	PM10 Annual Average	Particulate Matter10 Annual Arithmetic Average - Maintain Particulate Matter10 at or below annual arithmetic average of 20µg/m3 in the portion of the Region within California, and maintain Particulate Matter10 at or below annual arithmetic average in the portion of the Region within Nevada. Particulate Matter10 measurements shall be made using gravimetric or beta attenuation methods or any equivalent procedure which can be shown to provide equivalent results at or near the level of air quality standard.	Attainment	Considerably Better Than Target	Moderate Improvement	Moderate
AIR QUALITY	RESPIRABLE AND FINE PARTICULATE MATTER	AQ11	NUMERICAL STANDARD	PM2.5 24-hour	Particulate Matter2.5 24-hour Standard - Maintain Particulate Matter2.5 at or below 35µg/m3 measured over a 24-hour period using gravimetric or beta attenuation methods or any equivalent procedure which can be shown to provide equivalent results at or near the level of air quality standard.	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
AIR QUALITY	RESPIRABLE AND FINE PARTICULATE MATTER	AQ12	NUMERICAL STANDARD	PM2.5 Annual Average	Particulate Matter2.5 Annual Arithmetic Average - Maintain Particulate Matter2.5 at or below annual arithmetic average of 12µg/m3 in the portion of the Region within California and maintain Particulate Matter2.5 at or below annual arithmetic average of 15µg/m3 in the portion of the Region within Nevada. Particulate Matter2.5 measurements shall be made using gravimetric or beta attenuation methods or any equivalent procedure which can be shown to provide equivalent results at or near the level of air quality standard.	Attainment	Considerably Better Than Target	Little or No Change	Moderate

AIR QUALITY	NITRATE DEPOSITION	AQ13	MANAGEMENT STANDARC	Nitrate Deposition	Reduce the transport of nitrates into the Basin and reduce oxides of nitrogen (NOx) produced in the Basin consistent with the water quality thresholds.	Attainment	Implemented	N/A	N/A
AIR QUALITY	NITRATE DEPOSITION	AQ14	MANAGEMENT STANDARC	Vehicle Miles Traveled	Reduce vehicle miles of travel in the Basin by 10 percent of the 1981 base year values.	Attainment	At or Somewhat Better Than Target	Moderate-Improvement	Moderate-
VEGETATION PRESERVATION									
VEGETATION PRESERVATION	COMMON VEGETATION	VP1	MANAGEMENT STANDARC	SEZ non-degradation	A non-degradation standard shall apply to native deciduous trees, wetlands, and meadows to preserve plant communities and significant wildlife habitat, while providing for opportunities to increase the acreage of such riparian associations to be consistent with the SEZ threshold.	Attainment	Implemented	N/A	N/A
VEGETATION PRESERVATION	COMMON VEGETATION	VP2	MANAGEMENT STANDARC	Vegetation Community Richness, Abundance, and Pattern	Increase plant and structural diversity of forest communities through appropriate management practices as measured by diversity indices of species richness, relative abundance, and pattern.	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate

VEGETATION PRESERVATION	COMMON VEGETATION	VP3	Vegetation Community Richness MANAGEMENT STANDARC	maintain the existing species richness of the Basin by providing for the perpetuation of the following plant associations: Yellow Pine Forest: Jeffrey pine, White fir, Incense cedar, Sugar pine. Red Fir Forest: Red fir, Jeffrey pine, Lodgepole pine, Western white pine, Mountain hemlock, Western juniper. Subalpine Forest: Whitebark pine, Mountain hemlock, Mountain mahogany. Shrub Association: Greenleaf and Pinemat manzanita, Tobacco brush, Sierra chinquapin, Huckleberry oak, Mountain whitethorn. Sagebrush Scrub Vegetation: Basin sagebrush, Bitterbrush, Douglas chaenactis. Deciduous Riparian: Quaking aspen, Mountain alder, Black cotton-wood, Willow. Meadow Associations (Wet and Dry Meadow): Mountain squirrel tail, Alpine gentian, Whorled penstemon, Asters, Fescues, Mountain brome, Corn lilies, Mountain bentgrass, Hairgrass, Marsh marigold, Elephant heads, Tinker's penny, Mountain Timothy, Sedges, Rushes,	No Status Determination
VEGETATION PRESERVATION	COMMON VEGETATION	VP4	Abundance of Meadow and Wetlands MANAGEMENT STANDARC	Relative Abundance - Of the total amount of undisturbed vegetation in the Tahoe Basin: Maintain at least four percent meadow and wetland vegetation.	Non-Attainment
VEGETATION PRESERVATION	COMMON VEGETATION	VP5	Abundance of Riparian Deciduous MANAGEMENT STANDARC	Relative Abundance - Of the total amount of undisturbed vegetation in the Tahoe Basin: Maintain at least four percent deciduous riparian vegetation	Non-Attainment
VEGETATION PRESERVATION	COMMON VEGETATION	VP6	Abundance of Shrubs MANAGEMENT STANDARC	Relative Abundance - Of the total amount of undisturbed vegetation in the Tahoe Basin: Maintain no more than 25 percent dominant shrub association vegetation	Attainment

No status determination	N/A	N/A
Somewhat Worse Than Target	Little or No Change	Moderate
Considerably Worse Than Target	Little or No Change	Low
Considerably Better Than Target	Insufficient Data to Determine Trend	Low

VEGETATION PRESERVATION	COMMON VEGETATION	VP7	MANAGEMENT STANDARD	Abundance of Yellow Pine Forest in Seral Stages	Relative Abundance - Of the total amount of undisturbed vegetation in the Tahoe Basin: Maintain 15-25 percent of the Yellow Pine Forest in seral stages other than mature.	Non-Attainment
VEGETATION PRESERVATION	COMMON VEGETATION	VP8	MANAGEMENT STANDARD	Abundance of Red Fir Forest in Seral Stages	Relative Abundance - Of the total amount of undisturbed vegetation in the Tahoe Basin: Maintain 15-25 percent of the Red Fir Forest in seral stages other than mature Pattern - Provide for the proper juxtaposition of vegetation communities and age classes by; 1. Limiting acreage size of new forest openings to no more than eight acres Pattern - Provide for the proper juxtaposition of vegetation communities and age classes by; 2. Adjacent openings shall not be of the same relative age class or successional stage to avoid uniformity in stand composition and age.	Non-Attainment
VEGETATION PRESERVATION	COMMON VEGETATION	VP9	MANAGEMENT STANDARD	Size of New Forest Openings	Pattern - Provide for the proper juxtaposition of vegetation communities and age classes by; 2. Adjacent openings shall not be of the same relative age class or successional stage to avoid uniformity in stand composition and age.	Attainment
VEGETATION PRESERVATION	COMMON VEGETATION	VP10	MANAGEMENT STANDARD	Stand composition and age	Native vegetation shall be maintained at a maximum level to be consistent with the limits defined in the Land-Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide For Planning, Bailey, 19746, for allowable impervious cover and permanent site disturbance.	Attainment
VEGETATION PRESERVATION	COMMON VEGETATION	VP11	MANAGEMENT STANDARD	Bailey Capability	Attain and maintain a minimum percentage of 55 percent by area of forested lands within the Tahoe Region in a late seral or old growth condition, and distributed across elevation zones. Standards VP 13, VP14, and VP15 must be attained to achieve this threshold.	Non-Attainment
VEGETATION PRESERVATION	LATE SERAL AND OLD GROWTH FOREST ECOSYSTEMS	VP12	NUMERICAL STANDARD	Total Old growth		

Considerably Worse Than Target	Little or No Change	Moderate
Considerably Worse Than Target	Little or No Change	Moderate
Implemented	N/A	N/A
Implemented	N/A	N/A
Implemented	N/A	N/A
Considerably Worse Than Target	Insufficient Data to Determine Trend	Low

VEGETATION PRESERVATION	LATE SERAL AND OLD GROWTH FOREST ECOSYSTEMS8	VP13	NUMERICAL STANDARD	Sub-Alpine old growth	61 percent of the Subalpine zone (greater than 8,500 feet elevation) must be in a late seral or old growth condition. The Subalpine zone will contribute 5 percent (7,600 acres) of forested lands towards VP13.	Non-Attainment
VEGETATION PRESERVATION	LATE SERAL AND OLD GROWTH FOREST ECOSYSTEMS9	VP14	NUMERICAL STANDARD	Upper Montane old growth	60 percent of the upper montane zone (between 7,000 and 8,500 feet elevation) must be in a late seral or old growth condition. The Upper Montane zone will contribute 30 percent (45,900 acres) of forested lands towards VP13.	Non-Attainment
VEGETATION PRESERVATION	LATE SERAL AND OLD GROWTH FOREST ECOSYSTEMS10	VP15	NUMERICAL STANDARD	Montane old growth	48 percent of the Montane zone (lower than 7,000 feet elevation) must be in a late seral or old growth condition; the Montane zone will contribute 20 percent (30,600 acres) of forested lands towards VP13.	Non-Attainment
VEGETATION PRESERVATION	UNCOMMON PLANT COMMUNITIES	VP16	NUMERICAL STANDARD	Deepwater plants	Provide for the non-degradation of the natural qualities of any plant community that is uncommon to the Basin or of exceptional scientific, ecological, or scenic value. This threshold shall apply but not be limited to: The deep-water plants of Lake Tahoe.	Non-Attainment
VEGETATION PRESERVATION	UNCOMMON PLANT COMMUNITIES	VP17	NUMERICAL STANDARD	Freel Peak Long-petaled Lewisia - Lewisia pygmaea	Provide for the non-degradation of the natural qualities of any plant community that is uncommon to the Basin or of exceptional scientific, ecological, or scenic value. This threshold shall apply but not be limited to: The Freel Peak Cushion Plant community. Maintain a minimum of 2 Lewisia pygmaea longipetala population sites.	Non-Attainment
VEGETATION PRESERVATION	SENSITIVE PLANTS	VP18	NUMERICAL STANDARD	Cup Lake Draba - Draba asterophora v. longipetala	Maintain a minimum of 2 Draba asterophora v. macrocarpa population sites.	Attainment
VEGETATION PRESERVATION	SENSITIVE PLANTS	VP19	NUMERICAL STANDARD	macrocarpa		Attainment
VEGETATION PRESERVATION	SENSITIVE PLANTS	VP20	NUMERICAL STANDARD	Tahoe Draba - Draba asterophora v. asterophora	Maintain a minimum of 5 Draba asterophora v. asterophora macrocarpa population sites.	Attainment

Considerably Worse Than Target	Insufficient Data to Determine Trend	Low
Considerably Worse Than Target	Insufficient Data to Determine Trend	Low
Considerably Worse Than Target	Insufficient Data to Determine Trend	Low
Considerably Worse Than Target	Insufficient Data to Determine Trend	Low
Somewhat Worse Than Target	Rapid Decline	Low
Considerably Better Than Target	Little or No Change	Moderate
Considerably Better Than Target	Little or No Change	Moderate
Considerably Better Than Target	Little or No Change	Moderate

VEGETATION PRESERVATION	SENSITIVE PLANTS	VP21	NUMERICAL STANDARD	Tahoe Yellow Cress - Rorippa subumbellata	Maintain a minimum of 26 Rorippa subumbellata population sites	Attainment	Considerably Better Than Target	Moderate Improvement	High
VEGETATION PRESERVATION	SENSITIVE PLANTS	VP22	NUMERICAL STANDARD	Galena Rock Cress - Arabis rigidissima v. demote	Maintain a minimum of 7 Arabis rigidissima v. demote population sites.	Non-Attainment	Considerably Worse Than Target	Little or No Change	Low
WILDLIFE									
WILDLIFE	SPECIAL INTEREST SPECIES	W1	NUMERICAL STANDARD	Goshawk population sites	Provide a minimum of 12 Goshawk population sites.	No Status Determination	No status determination	Insufficient Data to Determine Trend	Low
WILDLIFE	SPECIAL INTEREST SPECIES	W2	NUMERICAL STANDARD	Osprey population sites	Provide a minimum of 4 Osprey population sites.	Attainment	Considerably Better Than Target	Rapid Improvement	Moderate
WILDLIFE	SPECIAL INTEREST SPECIES	W3	NUMERICAL STANDARD	Bald Eagle Wintering population sites	Provide a minimum of 2 Bald Eagle (Winter) population sites.	Attainment	Considerably Better Than Target	Rapid Improvement	Low
WILDLIFE	SPECIAL INTEREST SPECIES	W4	NUMERICAL STANDARD	Bald Eagle Nesting population sits	Provide a minimum of 1 Bald Eagle (Nesting) population sites	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
WILDLIFE	SPECIAL INTEREST SPECIES	W5	NUMERICAL STANDARD	Golden Eagle population sites	Provide a minimum of 4 Golden Eagle population sites	No Status Determination	No status determination	Insufficient Data to Determine Trend	Low
WILDLIFE	SPECIAL INTEREST SPECIES	W6	NUMERICAL STANDARD	Peregrine population sites	Provide a minimum of 2 Peregrine population sites.	Attainment	Considerably Better Than Target	Rapid Improvement	Moderate
WILDLIFE	SPECIAL INTEREST SPECIES	W7	NUMERICAL STANDARD	Waterfowl population sites	Provide a minimum of 18 Waterfowl population sites. Provide disturbance zones in the most suitable 500 acres surrounding nest site including a 0.25 mile buffer centered on nest sites, and influence zones in 3.5 mi for Goshawk.	Non-Attainment	Somewhat Worse Than Target	Little or No Change	Low
WILDLIFE	SPECIAL INTEREST SPECIES	W8	NUMERICAL STANDARD	Goshawk disturbance zone	Provide 0.25 mi disturbance zones and 0.6 mi influence zones for Osprey.	Attainment	Implemented	N/A	N/A
WILDLIFE	SPECIAL INTEREST SPECIES	W9	NUMERICAL STANDARD	Osprey disturbance zone	Provide disturbance zones in mapped areas and influence zones in mapped areas for Bald Eagle (Winter).	Attainment	Implemented	N/A	N/A
WILDLIFE	SPECIAL INTEREST SPECIES	W10	NUMERICAL STANDARD	Bald Eagle Wintering disturbance zone	Provide 0.5 mi disturbance zones and variable influence zones for Bald Eagle (Nesting).	Attainment	Implemented	N/A	N/A
WILDLIFE	SPECIAL INTEREST SPECIES	W11	NUMERICAL STANDARD	Bald Eagle Nesting disturbance zone	Provide 0.25 mi disturbance zones and 9.0 mi influence zones for Golden Eagle.	Attainment	Implemented	N/A	N/A
WILDLIFE	SPECIAL INTEREST SPECIES	W12	NUMERICAL STANDARD	Golden Eagle disturbance zone	Provide 0.25 mi disturbance zones and 7.6 mi influence zones for Peregrine.	Attainment	Implemented	N/A	N/A
WILDLIFE	SPECIAL INTEREST SPECIES	W13	NUMERICAL STANDARD	Peregrine disturbance zone	Provide disturbance zones in mapped areas and influence zones in mapped areas for Waterfowl.	Attainment	Implemented	N/A	N/A
WILDLIFE	SPECIAL INTEREST SPECIES	W14	NUMERICAL STANDARD	Waterfowl disturbance zone	Provide disturbance zones in meadows and influence zones in mapped areas for Deer.	Attainment	Implemented	N/A	N/A
WILDLIFE	SPECIAL INTEREST SPECIES	W15	NUMERICAL STANDARD	Deer disturbance zone		Attainment	Implemented	N/A	N/A

FISHERIES

FISHERIES	STREAM HABITAT	F1	NUMERICAL STANDARD	Excellent Stream Habitat	As indicated by the Stream Habitat Quality GIS data, amended May 1997, based upon the re-rated stream scores set forth in Appendix C-1 of the 1996 Evaluation Report, maintain: 75 miles of excellent stream habitat	Attainment	Considerably Better Than Target	Insufficient Data to Determine Trend	Low
FISHERIES	STREAM HABITAT	F2	NUMERICAL STANDARD	Good Stream Habitat	As indicated by the Stream Habitat Quality GIS data, amended May 1997, based upon the re-rated stream scores set forth in Appendix C-1 of the 1996 Evaluation Report, maintain: 105 miles of good stream habitat.	Non-Attainment	Considerably Worse Than Target	Insufficient Data to Determine Trend	Low
FISHERIES	STREAM HABITAT	F3	NUMERICAL STANDARD	Marginal Stream Habitat	As indicated by the Stream Habitat Quality GIS data, amended May 1997, based upon the re-rated stream scores set forth in Appendix C-1 of the 1996 Evaluation Report, maintain: 38 miles of marginal stream habitat.	Non-Attainment	Considerably Worse Than Target	Insufficient Data to Determine Trend	Low
FISHERIES	INSTREAM FLOWS	F4	MANAGEMENT STANDARC	Instream Flow	Until instream flow standards are established in the Regional Plan to protect fishery values, a non-degradation standard shall apply to instream flows.	Attainment	Implemented	N/A	N/A
FISHERIES	LAKE HABITAT	F7	MANAGEMENT STANDARC	Lake Habitat	A non-degradation standard shall apply to fish habitat in Lake Tahoe. Achieve the equivalent of 5,948 total acres of excellent habitat as indicated by the Prime Fish Habitat GIS Layer as may be amended based on best available science.	Attainment	At or Somewhat Better Than Target	Insufficient Data to Determine Trend	Low

NOISE

NOISE	SINGLE NOISE EVENTS	N1	NUMERICAL STANDARD	Aircraft Noise Departure/Arrival (8am to 8pm)	The following maximum noise levels are allowed. All values are in decibels. Aircraft measured 6,500 m-start of takeoff roll 2,000 m-runway threshold approach: 80 dBA - between the hours of 8am and 8pm8	Non-Attainment	Somewhat Worse Than Target	Insufficient Data to Determine Trend	Low
NOISE	SINGLE NOISE EVENTS	N2	NUMERICAL STANDARD	Aircraft Noise Departure/Arrival (8pm to 8am)	The following maximum noise levels are allowed. All values are in decibels. Aircraft measured 6,500 m-start of takeoff roll 2,000 m-runway threshold approach: 77.1 dBA - between the hours of 8pm and 8am	Non-Attainment	No status determination	Insufficient Data to Determine Trend	Low

NOISE	SINGLE NOISE EVENTS	N3	NUMERICAL STANDARD	Watercraft-Pass By Test	Watercraft: Pass-By Test - 82 Lmax - measured 50ft from engine at 3,000rpm. Watercraft: Shoreline test - 75 Lmax - measured with microphone 5 ft. above water, 2 ft., above curve of shore, dock or platform.	No Status Determination
NOISE	SINGLE NOISE EVENTS	N4	NUMERICAL STANDARD	Watercraft-Shoreline Test	Watercraft in Lake, no minimum distance.	Non-Attainment
NOISE	SINGLE NOISE EVENTS	N5	NUMERICAL STANDARD	Pre-1993 Watercraft-Stationary Test	Watercraft: Stationary Test - 88 dBA Lmax for boats manufactured before January 1, 1993; Microphone 3.3 feet from exhaust outlet - 5 feet above water.	No Status Determination
NOISE	SINGLE NOISE EVENTS	N6	NUMERICAL STANDARD	Post 1992 Watercraft-Stationary Test	Watercraft: Stationary Test - 90 dBA Lmax for boats manufactured after January 1, 1993; Microphone 3.3 feet from exhaust outlet - 5 feet above water. Motor Vehicles Less Than 6,000	No Status Determination
NOISE	SINGLE NOISE EVENTS	N7	NUMERICAL STANDARD	Motor Vehicles Less than 6,000 GV for speeds less than 35 mph	GVW: 76 dBA – Travelling at speeds less than 35 MPH at a monitoring distance of 50f	No Status Determination
NOISE	SINGLE NOISE EVENTS	N8	NUMERICAL STANDARD	Motor Vehicles Less Than 6,000 GVW for speeds greater than 35 mph	GVW: 82 dBA – Travelling at speeds greater than 35 MPH at a monitoring distance of 50ft. Motor Vehicles Greater Than 6,000	No Status Determination
NOISE	SINGLE NOISE EVENTS	N9	NUMERICAL STANDARD	Motor Vehicles Greater than 6,000 GVW for speeds less than 35 mph	GVW: 82 dBA – Travelling at speeds less than 35 MPH at a monitoring distance of 50ft.	No Status Determination
NOISE	SINGLE NOISE EVENTS	N10	NUMERICAL STANDARD	Motor Vehicles Greater than 6,000 GVW for speeds greater than 35 mph	GVW: 86 dBA – Travelling at speeds greater than 35 MPH at a monitoring distance of 50ft.	No Status Determination
NOISE	SINGLE NOISE EVENTS	N11	NUMERICAL STANDARD	Motorcycles for speeds less than 35 mph	Motorcycles: 77 dBA – Travelling at speeds less than 35 MPH at a monitoring distance of 50ft.	No Status Determination
NOISE	SINGLE NOISE EVENTS	N12	NUMERICAL STANDARD	Motorcycles for speeds greater than 35 mph	Motorcycles: 86 dBA – Travelling at speeds greater than 35 MPH at a monitoring distance of 50ft. Off-Road Vehicles: 72 dBA –	No Status Determination
NOISE	SINGLE NOISE EVENTS	N13	NUMERICAL STANDARD	Off-Road Vehicles for speeds less than 35 mph	Travelling at speeds less than 35 MPH at a monitoring distance of 50ft. Off-Road Vehicles: 86 dBA –	No Status Determination
NOISE	SINGLE NOISE EVENTS	N14	NUMERICAL STANDARD	Off-Road Vehicles for speeds greater than 35 mph	Travelling at speeds greater than 35 MPH at a monitoring distance of 50ft.	No Status Determination

No status determination	N/A	N/A
Somewhat Worse Than Target	Little or No Change	Low
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A
No status determination	N/A	N/A

NOISE	SINGLE NOISE EVENTS	N15	NUMERICAL STANDARD	Snowmobiles	Snowmobiles: 82 dBA – Travelling at speeds less than 35 MPH at a monitoring distance of 50ft.	No Status Determination	No status determination	N/A	N/A
NOISE	CUMULATIVE NOISE EVENTS	N16	NUMERICAL STANDARD	High Density Residential Areas	CNEL (Average Noise Level) in the High Density Residential Areas	Non-Attainment	Somewhat Worse Than Target	Little or No Change	Moderate
NOISE	CUMULATIVE NOISE EVENTS	N17	NUMERICAL STANDARD	Low Density Residential Areas	Background noise levels shall not exceed the following levels: 50 dBA CNEL (Average Noise Level) in the Low Density Residential Areas Land Use Category.	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
NOISE	CUMULATIVE NOISE EVENTS	N18	NUMERICAL STANDARD	Hotel/Motel Areas	Background noise levels shall not exceed the following levels: 60 dBA CNEL (Average Noise Level) in the Hotel/Motel Areas Land Use Category.	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
NOISE	CUMULATIVE NOISE EVENTS	N19	NUMERICAL STANDARD	Commercial Areas	Background noise levels shall not exceed the following levels:) 60 dBA CNEL (Average Noise Level)) in the Commercial Areas Land Use Category.	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
NOISE	CUMULATIVE NOISE EVENTS	N20	NUMERICAL STANDARD	Industrial Areas	Background noise levels shall not exceed the following levels: 65 dBA CNEL (Average Noise Level) in the Industrial Areas Land Use Category	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
NOISE	CUMULATIVE NOISE EVENTS	N21	NUMERICAL STANDARD	Urban Outdoor Recreation Areas	Background noise levels shall not exceed the following levels: 55 dBA CNEL (Average Noise Level) in the Urban Outdoor Recreation Areas Land Use Category.	Attainment	At or Somewhat Better Than Target	Little or No Change	Moderate
NOISE	CUMULATIVE NOISE EVENTS	N22	NUMERICAL STANDARD	Rural Outdoor Recreation Areas	Background noise levels shall not exceed the following levels: 50 dBA CNEL (Average Noise Level) in the Rural Outdoor Recreation Areas Land Use Category.	Attainment	At or Somewhat Better Than Target	Little or No Change	Low
NOISE	CUMULATIVE NOISE EVENTS	N23	NUMERICAL STANDARD	Wilderness and Roadless Areas	Background noise levels shall not exceed the following levels: 45 dBA CNEL (Average Noise Level) in the Wilderness and Roadless Areas Land Use Category.	Attainment	At or Somewhat Better Than Target	Moderate Improvement	Moderate
NOISE	CUMULATIVE NOISE EVENTS	N24	NUMERICAL STANDARD	Critical Wildlife Habitat Areas	Background noise levels shall not exceed the following levels: 45 dBA CNEL (Average Noise Level) in the Critical Wildlife Habitat Areas Land Use Category.	Non-Attainment	Considerably Worse Than Target	Insufficient Data to Determine Trend	Low

RECREATION

RECREATION	HIGH QUALITY RECREATIONAL EXPERIENCE	R1	POLICY STATEMENT	Recreation Experience	It shall be the policy of the TRPA Governing Body in development of the Regional Plan to preserve and enhance the high quality recreational experience including preservation of high-quality undeveloped shorezone and other natural areas. In developing the Regional Plan, the staff and Governing Body shall consider provisions for additional access, where lawful and feasible, to the shorezone and high quality undeveloped areas for low density recreational uses.	Attainment	Implemented	N/A	N/A
RECREATION	FAIR SHARE	R2	POLICY STATEMENT	Distribution of Recreation	It shall be the policy of the TRPA Governing Body in development of the Regional Plan to establish and ensure a fair share of the total Basin capacity for outdoor recreation is available to the general public.	Attainment	Implemented	N/A	N/A

SCENIC RESOURCES

SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S1	NUMERICAL STANDARD	Scenic Quality Ratings for Roadway Units	Maintain or improve the numerical rating assigned each unit, including the scenic quality rating of the individual resources within each unit, as recorded in the Scenic Resources Inventory and shown in: Table 13-3 of the Draft Study Report9	63% of units in attainment	At or Somewhat Better Than Target	Little or No Change	High
SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S2	NUMERICAL STANDARD	Scenic Quality Ratings for Shoreline Units	Maintain or improve the numerical rating assigned each unit, including the scenic quality rating of the individual resources within each unit, as recorded in the Scenic Resources Inventory and shown in: Table 13-5 of the Draft Study Report10.	67% of units in attainment	At or Somewhat Better Than Target	Moderate Improvement	High
SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S3	NUMERICAL STANDARD	Roadway Scenic Resources	Maintain or improve the numerical rating assigned each unit, including the scenic quality rating of the individual resources within each unit, as recorded in the Scenic Resources Inventory and shown in: Table 13-8 of the Draft Study Report11.	98% of units in attainment	At or Somewhat Better Than Target	Little or No Change	High

SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S4	NUMERICAL STANDARD	Shoreline Scenic Resources	Maintain or improve the numerical rating assigned each unit, including the scenic quality rating of the individual resources within each unit, as recorded in the Scenic Resources Inventory and shown in: Table 13-9 of the Draft Study Report12.	92% of units in attainment	At or Somewhat Better Than Target	Moderate Improvement	High
SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S5	NUMERICAL STANDARD	Roadway Travel Route Ratings	Maintain the 1982 ratings for all roadway and shoreline units as shown in: Table 13-6 of the Draft Study Report13.	63% of units in attainment	At or Somewhat Better Than Target	Little or No Change	High
SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S6	NUMERICAL STANDARD	Shoreline Travel Route Ratings	Maintain the 1982 ratings for all roadway and shoreline units as shown in: Table 13-7 of the Draft Study Report14.	67% of units in attainment	At or Somewhat Better Than Target	Moderate Improvement	High
SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S7	NUMERICAL STANDARD	Restore Roadway Scenic Quality	Maintain the 1982 ratings for all roadway and shoreline units as shown in: Restore scenic quality in roadway units rated 15 or below	98% of units in attainment	At or Somewhat Better Than Target	Little or No Change	High
SCENIC RESOURCES	ROADWAY AND SHORELINE UNITS	S8	NUMERICAL STANDARD	Restore Shoreline Scenic Quality	Maintain the 1982 ratings for all roadway and shoreline units as shown in: Restore scenic quality in shoreline units rated 7 or below.	92% of units in attainment	At or Somewhat Better Than Target	Moderate Improvement	High
SCENIC RESOURCES	OTHER AREAS	S9	NUMERICAL STANDARD	Scenic Quality of Other Areas (Recreation Sites and Bike Trails)	Maintain or improve the numerical rating assigned to each identified scenic resource, including individual subcomponent numerical ratings, for views from bike paths and other recreation areas open to the general public as recorded in the 1993 Lake Tahoe Basin Scenic Resource Evaluation. It shall be the policy of the TRPA Governing Body in development of the Regional Plan, in cooperation with local jurisdictions, to insure the height, bulk, texture, form, materials, colors, lighting, signing and other design elements of new, remodeled and	97.5% of units in attainment	At or Somewhat Better Than Target	Little or No Change	High
SCENIC RESOURCES	BUILT ENVIRONMENT	S10	POLICY STATEMENT	Built Environment		Attainment	Implemented	N/A	N/A

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
WATER QUALITY/SEZ - IN PLACE				
1	BMP requirements, new development: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, Fish	Y	The 2020 RTP/SCS does not alter provisions related to BMP compliance. All future transportation projects will be subject to the BMP requirements in Chapter 60 of the TRPA Code of Ordinances. Implementation of the transportation projects along roadways will expedite the completion of BMP's in areas that currently do not have these in place.
2	BMP implementation program -- existing streets and highways: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, Trans, Fish	Y	
3	BMP implementation program -- existing urban development: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, Fish	Y	
4	BMP implementation program -- existing urban drainage systems: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, Trans, Fish	Y	
5	Capital Improvement Program for Erosion and Runoff Control	WQ, Soils/SEZ, Trans, Fish	Y	A number of projects in the 2020 RTP/SCS are included in the Capital Improvement Program (CIP), or EIP 5-Year List, for Erosion and Runoff Control and will therefore help to accelerate implementation of the EIP.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
6	Excess coverage mitigation program: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ	N	The 2020 RTP/SCS does not alter provisions related to the excess coverage mitigation program. Transportation projects will be required to comply with Chapter 60 of TRPA Code provisions, where applicable.
7	Effluent limitations: California (SWRCB, Lahontan Board) and Nevada (NDP): <i>Code of Ordinances</i> Chapter 5	WQ, Soils/SEZ, Fish	N	The 2020 RTP/SCS does not alter effluent limitations.
8	Limitations on new subdivisions: (See the Goals and Policies: Land Use Element)	WQ, Soils/SEZ, Rec, Scenic	N	The 2020 RTP/SCS does not alter provisions related to subdivision of land.
9	Land use planning and controls: See the Goals and Policies: Land Use Element and Code of Ordinances Chapters 11, 12, 13, 14, and 21	WQ, Soils/SEZ, Trans, Scenic	N	The 2020 RTP/SCS does not alter provisions related to land use planning. All future transportation projects would be subject to the Land Use Element and Code of Ordinances Chapters 11, 12, 13, 14, and 21.
10	Residential development priorities, The Individual Parcel Evaluation System (IPES): Goals and Policies: Implementation Element and Code of Ordinances Chapter 53	WQ, Soils/SEZ	N	The 2020 RTP/SCS does not alter the provisions related to the Individual Parcel Evaluation System.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
11	Limits on land coverage for new development: Goals and Policies: Land Use Element and Code of Ordinances Chapter 30	WQ, Soils/SEZ, Scenic	Y	The 2020 RTP/SCS does not alter limits on land coverage for new development. Transportation projects identified in the 2020 RTP/SCS will be subject to the provisions regarding land coverage identified in Chapter 30.
12	Transfer of development: Goals and Policies: Land Use Element and Implementation Element	WQ, Soils/SEZ	Y	The 2020 RTP/SCS does not alter provisions related to transfer of development.
13	Restrictions on SEZ encroachment and vegetation alteration: <i>Code of Ordinances</i> Chapter 30	WQ, Soils/SEZ, Veg, Wildlife, Fish, Rec, Scenic	N	The 2020 RTP/SCS does not alter existing restrictions on SEZ encroachment and vegetation alteration in the TRPA Code, Chapter 30: Land Coverage. Transportation projects that involve construction or the placement of infrastructure near SEZ or that could alter vegetation would be subject to these provisions.
14	SEZ restoration program: Environmental Improvement Program.	WQ, Soils/SEZ, Veg, Wildlife, Fish, Scenic	N	The 2020 RTP/SCS does not affect or alter the SEZ restoration program.
15	SEZ setbacks: <i>Code of Ordinances</i> Chapter 53	WQ, Soils/SEZ, Veg, Wildlife, Fish	N	SEZ setback requirements in the TRPA Code, Chapter 53: Individual Parcel Evaluation System, Section 53.9, will not be altered by the 2020 RTP/SCS.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
16	Fertilizer reporting requirements: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, Fish, Rec	N	The 2020 RTP/SCS is not modifying the Resource Management and Protection regulations, Chapters 60 through 68, of the TRPA Code. Thus, fertilizer reporting and water quality mitigation requirements will remain in effect.
17	Water quality mitigation: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ	N	
18	Restrictions on rate and/or amount of additional development	WQ, Soils/SEZ, Wildlife, Scenic	N	The 2020 RTP/SCS is not modifying the rate and/or amount of additional development. New development associated with transportation projects would be within the development limits set by the Regional Plan.
19	Improved BMP implementation/enforcement program	WQ, Soils/SEZ	Y	See response to Compliance Measures 1 through 4.
20	Increased funding for EIP projects for erosion and runoff control	WQ, Soils/SEZ	Y	The 2020 RTP/SCS would not directly result in increased funding for erosion and runoff control. However, many projects identified in the Plan are EIP projects that, when constructed, will include improved erosion and runoff control components. Furthermore, 2020 RTP/SCS Policy 5.4 focuses on leveraging revenue sources to fund transportation and water quality improvements.
21	Artificial wetlands/runoff treatment program	WQ, Soils/SEZ	N	There are no changes to the artificial wetlands/runoff treatment program proposed within the 2020 RTP/SCS.
22	Transfer of development from SEZs	WQ, Soils/SEZ, Scenic	N	The 2020 RTP/SCS will not alter the current transfer of development from SEZ program.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
23	Improved mass transportation	WQ, Trans, Noise	Y	The 2020 RTP/SCS includes policies, programs, and projects that will improve and expand upon transit in the Region. See 2020 RTP/SCS Policies 2.1-2.14 and Appendix B for a list of constrained and unconstrained projects.
24	Redevelopment and redirection of land use: Goals and Policies: Land Use Element and Code of Ordinances Chapter 13	WQ, Soils/SEZ, Scenic	Y	The 2020 RTP/SCS includes policies, programs, and projects that will result in improved transportation connections between and within communities which is consistent with Regional goals and policies regarding redevelopment and redirection of land use. The 2020 RTP/SCS would not affect provisions in Chapter 13 related to Area Plans.
25	Combustion heater rules, stationary source controls, and related rules: <i>Code of Ordinances</i> Chapter 65	WQ, AQ	N	The 2020 RTP/SCS does not alter these Compliance Measures. Existing TRPA Code provisions will remain in effect.
26	Elimination of accidental sewage releases: Goals and Policies: Land Use Element	WQ, Soils/SEZ	N	
27	Reduction of sewer line exfiltration: Goals and Policies: Land Use Element	WQ, Soils/SEZ	N	
28	Effluent limitations	WQ, Soils/SEZ	N	
29	Regulation of wastewater disposal at sites not connected to sewers: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ	N	
30	Prohibition on solid waste disposal: Goals and Policies: Land Use Element	WQ, Soils/SEZ	N	
31	Mandatory garbage pick-up: Goals and Policies: Public Service Element	WQ, Soils/SEZ, Wildlife	N	

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
32	Hazardous material/wastes programs: Goals and Policies: Land Use Element and Code of Ordinances Chapter 60	WQ, Soils/SEZ	N	
33	BMP implementation program, Snow and ice control practices: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, AQ	N	The 2020 RTP/SCS does not change BMP requirements. See response to Compliance Measures 1 through 4.
34	Reporting requirements, highway abrasives and deicers: Goals and Policies:, Land Use Element and Code of Ordinances Chapter 60	WQ, Soils/SEZ, Fish	N	
35	BMP implementation program--roads, trails, skidding, logging practices: <i>Code of Ordinances</i> Chapter 60, Chapter 61	WQ, Soils/SEZ, Fish	N	
36	BMP implementation program--outdoor recreation: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, Fish, Rec	N	
37	BMP implementation program--livestock confinement and grazing: <i>Code of Ordinances</i> Chapter 21, Chapter 60, Chapter 64	WQ, Soils/SEZ, Veg, Wildlife, Fish	N	
38	BMP implementation program--pesticides	WQ, Soils/SEZ	N	
39	Land use planning and controls --timber harvesting: <i>Code of Ordinances</i> Chapter 21	WQ, Soils/SEZ, AQ, Wildlife, Fish, Scenic	N	

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
40	Land use planning and controls - outdoor recreation: <i>Code of Ordinances</i> Chapter 21	WQ, Soils/SEZ, Wildlife, Noise, Rec, Scenic	N	
41	Land use planning and controls--ORV use: Goals and Policies: Recreation Element	WQ, Soils/SEZ, AQ, Wildlife, Fish, Noise, Rec, Scenic	N	Regional Plan Policy R-1.5 states that "Off-road vehicle (ORV) use is prohibited in the Lake Tahoe Region except on specified roads, trails, or designated areas where the impacts can be mitigated." The 2020 RTP/SCS does not include alteration or expansion of ORV use.
42	Control of encroachment and coverage in sensitive areas	WQ, Soils/SEZ, Wildlife, Rec, Scenic	N	No changes are being proposed that would impact this compliance measure. The existing TRPA Code provisions will remain in effect.
43	Control on shorezone encroachment and vegetation alteration: <i>Code of Ordinances</i> Chapter 83	WQ, Soils/SEZ, Scenic	N	The 2020 RTP/SCS does not propose changes to shorezone ordinances. Any transportation project that includes development within the shorezone would be required to comply with these ordinance provisions.
44	BMP implementation program--shorezone areas: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ	N	
45	BMP implementation program--dredging and construction in Lake Tahoe: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ	N	
46	Restrictions and conditions on filling and dredging: <i>Code of Ordinances</i> Chapter 84	WQ, Soils/SEZ, Fish	N	
47	Protection of stream deltas	WQ, Soils/SEZ, Wildlife, Fish,	N	

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
48	Marina master plans: <i>Code of Ordinances</i> Chapter 14	WQ, AQ/Trans, Fish, Scenic	N	
49	Additional pump-out facilities: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ	N	
50	Controls on anti-fouling coatings: <i>Code of Ordinances</i> Chapter 60	WQ, Soils/SEZ, Fish	N	
51	Modifications to list of exempt activities	WQ, Soils/SEZ	N	

WATER QUALITY/SEZ - SUPPLEMENTAL

52	More stringent SEZ encroachment rules	WQ, Soils/SEZ, Wildlife, Fish	N	The 2020 RTP/SCS does not include any provisions that would impact Compliance Measures 52 through 61. Future transportation projects will be required to comply with provisions related to idling, pollutants, improved infiltration, and water conservation. Implementation of transportation infrastructure projects will include water quality improvements to drainage and prevention of pollutant deposition into water bodies.
53	More stringent coverage transfer requirements	WQ, Soils/SEZ	N	
54	Modifications to IPES	WQ, Soils/SEZ	N	
55	Increased idling restrictions	WQ, Soils/SEZ, AQ	N	
56	Control of upwind pollutants	WQ, Soils/SEZ, AQ	N	
57	Additional controls on combustion heaters	WQ, Soils/SEZ, AQ	N	
58	Improved exfiltration control program	WQ, Soils/SEZ	N	
59	Improved infiltration control program	WQ, Soils/SEZ	N	

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
60	Water conservation/flow reduction program	WQ, Soils/SEZ, Fish	N	
61	Additional land use controls	WQ, Soils/SEZ, Wildlife	N	

AIR QUALITY/TRANSPORTATION - IN PLACE

62	Fixed Route Transit - South Shore	Trans, Rec	Y	The 2020 RTP/SCS includes policies, programs, and projects focused on enhanced transit, including fixed route services.
63	Fixed Route Transit - North Shore	Trans, Rec	Y	The 2020 RTP/SCS includes policies, programs, and projects focused on enhanced transit, including fixed route services.
64	Demand Responsive Transit - South Shore	Trans	Y	The 2020 RTP/SCS includes policies, programs and projects focused on enhanced transit. See RTP/SCS Policy 2.7 and 2.14 specific to demand responsive transit.
65	Seasonal Trolley Services	Trans, Rec	Y	The 2020 RTP/SCS includes policies, programs and projects focused on enhanced transit, including seasonal shuttle services.
66	Social Service Transportation	Trans	Y	The 2020 RTP/SCS includes policies, programs, and projects focused on enhanced transit. See RTP/SCS Policies 2.7-2.10 specific to accessible transit.
67	Shuttle programs	Trans	Y	The 2020 RTP/SCS includes policies, programs and projects focused on enhanced transit, including visitor shuttle service.
68	Ski shuttle services	Trans, Rec	Y	The 2020 RTP/SCS includes policies, programs and projects focused on enhanced transit, including visitor shuttle service.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
69	Intercity bus services	Trans	Y	The 2020 RTP/SCS includes policies, programs, and projects focused on enhanced transit, including service between communities. Policy 2.3 and 2.4 specifically address inter-regional connections.
70	Passenger Transit Facilities: South Y Transit Center	Trans	Y	The 2020 RTP/SCS includes policies, programs, and projects focused on enhanced transit, including projects that will enhance south shore transit facilities.
71	Bikeways, Bike Trails	Trans, Noise, Rec, Scenic	Y	The 2020 RTP/SCS includes policies, programs, and projects focused on enhanced bicycle and pedestrian facilities, and safety improvements consistent with the 2016 Regional Active Transportation Plan (ATP). 2020 RTP/SCS Policies 2.15-2.17 focus on active transportation.
72	Pedestrian facilities	Trans, Rec, Scenic	Y	
73	Wood heater controls: <i>Code of Ordinances</i> Chapter 65	WQ, AQ	N	See response to Compliance Measures 16 and 17.
74	Gas heater controls: <i>Code of Ordinances</i> Chapter 65	WQ, AQ	N	

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
75	Stationary source controls: <i>Code of Ordinances</i> Chapter 65	WQ, AQ	N	
76	U.S. Postal Service Mail Delivery	Trans	N	The 2020 RTP/SCS does not include any provisions that would impact U.S. Postal Service Delivery.
77	Indirect source review/air quality mitigation: <i>Code of Ordinances</i> Chapter 65	WQ, AQ	N	See response to Compliance Measures 16 and 17.
78	Idling Restrictions: <i>Code of Ordinances</i> Chapter 65	WQ, AQ	N	
79	Vehicle Emission Limitations(State/Federal)	WQ, AQ	N	The 2020 RTP/SCS IS/IEC Section 3.4.2 analyzed vehicle emissions and found the plan to be in compliance with federal and state air quality standards.
80	Open Burning Controls: <i>Code of Ordinances</i> Chapters 61 and Chapter 65	WQ, AQ, Scenic	N	See response to Compliance Measures 16 and 17.
81	BMP and Revegetation Practices	WQ, AQ, Wildlife, Fish	Y	See response to Compliance Measures 1 through 4.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
82	Employer-based Trip Reduction Programs: <i>Code of Ordinances</i> Chapter 65	Trans	Y	The 2020 RTP/SCS includes policies, programs, and projects that will enhance and encourage transit, active transportation facilities, and reduce reliance on the automobile. Policy 1.7 commits TRPA to develop employee trip reduction programs in partnership with local jurisdictions and employers.
83	Vehicle rental programs: <i>Code of Ordinances</i> Chapter 65	Trans	N	The 2020 RTP/SCS does not alter provisions related to the vehicle rental program mitigation fee.
84	Parking Standards	Trans	Y	The 2020 RTP/SCS does not alter provisions related to parking standards, management areas, fees or facilities. The 2020 RTP/SCS Policies 2.16, 2.20, 2.21 focus on coordinated parking management programs.
85	Parking Management Areas	Trans	Y	
86	Parking Fees	Trans	Y	
87	Parking Facilities	Trans	Y	
88	Traffic Management Program - Tahoe City	Trans	Y	The 2020 RTP/SCS includes policies, programs and projects focused on reducing congestion throughout the Tahoe Region. Traffic management projects in Tahoe City include trail improvements, complete streets projects, and highway improvements.
89	US 50 Traffic Signal Synchronization - South Shore	Trans	Y	The US 50 Traffic Signal Synchronization has been identified in the 2020 RTP/SCS as the California Multi-Modal Signal Control Optimization Project.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
90	General Aviation, The Lake Tahoe Airport	Trans, Noise	N	The 2020 RTP/SCS Policy 1.8 requires continued coordination with the City of South Lake Tahoe in regards to the Airport Master Plan and limits aviation facilities to those existing in the Region.
91	Waterborne excursions	WQ, Trans, Rec	N	The 2020 RTP/SCS does not alter provisions related to waterborne excursions.
92	Waterborne transit services	WQ, Trans, Scenic	Y	The 2020 RTP/SCS includes Policy 2.6 regarding waterborne transit. The Lake Tahoe Waterborne Ferry Project is identified in the 2020 RTP/SCS.
93	Air Quality Studies and Monitoring	WQ, AQ	N	The 2020 RTP/SCS does not alter requirements for continued air quality studies and monitoring.
94	Alternate Fueled Vehicle - Public/Private Fleets and Infrastructure Improvements	Trans	Y	The 2020 RTP/SCS includes Policies 1.6 and 4.3 focused on electric and zero emission vehicles and infrastructure. Transit facility improvement projects also include electric vehicle fleet purchases.
95	Demand Responsive Transit - North Shore	Trans	N	See response to Compliance Measure 64.
96	Tahoe Area Regional Transit Maintenance Facility	Trans	Y	While a Maintenance Facility is not specifically addressed, Tahoe Area Regional Transit operations and maintenance projects are identified in the 2020 RTP/SCS.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
97	Heavenly Ski Resort Gondola	Trans	N	The 2020 RTP/SCS does not contain policies related to the Heavenly Gondola; however, increased transit service on the South Shore, parking management, and active transportation facilities will enhance connectivity to the Gondola and other ski area amenities.
AIR QUALITY/TRANSPORTATION - SUPPLEMENTAL				
98	Demand Responsive Transit - North Shore	Trans	N	See response to Compliance Measure 64.
99	Coordinated Transit System - South Shore	Trans	N	See response to Compliance Measure 62
100	Transit Passenger Facilities	Trans	Y	The 2020 RTP/SCS includes policies, programs and projects focused on enhanced transit.
101	South Shore Transit Maintenance Facility - South Shore	Trans	Y	The 2020 RTP/SCS has identified the TTD Maintenance and Administration Facility project.
102	Transit Service - Fallen Leaf Lake	WQ, Trans	N	The 2020 RTP/SCS does not specifically include transit service to Fallen Leaf Lake.
103	Transit Institutional Improvements	Trans	Y	The 2020 RTP/SCS Policy 2.1, 2.3, 2.5, 2.9 and 2.11 focus on transit institutional improvements.
104	Transit Capital and Operations Funding Acquisition	Trans	Y	The 2020 RTP/SCS includes a number of capital improvement and operations projects related to transit. 2020 RTP/SCS Policy 2.1 focuses on transit funding.
105	Transit/Fixed Guideway Easements - South Shore	Trans	N	NA
106	Visitor Capture Program	Trans	N	NA

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
107	Pedestrian and Bicycle Facilities-- South Shore	Trans, Rec	N	See response to Compliance Measure 71
108	Pedestrian and Bicycle Facilities-- North Shore	Trans, Rec	Y	
109	Parking Inventories and Studies Standards	Trans	N	See Response to Compliance Measures 84-87
110	Parking Management Areas	Trans	N	
111	Parking Fees	Trans	N	
112	Establishment of Parking Task Force	Trans	N	
113	Construct parking facilities	Trans	Y	
114	Intersection improvements-- South Shore	Trans, Scenic	Y	The 2020 RTP/SCS has identified a number of intersection improvement projects on the South Shore.
115	Intersection improvements-- North Shore	Trans, Scenic	Y	The 2020 RTP/SCS has identified a number of intersection improvement projects on the North Shore.
116	Roadway Improvements - South Shore	Trans, Scenic	Y	See response to Compliance Measure 114
117	Roadway Improvements - North Shore	Trans, Scenic	Y	See response to Compliance Measure 115
118	Loop Road - South Shore	Trans, Scenic	N	The U.S. 50 South Shore Community Revitalization Project (formerly referred to as the "Loop Road" project), has been identified in the 2020 RTP/SCS
119	Montreal Road Extension	Trans	N	NA
120	Kingsbury Connector	Trans	N	NA
121	Commercial Air Service: Part 132 commercial air service	Trans	N	See response to Compliance Measure 90.
122	Commercial Air Service: commercial air service that does not require Part 132 certifications	Trans	N	
123	Expansion of waterborne excursion service	WQ, Trans	N	See response to Compliance Measure 91.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
124	Re-instate the oxygenated fuel program	WQ, AQ	N	The 2020 RTP/SCS does not include provisions specific to the oxygenated fuel program.
125	Management Programs	Trans	N	The 2020 RTP/SCS complies with Air Quality Management Plans
126	Around the Lake Transit	Trans	Y	The 2020 RTP/SCS focuses on creating a seamless transportation network around the Lake. Transit and shuttle projects have been identified to further the connections around the Lake

VEGETATION - IN PLACE

127	Vegetation Protection During Construction: <i>Code of Ordinances</i> Chapter 33	WQ, AQ, Veg, Scenic	N	The 2020 RTP/SCS will not alter the provisions of Chapter 33 in the TRPA Code.
128	Tree Removal: <i>Code of Ordinances</i> Chapter 61	Veg, Wildlife, Scenic	N	See response to Compliance Measures 16 and 17.
129	Prescribed Burning: <i>Code of Ordinances</i> Chapter 61	WQ, AQ, Veg, Wildlife, Scenic	N	
130	Remedial Vegetation Management: <i>Code of Ordinances</i> Chapter 61	WQ, Veg, Wildlife	N	
131	Sensitive and Uncommon Plant Protection and Fire Hazard Reduction: <i>Code of Ordinances</i> Chapter 61	Veg, Wildlife, Scenic	N	
132	Revegetation: <i>Code of Ordinances</i> Chapter 61	WQ, Veg, Wildlife, Scenic	N	
133	Remedial Action Plans: <i>Code of Ordinances</i> Chapter 5	WQ, Veg	N	TRPA will continue to be responsible for preparing Remedial Action Plans, pursuant to Chapter 5: <i>Compliance</i> of the TRPA Code.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
134	Handbook of Best Management Practices	WQ, Soils/SEZ, Veg, Fish	N	The Handbook of Best Management Practices will continue to be used to design and construct BMPs.
135	Shorezone protection	WQ, Soils/SEZ, Veg	N	See response to Compliance Measures 43 through 50.
136	Project Review	WQ, Veg	Y	TRPA and its MOU partners will continue to perform project review and compliance inspections.
137	Compliance inspections	Veg	Y	
138	Development Standards in the Backshore	WQ, Soils/SEZ, Veg, Wildlife, Scenic	N	See response to Compliance Measures 43 through 50.
139	Land Coverage Standards: <i>Code of Ordinances</i> Chapter 30	WQ, Veg, Wildlife, Fish, Scenic	N	See response to Compliance Measure 11.
140	Grass Lake, Research Natural Area	WQ, Veg, Wildlife, Fish, Scenic	N	N/A
141	Conservation Element, Vegetation Subelement: Goals and Policies	Veg, Wildlife, Fish	N	The 2020 RTP/SCS will not affect the goals and policies contained in the Conservation Element, Vegetation Subelement.
142	Late Successional Old Growth (LSOG): <i>Code of Ordinances</i> Chapter 61	Veg, Wildlife, Fish	N	See response to Compliance Measures 16 and 17.
143	Stream Environment Zone Vegetation: <i>Code of Ordinances</i> Chapter 61	WQ, Veg, Wildlife, Fish	N	
144	Tahoe Yellow Cress Conservation Strategy	Veg	N	Implementation of the 2020 RTP/SCS will not negatively impact efforts to conserve the Tahoe Yellow Cress.
145	Control and/or Eliminate Noxious Weeds	Veg, Wildlife	N	See response to Compliance Measures 16 and 17.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
146	Freel Peak Cushion Plant Community Protection	Veg	N	N/A
VEGETATION - SUPPLEMENTAL				
147	Deepwater Plant Protection	WQ, Veg	N	See response to Compliance Measures 16 and 17 and 43 through 50.
WILDLIFE - IN PLACE				
148	Wildlife Resources: <i>Code of Ordinances</i> Chapter 62	Wildlife, Noise	N	See response to Compliance Measures 16 and 17.
149	Stream Restoration Program	WQ, Soils/SEZ, Veg, Wildlife, Fish, Rec, Scenic	N	The 2020 RTP/SCS does not include any changes to the Stream Restoration Program.
150	BMP and revegetation practices	WQ, Veg, Wildlife, Fish, Scenic	N	The 2020 RTP/SCS does not include any changes to existing BMP and revegetation requirements.
151	OHV limitations	WQ, Soils/SEZ, AQ, Wildlife, Noise, Rec	N	The 2020 RTP/SCS does not include any changes to OHV limitations.
152	Remedial Action Plans: <i>Code of Ordinances</i> Chapter 5	Wildlife	N	See response to Compliance Measure 133.
153	Project Review	Wildlife	Y	See response to Compliance Measure 136 and 137.
FISHERIES - IN PLACE				
156	Fish Resources: <i>Code of Ordinances</i> Chapter 63	WQ, Fish	N	See response to Compliance Measures 16 and 17.
157	Tree Removal: <i>Code of Ordinances</i> Chapter 61	Wildlife, Fish	N	The 2020 RTP/SCS does not change tree removal provisions of Chapter 61.
158	Shorezone BMPs	WQ, Fish	N	See response to Compliance Measures 43 through 50.
159	Filling and Dredging: <i>Code of Ordinances</i> Chapter 84	WQ, Fish	N	

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
160	Location standards for structures in the shorezone: <i>Code of Ordinances</i> Chapter 84	WQ, Fish	N	
161	Restrictions on SEZ encroachment and vegetation alteration	WQ, Soils/SEZ, Fish	N	See response to Compliance Measures 16 and 17.
162	SEZ Restoration Program	WQ, Soils/SEZ, Fish	N	See response to Compliance Measure 14.
163	Stream restoration program	WQ, Soils/SEZ, Fish	N	See response to Compliance Measures 16 and 17.
164	Riparian restoration	WQ, Soils/SEZ, Fish	N	
165	Livestock: <i>Code of Ordinances</i> Chapter 64	WQ, Soils/SEZ, Fish	N	
166	BMP and revegetation practices	WQ, Fish	N	See response to Compliance Measures 1 through 4.
167	Fish habitat study	Fish	N	See response to Compliance Measures 16 and 17.
168	Remedial Action Plans: <i>Code of Ordinances</i> Chapter 5	Fish	N	See response to Compliance Measure 133.
169	Mitigation Fee Requirements: <i>Code of Ordinances</i> Chapter 86	Fish	N	The mitigation fee requirements in Chapter 86 of the TRPA Code are not being modified by the 2020 RTP/SCS.
170	Compliance inspection	Fish	N	The 2020 RTP/SCS is not modifying existing compliance or inspection programs or provisions.
171	Public Education Program	Wildlife, Fish		The 2020 RTP/SCS Policy does not alter provisions related to public education programs.

NOISE - IN PLACE

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
172	Airport noise enforcement program	Wildlife, Fish	N	The 2020 RTP/SCS does not modify existing goals or policies related to noise. Transportation projects will be subject to existing enforcement programs.
173	Boat noise enforcement program	Wildlife, Fish, Rec	N	
174	Motor vehicle/motorcycle noise enforcement program: <i>Code of Ordinances</i> Chapters 5 and 23	Wildlife, Fish	N	
175	ORV restrictions	AQ, Wildlife, Noise, Rec	N	The 2020 RTP/SCS is not modifying existing ORV or snowmobile restrictions.
176	Snowmobile Restrictions	WQ, Wildlife, Noise, Rec	N	
177	Land use planning and controls	Wildlife, Noise	N	See response to Compliance Measure 9.
178	Vehicle trip reduction programs	Trans, Noise	Y	The 2020 RTP/SCS contains policies, programs, and projects aimed at reducing reliance on the private automobile.
179	Transportation corridor design criteria	Trans, Noise	Y	The 2020 RTP/SCS specifically addresses corridor design criteria in policies 3.2 and 4.18. Future transportation projects are required to comply with design standards specific to the respective Corridor Plans, Area and Community plans, and State and and federal design standards.
180	Airport Master Plan South Lake Tahoe	Trans, Noise	N	See response to Compliance Measure 90.
181	Loudspeaker restrictions	Wildlife, Noise	N	The 2020 RTP/SCS is not modifying loudspeaker restrictions.
182	Project Review	Noise	N	See response to Compliance Measures 136 and 137.
183	Complaint system: <i>Code of Ordinances</i> Chapters 5 and 68	Noise	N	Existing compliant systems are not being modified.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
184	Transportation corridor compliance program	Trans, Noise	N	The 2020 RTP/SCS does contain policies specific to transportation corridor compliance. Transportation projects would be required to comply with respective Corridor Plans.
185	Exemptions to noise limitations	Noise	N	Exemptions to noise limitations are not being modified.
186	TRPA's Environmental Improvement Program (EIP)	Noise	N	The 2020 RTP/SCS includes and prioritizes implementation of transportation, recreation, and water quality projects identified in the EIP program.
187	Personal watercraft noise controls	Wildlife, Noise	N	Watercraft noise controls are not modified by the 2020 RTP/SCS
NOISE - SUPPLEMENTAL				
188	Create an interagency noise enforcement MOU for the Tahoe Region.	Noise	N	The 2020 RTP/SCS does not include noise enforcement provisions.
RECREATION - IN PLACE				
189	Allocation of Development: <i>Code of Ordinances</i> Chapter 50	Rec	N	See response to Compliance Measure 10.
190	Master Plan Guidelines: <i>Code of Ordinances</i> Chapter 14	Rec, Scenic	N	The 2020 RTP/SCS does not alter provisions related to Master Plan guidelines.
191	Permissible recreation uses in the shorezone and lake zone: <i>Code of Ordinances</i> Chapter 81	WQ, Noise, Rec	N	The 2020 RTP/SCS does not alter provisions related to permissible uses in the shorezone and lake zone.
192	Public Outdoor recreation facilities in sensitive lands	WQ, Rec, Scenic	N	The 2020 RTP/SCS is not altering provisions regarding public outdoor recreation in sensitive lands.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
193	Hiking and riding facilities	Rec	Y	The 2020 RTP/SCS includes programs and projects that enhance accessibility and connections to hiking and riding facilities.
194	Scenic quality of recreation facilities	Rec, Scenic	N	All recreation facilities identified in the 2020 RTP/SCS will be required to meet Scenic Quality standards.
195	Density standards	Rec	N	The 2020 RTP/SCS does not alter provisions nor include projects that would affect the density standards.
196	Bonus incentive program	Rec	N	The 2020 RTP/SCS does not alter existing bonus incentive programs with regards to recreation facilities.
197	Required Findings: <i>Code of Ordinances</i> Chapter 4	Rec	N	All applicable TRPA Code findings will continue to apply to all projects, including those contained in the 2020 RTP/SCS.
198	Lake Tahoe Recreation Sign Guidelines	Rec, Scenic	N	The 2020 RTP/SCS will not impact or alter the Lake Tahoe Recreation Sign Guidelines. Furthermore, 2020 RTP/SCS Policy 2.19 focuses on wayfinding signage that will improve the recreational and visitor experience.
199	Annual user surveys	Rec	N	The 2020 RTP/SCS policy 4.11 recommends establishing a uniform method of data collection for resident and visitor travel behavior.
RECREATION - SUPPLEMENTAL				
200	Regional recreational plan	Rec	Y	The 2020 RTP/SCS will help to implement, through the maintenance, construction, and expansion of access to recreation facilities, the Goals and Policies in the Regional Recreation Plan, which is the Recreation Element in the Regional Plan.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
201	Establish fair share resource capacity estimates	Rec	N	The 2020 RTP/SCS does not establish or alter fair share resource capacity estimates, alter reservations of additional resource capacity, or include economic modeling.
202	Reserve additional resource capacity	Rec	N	
203	Economic Modeling	Rec	N	
SCENIC - IN PLACE				
204	Project Review and Exempt Activities: <i>Code of Ordinances Chapter 2</i>	Scenic	Y	See response to Compliance Measures 136 and 137.
205	Land Coverage Limitations: <i>Code of Ordinances Chapter 30</i>	WQ, Scenic	Y	See response to Compliance Measure 11.
206	Height Standards: <i>Code of Ordinances Chapter 37</i>	Scenic	N	The 2020 RTP/SCS does not alter provisions related to height standards. Development projects related to transportation infrastructure would be required to comply with the applicable height standards in Chapter 37.
207	Driveway and Parking Standards: <i>Code of Ordinances Chapter 34</i>	Trans, Scenic	Y	The 2020 RTP/SCS does not alter TRPA Code of Ordinances provisions related to driveway and parking standards.
208	Signs: <i>Code of Ordinances Chapter 38</i>	Scenic	N	The 2020 RTP/SCS does not contain specific provisions related to signage. Any new signage related development of transportation infrastructure would be required to comply with the provisions of Chapter 38.
209	Historic Resources: <i>Code of Ordinances Chapter 67</i>	Scenic	N	See response to Compliance Measures 16 and 17.

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
210	Design Standards: <i>Code of Ordinances</i> Chapter 36	Scenic	Y	The 2020 RTP/SCS does not alter design standards. Future transportation projects that include new development will be required to comply with the design standards contained in Chapter 36.
211	Shorezone Tolerance Districts and Development Standards: <i>Code of Ordinances</i> Chapter 83	Scenic	N	See response to Compliance Measures 43 through 50.
212	Development Standards Lakeward of Highwater: <i>Code of Ordinances</i> Chapter 84	WQ, Scenic	N	
213	Grading Standards: <i>Code of Ordinances</i> Chapter 33	WQ, Scenic	N	
214	Vegetation Protection During Construction: <i>Code of Ordinances</i> Chapter 33	AQ, Veg, Scenic	N	Grading and vegetation protection during construction shall continue to be required to meet the provisions of TRPA Code, Chapter 33, Grading and Construction.
215	Revegetation: <i>Code of Ordinances</i> Chapter 61	Scenic	N	See response to Compliance Measures 16 and 17.
216	Design Review Guidelines	Scenic	N	The 2020 RTP/SCS does not affect existing design guidelines. Future transportation infrastructure projects will be required to comply with design review guidelines applicable to the jurisdiction in which the project is located or with the design guideline provisions contained within the TRPA Code of Ordinances.
217	Scenic Quality Improvement Program(SQIP)	Scenic	Y	See response to Compliance Measure 194.
218	Project Review Information Packet	Scenic	N	
219	Scenic Quality Ratings, Features Visible from Bike Paths and Outdoor Recreation Areas Open to the General Public	Trans, Scenic	Y	

Tracking Number	Compliance Measure Description	Affected Threshold Categories	Affected by Action (Y/N)	Comments
220	Nevada-side Utility Line Undergrounding Program	Scenic	Y	The 2020 RTP/SCS includes Policy 6.4 addressing installation of underground utilities.
SCENIC - SUPPLEMENTAL				
221	Real Time Monitoring Program	Scenic	N	The 2020 RTP/SCS will not affect the real time monitoring program.
222	Integrate project identified in SQIP	Scenic	Y	The 2020 RTP/SCS would not affect compliance with the SQIP.

Attachment C

Threshold Update (strikethrough)

Attachment C: Proposed updates to the threshold standards included below. The proposal includes a new threshold standard category, “transportation and sustainable communities,” and the adoption of a single threshold standard in the category.

THRESHOLD STANDARDS

Threshold standards establish the Environmental Improvement Program partners’ shared goals for restoration and maintenance of the qualities of the Tahoe Region.

AIR QUALITY

NITRATE DEPOSITION

MANAGEMENT STANDARDS

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 percent of the 1981 base year values.~~

TRANSPORTATION AND SUSTAINABLE COMMUNITIES

TSC1) Reduce Annual Daily Average VMT Per Capita by 6.8% from 12.48, the 2018 baseline, to 11.63 in 2045.

Attachment D

Regional Plan Amendments Chapter 2, 3, and 7 (strikethrough)

Proposed Regional Plan Amendments

This proposal encompasses much needed improvements for bringing the transportation system into the 21st Century including the current Vehicle Miles Traveled (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 update to Transportation policies and a Regional Plan amendment and framework for updating the project impact assessment and fee used as one of the implementing mechanisms. Amendments are proposed to the Regional Plan Goals and Policies Chapter 2, Land Use Element, Chapter 3, Transportation Element, and Chapter 7, the Development and Implementation Priorities.

Chapter 2 Land Use Element, *proposed changes*

GOAL AQ-2

MAINTAIN AN EFFECTIVE ~~AIR QUALITY MOBILITY~~ MITIGATION PROGRAM FOR THE REGION.

Administer a program that effectively mitigates significant air quality impacts resulting from new projects or changes in use. Under the mitigation program, impact fees and mitigation measures are among the strategies to address significant impacts.

POLICIES:

AQ-2.1 IN ADDITION TO OTHER POLICIES AND REGULATIONS INTENDED TO MINIMIZE AIR QUALITY IMPACTS OF DEVELOPMENT, COLLECT AND EXPEND ~~AIR QUALITY MOBILITY~~ MITIGATION FEES TO OFFSET AIR POLLUTION IN COORDINATION WITH THE ENVIRONMENTAL IMPROVEMENT PROGRAM (EIP). A PORTION OF MITIGATION FUNDS SHALL BE EXPENDED IN THE LOCAL JURISDICTION WHERE THE FUNDS ARE GENERATED AND A PORTION OF THE FUNDS MAY BE USED ON THE MOST COST EFFECTIVE AND ENVIRONMENTALLY BENEFICIAL PROJECTS IN THE REGION.

Chapter 3 Transportation Element, *proposed policy changes*

GOAL 1: ENVIRONMENT

Protect and enhance the environment, promote energy conservation, and reduce greenhouse gas emissions.

Policies

- 1.1 Support mixed-use, transit-oriented development and community revitalization projects that encourages walking, bicycling, and easy access to existing and planned transit stops.
- 1.2 Leverage transportation projects to benefit multiple environmental thresholds through integration with the Environmental Improvement Program.
- 1.3 New Policy: Implement greenhouse gas reduction strategies in alignment with federal, state, and regional requirements and goals.

1.3 ~~Mitigate the regional and cumulative traffic impacts of new, expanded, or revised developments or land uses by prioritizing projects and programs that enhance non-automobile travel modes.~~

1.4 1.3 — Develop and implement project impact analysis, mitigation strategies and fee programs to reduce Vehicle Miles Travelled and auto trips. Mitigate the regional and cumulative traffic impacts of new, expanded, or revised developments or land uses by prioritizing projects and programs that enhance non-automobile travel modes.

1.5 New Policy: Prioritize projects and programs that enhance non-automobile travel modes.

1.6 1.4 — Facilitate and promote the use of electric and zero emission transit, fleet, and personal vehicles and fleets by supporting deployment of vehicle charging infrastructure within the Region, and through implementation of the Tahoe-Truckee Plug-In Electric Vehicle Readiness Plan, supporting incentives and education, incentives, funding, and permit streamlining of residents, businesses, and visitors related to the use of electric and zero emission vehicles.

1.7 5 Require Collaborate with all jurisdictions and employers in the basin to develop, maintain, and implement programs to reduce employee major employers of 100 employees or more to implement vehicle trips reduction programs.

1.7 8 Coordinate with the City of South Lake Tahoe to update and maintain an Airport Master Plan and limit aviation facilities within the Tahoe Region to existing facilities.

1.8 9 Consider ~~†~~ Traffic calming and noise reduction strategies, to achieve noise standards and Community Noise Equivalent Levels, should be included when planning transportation improvements.

1.9 10 Develop and implement a cooperative continuous, and comprehensive Congestion Management Process to adaptively manage congestion within the Region's multi-modal transportation system, with a focus on peak traffic periods and Basin entry/exit routes.

GOAL 2: CONNECTIVITY

Enhance and sustain the connectivity and accessibility of the Tahoe transportation system, across and between modes, communities, and neighboring regions, for people and goods.

Policies

Transit

2.1 Coordinate with Federal, state, and local governments, transportation management associations, as well as and private sector partners to identify and secure adequate fund and operate transit reliable service funding that provides a viable transportation alternatives to the private automobile for all categories of travelers in the Region.

2.2 Provide frequent transit service to major summer and winter recreational areas, including trailheads and shoreline access points.

2.3 Establish Collaborate with regional and inter-regional partners to establish efficient transportation connections within the Trans-Sierra Region including to and from Tahoe and

~~partnerships with surrounding metropolitan areas to expand transit to and from Lake Tahoe communities.~~

- ~~2.4~~ **New Policy:** Collaborate with nearby communities that share transportation to and from the Tahoe Basin, including the Town of Truckee, the Placer County Resort Triangle, Sacramento, Bay Area, Reno, and the Carson/Minden Valley.
- ~~2.54~~ Improve the existing transit system for the user making it frequent, fun, and free in targeted locations. Consider and use increased frequency, preferential signal controls, priority travel lanes, expanded service areas, and extended service hours.
- ~~2.5~~ **Integrate transit services across the Region.** Develop and use unified fare payment systems, information portals, and shared transfers.
- ~~2.6~~ Consider Use the best available technology to implement waterborne transportation systems that coordinates with other travel options consistent with the Shoreline Plan Greenhouse Gas Reduction Strategy. using best available technology to minimize air and water quality impacts in coordination with other modal options, as an alternative to automobile travel within the Region.
- ~~2.7~~ Provide specialized and subsidized public transportation services and programs for individuals with disabilities through subsidized fare programs for transit, taxi, demand response, and accessible van services that is consistent with the Coordinated Human Services Transportation plans.
- ~~2.8~~ **New Policy:** Ensure all transportation projects, programs, and policies meet the transportation needs and minimize negative impacts for disadvantaged communities and people with special needs.
- ~~2.8-9~~ Ensure that Make transit and pedestrian and bicycle facilities are Americans with Disabilities Act (ADA) -compliant and consistent with Coordinated Human Services Transportation Plans Universally Accessible.
- ~~2.10~~ **New Policy:** Ensure all transit is Americans with Disabilities Act (ADA) compliant, Universally Accessible, and consistent with Coordinated Human Services Transportation Plans.
- ~~2.119~~ Develop formal guidelines or standards and guidelines for incorporating transit multimodal amenities in new development or redevelopment, as part of local area plan conditions of project approval.
- ~~2.120~~ Implement the Safe Routes to School program Provide public transit services at locations nearby school campuses.
- ~~2.131~~ Coordinate public and private transit service, where feasible, to reduce service costs and avoid service duplication.
- ~~2.14~~ **New Policy:** Support, where feasible, the implementation and operation of on-demand, dynamically routed micro-transit shuttles.

Active Transportation

- ~~2.152~~ Develop and maintain an Active Transportation Plan as part of the regional transportation plan. Include policies, a project list of existing and proposed bicycle and pedestrian facilities,

and strategies for implementation in the Active Transportation Plan.

- 2.163 Incorporate programs and policies of the active transportation plan into regional and local land use plans and regulatory processes.
- 2.174 Construct, upgrade, and maintain pedestrian and bicycle facilities consistent with the active transportation plan.

Multi-modal

- 2.185 Accommodate the needs of all categories of travelers by designing and operating roads for safe, comfortable, and efficient travel for roadway users of all ages and abilities, such as pedestrians, bicyclists, transit riders, motorists, commercial vehicles, and emergency vehicles.
- 2.1619 ~~Encourage Support regional~~ parking management programs that incentivize non-auto modes and discourage private auto-mobile use at peak times in peak locations, alleviate circulating vehicle trips associated with parking availability, ~~and minimize parking requirements through the use of shared parking facilities while potentially providing funding that benefits infrastructure and services for transit, pedestrians, and bicyclists.~~
- 2.20 **New Policy:** Coordinate and maintain parking maximums and shared parking standards that support goals and policies of the Regional Plan.
- 2.21 **New Policy:** Paid parking revenues should benefit infrastructure and services for transit, pedestrians, and bicyclists within areas that where funds are generated.
- 2.2217 Coordinate and include in area plans, ~~where applicable,~~ intermodal transportation facilities (“Mobility Hubs”) that serve major activity centers and connect transit, pedestrian, bicycle facilities, and car/ride share, and car/ride share, and provide park and ride facilities, where appropriate in and outside of the region. ~~other major areas of activity while encouraging the consolidation of off-street parking within mixed use areas.~~
- 2.1823 In roadway improvements, construct, upgrade, and maintain active transportation and transit facilities along major travel routes. In constrained locations, all design options should be considered, including but not limited to restriping, roadway realignment, signalization, and purchase of right of way.
- 2.2419 Encourage ~~jurisdiction~~ partners to develop and implement plans ~~coordinated-coordinating~~ wayfinding and signage ~~plans for to build~~ awareness of alternative transportation ~~modes~~ opportunities including transit ~~(TART/BlueGO),~~ pedestrian, and bicycle facilities.

GOAL 3: SAFETY

Increase safety and security for all users of Tahoe’s transportation system.

Policies

- 3.1 Coordinate the collection and analysis of safety data, identify areas of concern, and propose safety-related improvements and user awareness that support state and federal safety programs and performance measures.
- 3.2 ~~Consider safety data and u~~Use proven safety design countermeasures for safety hotspots ~~recommended from roadway safety audits, the active transportation plan, corridor plans, and other reliable sources~~ when designing new or modifying existing travel corridors.

- 3.3 Coordinate safety awareness programs ~~that encourage law abiding behavior by all travelers.~~
- 3.4 Support emergency preparedness and response planning, including the development of regional evacuation plans, ~~and encourage appropriate agencies to use traffic incident management performance measures.~~
- 3.5 **New Policy:** Encourage appropriate agencies to use traffic incident management performance measures.
- 3.65 Design projects to maximize visibility at vehicular, bicycle, and pedestrian conflict points. Consider increased safety signage, site distance, and other design features, as appropriate.

GOAL 4: OPERATIONS AND CONGESTION MANAGEMENT

Provide an efficient transportation network through coordinated operations, system management, technology, and monitoring.

Policies

- 4.10 Prioritize regional and local investments that fulfill TRPA objectives in transit, active transportation, transportation demand management, and other programs which support identified TRPA transportation performance outcomes.
- 4.2 **New Policy:** Enable growth of shared and on-demand shared ride mobility services (i.e., ride-, car-, and bike-sharing, e-hailing, etc.).
- 4.3 **New Policy:** Work to ensure that new transportation services and technologies utilize electric vehicles as feasible.
- 4.4 **New Policy:** Coordinate policies across multiple partners to that support the use of electric assisted, low-speed devices on paths and trails to serve travel needs in Tahoe
- 4.51 Identify opportunities to implement comprehensive transportation solutions that include technology, safety, and other supporting elements when developing infrastructure projects.
- 4.26 Collaborate with jurisdictions and state departments of transportation DOT partners to develop adaptively management strategies roadway for peak traffic periods at Basin entry/exit routes.
- 4.73 Promote awareness of travel options ~~and conditions~~ through outreach, education, and advertising and real-time travel information, particularly in local schools.
- 4.8 **New Policy:** Invest resources in marketing and outreach campaigns to promote the use of non-auto travel options.
- 4.94 ~~Incorporate-Implement~~ programs and policies of the Tahoe Basin Intelligent Transportation Systems Strategic Plan to support needed infrastructure to achieve into-regional and local land use plans and regulatory processes transportation goals.
- 4.105 Support the use of emerging technologies, such as the development and use of mobile device applications, to navigate the active transportation network and facilitate ridesharing, efficient parking, transit use, and transportation network companies.
- 4.116 Level of service (LOS) criteria for the Region’s highway system and signalized intersections during peak periods shall be: “C” on rural recreational/scenic roads; “D” on rural

developed area roads; “D” on urban developed area roads; “D” for signalized intersections. Level of Service “E” may be acceptable during peak periods in urban areas, but not to exceed four hours per day. These vehicle LOS standards may be exceeded when provisions for multi-modal amenities and/or services (such as transit, bicycling, and walking facilities) are adequate to provide mobility for users at a level that is proportional to the project-generated traffic in relation to overall traffic conditions on affected roadways.

- 4.7 ~~Regional transportation plan updates shall review projected travel into and within adopted area plans and effectiveness of mobility strategies.~~
- 4.128 Prohibit the construction of roadways to freeway design standards in the Tahoe Region. Establish Tahoe specific traffic design volume for project development and analysis.
- 4.139 Require the development of traffic management plans for major temporary seasonal activities, including streetscape flexibility within urban centers, and the coordination of simultaneously occurring events.
- 4.140 ~~Expand and build capacity in~~ Actively support Transportation Management Associations (TMAs) in the Tahoe Region to develop public-private partnerships that support transportation initiatives.
- 4.151 Establish a uniform method of data collection and forecasting for resident and visitor travel behavior and demographics.
- 4.162 Maintain monitoring programs for all modes that assess the effectiveness of the long-term implementation of local and regional mobility strategies on a publicly accessible reporting platform (e.g., www.laketahoeinfo.org website).
- 4.173 Establish regional and inter-regional cooperation and cost-sharing to obtain a uniform method of transportation data collection and sharing. ~~to obtain basin-wide data for transportation-related activities.~~
- 4.184 Design roadway corridors, including driveways, intersections, and scenic turnouts, to minimize impacts to regional traffic flow, transit, and bicycle and pedestrian facilities by using shared access points where feasible.

GOAL 5: ECONOMIC VITALITY & QUALITY OF LIFE

Support the economic vitality of the Tahoe Region to enable a diverse workforce, sustainable environment, and quality experience for both residents and visitors.

Policies

- 5.1 Encourage community revitalization and transit oriented development projects that comprehensively support regional and local transportation, housing, land use, environment, and other goals.
- 5.2 New Policy: Ensure access to public transit in identified Priority Communities.
- 5.32 ~~Provide multimodal access to recreation sites.~~ Encourage collaboration between public lands managers, departments of transportation, transit providers, and other regional partners to support sustainable recreation and multi-modal access to recreation sites. ~~improve year-round access to dispersed recreation activities. Strategies could include active transportation end-of-~~

~~trip facilities, transit services, parking management programs, and incentives to use multi-modal transport.~~

- 5.43 Collaborate with local, state, regional, federal, and private partners to develop a regional revenue source to fund Lake Tahoe transportation ~~and water quality projects~~investments.
- 5.54 Collaborate with ~~bi-state partners regional and inter-regional partners~~ to establish efficient rail, air, and bus transportation connections to Tahoe within the Trans-Sierra Region including to and from Tahoe and surrounding metropolitan areas.

GOAL 6: SYSTEM PRESERVATION

Provide for the preservation of the existing transportation system through maintenance activities that support climate resiliency, water quality, and safety.

Policies

- 6.1 Preserve the condition of sidewalks and bicycle facilities and maintain, where feasible, ~~maintain their for~~ year-round use.
- 6.2 New Policy: Improve winter transit access by providing shelters, cleared sidewalks and paths around stops, winter accessible bike racks, and warm shelters at mobility hubs and major transit stops.
- 6.23 Maintain and preserve pavement condition to a level that supports the safety of the traveling public and protects water quality.
- 6.43 Make “dig once” the basin-wide standard, requiring public and private roadway projects to include the installation of conduit to support community needs. (e.g: fiber optic, broadband, lighting, etc.)
- 6.45 Consider the increased vulnerability and risk to transportation infrastructure from climate stressors, such as increased precipitation, flooding, and drought when designing new infrastructure and repairing or maintaining existing infrastructure.
- 6.6 New Policy: Advance transportation planning through public participation and collaboration.

Chapter 7 Development and Implementation Priorities – Proposed Changes

DP-2.2 THE MAXIMUM AMOUNT OF RESIDENTIAL ALLOCATIONS, COMMERCIAL FLOOR AREA, TOURIST BONUS UNITS AND RESIDENTIAL BONUS UNITS THAT MAY BE RELEASED BEFORE DECEMBER 31, 2032 IS OUTLINED IN THE TABLE BELOW.

TABLE REMAINS – no changes proposed

REMAINING 1987 ALLOCATIONS ARE AVAILABLE FOR USE IN ACCORDANCE WITH REGIONAL PLAN AND CODE OF ORDINANCE PROVISIONS. SUBJECT TO COMPLIANCE WITH REGIONAL PLAN POLICIES AND CODE OF ORDINANCES INCLUDING NOTE 3 ABOVE, TRPA WILL MAKE AVAILABLE UP TO 20 PERCENT OF THE 2013 RESIDENTIAL AND COMMERCIAL LAND USE ALLOCATIONS EVERY FOUR YEARS, IN CONJUNCTION WITH THE 2012 REGIONAL PLAN UPDATE AND FUTURE UPDATES OF THE

REGIONAL PLAN AND RTP.

~~TWO YEARS AFTER EACH RELEASE, TRPA SHALL MONITOR EXISTING AND NEAR-TERM LEVELS OF SERVICE (“LOS”) AT INTERSECTIONS AND ROADWAYS TO EVALUATE COMPLIANCE WITH APPLICABLE POLICIES. SHOULD LOS PROJECTIONS INDICATE THAT APPLICABLE LEVEL OF SERVICE GOALS AND POLICIES WILL NOT BE MET, ACTIONS SHALL BE TAKEN TO MAINTAIN COMPLIANCE WITH LOS STANDARDS.~~

~~TO ENSURE THAT THE “VEHICLE MILES TRAVELLED” THRESHOLD STANDARD IS MAINTAINED, TWO YEARS AFTER EACH RELEASE, THE AGENCY SHALL MONITOR ACTUAL ROADWAY TRAFFIC COUNTS AND FORECAST VEHICLE MILES TRAVELLED FOR THE NEXT RELEASE OF ALLOCATIONS. NEW CFA AND RESIDENTIAL ALLOCATION RELEASES WILL BE CONTINGENT UPON DEMONSTRATING, THROUGH MODELING AND THE USE OF ACTUAL TRAFFIC COUNTS, THAT THE VEHICLE MILES TRAVELLED THRESHOLD STANDARD SHALL BE MAINTAINED OVER THE SUBSEQUENT FOUR-YEAR PERIOD.~~

NEW:

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.

DP-5.2 THE TECHNICAL ADVISORY BODY (OR BODIES) WILL PREPARE AND TRANSMIT A REGULAR PERFORMANCE 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. Where possible the performance report will attempt to quantify project and program implementation, changes in VMT, VMT per capita, and effectiveness at both the regional and jurisdiction level. 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 and associated programs including but not limited to:

- A. Modifications to the FTIP/STIP project selection process
- B. Modifications to the TRPA regional- Ggrant Program funding formulacriterion
- 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.

E.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 and VMT Per Capita is not at or below the level identified in the schedule:
 - 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, or until an performance report as described in DP – 5.2 identifies that the pace of VMT reduction is consistent with expectations.
- 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:
 - 1. 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.
- C. 2048 Results Milestone – After completion of the 2048 results assessment, or upon the earliest performance report as described in DP – 5.2 that identifies that the per capita target VMT threshold standard has been attained:
 - 1. The technical body described in DP-5.1 will review the threshold standard and recommend a new target.

Attachment E

Code of Ordinance Changes (striketrough)



**TAHOE
REGIONAL
PLANNING
AGENCY**

ATTACHMENT E
CODE OF ORDINANCE CHANGES
(STRIKETHROUGH)

MARCH 16, 2021

REGIONAL PLAN IMPLEMENTATION COMMITTEE
AGENDA ITEM NOS. 3, 4, & 5

Amendments to the Code of Ordinances

#	Code Citation	Title	Action
Chapter 2: Applicability of the Code of Ordinances			
(1)	2.2.2.A	General Projects or Matters	Eliminate trip generation and Level of Service as a determining factor for Governing Board or Hearings Officer review of a project.
(2)	2.3.6.A.8	Changes in Operation	Revise the Qualified Exemption for changes in business operation to be determined based on vehicle miles travelled rather than trip generation.
Chapter 3: Environmental Documentation			
(3)	3.2.2.A.2	Projects Exempt from Preparation of Environmental Impact Statement	Revise the Environmental Impact Statement exemption to be based on vehicle miles travelled rather than vehicle trip generation.
Chapter 22: Temporary Uses, Structures, and Activities			
(4)	22.7.6	Traffic Mitigation	Require a traffic control plan rather than a traffic analysis for temporary closures of US Highway 50.
Chapter 34: Driveway and Parking Standards			
(5)	34.3	Driveways	Establish driveway standards based on whether a project requires a VMT analysis rather than a traffic analysis.
Chapter 39: Subdivisions			
(6)	39.2.3.J	Air Quality Mitigation Fees	Require a mobility mitigation fee be paid for subdivisions based on an increase in vehicle miles travelled, rather than an air quality fee based on vehicle trip generation.
(7)	39.2.5.J	Air Quality Mitigation Fees	Require a mobility mitigation fee be paid for subdivisions based on an increase in vehicle miles travelled, rather than an air quality fee based on vehicle trip generation.
Chapter 50: Allocation of Development			
(8)	50.4.3	LOS and VMT Monitoring	Delete the requirement for residential allocations to be based upon LOS and VMT monitoring.

(9)	50.6.1.B.2.b	“Additional” Commercial Floor Area	Revise the criteria for small commercial additions to be excluded from Commercial Floor Area. The revised criterion would be based upon vehicle miles rather than vehicle trips.
(10)	50.9.2	Definition of “Additional Recreation”	Replace vehicle trips with vehicle miles travelled as a determining factor for “additional recreation.”
Chapter 65: Existing Structures and Exempt Activities			
(11)	65.2	Traffic and Air Quality Mitigation Program	Revise the framework for Project Impact Assessment and the Mobility Mitigation Fee (formerly Air Quality Mitigation Fee).
(12)	65.3.1	Purpose	Update the reference to the Active Transportation Plan.
(13)	65.3.3.E.1	Air Quality Mitigation	Update the name of the mitigation fee – Mobility Mitigation Fee replaces Air Quality Mitigation Fee.
Chapter 82: Existing Structures and Exempt Activities			
(14)	82.5.6	Qualified Exempt Activities	Revise the Qualified Exemption for changes in business operation to be determined based on vehicle miles travelled rather than trip generation.
Chapter 90: Definitions			
(15)	90.2	Definitions	Delete obsolete definitions.
(16)	90.2	Definitions	Move two definitions from Chapter 65 to Chapter 90 and revise Chapter 65 references within two additional definitions.

(1) Modify Subparagraph A, *General Projects or Matters*, of Subsection 2.2.2, *Projects and Matters to be Approved by the Governing Board or Hearings Officer*, to read as follows:

CHAPTER 2: APPLICABILITY OF THE CODE OF ORDINANCES

2.2 PROJECT REVIEW

2.2.2. Projects and Matters to be Approved by the Governing Board or Hearings Officer

Categories of projects and matters listed in this subsection 2.2.2 or as otherwise required by law shall require Governing Board or Hearings Officer approval, as indicated.

A. General Projects or Matters

1. Governing Board Review

The following projects or matters require review and approval by the Governing Board:

- a. EIS certification (Chapter 3: Environmental Documentation);
- b. Projects for which an EIS has, or will be prepared, or at the discretion of the Executive Director;
- c. Plan amendments, ordinances and resolutions;
- d. Community Plans, including preliminary plan or work program, redevelopment, master or special plans;
- e. Problem assessments and remedial action plans, excluding voluntary problem assessments and remedial action plans (Section 5.12 Remedial Action Plans);
- f. Increases in supply of land coverage (Chapter 30: Land Coverage);
- g. Delegation Memoranda of Understanding pursuant to Section 2.5 (except as otherwise provided in this Code);
- h. Substantial harvest or tree removal plans (61.1.8) except for fuels management projects (61.1.7.D);
- i. Mitigation fund expenditures and projects (Section 60.2 and Section 65.2);
- j. Permit revocations (Chapter 5: Compliance);
- k. Historic resource designations (Chapter 67: Historic Resource Protection);
- ~~l. Projects resulting in a significant increase in traffic when the project causes level of service (LOS) to worsen by one letter grade at an intersection, or results in any additional delay at an intersection already rated at LOS "F" (Section 65.2);~~
- ~~m.~~ Allocation systems (Chapter 50: Allocation of Development);

- ~~am.~~ Establishing the level defining the top-ranked parcels, lowering the line defining the top-ranked parcels pursuant to subsection 53.5.1 and determining allowable base land coverage pursuant to subsection 53.8.1;
- ~~an.~~ Findings of the demonstration of commitment for affordable housing pursuant to subparagraph 39.2.5.F;
- ~~ao.~~ Special project allocations (subparagraph 50.6.4.D);
- ~~ap.~~ Area Plan conformity review (Chapter 13: Area Plans); and
- ~~aq.~~ In jurisdictions with conforming Area Plans, projects that are not eligible to be delegated from TRPA review, and delegated projects that are appealed to TRPA.

2. Hearings Officer Review

The following projects or matters require review and approval by the Hearings Officer:

- a. Special uses, including changes, expansions or intensifications of existing uses (Chapter 21: Permissible Uses);
- b. Additional height for eligible structures, in special height districts for adopted community and redevelopment plan areas (subsection 37.5.4);
- c. Additions, reconstruction, or demolition of eligible or designated historic resources (Chapter 67: Historic Resource Protection);
- d. Modification to SEZs, excluding modifications for residential projects in accordance with subparagraph 30.5.2.A and erosion control and other environmentally oriented projects and facilities in accordance with subparagraph 30.5.2.D;
- e. Land capability challenges and man-modified challenges, except land capability challenges pursuant to subsection 30.3.4 submitted under the special provisions for designated land banks (Chapter 30 and 80);
- f. Additional land coverage in excess of 1,000 square feet in land capability districts 1-3; and
- ~~g. Projects resulting in a significant increase in traffic that do not require Governing Board review (Section 65.2).~~

- (2) Modify Subparagraph A.8, *Changes in Operation*, of Subsection 2.3.6, *Qualified Exempt Activities*, to read as follows:

CHAPTER 2: APPLICABILITY OF THE CODE OF ORDINANCES

2.3. EXEMPT ACTIVITIES

2.3.6. Qualified Exempt Activities

The activities listed below are not subject to review and approval by TRPA, provided the applicant certifies on a TRPA-qualified exempt form that the activity fits within one or more of the following categories and the activity shall not result in the creation of additional land coverage or relocation of existing land coverage, and will comply with all restrictions set forth below. The statement shall be filed with TRPA for all qualified exempt activities at least three working days, before the activity commences and shall be made under penalty of perjury.

A. General Activities

The general activities listed below are qualified exempt.

8. Changes in Operation

Changes in operation resulting in generation of less than 650 vehicle miles travelled~~100 additional vehicle trips~~, in connection with a commercial, recreation or public service use, provided there is no change from one major use classification to another, the resulting use is an allowed use, and the applicant pays an air quality mobility mitigation fee in accordance with subparagraph 65.2.4.D.

- (3) Modify Paragraph A.2 of Subsection 3.2.2., *Activities and Projects Exempt from Preparation of Environmental Impact Statement*, to read as follows:

CHAPTER 3: ENVIRONMENTAL DOCUMENTATION

3.2 APPLICABILITY

3.2.2. Activities and Projects Exempt from Preparation of Environmental Impact Statement

Article VII(f) of the Compact, requires TRPA to adopt by ordinance a list of classes of projects which TRPA has determined will not have a significant effect on the environment and therefore shall be exempt from the requirement for the preparation of an environmental impact statement.

A. Projects Exempt From Preparation of Environmental Impact Statement

The projects listed below shall be exempt from preparation of an EIS and other environmental documents.

1. Construction of single-family houses and additions and accessory structures thereto, in compliance with the provisions of the Code;
2. Changes in use consisting of ~~minor-an~~ increases in ~~no more than 1,300~~650 vehicle ~~trips-miles travelled (See Subparagraph 65.2.3.D.2); (See Chapter 65: Air Quality/Transportation);~~ and
3. Transfers or conversions of development rights (does not include construction of new units).

(4) Modify Subsection 22.7.6, *Traffic Mitigation*, to read as follows:

CHAPTER 22: TEMPORARY USES, STRUCTURES, AND ACTIVITIES

22.7. STANDARDS FOR TEMPORARY ACTIVITIES

Except as otherwise provided in Section 22.6, temporary activities shall comply with the standards in this section.

22.7.6. Traffic Mitigation

For a temporary activity that includes the closure of a traffic lane or intersection of a state or federal highway for more than one hour, or the closure of U.S. 50 at any point between the South Y and Kingsbury Grade for any period of time, the applicant shall submit a traffic ~~analysis-control plan. pursuant to subparagraph 65.2.4.B. Other temporary activities are exempt from the requirements of Section 65.2.~~

(5) Modify Section 34.3, *Driveways*, to read as follows:

CHAPTER 34: DRIVEWAY AND PARKING STANDARDS

34.3. DRIVEWAYS

To ensure organized and well-designed ingress and egress of vehicles from driveways, TRPA shall review the design of driveways according to the standards and procedures in this section.

34.3.1. Compliance Program

The standards set forth in subsections 34.3.2 through 34.3.5, inclusive, shall be conditions of approval for projects with driveways, and for projects for which TRPA finds that the driveways are not in compliance with the standards set forth in subsections 34.3.2 through 34.3.5, inclusive, and are causing significant adverse impacts on traffic, transportation, air quality, water quality, or safety. If TRPA finds that driveways associated with existing development are causing such impacts, TRPA may implement corrective measures pursuant to Section 5.12 Remedial Action Plans.

34.3.2. General Standards

Driveways shall comply with the following standards:

A. New Driveways

New driveways shall be designed and located so as to cause the least adverse impacts on traffic, transportation, air quality, water quality, and safety.

B. Shared Driveways

In the application of subsections 34.3.3 through 34.3.5, inclusive, TRPA shall encourage shared driveways if TRPA finds that the effect is equal or superior to the effect of separate driveways.

C. Role of Community Plans

Approved community plans may replace the standards in subsections 34.3.3 through 34.3.5, inclusive, with alternative specific provisions, provided such provisions are more appropriate to the situation and provide equal or superior measures to satisfy the environmental thresholds. See also subparagraph 12.6.3.C.

D. Standards of Caltrans and Nevada Department of Transportation

On state and federal highways, the ingress/egress standards of the California or Nevada Department of Transportation shall apply, as appropriate, in addition to the

standards in subsections 34.3.3 through 34.3.5, inclusive. Where the state standards conflict with subsections 34.3.3 through 34.3.5, inclusive, the state standards shall control.

E. Slope of Driveways

Slopes of driveways shall not exceed the standards of the county or city in whose jurisdiction the driveway is located. Driveways shall not exceed ten percent slope, unless TRPA finds that construction of a driveway with a ten percent or less slope would require excessive excavation and that the runoff from a steeper driveway shall be infiltrated as required in Section 60.4. In no case shall the driveway exceed 15 percent slope.

F. Best Management Practices

Driveways shall be managed in accordance with Section 60.4.

34.3.3. Numbers of Driveways

~~Additional or transferred development that does not require a traffic analysis pursuant to subsection 65.2.4~~ Projects generating up to 1,300 vehicle miles travelled shall be served by a single driveway with no more than two points of ingress/egress from the public right-of-way or other access road. Additional or transferred development that ~~requires a traffic analysis~~ generates more than 1,300 vehicle miles travelled pursuant to subsection 65.2.4 shall conform to the ingress/egress provisions necessary to mitigate all ~~traffic transportation~~ and air quality impacts under subsection 65.2.4.

34.3.4. Width of Driveways

Driveway widths shall conform to the following standards:

A. Other Residential Uses

Two-way driveways serving residential uses other than single-family homes shall have a minimum width of 20 feet and a maximum width of 24 feet. One-way driveways serving other residential uses shall have a minimum width of ten feet and maximum width of 12 feet.

B. Commercial, Tourist Accommodation, Recreation, and Public Service Uses

Two-way driveways serving commercial, tourist accommodation, recreation, and public service uses shall have a minimum width of 20 feet and a maximum width of 30 feet. One-way driveways serving such uses shall have a minimum width of ten feet and a maximum width of 15 feet. For two-way driveways with median dividers serving such development, each direction shall have a minimum width of ten feet and a maximum width of 17 feet.

34.3.5. Service Drives

Uses, other than single-family homes, that do not require vehicle miles travelled (VMT) analysis ~~the preparation of a traffic analysis~~ pursuant to ~~subsection subparagraph~~ 65.2.3.D4 may be permitted an additional service driveway for maintenance and garbage removal. The

service driveway shall be at least ten feet wide and no more than 12 feet wide. Uses that ~~do require VMT analysis~~ ~~require the preparation of a traffic analysis~~ pursuant to subsection 65.2.3.D~~4~~ may be permitted an additional service driveway or driveways for maintenance and garbage removal provided the ~~traffic-transportation~~ and air quality impacts of such driveways shall be mitigated under subsection 65.2.4.

- (6) Modify Subparagraph J, *Air Quality Mitigation Fees*, of Subsection 39.2.3, *Subdivision of Existing Structures*, to read as follows:

CHAPTER 39: SUBDIVISION

39.2. SUBDIVISION STANDARDS

39.2.3. Subdivision of Existing Structures

Subdivision of eligible existing structures, as set forth in subparagraph 39.1.3.E, may be permitted subject to the following requirements:

J. ~~Air Quality~~**Mobility Mitigation Fees**

If the subdivision of an existing structure effects a change in use (e.g., multi-family to single-family) that results in an increase in ~~daily vehicle trips~~**vehicle miles travelled**, then an ~~air quality~~**mobility** mitigation fee shall be assessed pursuant to subparagraph 65.2.4.D.

- (7) Modify Subparagraph K, *Air Quality Mitigation Fees*, of Subsection 39.2.5, *Subdivision of Post-1987 Projects*, to read as follows:

CHAPTER 39: SUBDIVISION

39.2. SUBDIVISION STANDARDS

39.2.5. Subdivision of Post-1987 Projects

Subdivision of projects approved after July 1, 1987 pursuant to the 1987 Regional Plan, as it may be amended, may be permitted subject to the following requirements:

K. **Air Quality Mobility Mitigation Fees**

Subdivisions that result in a change of use that increases ~~daily vehicle trips~~vehicle miles travelled shall be assessed an ~~air quality~~air quality mobility mitigation fee pursuant to subparagraph 65.2.4.D. Approval of a subdivision shall not be cause for a partial refund of mitigation fees assessed in connection with the underlying project approval.

- (8) Delete Subsection 50.4.3, *LOS and VMT Monitoring*.

CHAPTER 50: ALLOCATION OF DEVELOPMENT

50.4 ALLOCATION AND ACCOUNTING OF DEVELOPMENT RIGHTS

TRPA shall allocate the development of additional residential units as follows:

~~50.4.3. LOS and VMT Monitoring~~

~~Two years after each release, TRPA shall monitor existing and near term LOS to evaluate compliance with applicable LOS policies. Should LOS projections indicate that applicable LOS policies will not be met, TRPA shall take action to maintain compliance with LOS standards. TRPA shall also monitor VMT and only release residential allocations upon demonstrating, through modeling and the use of actual traffic counts, that the VMT Threshold Standard shall be maintained over the subsequent four year period.~~

- (9) Modify Subsection 50.6.1, *Definition of "Additional Commercial Floor Area"*, Subparagraph B.2.b. to read as follows:

CHAPTER 50: ALLOCATION OF DEVELOPMENT

50.6 ALLOCATION OF ADDITIONAL COMMERCIAL FLOOR AREA

50.6.1. Requirement of Allocation

No person shall construct a project or commence a use that creates additional commercial floor area without first receiving an allocation approved by TRPA or obtaining necessary development rights pursuant to Chapter 51: *Banking, Conversion, and Transfer of Development Rights*. In order to construct the project or commence the use, the recipient shall comply with all other applicable provisions of this Code.

B. "Additional" Commercial Floor Area

Commercial floor area is considered "additional" if it is to be created pursuant to a TRPA approval issued on or after January 1, 1987.

2. Additional commercial floor area excludes the following:

- b. Additions to, or expansions of, legally existing commercial floor area of 500 square feet or five percent of the existing commercial floor area, whichever is less, provided:
 - (i) The existing structure and any subsequent additions or expansions physically exist and were completed at least one year prior to an application pursuant to this subparagraph;
 - (ii) The exempt addition or expansion is not applied for or built in conjunction with any other addition or expansion;
 - (iii) There is no change in use;
 - (iv) ~~Any The change in operation generates no more than 650 vehicle miles travelled; increase in traffic is insignificant as defined in Section 66.2: Traffic and Air Quality Mitigation Program;~~
 - (v) The exempt addition or expansion occurs within a single project area; and

- (vi) The exempt addition or expansion does not occur within the same project area more frequently than once every ten years;

(10) Modify Subsection 50.9.2, *Definition of "Additional Recreation"*, to read as follows:

CHAPTER 50: ALLOCATION OF DEVELOPMENT

50.9. REGULATION OF ADDITIONAL RECREATION FACILITIES

TRPA shall regulate the rate and distribution of additional recreation facilities as follows:

50.9.2. Definition of "Additional Recreation"

Recreation shall be considered "additional" if it is to be created pursuant to a TRPA approval issued on or after January 1, 1987, and would result in an increase in vehicle miles travelled trips that requires a traffic-VMT analysis pursuant to subparagraph 65.2.4.B, or increased floor space of five percent, or 500 square feet, or would increase PAOT capacity(See subsection 11.6.11). The conversion of an existing non-recreational use to a use constituting a recreation facility shall be additional recreation subject to this chapter. The following shall not be "additional" recreation facilities:

- A. The reconstruction or replacement on the same parcel of recreation facilities legally existing on or approved before January 1, 1987;
- B. Modifications to legally existing recreation and their accessory uses that do not create additional service capacity;
- C. Relocation of legally existing recreation facilities through a transfer approved by TRPA pursuant to Chapter 51; or
- D. Dispersed recreation.

(11) Modify Section 65.2, *Air Quality Mitigation Program*, to read as follows:

CHAPTER 65: AIR QUALITY/TRANSPORTATION

65.2 ~~TRAFFIC AND~~ AIR QUALITY, GREENHOUSE GAS REDUCTION, AND MOBILITY MITIGATION PROGRAM

65.2.1 Purpose

The purpose of this section is to implement TRPA's 1992 Air Quality Plan and Goal #4, Policy 2 of the Development and Implementation Priorities Subelement, Implementation Element of the Goals and Policies in the Regional Plan, with respect to the establishment of fees and other procedures to offset impacts from indirect sources of air pollution; reduce mobile source greenhouse gas emissions per capita; and provide a more effective multimodal transportation system that reduces vehicle miles traveled per capita.

65.2.2 Applicability

The provisions of this section are applicable to all additional development or transferred development and all changes in operation as defined in this section.

65.2.3 Definitions and Standards

For purposes of this section, the following terms are defined as provided below:

~~A. —~~ Approved Center

~~A multi-use commercial center with sufficient size, parking, diversity of use, level of service, and access management, as to which TRPA has found that limited changes in operation would cause insignificant increases in new vehicle trips.~~

~~B.A. —~~ Change in Operation

Any modification, change, or expansion of an existing or previous use resulting in additional ~~vehicle trip generation~~ vehicle miles travelled. Changes in operation include, but are not limited to:

1. Expansion of gross floor area; or
2. Change in the type of generator on the trip table, normally indicated by a substantial change in products or services provided.

~~C. —~~ Insignificant Increase

~~An increase of 100 or fewer daily vehicle trips, determined from the trip table (subparagraph 65.2.3.H) or other competent technical information.~~

D. Maintenance Area

~~The urbanized portions of El Dorado and Douglas Counties within the Tahoe region that are designated as maintenance areas for carbon monoxide under the federal Clean Air Act. The plan area statements listed below are within the maintenance area:~~

1. Within the County of Douglas

~~South Shore Area Plan; Round Hill Community Plan; and PASs 057, 058, 059, 060, 061, 062, 063, 064, 065, 066, 067, 068, 070A, 070B, 072, 073, 074, and 080.~~

2. Within the City of South Lake Tahoe

~~Tourist Core Area Plan; Tahoe Valley Area Plan; Bijou/Al Tahoe Community Plan; and PASs 089B, 090, 092, 093, 099, 100, 101, 103, 104, 105, 108, 111, 114, and 116.~~

3. Within the County of El Dorado

~~Meyers Area Plan and PASs 116, 118, 119, 120, 122, 123, 124, 130, 135, 136, 139, and 140.~~

E. Minor Increase

~~An increase of more than 100 but not more than 200 daily vehicle trips determined from the trip table or other competent technical information.~~

B. New Development

~~Additional development, transferred development, or a change in operation.~~

F.C. Previous Use

The most recent permanent use in the project area that existed for more than 90 consecutive days of operation within the 60 months preceding submission of a complete application to TRPA for review of a change in operation. Uses which have received CTRPA or TRPA approval, but have not operated for 90 consecutive days within the previous 60 months, shall not be recognized as previous uses. A use that regularly operated fewer than seven days per week shall have operated for 13 consecutive weeks within the previous 60 months to constitute a previous use.

G. Significant Increase

~~An increase of more than 200 daily vehicle trips, as determined from the trip table or other competent technical information.~~

D. Screened from Additional Impact Assessment

~~Criteria for projects to be screened from further analysis. A project that meets one or more of the following criteria shall be considered to be screened:~~

1. Affordable, Moderate, or Achievable Housing

Affordable housing that is 100 percent deed-restricted affordable, moderate, or achievable and meets the requirements of Subsection 52.3.4, Affordable, Moderate, and Achievable-Income Housing.

2. Projects Generating Low VMT

Projects will be screened using the following vehicle miles travelled calculations:

a. 1,300 VMT outside of Centers.

b. A 20% reduction in VMT calculation within Town Centers and the half-mile buffer around them.

c. A 35% reduction in VMT calculation in the Regional Center and High-Density Tourist District and the half-mile buffer around it.

3. Active Transportation Projects

Any of the following projects: Bicycle, pedestrian, and transit projects

E. Standards of Significance

A project would have a significant impact and therefore require additional analysis and mitigation if it exceeds the applicable standards for land uses as shown in Table 65.2.3-1.

Where a project replaces existing VMT-generating land uses that 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 in Table 65.2.3-1 would apply.

TABLE 65.2.3-1

Standards of Significance

APPLICABLE LAND USE	STANDARD OF SIGNIFICANCE
<u>Commercial</u>	<u>No-net unmitigated VMT</u>
<u>Mixed Uses</u>	<u>Evaluate each land use component of a mixed-use project independently, and apply the threshold of significance for each land use type included</u>
<u>Public Services</u>	<u>15% below existing sub-regional average VMT</u>
<u>Recreation</u>	<u>No-net unmitigated VMT</u>
<u>Residential Uses</u>	<u>15% below existing sub-regional average VMT per resident</u>
<u>Tourist Accommodation Unit (TAU)</u>	<u>15% below existing sub-regional average VMT per TAU</u>

Transportation

No-net unmitigated VMT

To determine sub-regional standards of significance, TRPA will prepare and maintain standards of significance at the local government jurisdiction level. The boundaries used for these standards must be consistent with the VMT Generation Areas in 65.2.3.F, calculated using the same methodology used to calculate VMT metrics for the region per 65.2.3.G, and must support greenhouse gas emissions reduction, encourage development of multimodal transportation networks, and promote a diversity of land uses that will reduce VMT per capita.

Proposed projects found to have a significant impact will be required to mitigate the project impact to or below the standards of significance using mitigation measures in 65.2.4.C.2, 65.2.4.C.3, and payment of mobility mitigation fees.

H. Trip Table

TRPA shall adopt and maintain a trip table for the purpose of estimating the number of vehicle trips resulting from additional development or changes in operation. TRPA shall generate and update the data in the trip table by referring to recent publications on traffic and trip generation (for example, publications of the Institute of Transportation Engineers and California Department of Transportation) and field surveys conducted in the Tahoe region by TRPA or other competent technical experts.

F. VMT Generation Areas

TRPA shall create zones for each land use type and for all areas in the region. These zones will be used to calculate VMT generation for impact assessment and fee calculation. Zones will be classified as to whether they are above or below the corresponding standard of significance. Zones that are above the corresponding standard of significance are those where individuals travel farther distances to get between home, work, and shopping, and are generally reliant on the automobile to move between their destinations. Zones that are below the corresponding standard of significance are those that are characterized by shorter distance trips between destinations, and where options other than the personal automobile (e.g., bike paths, transit service, sidewalks) are in place and chosen more frequently for trips. TRPA will document and make available to applicants and the general public the zones as part of the documentation of the project impact analysis methodology.

G. VMT Metrics

For the purposes of this section the metrics to be used for applicable land uses are as shown in Table 65.2.3-2:

TABLE 65.2.3-2

VMT Metrics

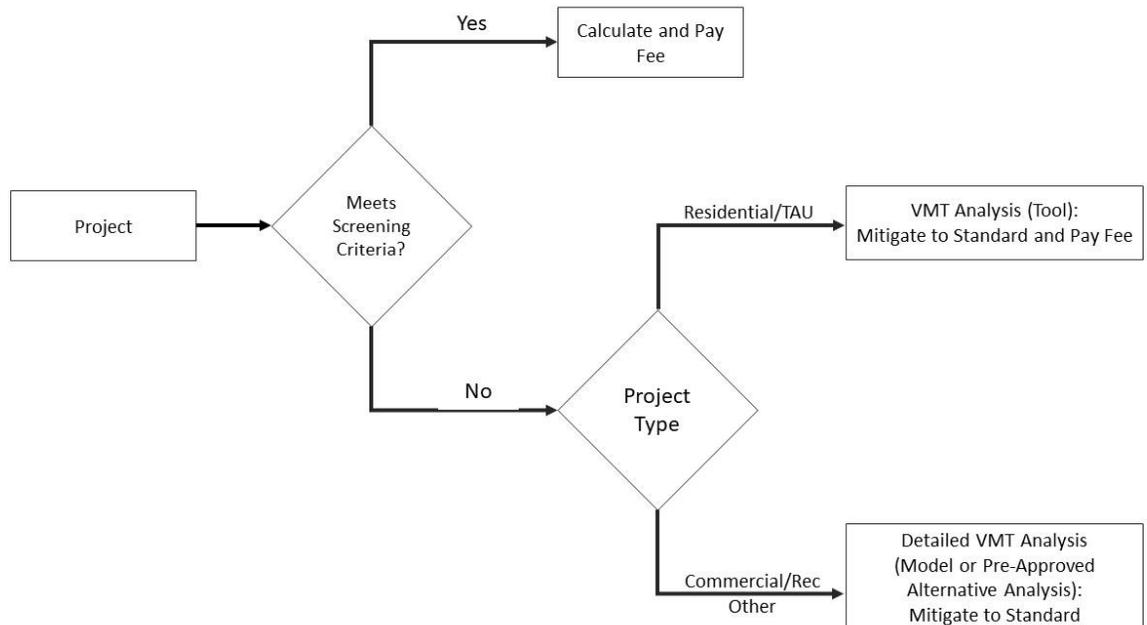
APPLICABLE LAND USE	VMT METRIC
Commercial	Total VMT
Public Service	VMT per Public Service Use
Recreation	Total VMT
Residential Uses	VMT per resident
Tourist Accommodation Unit	VMT per TAU
Transportation Projects	Total VMT

65.2.4 Standards Requirements for Additional or Transferred New Development

~~Additional New~~ development ~~or transferred development~~ shall be subject to the requirements provided below and illustrated in Figure 65.2.4-1.

FIGURE 65.2.4-1

Project Impact Analysis and Mitigation Fee Process Summary



A. Applicant Responsibility

~~Project Information~~ information about proposed uses, transportation demand management features included in the proposed project, vehicle trip generation, vehicle miles travelled, and other information relevant to the project and required for analysis of the project transportation impact shall be made available to TRPA by the applicant at the time application is made.

B. Traffic Project Impact Analysis

As part of the project application for ~~additional or transferred~~ new development ~~that would result in a significant increase in daily vehicle trips at the project area,~~ the applicant shall prepare and submit to TRPA ~~an technically adequate~~ analysis of potential ~~traffic transportation~~ and air quality impacts using the TRPA project impact analysis methodology. If more detailed VMT analysis than what can be provided using the project impact analysis methodology is necessary, the applicant shall submit a technically adequate analysis of potential transportation impacts in addition to the analysis from the project impact analysis methodology. If a project's impacts to air quality cannot fully be evaluated using the project impact analysis methodology, additional air quality analysis may be required. ~~For additional or transferred development that would result in a minor increase in daily vehicle trips at the project area, and where the subject parcel is located within 300 feet of the center of the U.S. Highway 50 right of way and in a maintenance area, the applicant shall prepare and submit to TRPA as part of the project application an analysis of potential traffic and air quality impacts.~~ A traffic analysis shall include:

- ~~1.~~ _____ Trip generation rates of the proposed project;
- ~~2.~~ _____ Impacts of the proposed project on the level of service at any impact intersections;
- ~~3.~~ _____ Impacts of the proposed project on regional vehicle miles travelled (VMT);
- ~~4-1.~~ _____ Impacts of the proposed project on regional and subregional air quality;
- ~~5.~~ _____ Ingress and egress characteristics of the proposed project, and their impacts on traffic flow adjacent to the project area;
- ~~6-2.~~ _____ Measures necessary to mitigate all ~~traffic and~~ air quality impacts to a level consistent with the environmental thresholds, the Goals and Policies, the Regional Transportation Plan, and the 1992 Air Quality Plan; and
- ~~7-3.~~ _____ Additional information that TRPA may require.

C. Required Offsets

~~Additional or transferred~~ New development shall offset the potential ~~traffic transportation~~ and air quality impacts of the project in accordance with the provisions provided below.

1. Regional and Cumulative Impact Fees

In order to offset regional and cumulative impacts, additional development shall contribute to the ~~Air Quality~~Mobility Mitigation Fund, except as provided for in subparagraph 2 below. The amount of contribution is established in subparagraph 65.2.4.D.

2. Regional and Cumulative Mitigation Measures

To offset regional and cumulative impacts, and in lieu of the contribution required under subparagraph 65.2.4.C.1, additional development may provide mitigation measures. The cost of such measures shall be equal to or greater than the contribution required under subparagraph 65.2.4.C.1. Regional and cumulative mitigation measures may include, but are not limited to:

- a. Transfer and retirement of remote offsite development rights;
- b. Integration of affordable, moderate, and achievable (i.e., below market rate) housing into the project;
- c. Offsite Transit-transit facility construction and other measures to increase transit accessibility;
- ~~a-d.~~ Offsite facilities to reduce commuter trips;
- e. Inclusion of features in the proposed development that will reduce vehicle miles travelled, Transportation systems management measures, including, but not limited to, publicly available parking restricted to carpool and transit users, transit facilities, bicycle facilities, and pedestrian facilities, and use of alternative fuels in fleet vehicles; or
- f. Contribution to the Mobility Mitigation Fund in an amount sufficient to pay for the necessary mitigation measures; and
- ~~b-g.~~ Other measures included in the project impact analysis methodology.
- ~~c.~~ Transfer and retirement of offsite development rights.

3. Localized Mitigation Measures

In order to offset the localized impacts of a project, when a ~~traffic project~~impact analysis has been prepared pursuant to subparagraph 65.2.4.B, all necessary mitigation measures shall be required as a condition of project approval for all ~~additional or transferred~~new development. Mitigation measures may include, but are not limited to:

- ~~a.~~ Acceleration/deceleration lanes;
- ~~b.~~ Left turn lanes;
- ~~c.~~ Stop or yield controls;
- ~~d.~~ Access management;

- a. Inclusion of features in the proposed development that will reduce vehicle miles traveled, including, but not limited to, publicly available parking restricted to carpool and transit users, transit facilities, bicycle facilities, and pedestrian facilities;
- b. Unbundle parking costs from property costs and implement market price public parking;
- c. ~~Transportation systems management measures, including but not limited to, bicycle facilities and pedestrian facilities; or~~
- c. Contribution to the Air Quality Mobility Mitigation Fund in an amount sufficient to pay for the necessary mitigation measures; and-
- f.d. Other measures included in the project impact analysis methodology.

D. Fee Schedule

The ~~air quality~~mobility mitigation fee shall be assessed in accordance with the mitigation fee schedule in the Rules of Procedure.

E. Limited Exception for ~~Additional or Transferred~~New Development within Adopted Area or Community Plans

~~Additional or transferred~~New development located within an adopted area or community plan, wherein the ~~traffic transportation~~ and air quality impacts ~~of which~~ were evaluated in the EIS, EA, or IEC for the area or community plan and mitigated by the provisions of the area or community plan, shall be exempt from the requirements of subparagraph 65.2.4.C, provided TRPA finds that the implementation element of the area or community plan as a whole meets the standards of subparagraphs 65.2.4.B and 65.2.4.C.

~~65.2.5~~ Standards for Changes in Operation

~~The standards provided below shall apply to changes in operation.~~

~~A. Applicant Responsibility~~

~~Information about vehicle trip generation relevant to the project shall be made available to TRPA by the applicant at the time application is made.~~

~~B. Traffic Analysis~~

~~As part of the project application for changes in operation that would result in a significant increase in daily vehicle trips, the applicant shall prepare and submit to TRPA a technically adequate analysis of potential traffic and air quality impacts. For changes in operation that would result in a minor increase in daily vehicle trips and are located within 300 feet of U.S. Highway 50 in a maintenance area, the applicant shall prepare and submit to TRPA, as part of the project application, a technically adequate analysis of potential traffic and air quality impacts. A traffic analysis shall include the elements listed in subparagraph 65.2.4.B.~~

C. Required Offsets

All changes in operation shall offset the potential traffic and air quality impacts of the project in accordance with the provisions below.

1. Regional and Cumulative Impact Fees

To offset regional and cumulative impacts, changes in operation shall contribute to the Air Quality Mitigation Fund, except as provided for in subparagraph 2 below. The amount of contribution is established in subparagraph 65.2.5.D.

2. Regional and Cumulative Mitigation Measures

To offset regional and cumulative impacts, and in lieu of the contribution required under subparagraph 65.2.5.C.1, mitigation measures may be provided. The cost of such measures shall be equal to or greater than the contribution required under subparagraph 65.2.5.C.1. Regional and cumulative mitigation measures may include, but are not limited to, the elements listed in subparagraph 65.2.5.C.2.

3. Localized Mitigation Measures

In order to offset the localized impacts of a project, when a traffic analysis has been prepared pursuant to subparagraph 65.2.5.B, all necessary mitigation measures shall be required as a condition of project approval. Mitigation measures may include, but are not limited to, the elements listed in subparagraph 65.2.4.C.3.

D. Fee Schedule

As provided in subsection 65.2.5.C, TRPA shall assess an air quality mitigation fee, based on data from the Trip Table or other competent technical information, according to the fee schedule in subsection 10.8.5 in the Rules of Procedure.

E. Limited Exception for Approved Centers

TRPA shall evaluate multi-use commercial centers and the adjacent roadways as to their size, parking, diversity of use, level of service, and ingress and egress. Where TRPA finds that limited changes in operation in a multi-use commercial center would cause insignificant increases in new vehicle trips, the center shall be included on a list of approved centers. An approved center shall be exempt from subparagraphs 65.2.5.A through D, with the following exceptions:

1. Changes in operation where the previous or proposed use occupies more than 5,000 square feet of gross floor area;
2. Changes in operation where the previous or proposed use is identified for case-by-case review on the trip table;
3. Changes in operation where the vehicle trip generation rate of the proposed use is identified on the trip table as being greater than 300 vehicle trips per 1,000 square feet of gross floor area; or

- ~~4. Changes in operation in an area with a monitored worsening in level of service of nearby streets or intersections.~~

65.2.65 Use and Distribution of Mitigation Funds

- A. TRPA shall deposit ~~air quality~~mobility mitigation funds in a trust account. Interest accruing to the trust account shall remain in the account until used on ~~air quality~~mobility mitigation projects. TRPA shall keep track of the amount of funds collected for each local jurisdiction, with interest, and shall disburse funds to the local jurisdiction, or to the Tahoe Transportation District at the local jurisdiction's request, for expenditure within the jurisdiction of origin, provided TRPA finds that the expenditure is consistent with TRPA's Regional Transportation Plan constrained project list or the 1992 Air Quality Plan and is included as a project in the most recent transportation improvement program and Five Year Environmental Improvement Program (EIP) Priority Project List. Pursuant to subparagraphs ~~65.2.4.C.2 and 65.2.5.C.2~~, certain funds may be identified for the construction of specific projects. By October 1 of each year, the recipient shall submit to TRPA an annual report of the funds expended as of June 30 each year.
- B. As an alternative to distributing ~~air quality~~mobility mitigation funds to the jurisdiction of origin, a portion of the ~~air quality~~mobility mitigation funds may be distributed across jurisdictional boundaries to support projects of regional priority that are specifically identified in a regional capital improvement program developed in cooperation with local jurisdictions, such as the Five Year Environmental Improvement Program (EIP) Priority Project List.

65.2.76 Revision of Fee Schedules

TRPA shall review the fee schedules in accordance with subsection 10.7 in the Rules of Procedure.

65.2.87 Mitigation Credit

The two programs below address ~~air quality~~mobility mitigation credit.

A. Mitigation Fee Credit

If a project approval expires and the project is not complete, then an ~~air quality~~mobility mitigation fee credit may be given for a subsequent similar project approval. This subparagraph shall not be construed to require a refund of an ~~air quality~~mobility mitigation fee. Credit shall be given if the following requirements are met:

1. The prior project approval was granted within the same project area as the project approval for which a credit is sought;
2. The applicant provides sufficient evidence of the payment of ~~an air quality~~mobility (previously air quality) mitigation fee; and

3. An ~~air-quality~~mobility mitigation fee is required as part of the project approval for which a credit is sought.

B. Regional and Cumulative Mitigation Credit Programs

In those instances when a reduction in ~~daily vehicle trip ends (DVTE) of 1,000 or greater~~VMT will result from the implementation of a project that is in the most recent transportation improvement program and is an EIP program~~Priority Project~~ that is not associated with any required mitigation, TRPA may allow for a regional and cumulative mitigation credit to be given to the participating entities. Credit shall be given based on the number of ~~DVTE~~VMT that will be reduced as a result of the proposed ~~program~~project. Credit cannot be awarded when the reduction in vehicle trips/VMT is a mitigation requirement pursuant to subparagraphs 65.2.4.C ~~or 65.2.5.C~~ above. Candidate credit recipients shall submit a plan to TRPA describing the proposed ~~program~~project, quantifying the reduction in ~~DVTE~~VMT, and specifying the areas where the credit can be used. The award of mitigation credit shall be reviewed and approved by TRPA, in consultation with the appropriate local jurisdiction and the Tahoe Transportation District, on an individual basis. Credit shall be awarded at such time that the proposed ~~program~~project is implemented. ~~TRPA staff may reevaluate the 1,000 DVTE minimum requirement to determine if the level should be adjusted.~~

(12) Modify Subsection 65.3.1, *Purpose*, to read as follows:

CHAPTER 65: AIR QUALITY/TRANSPORTATION

65.3 BICYCLE AND PEDESTRIAN FACILITIES

65.3.1 Purpose

The requirements in this section are intended to implement Map 5 of the Regional Plan (Bicycle and Pedestrian Facilities) and the current Active Transportation Plan~~Lake Tahoe Region Bicycle and Pedestrian Plan~~.

(13) Modify Subsection 65.3.3, *Standards*, Subparagraph E.1 to read as follows:

CHAPTER 65: AIR QUALITY/TRANSPORTATION

65.3 BICYCLE AND PEDESTRIAN FACILITIES

65.3.3 Standards

E. Relationship to Other Code Requirements

1. ~~Air Quality~~Mobility Mitigation

Any dedication made pursuant to this section may qualify toward required offsets of the ~~air quality~~mobility mitigation program (See Section 65.2.4.C).

(14) Modify Subsection 82.5.6 to read as follows:

CHAPTER 82: EXISTING STRUCTURES AND EXEMPT ACTIVITIES

82.5. QUALIFIED EXEMPT ACTIVITIES

No TRPA review and approval is necessary for the following activities if the activity fully meets one or more of the categories in this section and the applicant files a properly completed TRPA Qualified Exempt declaration form pursuant to subsection 2.3.7 with TRPA at least five working days before the activity begins.

- 82.5.6. A change in operation that generates less than ~~100-650~~ additional vehicle miles travelled trips and adds less than five additional motorized watercraft, provided there is no change from one use classification to another, the resulting use is allowed by this Chapter, there is no increase in threshold impacts (e.g., noise, water quality, etc.), and the applicant pays the applicable TRPA air quality mitigation fee.

- (15)** Delete the following terms from Section 90.2, *Definitions*: *Approved Center*, *Insignificant Increase*, and *Maintenance Area*

CHAPTER 90: DEFINITIONS

90.2. OTHER TERMS DEFINED

For definitions of uses see Section 21.4 (List of Primary Uses), and Section 81.5.

~~Approved Center~~

~~See subparagraph 65.2.3.A.~~

~~Insignificant Increase~~

~~See subparagraph 65.2.3.C.~~

~~Maintenance Area~~

~~See subparagraph 65.2.3.D.~~

- (16)** Modify the following terms in Section 90.2, *Definitions* to read as follows:

CHAPTER 90: DEFINITIONS

90.2. OTHER TERMS DEFINED

For definitions of uses see Section 21.4 (List of Primary Uses), and Section 81.5.

Change in Operation

See subparagraph 65.2.3.~~A~~**B**

Previous Use

See subparagraph 65.2.3.~~FC~~

Trip Table

~~See subparagraph 65.2.3.H~~ TRPA shall adopt and maintain a trip table for the purpose of estimating the number of vehicle trips resulting from additional development or changes in operation. TRPA shall generate and update the data in the trip table by referring to recent publications on traffic and trip

generation (for example, publications of the Institute of Transportation Engineers and California Department of Transportation) and field surveys conducted in the Tahoe region by TRPA or other competent technical experts.

Vehicle Trip

See subparagraph 65.2.3-I. A one directional vehicle movement to or from a project area. The number of vehicle trips assigned to a project shall be the total daily vehicle trips to and from the project during its maximum hours of operation for the review period. When exact numbers of vehicle trips are not known for a use, they shall be determined from the trip table or other competent technical information.

Attachment F

[Final Draft 2020 RTP/SCS](#)

Attachment G

Project Impact Analysis Update: Project Impact Assessment and Fee Framework



**TAHOE
REGIONAL
PLANNING
AGENCY**

ATTACHMENT G

PROJECT IMPACT ANALYSIS UPDATE: PROJECT IMPACT ASSESSMENT AND AIR QUALITY MITIGATION FEE FRAMEWORK

MARCH 16, 2021

imagine. plan. achieve.

REGIONAL PLAN IMPLEMENTATION COMMITTEE
AGENDA ITEM NOS. 3, 4, & 5

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, change¹, or expand an existing or previous use resulting in additional vehicle miles traveled (VMT) by transparently determining significant impacts and mitigations; providing a streamlined review process for simpler projects; and providing detailed analysis for significance and mitigation determination of more complex projects. The updates measure and mitigate a project's transportation impacts. For those projects subject to environmental analysis for air quality and greenhouse gas, those impacts will be evaluated using VMT as factors in those analyses.

Goals of the modernized program include:

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

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 all projects to determine if they meet defined screening criteria, to further evaluate non-screened residential or tourist accommodation unit projects for impacts to VMT and provide appropriate mitigation strategies as needed, and to calculate the mobility mitigation fee for all projects. Commercial, recreation, and other projects not defined in the framework that are not screened from additional impact assessment will submit a detailed assessment of the project's impact on VMT. An applicant could choose to have a more detailed analysis if they believe it would more accurately reflect the project's effect on VMT or if a pre-approved alternative analysis, e.g., a market study, would provide more information than considered in the tool.

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 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. Determining if any project types should be exempt from assessment and/or fees
3. Simplifying project evaluation using specific targets for land use equivalents
4. Establishing geographic boundaries (i.e., zones) for project impact assessment
5. Defining unique projects to be assessed on a case-by-case basis
6. Requiring all projects to mitigate their VMT through implementation of VMT mitigations and/or paying a fee
7. Imposing a fee on significant projects that produce unmitigated VMT

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.A, normally indicated by a substantial change in products or services provided

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 it will contribute to the overall effort to attain and maintain that per capita VMT reduction standard.

The framework will be reviewed and revised within a year following an adopted update to the Regional Transportation Plan so that the updated TRPA Model data and projections and RTP constrained project list, costs, and anticipated funding, are reflected in the project impact assessment, mitigation strategies, and mobility mitigation fee.

Project Impact Assessment Elements

Consultant Fehr & Peers provided evaluation of the TRPA model (Appendix 1), best practices, and relevant research, and made 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 (Figure 1).

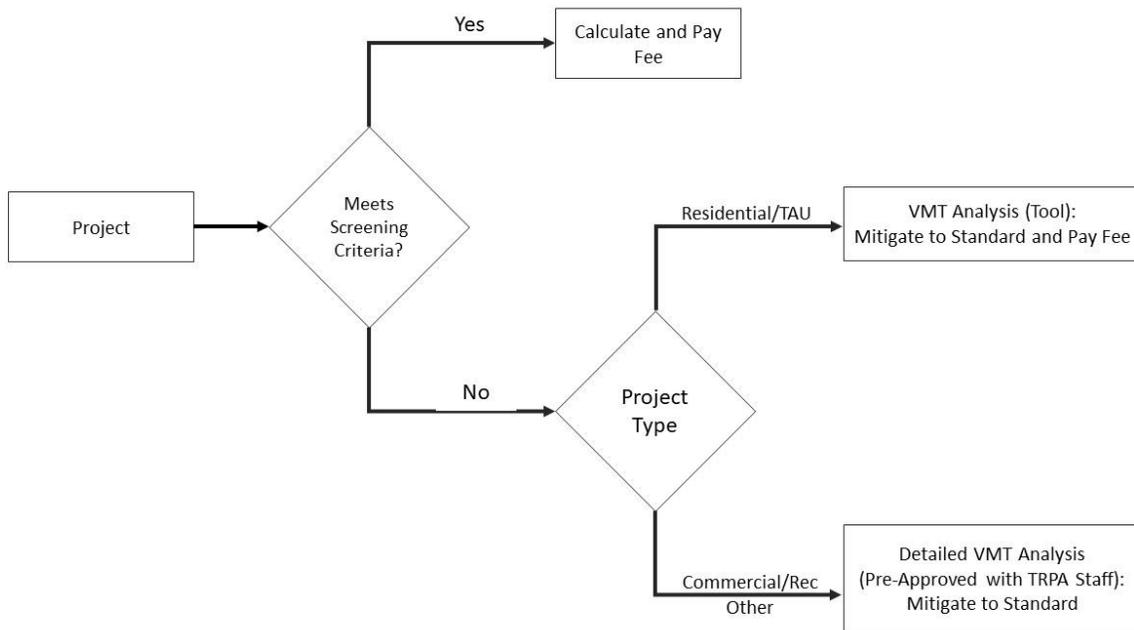


Figure 1: Proposed Project Impact Assessment and Fee Update Framework

The 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

Screen smaller and less complex projects where fee contribution to regional projects is more appropriate and 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 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
Commercial	Total VMT
Public Service ²	VMT per Public Service Use
Recreation ³	Total VMT
Residential Uses	VMT per resident ⁴
Tourist Accommodation Unit	VMT per TAU

2 Public service uses defined Per Table 21.4-A in the Tahoe Code of Ordinances: 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

3 Recreation uses defined Per Table 21.4-A in the Tahoe Code of Ordinances: Beach recreation, Boat launching facilities, Cross country ski courses, Day use areas, Developed campgrounds, Downhill ski facilities, Golf courses, Group facilities, Marinas, Off-road vehicle courses, Outdoor recreation concessions, Participant sports facilities, Recreation centers, Recreational vehicle parks, Riding and hiking trails, Rural sports, Snowmobile courses, Sport assembly, Undeveloped campgrounds, and Visitor information centers

4 Resident is defined here per the US Census definition: all persons who are "usually resident" in a specified geographic area, and VMT generated from those residents which is calculated at the transportation analysis zone (TAZ) level

Project Types	VMT Metric
Transportation Projects	Total VMT

Screening Criteria

The main goal of screening is to streamline VMT impact assessment by removing projects that are 1) expected to have a minor impact to transportation by producing less VMT than the adopted standard of significance or by providing a beneficial outcome (e.g., affordable housing); or 2) are simple enough that their impacts can be determined without undergoing a complex analysis.

Projects that are screened most effectively mitigate their impacts with VMT through paying mobility mitigation fees, which help fund implementation of projects and programs designed to mitigate anticipated future VMT in the region. Non-screened projects are of a size that can meaningfully mitigate VMT at the project level through implementation of mitigation strategies and paying fees that support regional VMT mitigations.

Screening criteria typically include small projects, such as a single-family residence, projects that would reduce trips or 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.

Commercial, recreation, and other project types not defined here that do not meet the screening criteria will submit a detailed assessment of the project’s impact on VMT. Applicants should consult TRPA staff for guidance on the most appropriate approach to analyzing impacts.

Projects that are inconsistent with adopted plans cannot be screened and must submit a detailed assessment of the project’s impact on VMT.

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 (appendices 2 and 3).

When a project is screened it is not required to mitigate to the standard of significance for the project type. Screened projects are required to calculate VMT and pay the mobility mitigation fee associated with the project to offset the net additional VMT it generates.

Affordable Housing

Affordable housing that is 100% deed-restricted affordable, moderate, or achievable⁵ and is in an area eligible for affordable housing bonus units⁶ would be exempt from additional project impact assessment

5 Per 90.2 Other Terms Defined in the TRPA Code of Ordinances

6 Per 52.3.4 Affordable, Moderate, and Achievable-Income Housing in the TRPA Code of Ordinances

because data demonstrates an association between lower VMT rates and lower household incomes.⁷ The low-income factor used in the TRPA model will be applied to VMT calculation for affordable housing to reflect the lower VMT associated with this type of project.

Active Transportation

Transportation projects involving active transportation or transit would be exempt from additional project impact assessment because these classes of projects would likely not lead to a substantial or measurable increase in VMT, e.g., bicycle, pedestrian, and transit projects.⁸

Previously Analyzed Projects

Projects analyzed in Area Plans with an environmental analysis per 65.2.4.E of the TRPA Code of Ordinances would be exempt from additional project impact assessment.

Low-VMT

The current project impact assessment process, based on daily vehicle trip ends (DVTE), identifies projects that produce less than 200 DVTE as having an insignificant effect and so not requiring additional analysis.⁹ This screen is carried forward into the current framework as a VMT equivalent to identify lower VMT producing projects which do not require more complex analysis.

The low-VMT screen proposes screening projects anywhere in the region from additional analysis when the project produces less than the VMT equivalent of 200 DVTE: 1,300 VMT. The 1,300 VMT equivalent is calculated using the regional average in-basin trip length (6.53 miles¹⁰). With 1.4 million VMT in the Tahoe Basin on an average midweek early/late summer day, the low-VMT screen of 1,300 VMT represents less than 0.09% of daily VMT in the region.

The low-VMT screen differs from the OPR guidance to use 110 DVTE because that guidance does not recognize trip length, which can vary depending on project location and land use type. The low-VMT screen recognizes location, land use type, and trip length, and reflects the appropriate mechanisms for projects to mitigate their impacts based on their VMT. That is, when a project's impact with VMT is below the low-VMT screen it is best able to mitigate its' impacts by advancing regional VMT mitigating projects and programs from the RTP by paying the mobility mitigation fee, and, when a project is above the low-VMT screen, implementing mitigations at the project level and paying fees is effective for mitigating VMT. The RTP, with its robust VMT mitigation program and proven record for reducing VMT in the region, supports the low-VMT screen by providing effective VMT reductions for low-VMT screened projects to advance by paying mobility mitigation fees.

The screen adjusts VMT calculations for projects in or within a one-half mile buffer of a Town Center or Regional Center if it also uses parking rates that do not exceed local jurisdiction minimum parking rates. These centers, and their half-mile buffers, produce less VMT than all other zones in the region because of the proximity of a mix of land uses and non-personal automobile transportation options. This approach advances the Regional Plan goals for a more walkable, bikeable, and transit served region

7 See: [Household Income and Vehicle Fuel Economy in California \(sjsu.edu\)](#) and [Microsoft Word - CNT Working Paper revised 2015-12-18 kn mg edits](#)

8 Per the Technical Advisory on Evaluating Transportation Impacts in CEQA

9 Per 65.2.3 Definitions of the TRPA Code of Ordinances

10 Based on 2018 from the TRPA Travel Demand Model

through improved land use and transportation solutions by moving development into and near to town and regional centers.

Projects will be screened based on their location and VMT using the following adjustment factors:

- Regional Centers and the half-mile buffer: A 35% reduction in VMT calculation based on the greater number of pedestrian, bicycle, and transit trips in Regional Centers.¹¹
- Town Centers and the half-mile buffer: A 20% reduction in VMT calculation based on trip lengths in Town Centers averaging about 80% of the basinwide average.¹¹

Projects that do not meet the low-VMT screen will be required to conduct additional analysis and apply mitigations (strategies and/or fees) to reduce the project's VMT to at or below the corresponding standard of significance.

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.

Standards of significance for the proposed system have been determined based on analysis and guidance from OPR, input from stakeholders and the Transportation Technical Advisory Committee, and adapted for the needs of the Tahoe region:

- 15% below the sub-regional¹³ average VMT for residential uses¹⁰; e.g., VMT/Resident for Residential and VMT/Tourist Accommodation Unit, and 15% below the sub-regional¹³ average VMT for Public Service projects¹⁰
- No-net increase in VMT for commercial, recreation and transportation projects¹²
- Other projects will be determined on a case-by-case basis

The framework uses sub-regional (i.e., jurisdictional¹³) standards of significance for residential, tourist accommodation uses, and public service uses. These standards of significance are designed to encourage applicants to reduce VMT by locating projects in the most efficient parts of each jurisdiction (Table 2).

Where a project replaces existing VMT-generating land uses that 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 project evaluation will recognize internal trip capture within the project site in its trip generation calculation. The mixed-use project would be evaluated using the respective standards of significance for each of the project land use types, per OPR Guidance.

11 Per the 2018 Summer TRPA Travel Mode Share Survey

12 Per the California Office of Planning and Research Technical Advisory on Evaluating Transportation Impacts in CEQA

13 Jurisdictions include Carson City, City of South Lake Tahoe, Douglas County, El Dorado County, Placer County, and Washoe County

Table 2: Standards of Significance

Project Types	Standard of Significance ¹⁴
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 sub-regional average VMT per Public Service Use ¹⁰¹⁵
Recreation	No-net VMT
Residential Uses	15% below sub-regional average VMT per resident ¹⁰
Tourist Accommodation Unit	15% below sub-regional average VMT per TAU ¹⁰¹⁵
Transportation	No-net VMT

Mitigation

The purpose of mitigations is to ensure that new development and redevelopment, projected through the year 2045 by the TRPA Model for the 2020 RTP, offsets its VMT impacts through mitigations, where feasible, and mitigation fees.

All projects are expected to have a less-than-significant impact. Projects that are not screened must reduce their impact to less-than-significant through implementing appropriate VMT mitigation strategies. Non-screened projects that cannot mitigate to less-than-significant should consult TRPA staff for guidance on the most appropriate approach to achieving less-than-significant impact, which may include paying a fee for the remaining unmitigated VMT.

Projects that receive VMT credit through 65.2.8 of the TRPA Code of Ordinances or a jurisdiction level VMT credit program¹⁶ will have the VMT credit recognized in project impact assessment and mobility mitigation fee calculation.

Screened projects, excluding transportation projects that include bicycle, pedestrian, and/or transit, will be required to pay the mobility mitigation fee if additional VMT is generated. Screened 100% deed-restricted affordable, moderate, and achievable housing projects will be required to pay a fee should new VMT be generated.

Mitigation Strategies

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.

¹⁴ Calculated using the regional average in-basin trip length of 6.53 miles, per the 2018 TRPA Travel Demand Model

¹⁵ Sub-regional average trip length is used as a proxy for VMT

¹⁶ Per 65.2.8 B Regional and Cumulative Mitigation Credit Programs in the TRPA Code of Ordinances

Consultant, Fehr & Peers, identified the following VMT mitigation strategies to be appropriate to reduce project generated VMT in Tahoe, based on the draft 2020 RTP, the Placer County Resort Triangle Transportation Plan, the CAPCOA Quantifying Greenhouse Gas Mitigation Measures report, and additional research, (Appendix 4):

- 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

Mobility Mitigation Fees

The Air Quality Management (AQM) fee is being updated and renamed to the Mobility Mitigation Fee.

Fees are used by the region's jurisdictions and implementing agencies to provide the transportation infrastructure necessary to implement the policies and achieve the goals of the RTP.

Each trip that produces VMT has an origin and a destination. The origin is the production of the trip and the destination is the attraction of the trip, with each being responsible for a proportional share of the trip's associated VMT. Since 1987, TRPA has weighted the origin/production of a vehicle trip at 90 percent, and the destination/attraction end of the trip at 10 percent. Within this framework, "beds" account for the origins/productions (e.g., houses, hotel/motel rooms, campgrounds) and commercial, recreation, public service, and other uses as the destinations/attractions, meaning Residential and Tourist Accommodation Units are charged 90% of the AQM fee and Commercial, Recreation, Public Service, and Other land use projects are charged 10% of the AQM fee.

The current approach to apportioning fees based on the land use type of the project is continued under the mobility mitigation fee.

TRPA will develop the mobility mitigation fee following the 2020 RTP adoption. The "per VMT" fee amount will be calculated using significant projects identified in the adopted RTP constrained project list, including costs and anticipated funding, that address new VMT from development and redevelopment projected in the TRPA model, and as modified by applicable constitutional principles and the policy considerations used to generate the existing AQM fee.

Two fee rates will be determined through this process: 1) a mobility mitigation fee rate charged to all new, unmitigated VMT, and 2) a fee to offset any unmitigated VMT above the standards of significance. This work will be completed in consultation with jurisdictions, stakeholders, and the development

community, and in consideration of current transportation fees in the region and in nearby communities. Updating the mobility mitigation fee will require a revision of the TRPA Rules of Procedure and Governing Board action at a public hearing.

Screened projects will pay the mobility mitigation fee on all new VMT up to the corresponding standard of significance.

After exhausting all reasonable mitigation options, non-screened projects that cannot reduce VMT to at or below the corresponding standard of significance should consult TRPA staff for guidance on the most appropriate approach to achieving less-than-significant impact, which may include paying a fee for the remaining unmitigated VMT.

It is anticipated that the updated program will collect roughly the same amount of fees as the existing AQM fee program.¹⁷

Local jurisdictions that have MOUs with TRPA will collect the TRPA mobility mitigation fee for covered projects. TRPA will collect the fee when no MOU is in place and for non-covered projects.

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 RTP and that reduce VMT.

Local VMT Fees

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

The mobility mitigation fee program will recognize these local fee program revenues when calculating the TRPA mobility mitigation fee.

VMT Calculation

Project generated VMT is calculated based on the land use type, size, and location of the proposed project using location-based data from the TRPA travel demand model.

The travel demand model's 282 TAZs have been grouped into a set of 79 zones to simplify analysis and to recognize the underlying land use and transportation contexts more closely, e.g., neighborhoods, transportation systems.

¹⁷ Approximately \$400,000 per year

These 80 zones are used as the basis for providing VMT data for project generated VMT and mobility mitigation fee calculation for each defined land use type (Figure 2).

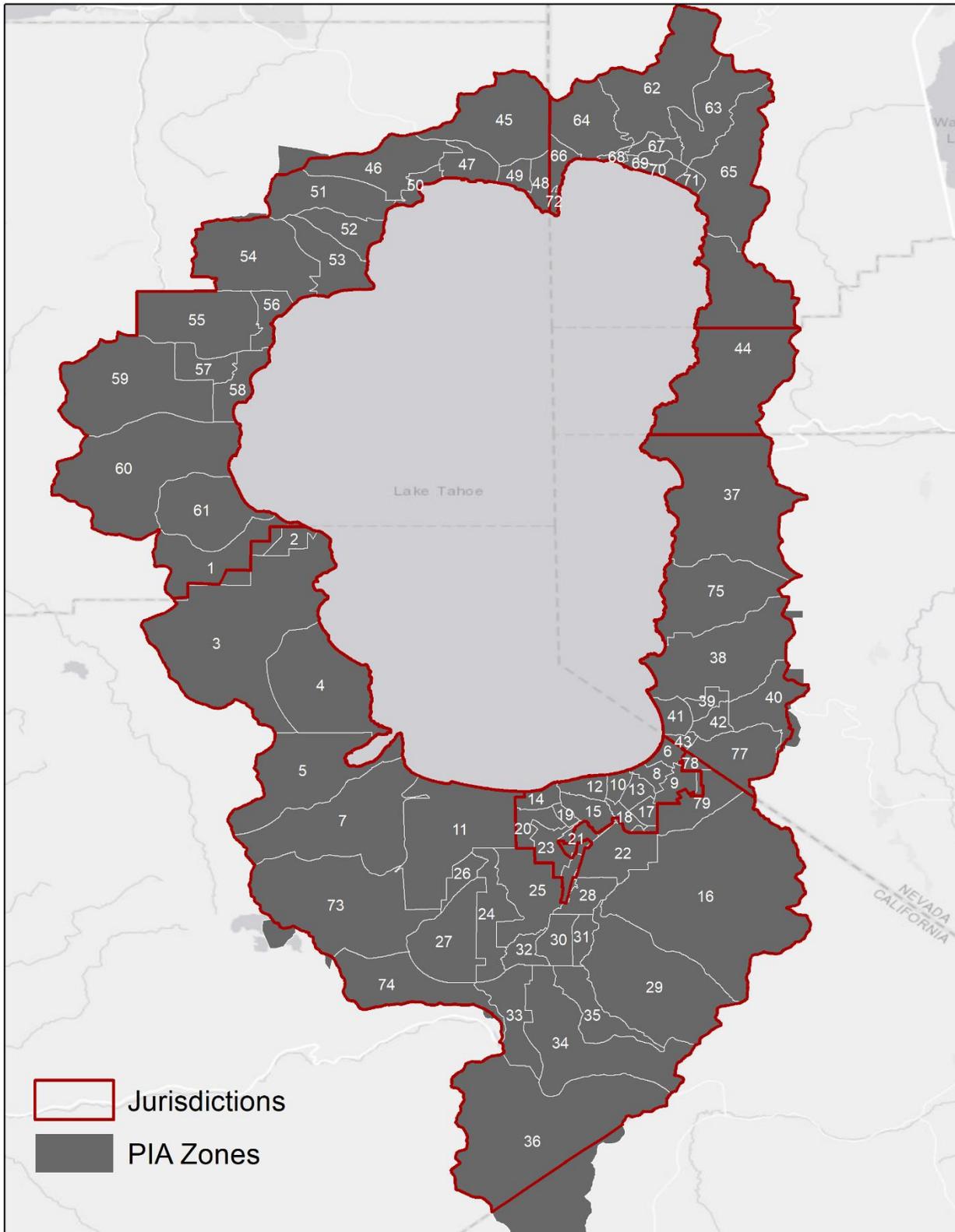


Figure 2: VMT Calculation Zones

Residential

Residential project VMT is calculated using the number of proposed residential units and location (i.e., zone) of the project. Residential VMT per capita is calculated by summing all residential VMT of residents in each zone and divided by the number of residents in the zone (Appendix 5). Resident is defined here per the US Census definition: all persons who are "usually resident" in a specified geographic area. Where a project is proposed will determine its assumed residential VMT per capita. To calculate residential project generated VMT, the project's zone VMT per capita is multiplied by the average number of people per household for that zone and is then multiplied by the number of proposed units:

$$\text{Zone VMT Per Capita} * \text{Zone Persons per Household} * \text{Number of Proposed Units}$$

Non-Residential Project Types

Project generated VMT for non-residential projects, e.g., Commercial, Recreation, Public Service, and TAU, are calculated using a combination of ITE trip rates and the TRPA model trip lengths for the project location (i.e., zone) (Appendix 6). Average trip length was calculated for each zone by averaging all trips that started or ended in the zone.

$$\text{Zone average trip length} * \text{ITE trip rate for project land use type}$$

Standard of Significance

The standard of significance VMT for each land use type utilizes the same methodology as previously described except that for projects evaluated using an efficiency VMT metric, the values are derived from TRPA model data at the sub-regional (i.e., jurisdiction) level, rather than per individual zone.

Mitigation Monitoring

TRPA is committed to monitoring the efficacy of the updated program. However, approaches to monitoring VMT mitigations at the project level are evolving. The National Center for Sustainable Transportation at the University of California, Davis¹⁸ 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 efforts as they develop over time.

Framework Update

The framework will be reviewed and revised within a year following an adopted update to the Regional Transportation Plan so that the updated TRPA Model data and projections and RTP constrained project list, costs, and anticipated funding, are reflected in the project impact assessment and mitigation strategies and fees.

Tool Development

TRPA is developing a project impact assessment tool with Placer County and consultant, Fehr and Peers. The tool will be driven by data from the TRPA Travel Demand model according to the framework detailed here and for California jurisdiction impact assessment to comply with CA SB 743. The tool will

18 <https://ncst.ucdavis.edu/project/monitoring-vehicle-miles-traveled-reduction-claims-local-development-review>

be available to the public, consultants, developers, and others to assist in the screening process; to assess whether projects meet screening criteria; to evaluate VMT for non-screened residential, tourist accommodation, and public service projects; to incorporate appropriate VMT mitigations into projects determined to have a significant impact (i.e., those that exceed the standards of significance); and to calculate the mobility mitigation fee.

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.

Appendix 1: Tahoe Activity-Based Travel Demand Model Assessment

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 Irrigated 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
	Jurisdictional VMT – Likely	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'.
	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.
	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).	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.

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.

Appendix 2: Review of Screening Criteria for Vehicle Miles Travelled

MEMORANDUM

Date: January 13, 2021 – 3rd Draft

To: Melanie Sloan, Senior Planner – Transportation

From: Michael Conger, AICP, Senior Planner – Long Range Planning

Subject: **Review of Screening Criteria for Vehicle Miles Travelled**

Summary

In reviewing available data, various jurisdictions' approaches, and OPR's guidance, I have come to a key conclusion: there is little information about the relationship between land uses and Vehicle Miles Travelled (VMT). VMT is most conclusively estimated by considering trip generation from individual land uses and trip lengths which are most often done at a Transportation Analysis Zone (TAZ) level. As a result of the lack of definitive information, I recommend that we stick as closely as possible to the Governor's Office of Planning and Research (OPR) guidance, which is well substantiated.

Purpose

This document is intended to explain the recommendations in greater detail and identify various options for alternatives.

Findings in Brief

- (1) Most jurisdictions are following OPR's guidelines, with some proposing jurisdiction-specific deviations.
- (2) There is no readily accessible data on trip length as it relates to specific land uses.
- (3) The line between local and regional retail for Tahoe falls somewhere between 10,000 and 40,000 square feet.
 - a. Retailers under 10,000 square feet can be presumed to be local serving.
 - b. Nonetheless some retailers over 10,000 square feet are also local serving.
 - c. Most non-grocery retailers over 40,000 square feet will need to draw from beyond Tahoe and are therefore regional serving.
- (4) 1,300 Vehicle Miles Travelled is an appropriate benchmark for determining the size of developments that can be screened.
- (5) Trip-length / mode-share adjustments of 20 percent for Town Centers and 35 percent for the Regional Center / High-Density Tourist District are appropriate.

Recommendation

The following table summarizes the proposed recommendation in relation to OPR's guidance:

Screen	OPR Guidance	Recommendation
Small Projects	Generates \leq 110 daily trips or sized \leq 10,000 sqft	Require both \leq 110 daily trips and \leq 10,000 sqft

Affordable Housing	Projects with 100-percent affordable housing	Follow OPR recommendation but also include affordable housing in mixed-use developments
Local-serving retail	Retail projects with less than 50,000 square feet of retail space	<ul style="list-style-type: none"> • Retail projects with less than 10,000 square feet of space¹⁹; and • Retail projects with less than 40,000 square feet of space when “local-serving” • Include other local serving uses
Projects near Transit	Projects within ½ mile of a major transit stop or high-quality transit corridor	Exclude this screen, as there are no qualifying transit stops or corridors in the region
Projects in Low-VMT areas	Residential and office projects in areas where VMT is already below the threshold	Expand to include Centers; Limit to the following uses and sizes: <ul style="list-style-type: none"> • Moderate income and achievable housing • Redevelopment projects that result in lower VMT • Commercial projects • Recreation projects
Transportation Projects	Transportation projects that promote non-automobile transportation	<i>Same as OPR Recommendation</i>

Recommended Screens

Screen #1: Small Projects

OPR’s Recommendation

OPR recommends that projects that generate no more than 110 daily trips or are no larger than 10,000 square feet be screened.

Proposed Approach for TRPA

TRPA should implement this screen but require that projects meet both the trip and square footage limitations rather than one or the other. This screen would apply regionwide.

Projects that Could Be Screened

Any type of project could use the small projects screen. The level of development that would be allowed is based on trip generation and square footage. The following non-exhaustive examples illustrate the level of development that could be allowed under the small projects screen:

- 1 single-family residence on an existing lot
- 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

¹⁹ Outside of Centers,

Rationale

These projects are relatively small. TRPA's current practice is to screen out projects from transportation analysis that generate fewer than 200 daily trips. The trip and square footage recommended by OPR comes from the Class 1 exemption from the California Environmental Quality Act (CEQA). OPR rationalizes that if this level of development has been identified as resulting in insignificant impacts, the associated VMT would also be below a level of significance.

Alternative Approaches

Using VMT for the Small Project Screen

Rather than using the number of daily trips, the small project screen could be set based on VMT. In this case, 700 VMT would be an appropriate figure²⁰. Alternative B2 uses this approach. With VMT as a limiting factor, the level of screened development would depend upon location:

Land Use	Low VMT Area Incline Village	Average VMT Area	High VMT Area Tahoe City
Trip Length	4.09 mi	6.53 mi	10.52 mi
Detached residences (units)	17	11	6
Attached residences (units)	25	16	10
General Merchandise (sqft)	3,900	2,400	1,500
Restaurant (sqft)	800	500	300
Tourist accommodation (units)	17	11	6
Service / industrial (sqft)	4,800	3,000	1,900

Limiting the Small Project Screen to Low-VMT Areas

All or some components (e.g., residences and tourist accommodation units) of the small project screen could be limited to designated low-VMT areas and centers. The concern with this approach is that it may overlook the need to screen relatively small projects outside of these areas. If we are to take this approach, we will want to run several test cases to ensure that we are not unintentionally requiring smaller projects to go through VMT analysis.

Basing the screen on 200 trips / 1,300 VMT

Rather than using 110 trips / 700 VMT as the benchmark for the small project screen, TRPA could choose to increase the small project screen up to 200 trips. This is consistent with existing practice, where projects are screened from transportation analysis if they generate fewer than 200 trips.

Other Jurisdictions

Most other jurisdictions are implementing the small project screen using daily trips only, while some are using daily trips or square footage. Several jurisdictions have deviated from OPR's recommendation by allowing more trips (e.g., 300 daily trips, or in one case 525 daily trips). All jurisdictions reviewed are using some form of the small project screen.

²⁰ This is based on 110 daily trips multiplied by the region's average trip length of 6.534, rounded to the nearest hundred.

Screen #2: Affordable Housing Projects

OPR's Recommendation

OPR recommends that 100-percent affordable housing projects be screened.

Proposed Approach for TRPA

Implement the screen as proposed by OPR but also allow use of the screen when a mixed-use development contains at least 80 percent housing and the housing is 100-percent affordable. This screen would apply regionwide. Similarly, the affordable housing component of any mixed-use project could qualify for screening. Qualifying projects would need to meet parking and active transportation design criteria.

Rationale

OPR's technical guidance²¹ provides substantial evidence to demonstrate that "adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT." TRPA's growth management and zoning controls would restrict multi-family residential development to infill areas.

Alternative Approaches

Expanding the Screen to Include Moderate-Income and Achievable Housing

Using OPR's rationale, TRPA could choose to expand the affordable housing screen to also include moderate-income²² and achievable²³ housing.

Limiting the Screen to Low-VMT Areas

TRPA could choose to apply the screen only to low-VMT areas. The negative of this approach is that there may be lucrative affordable housing sites in higher VMT areas that could still reduce commute length substantially.

Other Jurisdictions

Most other jurisdictions appear to be implementing the affordable housing screen as proposed, with several acknowledging the option for mixed-use. Several jurisdictions have chosen not to implement this screen, presumably for political reasons. A couple jurisdictions limit the use of this screen to low-VMT areas or areas near high-quality transit.

Screen #3: Local-Serving Retail

OPR's Recommendation

OPR recommends that local-serving retail uses be screened. Retail uses over 50,000 square feet could be presumed not to be local serving.

Proposed Approach for TRPA

The proposed approach for TRPA would be a two-tiered approach:

- Certain retail commercial uses would be presumed to be local serving if they are under a specific size limit:

²¹ State of California, Governor's Office of Planning and Research (December 2018). Technical advisory: On evaluating transportation impacts in CEQA.

²² 80-120 percent of annual median income.

²³ 120-160 percent of annual median income.

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- 10,000 square feet outside of Centers
 - 12,000 square feet inside of Town Centers
 - 13,500 square feet in the Regional Center / High-Density Tourist District
 - Retail commercial uses that exceed those size limits but are under 40,000 square feet would be reviewed on a case-by-case basis to consider if they are local serving. TRPA may require a market study if there is a question about the local-serving nature of a business.

The proposal would also include an additional screen for other local serving uses, such as churches, banks, and doctors' offices. This screen would apply regionwide. Qualifying projects would need to meet parking and active transportation design criteria.

Rationale

OPR's technical guidance notes that "new retail development typically redistributes shopping trips rather than creating new trips... By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT." Defining what is *local serving* is up to the individual lead agencies. Based on my review, the line between local serving and regional serving falls somewhere between 10,000 and 40,000 square feet. The proposal also includes other non-retail local serving uses. This is because these other uses act similarly to local-serving use in redistributing trips that may otherwise go to a further destination.

Alternative Approaches

Exclude the Case-by-Case Consideration for Structures up to 40,000 Square Feet

Making a case-by-case determination of the local-serving nature of a use may be complicate administration. In that case, we may want to eliminate case-by-case consideration from this framework. This would leave only structures below the lower limits as eligible for screening. If this were to occur, I recommend we establish a higher screening threshold for grocery stores and pharmacies, as these are commonly local serving even when over 10,000 square feet in size.

Eliminate the Non-Retail Uses

Rather than expanding the screen to include public service and other non-retail local serving uses, the screen could be limited just to retail uses.

Other Jurisdictions

Most other jurisdictions have adopted some form of the local-serving retail screen. The most common approach is to presume that a business is local serving if it is under 50,000 square feet. This is commonly adjusted by local jurisdictions. San Francisco, Palo Alto, and Goleta all use 10,000 square feet. San Diego expands the limit to 100,000 square feet and Rancho Cordova expands it to 200,000 square feet in certain parts of the city. It is also common for jurisdictions to include public service and other non-retail uses in the screen.

Screen #4: Low-VMT Areas

OPR's Recommendation

OPR recommends that residential and office projects that exhibit similar design characteristics be screened in areas where VMT is already below threshold.

Proposed Approach for TRPA

TRPA could establish a screen for areas where VMT is already below threshold levels based on mapped TAZ boundaries. The screen should also be expanded to include all Centers regardless of their VMT characteristics, as these areas have design standards and requirements that ensure development will be pedestrian oriented. The screen should apply only to certain classes of development:

- (1) Moderate-Income and Achievable Housing Projects. Projects comprised 100 percent of moderate-income or achievable housing, or a mixed-use development with no more than 20 percent of non-residential uses where 100 percent of the residential component is moderate-income or achievable housing. This would also include any moderate-income / achievable housing components within a mixed-use development.
- (2) Redevelopment Projects that Result in Less VMT. Projects that result in less net VMT than the development it is replacing.
- (3) Commercial and Recreation Projects. Commercial and Recreation projects up to a certain size (based on 1,300 VMT):

Land Use	Outside of Center	Town Centers	Regional Center / High-Density Tourist District
Commercial (square feet)	6,500	8,000	9,000
Indoor Recreation (square feet)	6,500	8,000	9,000
Outdoor Recreation (acres)	20	24	27

Qualifying projects would need to meet parking and active transportation design criteria.

Rationale

Areas that are currently below threshold VMT will continue to be low VMT. OPR notes that projects “that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT.” While OPR limits its analysis to residential and office projects, it may be appropriate to screen commercial and recreation projects of a certain size. Additionally, it would be appropriate to screen redevelopment projects that result in a net reduction in VMT.

Alternative Approaches

Break Commercial Sizes Down by Use

Commercial uses could be broken down into smaller categories and set square footages for each on the basis of 1,300 VMT:

Trip Rate Categories		General Categories	Retail Categories
<ul style="list-style-type: none"> • Auto repair and service • Bank 	<ul style="list-style-type: none"> • Hospital • Industrial services 	<ul style="list-style-type: none"> • General merchandise 	<ul style="list-style-type: none"> • Retail • Non-Retail • Restaurants

<ul style="list-style-type: none"> • Building materials/ lumber • Clinic • Convenience market • Discount store • Drinking place • Fast food restaurant • Furniture store • General light industrial • General office building • Hardware / paint store • High-turnover sit-down restaurant 	<ul style="list-style-type: none"> • Laundry and dry cleaning • Manufacturing • Mini-warehouse • Movie theatre • New car sales • Nursery • Quality restaurant • Research center • Savings and loan • Self-service car wash • Service station • Specialty retail center • Supermarket • Warehousing • Wholesale market 	<ul style="list-style-type: none"> • Convenience shopping • Specialty retail and offices • Personal services • Service / industrial • Restaurants • Entertainment 	
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Include Tourist Accommodation Units

TRPA could choose to include tourist accommodation units in the low-VMT screen. Based on the 1,300 VMT limit, this would amount to roughly:

- 22 units outside of centers
- 26 units in Town Centers
- 30 units in the Regional Center / High-Density Tourist District

Alternatively, a weighting factor could be applied (i.e., 100% trip length factor) to account for longer trip lengths (see Alternative A1).

Include Market-Rate Residential Units

TRPA could choose to include market-rate residential units. Because tourist and detached residential units have similar trip generation factors, the same number of units would result:

- 22 units outside of centers
- 26 units in Town Centers
- 30 units in the Regional Center / High-Density Tourist District

Exclude all but Residential and Office Uses

To keep as closely as possible to the OPR recommendations, TRPA could limit the low-VMT screen to apply only to residential and office projects.

Expand the Map

If the low-VMT map, which is based on subregional thresholds, is too limiting, we could consider applying the screen to areas that meet *either* the regional or the subregional threshold. This would substantially increase applicability.

Other Jurisdictions

Most of the reviewed jurisdictions are using the regional (rather than subregional or jurisdictional) threshold to screen low-VMT areas. These tend to be based on mapping layers provided to the city/county by their MPO, with TAZs as the base layer. In several cases, once you meet the locational criteria, all projects are screened. In other cases, only residential and office projects are screened. It is common to see this screen expanded to include industrial projects, employment-based projects, and redevelopment projects that result in lower VMT.

Screen #5: Transportation Projects

OPR's Recommendation

OPR recommends that transportation projects that do not promote automobile use be screened from VMT analysis. They include a list of project types.

Proposed Approach for TRPA

The OPR recommendation should be applied as the screen. The list of project types provided to TTAC in December can be used.

Rationale

While many transportation projects change travel patterns, a project that leads to additional vehicle travel on a roadway could result in generation of additional VMT. Certain classes of project would not likely lead to a substantial or measurable increase in vehicle travel and should be exempted from VMT analysis.

Alternative Approaches

No alternative approaches were considered.

Other Jurisdictions

All reviewed jurisdictions appear to implement some form of the transportation project screen. The individual types of projects listed tended to vary, however.

Findings

(1) **Most jurisdictions are following OPR's guidelines.** Most cities and counties have decided to adopt the same screening thresholds as those recommended in OPR's guidelines. While many jurisdictions have chosen to adjust the screening criteria, these adjustments tend to be relatively minor and stick within the larger framework of OPR's guidance. Some of the adjustments made include:

- Increasing or reducing the size of retailers defined as "local-serving." OPR recommends 50,000 square feet. The range appears to be 10,000 (San Francisco) to 200,000 square feet (Rancho Cordova).
- Increasing or reducing the range of "small projects" that may be screened out. OPR recommends 110 daily vehicle trips or 10,000 square feet. Some jurisdictions require both the trip generation and square footage. Others allow more than 110 trips – San Diego allows 300 trips and Long Beach allows 525 trips. Placer County's recommended screen would be based on 880 vehicle miles travelled²⁴ rather than the number of trips.

²⁴ 880 VMT is equivalent to 110 daily trips multiplied by Placer County's average trip length.

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- Defining “local-serving” uses by use category. Alternatively, some jurisdictions require case-by-case consideration of whether a business is local-serving.
 - Screening out redevelopment projects that result in fewer VMT than the projects they are replacing.
 - Screening out local-serving public service uses.

(2) **There is no readily accessible data on trip length as it relates to specific land uses.** This analysis is intended to consider vehicle miles travelled as a metric. Unfortunately, there is very little data on how individual land uses affect trip length. Most studies point to trip length being most correlated to features of the surrounding environment and not to any individual proposed land use. For example, a coffee shop would generate larger trip lengths in an auto-dominated environment when compared with placement in a pedestrian-oriented downtown. As a result, the analysis I conducted focused largely on trip generation as a proxy for vehicle miles travelled. It is assumed that trip lengths are equal except where an adjustment was made²⁵. Because data is limited, my recommendation is to stick as closely as possible to the OPR guidance.

(3) **The line between local and regional retail for Tahoe falls somewhere between 10,000 and 40,000 square feet.**

- a. **Retailers under 10,000 square feet can be presumed as local serving.** According to the data, roughly 92 percent of Tahoe businesses in local-serving uses are under 10,000 square feet in size. As such, presumption of a local-serving nature is justified for businesses under 10,000 square feet.
- b. **Nonetheless, some retailers over 10,000 square feet are local serving.** Local-serving businesses that are larger than 10,000 square feet include the following:
 - Grocery stores, such as Safeway or Raley’s, which range from 35,000 to 65,000 square feet, with an average of 51,000 square feet.
 - Pharmacies, such as CVS or Rite Aid, which range from 7,000 to 35,000 square feet, with an average of 21,000 square feet.

Both grocery stores and pharmacies, though larger than 10,000 square feet, tend to serve a local population and reduce VMT by locating in close proximity to their user base. Additionally, the data indicates that certain other types of businesses tend to be over 10,000 square feet. These include:

- Industrial services (~100%)
- Movie theatre (~100%)
- Warehousing (~100%)
- Mini-warehouse (storage units) (~80%)
- Wholesale market (~50%)
- Laundry and dry cleaning (~40%)

²⁵ For example, Alternative A1 uses weighting to adjust trip lengths down for convenience shopping and up for tourist accommodation units. All alternatives also use trip length/mode share weighting for Town Centers and the Regional Center.

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- New car sales (~40%)
 - Furniture stores (~30%)
 - Building materials and lumber (~25%)
 - General light industrial (~20%)

Several of the above uses (e.g., furniture store, and building materials and lumber) could be considered local serving in nature, as even larger facilities serve a primarily local population.

- c. **Most non-grocery retailers over 40,000 square feet will need to draw from beyond Tahoe and are therefore regional serving.** For a variety of reasons, most large formula retail will not locate in the Tahoe region. The region includes two distinct markets – north shore and south shore. Only the south shore is capable of attracting non-grocery retailers of 40,000 square feet. Furthermore, the north and south shore are part of a larger sub-regional market area that includes places like Truckee and Carson City and a regional market area that includes the Reno area. Development restrictions in Tahoe are far stricter than in these other communities. To support large retailers over 40,000 square feet, the store would need to draw from outside of the region. This is made difficult by high mountain passes. Additionally, locations like Carson City are more centralized to other population centers in western Nevada. As a result, retailers tend to choose Carson City and Reno over the Lake Tahoe region.

- (4) **1,300 VMT is an appropriate benchmark for determining the size of screened development.**

TRPA has historically considered projects that generate more than 200 trips as crossing a threshold of significance for the purposes of environmental review. This equates to roughly 1,300 VMT. As such, to ensure that no major impacts would occur, we could continue to use 1,300 VMT as the de minimis benchmark to determine screening levels.

- (5) **Trip-length / mode-share adjustments of 20 percent for Town Centers and 35 percent for the Regional Center / High-Density Tourist District are appropriate.** Trip lengths in Town Centers average about 80 percent of the basinwide average, based on an analysis of underlying TAZs. This justifies applying a trip length reduction factor of 20 percent in Centers. An additional 15 percent mode-share reduction factor is also justified for projects in the Regional Center and High-Density Tourist District, as a greater number of trips in this area are pedestrian, bicycle, and transit. These adjustment factors align with the 2018 summer travel surveys, which indicates roughly 35 percent of trips in the tourist core were non-automobile.

Additional Recommendations

- **Run several types of projects through the screens and make adjustments, as necessary.** The screens should be tested by running several different scenarios. This would include variations in land use, size, existing use, and location. A preliminary list follows:
 - (1) Single family residence on an existing legal lot of record
 - a. Inside Low-VMT area
 - b. Outside Low-VMT area
 - (2) Adding a secondary unit
 - a. Inside Low-VMT area

b. Outside Low-VMT area

- (3) 10-unit luxury condominium in Tourist Core Area Plan
- (4) 20-unit boutique hotel in Tourist Core Area Plan
- (5) Redevelopment of an existing shopping center in Tahoe City
- (6) Change in use – 2,500 square foot retail to restaurant
- (7) 7,000 square foot gym in Tahoe Valley area
- (8) Redevelopment of a shopping center in Tahoe Valley
- (9) Large-scale redevelopment at Nevada North Stateline

Methodology

OPR Guidance

OPR guidance was used as a starting point for developing the screening recommendations. OPR recommends six types of projects be screened:

- Small projects
- Affordable housing projects
- Local-serving retail
- Projects in low-VMT areas
- Projects near high-quality transit
- Transportation projects

All but the projects near high-quality transit are carried forward as recommendations. High-quality transit was excluded, as there are presently no high-quality transit corridors in the Tahoe Region. High quality transit refers to rail transit, a ferry terminal served by bus or rail, or major bus routes operating on 15-minute headways during peak hours.

I also reviewed various local jurisdictions' screening recommendations and noted other common adjustments being made. Some opportunities for adjustment include the following:

- Requiring that small projects not exceed *both* 110 daily trips and 10,000 square feet in size, rather than one or the other.
- Expanding the affordable housing screen to include moderate and achievable housing
- Defining the maximum square footage for retail to be presumed as *local serving*.
- Defining criteria for mapped low-VMT areas.
- Limiting the amount of development to be screened in low-VMT areas.

Review of Local Jurisdiction Proposals

In addition to the OPR guidance, I also reviewed the following jurisdictions' recommended screening approaches:

- | | | |
|----------------------|------------------|--------------------|
| • Arroyo Grande | • Menifee | • San Diego County |
| • Carlsbad | • Monrovia | • San Francisco |
| • Fairfield | • Palo Alto | • San Jose |
| • Goleta | • Placer County | • Truckee |
| • Long Beach | • Rancho Cordova | • Tulare |
| • Los Altos | • Redlands | |
| • Los Angeles County | • San Diego | |

Tahoe Business Data

My analysis relied upon data from 2014 that was obtained as part of the Development Rights Strategic Initiative. This data identifies all businesses in the Tahoe Basin and includes a range of business square footage. As part of the Development Rights effort, a land use type and trip rate category were applied to each business. This data was used to draw conclusions about the size and nature of Tahoe businesses and to estimate VMT impacts using trip generation as a proxy.

Queries were run on this data, including the following:

- Business sizes by business type
- Trip rates by business category

Retailer Typologies

For the purposes of comparison, several retailer typologies were developed (see Table 1). These typologies are based upon store sizes for several retailers in the Northern Nevada and Greater Sacramento areas. Data was gathered on store size by estimating gross leasable area using Google Earth. The stores that were reviewed fell into the following categories:

- Regional retailer
- Home hardware
- Specialty anchor
- Department store
- Discount store
- Grocery
- Discount grocery
- Specialty grocery
- Pharmacy
- Convenience store

These categories were further condensed into a series of retail typologies.

Category	Size (1,000 sqft)	Market	Population (1,000)
 Boutique Retail <ul style="list-style-type: none"> • T-shirt store • Art gallery 	0-2.5	Local	0-2
 Small Retail <ul style="list-style-type: none"> • Local pet store • Hardware store • 7-Eleven • Dollar General 	2.5-10	Local	1-3
 Grocery Stores and Pharmacies <ul style="list-style-type: none"> • Raley's • Safeway • CVS • Rite Aid 	10-65	Local or Sub-regional	3-19
 Large General Retail <ul style="list-style-type: none"> • K-Mart • JC Penney 	50-75	Sub-regional	17-23
 Large Specialty Retail <ul style="list-style-type: none"> • Ross • Bed Bath & Beyond • Big Lots • Bevmo! • Dick's Sporting Goods • Petco 	10-100+	Local or Sub-regional	3-30+
 Big-Box Retail <ul style="list-style-type: none"> • Costco • Wal-Mart • Kohls • Macy's 	75-200+	Sub-regional or Regional	37-110+

	<ul style="list-style-type: none"> • Home Depot • Target 			
--	--	--	--	--

Markets

- Local – includes just the south shore and north shore areas respectively, with travel generally from 0-10 miles
- Sub-regional – includes local areas, plus Carson City and the Truckee area for the north shore, and the Carson Valley for the south shore, with travel generally up to 30 miles
- Regional – includes sub-regional areas, plus the Reno metro area, with travel generally up to 50 miles

<p>Businesses Likely to Locate in Tahoe</p> <ul style="list-style-type: none"> • Boutique retail • Small retail • Grocery stores and pharmacies • Specialty retail under 40,000 square feet 	<p>Businesses Unlikely to Locate in Tahoe</p> <ul style="list-style-type: none"> • Big-box retail • Specialty retail over 40,000 square feet • Large general retail
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National Retailer Sizes

7-Eleven	2900
Dollar General	10100
Bevmo	11600
Dollar Tree	12400
Trader Joe's	14200
Petco	14500
CVS	19300
Rite Aid	23200
Michaels	23800
Smart & Final	25900
TJ Maxx	26600
Grocery Outlet	27100
Bed Bath and Beyond	28700
Ross	29900
Marshalls	31500
Big Lots	35100

Best Buy	36800
Whole Foods	43200
Safeway	45500
Dick's Sporting Goods	48000
Raley's	49900
Smith's	62200
JC Penney	63600
K-Mart	70500
Kohls	82400
Dillard's	102100
Home Depot	107700
Macy's	124200
Target	125300
Costco	141100
Walmart	197500

Construction Trends

On average, we allocate roughly 10,000 square feet of Commercial Floor Area each year, based on years 2013-2018. In three of these six years, more CFA square footage was banked than allocated for new development.

Service Population Calculations

Service population for each store was calculated based on several different statistics, including the median household income and population per household. It is assumed that 40% of household income is used for retail spending²⁶ and that such spending is divided as follows²⁷:

- Apparel.....7.1%
- General Merchandise12.1%
- Furniture / Appliances.....2.3%
- Specialty.....13.8%
- Food20.8%
- Eating / Drinking13.4%
- Building/Hardware.....6.4%
- Auto Dealers / Parts12.3%
- Service Stations.....11.8%

Retail sales were estimated as follows²⁷:

- \$250/square foot for boutique retail, small retail, and large specialty retail
- \$300/square foot for general retail and big box retail
- \$400/square foot for grocery stores and pharmacies

This spending was then allocated to estimated percentages for each business type. Retail capture was estimated at 50 percent for all uses except grocery and pharmacy, which was allocated 75 percent capture. The number of households needed to support each store at its low, medium, and high square footages were then calculated.

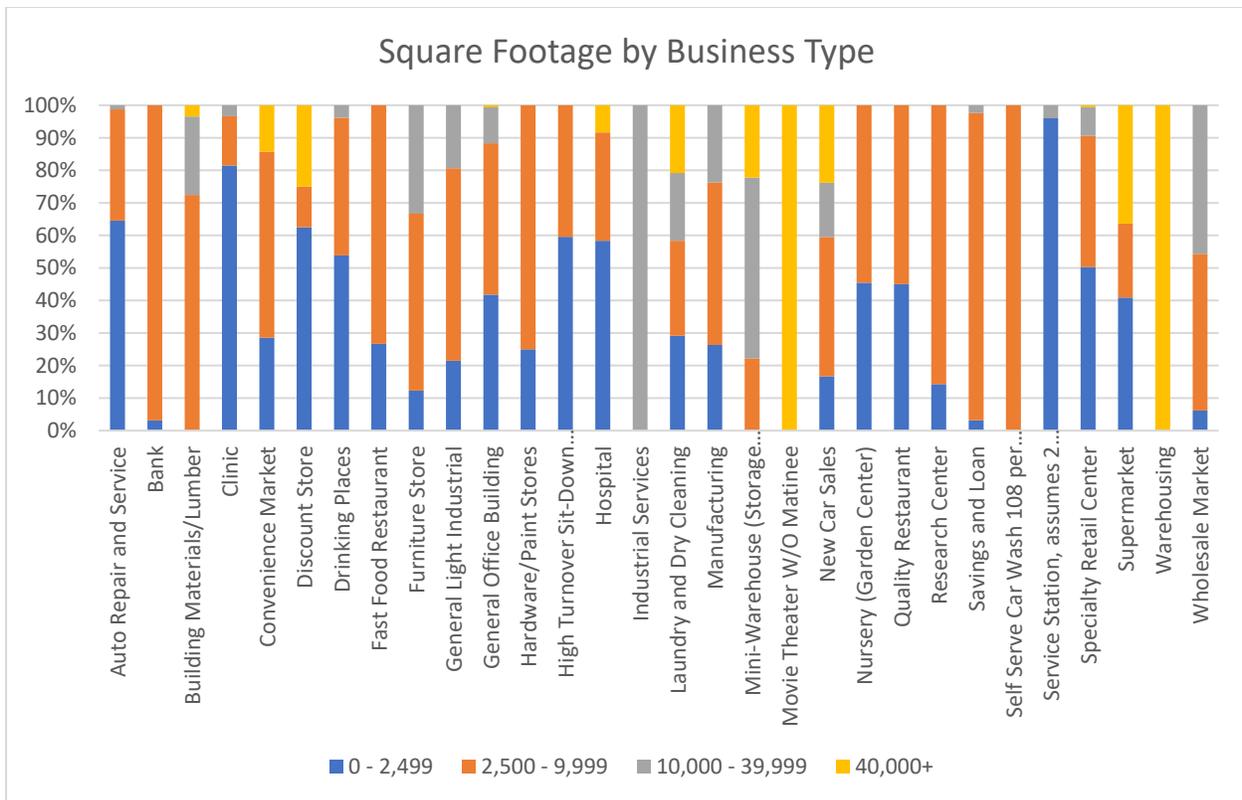
Local-Serving Retail

Determining retail square footage

Roughly 88 percent of businesses in the Lake Tahoe Region are less than 10,000 square feet in size, indicating a tendency towards smaller businesses. Additionally, 92 percent of businesses with local-serving uses are no larger than 10,000 square feet. Most national formula retailers that draw from a sub-regional or regional market area are over 40,000 square feet in size. As such, an appropriate place to draw the line between local- and regional-serving uses would be somewhere between 10,000 and 40,000 square feet. To be conservative in our screening, a 10,000 square foot limit would be recommended. Construction trends indicate that it has been uncommon for a commercial project to exceed 10,000 square feet. Nonetheless, it would be appropriate to consider the local-serving nature of businesses between 10,000 and 40,000 square feet on a case-by-case basis. Over 3,800 retailers are included in the 2014 business data. These retailers are divided into the following categories based on the trip generation rates assigned to them:

²⁶ The Natelson Dale Group (2012). San Miguel Economic Strategy

²⁷ From Urban Land Institute (2008). Dollars and Cents of Shopping Centers



Roughly 88 percent of businesses are under 10,000 square feet in size. Roughly 92 percent of businesses characterized as “local-serving” are under 10,000 square feet in size.

Adjusting for Centers

VMT is the product of trip generation and trip length. Trip lengths in Regional Plan-designated centers are roughly 80 percent of the average regional trip length as calculated. Because trip lengths in Centers are shorter, buildings in Centers would generate fewer VMT. The recommended 20 percent adjustment accounts for this by allowing larger buildings in Centers. A further 15 percent adjustment, for a total of 35 percent is recommended for the Regional Center and High-Density Tourist District. This is intended to account for modal shift, as the Regional Transportation Plan calls for this area to be well-served by transit and active transportation opportunities. The overall 35 percent adjustment figure is consistent with information on non-auto trips from the *2018 Summer TRPA Travel Mode Share Survey* for locations near the Stateline area, which estimated non-automotive trip percentage in this area as approximately 37 percent²⁸.

Low-VMT Areas

Determining square footage based on trip generation

Using the business data, trips generated by commercial floor area were estimated using a basis of 300 trips at the average trip length (6.534 miles). This equates to just under 2,000 vehicle miles travelled as the screen for low-VMT areas, which is then used as a basis to determine the number of commercial

²⁸ From LSC Transportation Consultants (August 18, 2020). Old Colony Inn Redevelopment / TCAP Amendments – Trip Generation and VMT Analysis.

trips that could be generated. The generated trips translate into building square footage using ITE trip generation rates. The following were used for trip generation rates:

Screening	Land Use	Trip Rate
Recommendation	Commercial	32.17 trips / 1,000 sqft
	Indoor Recreation	33.82 trips / 1,000 sqft
	Outdoor Recreation	10.99 trips / acre
Alternatives A1 and A2	Tourist Accommodation Units*	9.67 trips / unit
	General Merchandise	44.42 trips / 1,000 sqft
	Convenience Shopping*	349.48 trips / 1,000 sqft
	Specialty Retail and Offices	18.41 trips / 1,000 sqft
	Personal Services	44.32 trips / 1,000 sqft
	Service / Industrial	35.36 trips / 1,000 sqft
	Restaurants	203.7 trips / 1,000 sqft
	Entertainment	78.06 trips / 1,000 sqft
	Public Services	9.17 trips / 1,000 sqft 24 sqft / person
	Recreation	33.82 trips / 1,000 sqft
Alternative A2	Residential	9.52 trips / unit
Alternative A3	Tourist Accommodation	9.67 trips / unit
	Commercial Retail	52.01 trips / 1,000 sqft
	Commercial Non-Retail	22.4 trips / 1,000 sqft
	Restaurants	203.7 trips / 1,000 sqft
	Public Services	9.17 trips / 1,000 sqft 24 sqft / person
	Recreation	33.82 trips / 1,000 sqft
Alternative B1	Commercial	32.17 trips / 1,000 sqft
	Public Services	27.92 trips / 1,000 sqft 24 sqft / person
	Indoor Recreation	33.82 trips / 1,000 sqft
	Outdoor Recreation	10.99 trips / acre
Alternative B2	Commercial	32.17 trips / 1,000 sqft
	Public Services	14.72 trips / employee
	Indoor Recreation	33.82 trips / 1,000 sqft
	Outdoor Recreation	10.99 trips / acre

* - weighting is applied in Alternative A1.

Commercial Trip Rates

Trip rates for the various commercial categories were generated using the same methodology as the Development Rights Strategic Initiative. A trip rate has been assigned to each business in the Tahoe Basin. Once a category is assigned, the average trip rate is calculated.

Public Services Trip Rates

Public service use trip rates were generated several different ways. The recommendation uses a Government Office Complex as a proxy to determine the trip rate. Alternatives A1 through A3 use a

church as a proxy to determine trip rate. Alternative B establishes a per-employee trip rate by using the same methodology as the commercial trip rates.

Recreation Trip Rates

Recreation trip rates were determined through two methods. The recommendation and all alternatives use an indoor trip rate associated with a recreation center. The recommendation includes an outdoor recreation screen using acreage, which is based on the same methodology as used for the commercial trip rates.

Removing tourist-accommodation and market-rate residential

In the recommendation, tourist accommodation and market-rate residential were removed from consideration, though they were included in various alternatives. The rationale for removing these uses is that tourist accommodation results in longer vehicle miles travelled as they cater to people from outside of the region. Additionally, as a large share of market-rate residences function as second homes and vacation rentals²⁹, longer average trip lengths are anticipated. This is justification to exclude these uses from screening.

Adjusting for Centers

The same 20 percent adjustment for Town Centers and 35 percent adjustment for the Regional Center / High-Density Tourist District as applied for local-serving retail were applied to the low-VMT areas.

Weighting in Alternative A1

The following weighting was applied to Alternative A1

- Tourist Accommodation Units had a 100% trip length adjustment added. This is on the basis that at least two trips begin/end outside of the region.
- Convenience shopping had a 75% trip length reduction added. This is on the basis that the nature of convenience shopping leads to lower trip lengths.

Site Design Criteria

OPR guidance notes that not all project meeting the screening criteria may be suitable for screening. For example, a project in a low-VMT area may not be suitable for screening if it is automobile-oriented, excessively parked, and disconnected from pedestrian and bicycle infrastructure. To recognize this, all projects other than small projects should also comply with certain design criteria, specifically:

- Parking. To be screened out a project should not have excess parking.
- Active Transportation. To be screened out a project should have some connection to the active transportation system or be close by to existing infrastructure.

OPR considered several other disqualifying factors, but these were focused on the transit priority area screen, which we are not proposing to carry forward. OPR's suggestion is that projects that are not built at an FAR of at least 0.75 should not be considered for screening under that criterion.

²⁹ Tahoe Prosperity Center (October 2019). South Shore Region Housing Needs and Opportunities.

Parking Practices in the Tahoe Region

Location	Parking Rates	Adjustments
CITY OF SOUTH LAKE TAHOE		
Tourist Core AP	Multi-Family Residential (MFR): 2 spaces/unit General merchandise: 1 space / 300 sqft	Allowed through Special Use Permit
Tahoe Valley AP		
Bijou / Al Tahoe CP		
South Y Industrial Tract CP		
Balance of City		
DOUGLAS COUNTY		
Round Hill CP	General merchandise: 1 space / 300 sqft MFR: 1 space / 2 beds and ½ space per bedroom	Allowed with submittal of parking analysis
South Shore AP	Retail: 1 space / 250 sqft MFR: 2 spaces / unit plus 1 guest space / 4 units	Allowed with submittal of parking analysis
Balance of County		No mechanism available
WASHOE COUNTY		
Incline Village Commercial CP	MFR: 1 space / 2 beds and ½ space per bedroom General merchandise: 1 space / 300 sqft	Allowed with submittal of parking analysis
Incline Village Tourist CP		
Nevada North Stateline CP		
Ponderosa Ranch CP		
Balance of County	MFR: 1.6-2.1 spaces/unit Retail: 3 spaces/1,000 sqft	Allowed with Director discretion
EL DORADO COUNTY		
Meyers AP	MFR: 1.5 spaces/unit	No mechanism
Balance of County	General retail: 1 space / 300 sqft active use + 1 space / 600 sqft storage	No mechanism
PLACER COUNTY		
Placer County Tahoe Basin AP	MFR: 1 per bedroom for the first 2 bedrooms and ½ space per additional bedroom General merchandise: 3.33 per 1,000 sqft	Allowed with submittal of parking analysis

All Washoe County community plan areas have a maximum parking equal to 10 percent over the minimum parking. City substitute standards have a maximum parking equal to 25 percent over the minimum parking.

Section 34.4, *Parking* in the TRPA Code of Ordinances is “[Reserved].” As a result, parking standards in local plans or municipal codes apply.

Project-Based Parking Practices that Can Reduce VMT

- Decoupling parking from lease/rent price
- Establishing paid parking
- Providing bicycle parking

Active Transportation Practices in the Tahoe Region

Location	Goals / Policies	Standards / Guidelines
CITY OF SOUTH LAKE TAHOE		
Tourist Core AP	<ul style="list-style-type: none"> • Provide bike/pedestrian connections (T-2.2) • Provide infrastructure as conditions of approval (T-2.4, T-2.5) • Maintain paths year-round (T-2.7) • Develop complete streets (T-5) 	<ul style="list-style-type: none"> • Provide internal pedestrian circulation and connections to the sidewalk, neighboring properties, and transit. (Standard D) • Interior walkway design standards (Standard D.5) • Provide bicycle parking (Standard E)
Tahoe Valley AP	<ul style="list-style-type: none"> • Provide bike/pedestrian connections (T-3.1, 4.1) • Require projects to construct sidewalks (T-3.4) • Remove obstacles in right-of-way (T-3.5) • Plow trails in winter (T-4.3) 	<ul style="list-style-type: none"> • Provide internal pedestrian circulation and connections to the sidewalk, neighboring properties, and transit. (Standard D) • Interior walkway design standards (Standard D.5) • Provide bicycle parking (Standard E)
Bijou / Al Tahoe CP	<ul style="list-style-type: none"> • Pedestrian and bicycle facilities shall be constructed as part of the CIP (Trans. 4.C) • Implement improvements as part of the CIP or conditions of project approval (Impl. 1.d) 	<ul style="list-style-type: none"> • Cross sections for Highway 50, arterial streets, and local commercial streets.
South Y Industrial Tract CP	None	<ul style="list-style-type: none"> • Sidewalk improvements on both sides of D Street
Balance of City	None	<ul style="list-style-type: none"> • A pedestrian circulation system shall be incorporated into the site. (Standard 1.A(4)) • Guidelines for design, wayfinding (Guideline 4)
DOUGLAS COUNTY		
Round Hill CP	<ul style="list-style-type: none"> • Develop pedestrian linkages (Transp. 6a) • Pedestrian/recreation trail to be developed as part of the 	None

Location	Goals / Policies	Standards / Guidelines
	CIP or conditions of approval (Transp. 6c) <ul style="list-style-type: none"> Develop a trail system (Rec. 2a) 	
South Shore AP	<ul style="list-style-type: none"> Pedestrian linkage between parking lots shall be provided (T-4.2) 	<ul style="list-style-type: none"> Pedestrian access standards/guidelines (Sec. 2.5) Bicycle access standards/guidelines (Sec. 2.6)
WASHOE COUNTY		
Incline Village Commercial CP	<ul style="list-style-type: none"> Expand bicycle paths (ICCP 8.1) Create a pedestrian corridor along SR 28 (ICCP 9.1.1) Create pedestrian connections (ICCP 9.1.3) 	None – some policies implemented as standards
Incline Village Tourist CP	<ul style="list-style-type: none"> Projects shall provide on-site pedestrian paths (ITCP 2.1.2) Provide trail connections (ITCP 8.1) 	None – some policies implemented as standards
Nevada North Stateline CP	<ul style="list-style-type: none"> Projects shall connect with the path system (NNSCP 1.3) Pedestrian paths and bicycle trails shall be provided (NNSCP 5.2.2) On-site pedestrian networks required (NNSCP 8.1.1) Bike lanes should be created (NNSCP 9.1.1) Bike parking to be provided (NNSCP 9.1.2) 	None – some policies implemented as standards
Ponderosa Ranch CP	<ul style="list-style-type: none"> Expand the path system (PRCP 8.1, 8.2) 	None
EL DORADO COUNTY		
Meyers AP	<ul style="list-style-type: none"> Encourage bike and pedestrian linkage (Transp. 6) Build bicycle and pedestrian facilities per active transportation plan (Transp. Action 14-16; Rec. Action 2) Remove snow on bike/pedestrian paths (Transp. Action 17) 	<ul style="list-style-type: none"> Pedestrian circulation shall be incorporated into a project site plan (Standard B.1.b.B)

Location	Goals / Policies	Standards / Guidelines
PLACER COUNTY		
Placer County Tahoe Basin AP	<ul style="list-style-type: none"> • Create complete streets (T-P-23) • Provide pedestrian and bicycle connections with projects (T-P-26) • Explore funding sources to maintain paths in the winter (T-P-28) • Preserve facility condition (T-P-29) 	<ul style="list-style-type: none"> • Streetscape and roadway design and construction obligation – cross sections, widths, etc. (Standard 3.06)

Code of Ordinances

Section 36.5.2.B: “An active transportation circulation system shall be incorporated into the site plan to assure that all active transportation users can move safely and easily both on the site and between properties and activities within the neighborhood year-round.” – Applies to commercial, tourist accommodation, public service, and multi-residential projects. All projects that include such facilities also must file a maintenance plan (36.5.5)

Section 65.3 requires granting of an easement for development of at least five residential or tourist units or up to 10,000 square feet when a property is situated along a designated bicycle or pedestrian trail.

Project-Based Active Transportation Practices that Can Reduce VMT

- Connecting with existing active transportation infrastructure
- Providing active transportation infrastructure across the site

Summary of Alternatives

Alternatives A1 through A3 are modified versions of the screens presented to TTAC in December. Alternative B is a modified version of the preliminary recommendation.

Alternative A

Alternative A consists of three versions derived from staff’s December TTAC recommendation. All versions of Alternative A requires that a project (other than a single-family residence) be located within a low-VMT area. This contrasts with the preliminary recommendation and Alternative B, both of which offer several screens for projects outside of low-VMT areas.

Alternative A1

Alternative A1 is the modified original version with weighting. It breaks down commercial uses into multiple categories and assigns a square footage based on each category’s trip generation rate. Unlike the recommendation, this alternative include tourist accommodation units. Under this alternative, two of the uses are weighted. Convenience shopping is adjusted down by 75 percent to account for low trip lengths. Tourist accommodation units are adjusted up by 100 percent to account for high trip lengths.

Alternative A2

Alternative A2 is the modified original version without weighting, using the same commercial categories as Alternative A1. It also includes residential units as a possible screen, as they result in similar VMT generation to tourist accommodation units³⁰.

	Outside of Centers	Town Centers	Regional Center
Residential (units)	22	26	30
Tourist Accommodation (units)			
<i>Without Weighting</i>	22	26	30
<i>With Weighting</i>	11	13	15
Commercial			
General Merchandise (sqft)	5,000	6,000	6,500
Convenience Shopping (sqft)	500	500	1,000
<i>With Weighting</i>	2,500	3,000	3,500
Specialty Retail and Offices (sqft)	11,500	14,000	16,000
Personal Services (sqft)	5,000	6,000	6,500
Service / Industrial (sqft)	6,000	7,500	8,000
Restaurants (sqft)	1,000	1,500	1,500
Entertainment (sqft)	3,000	3,500	3,500
Public Services (persons)	900		
Recreation (sqft)	6,500	8,000	9,000
Transportation Projects	[same as recommendation]		

Alternative A3

Alternative A3 collapses commercial categories down into three: retail commercial, non-retail commercial, and restaurants. No weighting is applied.

	Outside of Centers	Town Centers	Regional Center
Commercial			
Retail ³¹ (sqft)	4,000	5,000	5,500
Non-Retail	9,500	11,500	13,000
Restaurants (sqft)	1,000	1,500	1,500

Alternative B

Alternatives B1 and B2 are modified versions of the recommendation.

³⁰ I was unable to come up with a rationale for excluding residential units, but not tourist accommodation units, from the screening. If we include one, we should include the other or come up with a compelling reason to distinguish between the two.

³¹ A further alternative could consider weighting retail trips on the basis that they will be reducing trip lengths.

Comparison Table of the Alternatives

	December TTAC Proposal	Recommendation	Alternatives A1 through A3	Alternative B1 and B2
Small Project Screen	No	Yes	No	Yes
Affordable Housing Screen	Low-VMT Areas	Basinwide	Low-VMT Areas	Basinwide
AH Screen Includes Moderate / Achievable	Yes	Low-VMT Areas	Yes	Yes
Local-Serving Retail Screen	Low-VMT Areas	Basinwide	Low-VMT Areas	Basinwide
Low-VMT Area Screen	Subregional Threshold and Town Centers	Subregional Threshold and Town Centers	Subregional Threshold and Town Centers	Alt B1: Regional Threshold and Town Centers Alt B2: Subregional Threshold and Town Centers
Tourist Accommodation	Low-VMT Areas	No	Low-VMT Areas	No
Redevelopment Projects	No	Low-VMT Areas	No	No
Market-Rate Residential	No	No	Alt A1 & A3: No Alt A2: Low-VMT Areas	No
Public Services Uses	Low-VMT Areas	Basinwide	Low-VMT Areas	Alt B1: Low-VMT Areas Alt B2: Basinwide
Transportation Projects	Low-VMT Areas	Basinwide	Low-VMT Areas	Basinwide
Weighting Used	No	No	Alt A1: Yes Alt A2 & A3: No	No

Alternative B1

Alternative B1 is similar to the recommendation with the following distinctions:

- The affordable housing project screen includes moderate-income and achievable housing and does not account for mixed-use development.
- The local-serving use screen is limited to retail projects only and does not afford case-by-case consideration.

Maximum Size	Outside Centers	Town Centers	Regional Center
Retail Commercial (sqft)	10,000	12,000	13,500

- The low-VMT area screen uses the regional threshold rather than the subregional threshold

Maximum Size	Outside Centers	Town Centers	Regional Center
Commercial ³² (sqft)	6,500	8,000	9,000
Public Services (persons ³³)	300	350	425
Indoor Recreation (sqft)	6,500	8,000	9,000
Outdoor Recreation (acres)	20	24	27

- There is no option for redevelopment projects to be screened in low-VMT areas.
- Public services are added as a screen in low-VMT areas.
- Design criteria relies on the ITE Parking Generation manual.

Alternative B2

Alternative B2 is similar to the Alternative B1, with the following distinctions:

- The small project screen is determined based on Vehicle Miles Travelled rather than trip generation or building size. As a result, the level of project that gets screened depends on the trip lengths in the project’s TAZ.
- The affordable housing project screen includes mixed-use projects where at least 80 percent of the development is residential and 100 percent of that is affordable, moderate, or achievable.
- The local-serving retail screen is expanded to include other local-serving uses. The square footage screens are also doubled for grocery stores and pharmacies, as these tend to be local serving even when over 10,000 square feet in size. Under this alternative, a planner would need to screen a project and make a determination that the use is indeed local serving.

Maximum Size	Outside Centers	Town Centers	Regional Center
Food and Beverage Retail Sales (sqft)			
Grocery Store	20,000	24,000	27,000
Other	10,000	12,000	13,500
Health Care Services (sqft)			
Drug Store / Pharmacy	20,000	24,000	27,000
Other	10,000	12,000	13,500
Other Local-Serving Uses (sqft)	10,000	12,000	13,500

³² Includes all commercial uses in Table 21.4-A

³³ Structural capacity as permitted under the fire code.

-
- Rather than using the subregional threshold, the low-VMT screen would use the regional threshold. This expands the number of TAZs that could use the screen. Additionally, public services uses would be screened based on number of employees rather than capacity.

Maximum Size	Outside Centers	Town Centers	Regional Center
Public Services (employees)	15	18	20

- The parking and active transportation criteria would be rephrased to be disqualifying factors rather than design criteria.

Proposed Screening Recommendation

- (1) **Small Projects.** Projects that generate fewer than 110 trips and involve no more than 10,000 square feet in structural development.

Examples of Small Projects

- 1 single-family residence on an existing lot
- 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

- (2) **Affordable Housing Projects.** Projects comprised of 100-percent affordable housing; or mixed-use projects with a maximum 20 percent of non-residential use and all residential areas comprised of 100 percent affordable housing.

- (3) **Local-Serving Retail and Other Local-Serving Uses.**

- a. **Qualifying Uses.** The following uses qualify for screening under this provision:

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

Services

- Business support services
- Financial services
- Health care services

Public Services

General

- 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
- Threshold-related research facilities

- b. **Local-Serving Presumption.** Qualifying projects with structural areas at or below the following levels are presumed to be local serving:
- i. 10,000 square feet outside of Centers

- ii. 12,000 square feet within Town Centers
- iii. 13,500 square feet within the Regional Center and High-Density Tourist District

c. **Local-Serving Determination.** TRPA may determine that individual local-serving projects with structural areas that are under 40,000 square feet, but exceed what is allowed by Subparagraph C.1, are local-serving businesses. In cases where the local-serving nature of a retail business is in question, TRPA may require preparation of a market study.

(4) **Projects in Centers and Low-VMT Areas.** Certain classes of projects within designated Centers and areas where existing VMT is already below the subregional threshold:

- a. **Moderate-Income and Achievable Housing.** Projects comprised of 100-percent moderate-income or achievable housing; or mixed-use projects with a maximum 20 percent of non-residential use and all residential areas comprised of 100 percent moderate-income or achievable housing.
- b. **Redevelopment Projects that Result in Reduced VMT.** Redevelopment projects where the proposed project VMT is below the VMT of the project it is replacing.
- c. **Commercial and Recreational Development.** Commercial and recreational development up to a specified size limit:

Maximum Size	Outside Centers	Town Centers	Regional Center
Commercial ³⁴ (sqft)	10,000	12,000	13,500
Indoor Recreation (sqft)	10,000	12,000	13,500
Outdoor Recreation (acres)	30	36	40

(5) **Transportation Projects.** Projects involving active transportation or transit, including:

- 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 (excluding microtransit), 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 (excluding microtransit) 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.

³⁴ Includes all commercial uses in Table 21.4-A

DESIGN CRITERIA

- (1) **Maximum parking.** Project parking shall not exceed the number of spaces required by the local city or county.
- (2) **Integration with the active transportation network.** Commercial, tourist accommodation, public service, and multi-residential projects shall comply with the requirements for an integrated active transportation network, as set forth in Subparagraph 36.5.2.B.

Appendix 3: Technical Advisory on Evaluating Transportation Impacts in CEQA

TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA



December 2018

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A. Introduction

This technical advisory is one in a series of advisories provided by the Governor’s Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subs. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

[Senate Bill 743](#) (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: “During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy” (*Covina Residents for Responsible Development v. City of Covina* (2018) 21 Cal.App.5th 712, 729.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” (*Id.*, subd. (b)(1); see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) To that end, in developing the criteria, OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project’s transportation impacts. With the California Natural Resources Agency’s certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by “level of service” and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 [“It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs.”].)

This December 2018 technical advisory is an update to the advisory it published in April 2018. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

B. Background

VMT and Greenhouse Gas Emissions Reduction. Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12 provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth. Further, in its 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB found that despite the State meeting its 2020 climate goals, "emissions from statewide passenger vehicle travel per capita [have been] increasing and going in the wrong direction," and "California cannot meet its [long-term] climate goals without curbing growth in single-occupancy vehicle activity."¹ CARB also found that "[w]ith emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built."²

Thus, to achieve the State's long-term climate goals, California needs to reduce per capita VMT. This can occur under CEQA through VMT mitigation. Half of California's GHG emissions come from the transportation sector³, therefore, reducing VMT is an effective climate strategy, which can also result in co-benefits.⁴ Furthermore, without early VMT mitigation, the state may follow a path that meets GHG targets in the early years, but finds itself poorly positioned to meet more stringent targets later. For example, in absence of VMT analysis and mitigation in CEQA, lead agencies might rely upon verifiable offsets for GHG mitigation, ignoring the longer-term climate change impacts resulting from land use development and infrastructure investment decisions. As stated in CARB's 2017 Scoping Plan:

"California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches."⁵ (*Id.* at p. 102.)

¹ California Air Resources Board (Nov. 2018) *2018 Progress Report on California's Sustainable Communities and Climate Protection Act*, pp. 4, 5, available at https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf.

² *Id.*, p. 28.

³ See <https://ca50million.ca.gov/transportation/>

⁴ Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*.

⁵ California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 102, available at https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

In light of this, the 2017 Scoping Plan describes and quantifies VMT reductions needed to achieve our long-term GHG emissions reduction goals, and specifically points to the need for statewide deployment of the VMT metric in CEQA:

“Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375.”⁶

VMT and Other Impacts to Health and Environment. VMT mitigation also creates substantial benefits (sometimes characterized as “co-benefits” to GHG reduction) in both in the near-term and the long-term. Beyond GHG emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel lead to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affect other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development that leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways.⁷

VMT and Economic Growth. While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.^{8,9}

⁶ *Id.* at p. 76.

⁷ Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*, available at https://ncst.ucdavis.edu/wp-content/uploads/2017/03/NCST-VMT-Co-Benefits-White-Paper_Fang_March-2017.pdf.

⁸ Haynes et al. (Sept. 2015) *Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2015/11/Haynes_Congested-Development_1-Oct-2015_final.pdf.

⁹ Osman et al. (Mar. 2016) *Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2016/08/Taylor-Not-so-Fast-04-01-2016_final.pdf.

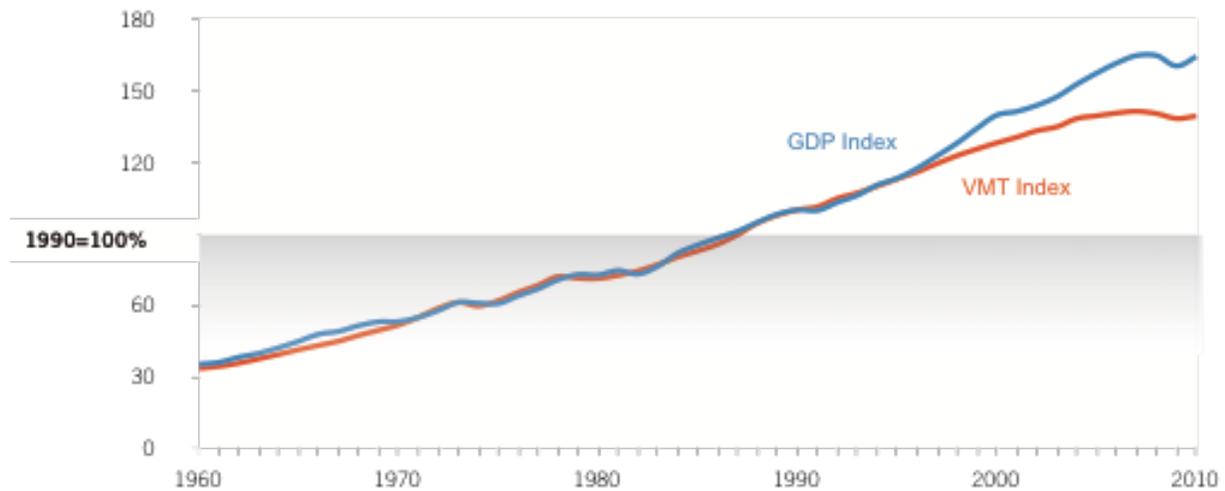


Figure 1. Kooshian and Winkelman (2011) *VMT and Gross Domestic Product (GDP), 1960-2010.*

C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project’s greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a “lead agency may use models to estimate a project’s vehicle miles traveled . . .” CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 [“the issue is not whether the studies are irrefutable or whether they could have been better” ... rather, the “relevant issue is only whether the studies are sufficiently credible to be considered” as part of the lead agency’s overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

Vehicle Types. Proposed Section 15064.3, subdivision (a), states, “For the purposes of this section, ‘vehicle miles traveled’ refers to the amount and distance of automobile travel attributable to a project.” Here, the term “automobile” refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples

comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

Residential and Office Projects. Tour- and trip-based approaches¹⁰ offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

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

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

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

Retail Projects. Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT¹¹ because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

¹⁰ See Appendix 1, *Considerations About Which VMT to Count*, for a description of these approaches.

¹¹ See Appendix 1, *Considerations About Which VMT to Count*, “Assessing Change in Total VMT” section, for a description of this approach.

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

Combining land uses for VMT analysis is not recommended. Different land uses generate different amounts of VMT, so the outcome of such an analysis could depend more on the mix of uses than on their travel efficiency. As a result, it could be difficult or impossible for a lead agency to connect a significance threshold with an environmental policy objective (such as a target set by law), inhibiting the CEQA imperative of identifying a project’s significant impacts and providing mitigation where feasible. Combining land uses for a VMT analysis could streamline certain mixes of uses in a manner disconnected from policy objectives or environmental outcomes. Instead, OPR recommends analyzing each use separately, or simply focusing analysis on the dominant use, and comparing each result to the appropriate threshold. Recommendations for methods of analysis and thresholds are provided below. In the analysis of each use, a mixed-use project should take credit for internal capture.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subds. (a)(7), (b)(1).)

Cumulative Impacts. A project’s cumulative impacts are based on an assessment of whether the “incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.” (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).) When using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate. However, metrics such as VMT per capita or VMT per employee, i.e., metrics framed in terms of efficiency (as recommended below for use on residential and office projects), cannot be summed because they employ a denominator. A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa. This is similar to the analysis typically conducted for greenhouse gas emissions, air quality impacts, and impacts that utilize plan compliance as a threshold of significance. (See *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 219, 223; CEQA Guidelines, § 15064, subd. (h)(3).)

D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific “criteria for determining the significance of transportation impacts of projects[.]” (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on “thresholds of significance.” The CEQA Guidelines define a “threshold of significance” to mean “an identifiable **quantitative, qualitative¹² or performance level** of a particular environmental effect, non-compliance with which means the effect will **normally** be determined to be significant by the agency and compliance with which means the effect **normally** will be determined to be less than significant.” (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, “provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.” (*Id.* at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means “enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached.” (*Id.* at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to **make a decision which intelligently takes account of environmental consequences**. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is **reasonably feasible**. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The **courts have looked not for perfection** but for **adequacy, completeness**, and a **good faith effort** at full disclosure.

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR’s recommendations regarding thresholds of significance for VMT set forth below.

¹² Generally, qualitative analyses should only be conducted when methods do not exist for undertaking a quantitative analysis.

E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own

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

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.
- Senate Bill 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.
- Pursuant to Senate Bill 375 (2008), the California Air Resources Board GHG emissions reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies (RTP/SCS). Current targets for the State's largest MPOs call for a 19 percent reduction in GHG emissions from cars and light trucks from 2005 emissions levels by 2035.
- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

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

Considering these various targets, the California Supreme Court observed:

Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan ... assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(Center for Biological Diversity v. California Dept. of Fish & Wildlife, supra, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project’s effect on meeting long-term reduction goals. *(Ibid.)* And more recently, the Supreme Court stated that “CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes.” *(Cleveland National Forest Foundation v. San Diego Assn. of Governments (2017) 3 Cal.5th 497, 504.)*

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb GHG emissions and other pollutants. But targets for overall GHG emissions reduction do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB’s *First Update to the Climate Change Scoping Plan* explains:

“Achieving California’s long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**”¹³ CARB’s *2018 Progress Report on California’s Sustainable Communities and Climate Protection Act* states on page 28 that “California cannot meet its climate goals without curbing growth in single-occupancy vehicle activity.” In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the GHG emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.

- **New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.**
- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.
- **Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.**
- When assessing climate impacts of some types of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity, supra.*)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR’s Technical Advisory is not binding on public agencies, CEQA allows lead agencies to “consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence.” (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR’s extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State’s long-term climate goals, **OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold.**

Fifteen percent reductions in VMT are achievable at the project level in a variety of place types.¹⁴

Moreover, a fifteen percent reduction is consistent with SB 743’s direction to OPR to select a threshold that will help the State achieve its climate goals. As described above, section 21099 states that the

¹³ California Air Resources Board (May 2014) *First Update to the Climate Change Scoping Plan*, p. 46 (emphasis added).

¹⁴ CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, p. 55, available at <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>.

criteria for determining significance must “promote the reduction in greenhouse gas emissions.” In its document *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*¹⁵, CARB assesses VMT reduction per capita consistent with its evidence-based modeling scenario that would achieve State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050. Applying California Department of Finance population forecasts, CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. Below these levels, a project could be considered low VMT and would, on that metric, be consistent with 2017 Scoping Plan Update assumptions that achieve climate state climate goals.

CARB finds per capita vehicle travel would need to be kept below what today’s policies and plans would achieve.

CARB’s assessment is based on data in the 2017 Scoping Plan Update and 2016 Mobile Source Strategy. In those documents, CARB previously examined the relationship between VMT and the state’s GHG emissions reduction targets. The Scoping Plan finds:

“While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State’s 2030 and 2050 goals.”¹⁶

Note that, at present, consistency with RTP/SCSs does not necessarily lead to a less-than-significant VMT impact.¹⁷ As the Final 2017 Scoping Plan Update states,

VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State’s 2030 and 2050 goals.”¹⁸

¹⁵ California Air Resources Board (Jan. 2019) *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, available at <https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate>.

¹⁶ California Air Resources Board (Nov. 2017) *California’s 2017 Climate Change Scoping Plan*, p. 101.

¹⁷ California Air Resources Board (Feb. 2018) *Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, Figure 3, p. 35, available at https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf.

¹⁸ California Air Resources Board (Nov. 2017) *California’s 2017 Climate Change Scoping Plan*, p. 75.

Also, in order to capture the full effects of induced travel resulting from roadway capacity projects, an RTP/SCS would need to include an assessment of land use effects of those projects, and the effects of those land uses on VMT. (See section titled “*Estimating VMT Impacts from Transportation Projects*” below.) RTP/SCSs typically model VMT using a collaboratively-developed land use “vision” for the region’s land use, rather than studying the effects on land use of the proposed transportation investments.

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

1. Screening Thresholds for Land Use Projects

Many agencies use “screening thresholds” to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, transit availability, and provision of affordable housing.

Screening Threshold for Small Projects

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day¹⁹ generally may be assumed to cause a less-than-significant transportation impact.

Map-Based Screening for Residential and Office Projects

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with VMT data, for example from a travel survey or a travel demand model, can illustrate areas that are

¹⁹ CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

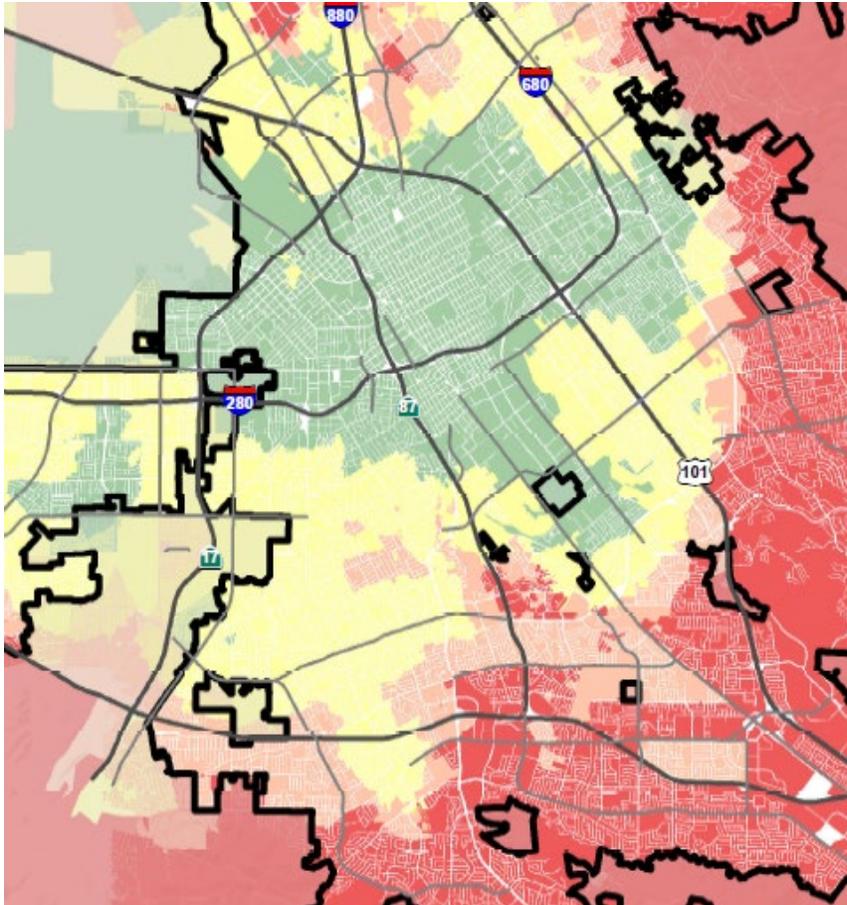


Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

Presumption of Less Than Significant Impact Near Transit Stations

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop²⁰ or an existing stop

²⁰ Pub. Resources Code, § 21064.3 (“‘Major transit stop’ means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.”).

along a high quality transit corridor²¹ will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units

A project or plan near transit which replaces affordable residential units²² with a smaller number of moderate- or high-income residential units may increase overall VMT because the increase in VMT of displaced residents could overwhelm the improvements in travel efficiency enjoyed by new residents.²³

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

Presumption of Less Than Significant Impact for Affordable Residential Development

Adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT.^{24,25} Further, "... low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available."²⁶ In areas where existing jobs-housing match is closer to optimal, low income housing nevertheless generates less VMT than market-

²¹ Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").

²² Including naturally-occurring affordable residential units.

²³ Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, Chapter 4, pp. 159-160, available at <https://www.arb.ca.gov/research/apr/past/13-310.pdf>.

²⁴ Karner and Benner (2016) *The convergence of social equity and environmental sustainability: Jobs-housing fit and commute distance* ("[P]olicies that advance a more equitable distribution of jobs and housing by linking the affordability of locally available housing with local wage levels are likely to be associated with reduced commuting distances").

²⁵ Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages*.

²⁶ Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages*.

rate housing.^{27,28} Therefore, a project consisting of a high percentage of affordable housing may be a basis for the lead agency to find a less-than-significant impact on VMT. Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units.

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

²⁷ Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, available at <https://www.arb.ca.gov/research/apr/past/13-310.pdf>.

²⁸ CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, pp. 176-178, available at <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.²⁹ It is critical, however, that the agency be consistent in its VMT measurement approach throughout the analysis to maintain an “apples-to-apples” comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an “apples-to-apples” comparison.

Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,³⁰ estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project’s transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-

²⁹ See Appendix 1 for a description of these approaches.

³⁰ Lovejoy, et al. (2013) *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California*, *The Journal of Transport and Land Use*.

specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

Mixed-Use Projects

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

Other Project Types

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

Redevelopment Projects

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

As described above, a project or plan near transit which replaces affordable³¹ residential units with a smaller number of moderate- or high-income residential units may increase overall VMT, because

³¹ Including naturally-occurring affordable residential units.

displaced residents' VMT may increase.³² A lead agency should analyze VMT for such a project even if it otherwise would have been presumed less than significant. The assessment should incorporate an estimate of the aggregate VMT increase experienced by displaced residents. That additional VMT should be included in the numerator of the VMT per capita assessed for the project.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

RTP/SCS Consistency (All Land Use Projects)

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation. For example, a development may be inconsistent with an RTP/SCS if the development is outside the footprint of development or within an area specified as open space as shown in the SCS.

3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans across the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. And as with projects, VMT should be counted in full rather than split between origin and destination. (Emissions inventories have sometimes split cross-boundary trips in order to sum to a regional total, but CEQA requires accounting for the full impact without truncation or discounting). Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above. Where the lead agency tiers from a general plan EIR pursuant to CEQA Guidelines sections 15152 and 15166, the lead agency generally focuses on the environmental impacts that are specific to the later project and were not analyzed as significant impacts in the prior EIR. (Pub. Resources Code, § 21068.5; Guidelines, § 15152, subd. (a).) Thus, in analyzing the later project, the lead agency

³² Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, Chapter 4, pp. 159-160, available at <https://www.arb.ca.gov/research/apr/past/13-310.pdf>.

would focus on the VMT impacts that were not adequately addressed in the prior EIR. In the tiered document, the lead agency should continue to apply the thresholds recommended above.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

4. Other Considerations

Rural Projects Outside of MPOs

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

Impacts to Transit

Because criteria for determining the significance of transportation impacts must promote “the development of multimodal transportation networks” pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as “induced vehicle travel,” would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to

examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining “project” under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining “project-specific effect” to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project’s environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported.³³

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects’ effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project’s transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

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

³³ See, e.g., California Department of Transportation (2006) *Guidance for Preparers of Growth-related, Indirect Impact Analyses*, available at http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/GRI_guidance06May_files/gri_guidance.pdf.

- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. (*Id.*; see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) With those goals in mind, OPR prepared and the Agency adopted an appropriate transportation metric.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)³⁴
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)
- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The CARB Scoping Plan and the CARB Mobile Source Strategy delineate VMT levels required to achieve legally mandated GHG emissions reduction targets. A lead agency should develop a project-level threshold based on those VMT levels, and may apply the following approach:

1. Propose a fair-share allocation of those budgets to their jurisdiction (e.g., by population);

³⁴ The California Air Resources Board has ascertained the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. (See [The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target](#) (p. 78, p. 101); [Mobile Source Strategy](#) (p. 37).) CARB's [Updated Final Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets](#) illustrates that the current Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving the necessary on-road transportation-related GHG emissions reductions called for in the 2017 Scoping Plan (Figure 3, p. 35). Accordingly, OPR recommends not basing GHG emissions or transportation impact analysis for a transportation project solely on consistency with an RTP/SCS.

2. Determine the amount of VMT growth likely to result from background population growth, and subtract that from their “budget”;
3. Allocate their jurisdiction’s share between their various VMT-increasing transportation projects, using whatever criteria the lead agency prefers.

2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project’s potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the “change in total VMT” method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

Transit and Active Transportation Projects

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Roadway Projects

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.

Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., “elasticity”).³⁵ Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study, estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.³⁶

To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

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

A National Center for Sustainable Transportation tool can be used to apply this method:

<https://ncst.ucdavis.edu/research/tools>

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially

³⁵ See U.C. Davis, Institute for Transportation Studies (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*; Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.

³⁶ See Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at <http://www.nber.org/papers/w15376>.

shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

Mitigation and Alternatives

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.³⁷ If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change “does not relieve a public agency of the requirement to analyze a project’s potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation.” OPR expects that lead agencies will continue to

³⁷ See National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf; see Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at <http://www.nber.org/papers/w15376>.

address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA's requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments, metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of OPR's [General Plan Guidelines](#) summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation, supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid.*)

Several examples of potential mitigation measures and alternatives to reduce VMT are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of

the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.
- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking cash-out programs.
- Implement roadway pricing.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a “project’s incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact”].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated

on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- 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.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.³⁸ A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

³⁸ The California Supreme Court has explained that when an agency has prepared an environmental impact report:

[T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Assessing Change in Total VMT

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

Using Models to Estimate VMT

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the [preliminary discussion draft](#)). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, 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.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an “apples-to-apples” comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission’s [“2010 Regional Transportation Plan Guidelines,”](#) beginning at page 35.

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

Evidence of Induced Vehicle Travel. A large number of peer reviewed studies³⁹ have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

³⁹ See, e.g., Boarnet and Handy (Sept. 2014) Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf; National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf.

Most of these studies express the amount of induced vehicle travel as an “elasticity,” which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish “short run elasticity” (increase in vehicle travel in the first few years) from “long run elasticity” (increase in vehicle travel beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0,⁴⁰ meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel.⁴¹ (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

Quantifying Induced Vehicle Travel Using Models. Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes toward automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT)
 - Note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary if this effect could be substantial.

However, estimating long-run induced VMT also requires an estimate of the project’s effects on land use. This component of the analysis is important because it has the potential to be a large component of

⁴⁰ See Boarnet and Handy (Sept. 2014) [Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions](https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf), California Air Resources Board Policy Brief, p. 2, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.

⁴¹ Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at <http://www.nber.org/papers/w15376>.

the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.
3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In rare cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

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

Appendix 4: Review of Vehicle Miles Traveled Mitigation Strategies for Use in the Tahoe Basin

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.

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 Irrigated 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
	Jurisdictional VMT – Likely	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'.
	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	CSTD M	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.
	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).	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.

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.

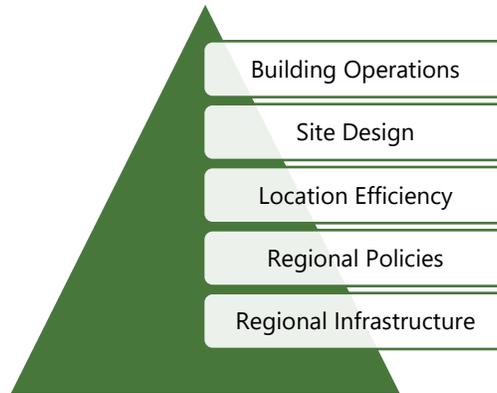
To demonstrate their effectiveness in an environmental analysis, TDM strategies must have sufficient evidence to quantify the level of VMT reduction that a strategy would achieve when implemented. In general, the TDM strategies can be quantified using CAPCOA calculation methodologies, but there are some 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:

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

where

$$P_x = \text{percent reduction of each VMT reduction strategy}$$

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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Requires additionality¹ • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Requires additionality¹ • 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: ¹Additionality: 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

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?		
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 individual land use project. May be applicable for land use plans at the city or larger area.	Elasticity -0.05 to -0.25 VMT percent reduction per 1 percent increase in regional accessibility	Primary source: Handy, S. et al. (2013) Impacts of Regional Accessibility Based on a Review of the Empirical Literature - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm 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-0829%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 individual 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	

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 measurable 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?				
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 1/4 mile from stop to edge of development), and/or • A rail station located within a 20 minute walk (or roughly 1/2 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	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." <i>Measuring the Miles: Developing new metrics for vehicle travel in LA.</i> 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								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								Summer; Diminished or no effectiveness in Winter	No (limited data)			

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

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 measurable 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?	
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.vtppi.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.vtppi.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://vtppi.org/tdm/tdm34.htm	Regionally implemented dynamic ridesharing (conservative implementation).				Regional, employee-based trip reduction program	Year-round	Yes	Yes	No	

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						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?						
Commuter 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/tdm1.htm 2) Carolina, P. et al. (2016). Do Employee Commuter Benefits Increase Transit Ridership? Evidence from 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
Commuter 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)			
Commuter 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	
Commuter 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		
Commuter 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)		
Commuter 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 <i>Need to verify with more recent UCD research.</i>					Regional, employee-based trip reduction program	Year-round	Yes		No	
Commuter 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) <i>See TRT-205 Annual Report Approved on March 15, 2017 from</i>						Year-round	Yes		No	
Commuter 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, Sisinio, 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	
Commuter 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	

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	3.4.13	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/tm/tm11.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

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

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

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



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

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

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).

Appendix 5: Residential VMT Data per Zone

Zone ID	Subregion	Zone Residential VMT per Capita	Subregional Residential VMT per Capita	Standard of Significance Residential VMT per Capita	Relationship to Standard of Significance	Percent of Standard of Significance
1	PLACER	22.73	15.42	13.11	Over 150%	1.73
2	EL DORADO	20.58	17.07	14.51	125-150%	1.42
3	EL DORADO	30.41	17.07	14.51	Over 150%	2.10
4	EL DORADO	24.27	17.07	14.51	Over 150%	1.67
5	EL DORADO	25.91	17.07	14.51	Over 150%	1.79
6	City of South Lake T	8.10	10.88	9.25	75-100%	0.88
7	EL DORADO	17.17	17.07	14.51	100-125%	1.18
8	City of South Lake T	9.63	10.88	9.25	100-125%	1.04
9	City of South Lake T	11.95	10.88	9.25	125-150%	1.29
10	City of South Lake T	11.52	10.88	9.25	100-125%	1.25
11	EL DORADO	17.43	17.07	14.51	100-125%	1.20
12	City of South Lake T	10.31	10.88	9.25	100-125%	1.12
13	City of South Lake T	10.43	10.88	9.25	100-125%	1.13
14	City of South Lake T	13.44	10.88	9.25	125-150%	1.45
15	City of South Lake T	10.76	10.88	9.25	100-125%	1.16

Zone ID	Subregion	Zone Residential VMT per Capita	Subregional Residential VMT per Capita	Standard of Significance Residential VMT per Capita	Relationship to Standard of Significance	Percent of Standard of Significance
16	EL DORADO	NA	17.07	14.51	NA	NA
17	City of South Lake T	11.24	10.88	9.25	100-125%	1.21
18	City of South Lake T	NA	10.88	9.25	NA	NA
19	City of South Lake T	10.87	10.88	9.25	100-125%	1.18
20	City of South Lake T	12.36	10.88	9.25	125-150%	1.34
21	City of South Lake T	8.66	10.88	9.25	75-100%	0.94
22	EL DORADO	12.76	17.07	14.51	75-100%	0.88
23	City of South Lake T	11.33	10.88	9.25	100-125%	1.22
24	EL DORADO	18.68	17.07	14.51	125-150%	1.29
25	EL DORADO	14.88	17.07	14.51	100-125%	1.03
26	EL DORADO	38.78	17.07	14.51	Over 150%	2.67
27	EL DORADO	15.27	17.07	14.51	100-125%	1.05
28	EL DORADO	17.57	17.07	14.51	100-125%	1.21
29	EL DORADO	NA	17.07	14.51	NA	NA
30	EL DORADO	17.67	17.07	14.51	100-125%	1.22
31	EL DORADO	NA	17.07	14.51	NA	NA
32	EL DORADO	14.93	17.07	14.51	100-125%	1.03

Zone ID	Subregion	Zone Residential VMT per Capita	Subregional Residential VMT per Capita	Standard of Significance Residential VMT per Capita	Relationship to Standard of Significance	Percent of Standard of Significance
33	EL DORADO	20.05	17.07	14.51	125-150%	1.38
34	EL DORADO	23.15	17.07	14.51	Over 150%	1.60
35	EL DORADO	NA	17.07	14.51	NA	NA
36	EL DORADO	23.78	17.07	14.51	Over 150%	1.64
37	DOUGLAS	25.56	15.39	13.08	Over 150%	1.95
38	DOUGLAS	16.31	15.39	13.08	100-125%	1.25
39	DOUGLAS	13.15	15.39	13.08	100-125%	1.01
40	DOUGLAS	16.57	15.39	13.08	125-150%	1.27
41	DOUGLAS	11.44	15.39	13.08	75-100%	0.87
42	DOUGLAS	12.32	15.39	13.08	75-100%	0.94
43	DOUGLAS	4.90	15.39	13.08	Less than 50%	0.37
44	CARSON	NA	NA	NA	NA	NA
45	PLACER	15.20	15.42	13.11	100-125%	1.16
46	PLACER	17.99	15.42	13.11	125-150%	1.37
47	PLACER	14.15	15.42	13.11	100-125%	1.08
48	PLACER	14.83	15.42	13.11	100-125%	1.13

Zone ID	Subregion	Zone Residential VMT per Capita	Subregional Residential VMT per Capita	Standard of Significance Residential VMT per Capita	Relationship to Standard of Significance	Percent of Standard of Significance
49	PLACER	13.57	15.42	13.11	100-125%	1.03
50	PLACER	16.27	15.42	13.11	100-125%	1.24
51	PLACER	16.70	15.42	13.11	125-150%	1.27
52	PLACER	17.54	15.42	13.11	125-150%	1.34
53	PLACER	16.47	15.42	13.11	125-150%	1.26
54	PLACER	15.44	15.42	13.11	100-125%	1.18
55	PLACER	12.14	15.42	13.11	75-100%	0.93
56	PLACER	11.84	15.42	13.11	75-100%	0.90
57	PLACER	20.03	15.42	13.11	Over 150%	1.53
58	PLACER	15.02	15.42	13.11	100-125%	1.15
59	PLACER	22.58	15.42	13.11	Over 150%	1.72
60	PLACER	21.03	15.42	13.11	Over 150%	1.60
61	PLACER	20.86	15.42	13.11	Over 150%	1.59
62	WASHOE	14.78	12.96	11.02	125-150%	1.34
63	WASHOE	14.23	12.96	11.02	125-150%	1.29

Zone ID	Subregion	Zone Residential VMT per Capita	Subregional Residential VMT per Capita	Standard of Significance Residential VMT per Capita	Relationship to Standard of Significance	Percent of Standard of Significance
64	WASHOE	15.48	12.96	11.02	125-150%	1.40
65	WASHOE	13.50	12.96	11.02	100-125%	1.22
66	WASHOE	17.35	12.96	11.02	Over 150%	1.57
67	WASHOE	12.24	12.96	11.02	100-125%	1.11
68	WASHOE	15.34	12.96	11.02	125-150%	1.39
69	WASHOE	9.24	12.96	11.02	75-100%	0.84
70	WASHOE	11.64	12.96	11.02	100-125%	1.06
71	WASHOE	13.71	12.96	11.02	100-125%	1.24
72	WASHOE	16.59	12.96	11.02	Over 150%	1.51
73	EL DORADO	20.33	17.07	14.51	125-150%	1.40
74	EL DORADO	20.67	17.07	14.51	125-150%	1.42
75	DOUGLAS	20.88	15.39	13.08	Over 150%	1.60
76	NA	NA	NA	NA	NA	NA
77	DOUGLAS	17.90	15.39	13.08	125-150%	1.37
78	EL DORADO	11.35	17.07	14.51	75-100%	0.78
79	EL DORADO	NA	17.07	14.51	NA	NA

Appendix 4: Trip Length Data per Zone

zone_id	Subregion	Zone Average Trip Length	Subregional Average Trip Length	Standard of Significance Trip Length	Relationship to Standard of Significance	Percent of Standard of Significance
Zone 1	PLACER	9.15	6.51	5.53	Over 150%	1.65
Zone 2	EL DORADO	9.62	6.69	5.69	Over 150%	1.69
Zone 3	EL DORADO	11.38	6.69	5.69	Over 150%	2.00
Zone 4	EL DORADO	13.90	6.69	5.69	Over 150%	2.44
Zone 5	EL DORADO	14.05	6.69	5.69	Over 150%	2.47
Zone 6	CSLT	4.97	4.26	3.62	125-150%	1.37
Zone 7	EL DORADO	11.14	6.69	5.69	Over 150%	1.96
Zone 8	CSLT	3.96	4.26	3.62	100-125%	1.09
Zone 9	CSLT	4.51	4.26	3.62	100-125%	1.24
Zone 10	CSLT	4.51	4.26	3.62	100-125%	1.24
Zone 11	EL DORADO	8.51	6.69	5.69	125-150%	1.50
Zone 12	CSLT	4.11	4.26	3.62	100-125%	1.13
Zone 13	CSLT	3.67	4.26	3.62	100-125%	1.01
Zone 14	CSLT	5.31	4.26	3.62	125-150%	1.47
Zone 15	CSLT	3.85	4.26	3.62	100-125%	1.06
Zone 16	EL DORADO	8.13	6.69	5.69	125-150%	1.43
Zone 17	CSLT	4.01	4.26	3.62	100-125%	1.11
Zone 18	CSLT	4.13	4.26	3.62	100-125%	1.14
Zone 19	CSLT	4.21	4.26	3.62	100-125%	1.16
Zone 20	CSLT	3.92	4.26	3.62	100-125%	1.08
Zone 21	CSLT	4.42	4.26	3.62	100-125%	1.22
Zone 22	EL DORADO	4.69	6.69	5.69	75-100%	0.83
Zone 23	CSLT	4.31	4.26	3.62	100-125%	1.19
Zone 24	EL DORADO	5.98	6.69	5.69	100-125%	1.05
Zone 25	EL DORADO	7.29	6.69	5.69	125-150%	1.28
Zone 26	EL DORADO	11.25	6.69	5.69	Over 150%	1.98
Zone 27	EL DORADO	6.38	6.69	5.69	100-125%	1.12
Zone 28	EL DORADO	5.80	6.69	5.69	100-125%	1.02
Zone 29	EL DORADO	NA	6.69	5.69	NA	NA
Zone 30	EL DORADO	6.42	6.69	5.69	100-125%	1.13

zone_id	Subregion	Zone Average Trip Length	Subregional Average Trip Length	Standard of Significance Trip Length	Relationship to Standard of Significance	Percent of Standard of Significance
Zone 31	EL DORADO	6.67	6.69	6.69	5.69 100-125%	1.17
Zone 32	EL DORADO	4.78	6.69	6.69	5.69 75-100%	0.84
Zone 33	EL DORADO	7.20	6.69	6.69	5.69 125-150%	1.27
Zone 34	EL DORADO	8.76	6.69	6.69	5.69 Over 150%	1.54
Zone 35	EL DORADO	NA	6.69	6.69	5.69 NA	NA
Zone 36	EL DORADO	10.26	6.69	6.69	5.69 Over 150%	1.80
Zone 37	DOUGLAS	9.90	6.37	6.37	5.41 Over 150%	1.83
Zone 38	DOUGLAS	6.53	6.37	6.37	5.41 100-125%	1.21
Zone 39	DOUGLAS	4.83	6.37	6.37	5.41 75-100%	0.89
Zone 40	DOUGLAS	7.11	6.37	6.37	5.41 125-150%	1.31
Zone 41	DOUGLAS	4.96	6.37	6.37	5.41 75-100%	0.92
Zone 42	DOUGLAS	4.78	6.37	6.37	5.41 75-100%	0.88
Zone 43	DOUGLAS	6.20	6.37	6.37	5.41 100-125%	1.14
Zone 44	CARSON	12.39	13.1	13.1	11.14 100-125%	1.11
Zone 45	PLACER	6.42	6.51	6.51	5.53 100-125%	1.16
Zone 46	PLACER	6.25	6.51	6.51	5.53 100-125%	1.13
Zone 47	PLACER	6.46	6.51	6.51	5.53 100-125%	1.17
Zone 48	PLACER	5.06	6.51	6.51	5.53 75-100%	0.91
Zone 49	PLACER	5.38	6.51	6.51	5.53 75-100%	0.97
Zone 50	PLACER	6.79	6.51	6.51	5.53 100-125%	1.23
Zone 51	PLACER	6.01	6.51	6.51	5.53 100-125%	1.09
Zone 52	PLACER	6.33	6.51	6.51	5.53 100-125%	1.14
Zone 53	PLACER	6.35	6.51	6.51	5.53 100-125%	1.15
Zone 54	PLACER	7.71	6.51	6.51	5.53 125-150%	1.39
Zone 55	PLACER	7.48	6.51	6.51	5.53 125-150%	1.35
Zone 56	PLACER	6.70	6.51	6.51	5.53 100-125%	1.21
Zone 57	PLACER	6.89	6.51	6.51	5.53 100-125%	1.25
Zone 58	PLACER	6.44	6.51	6.51	5.53 100-125%	1.16
Zone 59	PLACER	10.22	6.51	6.51	5.53 Over 150%	1.85
Zone 60	PLACER	9.31	6.51	6.51	5.53 Over 150%	1.68

zone_id	Subregion	Zone Average Trip Length	Subregional Average Trip Length	Standard of Significance Trip Length	Relationship to Standard of Significance	Percent of Standard of Significance
Zone 61	PLACER	9.03	6.51	5.53	Over 150%	1.63
Zone 62	WASHOE	5.54	5.56	4.73	100-125%	1.17
Zone 63	WASHOE	6.14	5.56	4.73	125-150%	1.30
Zone 64	WASHOE	4.65	5.56	4.73	75-100%	0.98
Zone 65	WASHOE	6.57	5.56	4.73	125-150%	1.39
Zone 66	WASHOE	4.97	5.56	4.73	100-125%	1.05
Zone 67	WASHOE	5.10	5.56	4.73	100-125%	1.08
Zone 68	WASHOE	7.26	5.56	4.73	Over 150%	1.54
Zone 69	WASHOE	4.08	5.56	4.73	75-100%	0.86
Zone 70	WASHOE	6.27	5.56	4.73	125-150%	1.33
Zone 71	WASHOE	4.79	5.56	4.73	100-125%	1.01
Zone 72	WASHOE	6.52	5.56	4.73	125-150%	1.38
Zone 73	EL DORADO	10.65	6.69	5.69	Over 150%	1.87
Zone 74	EL DORADO	9.21	6.69	5.69	Over 150%	1.62
Zone 75	DOUGLAS	8.51	6.37	5.41	Over 150%	1.57
Zone 76	PLACER	NA	6.51	5.53	NA	NA
Zone 77	DOUGLAS	6.37	6.37	5.41	100-125%	1.18
Zone 78	EL DORADO	2.95	6.69	5.69	50-75%	0.52
Zone 79	EL DORADO	5.17	6.69	5.69	75-100%	0.91

Attachment H

[IEC 2020 RTP/SCS](#)

Attachment I

[IEC for VMT Update/PIA.pdf](#)

Attachment J

2020 RTP/SCS Comment Matrix

Draft 2020 Regional Transportation Plan Public Comment Record					
Number	Name	Organization Type	Date Received	Summary of Comment	Date of Response
1	Jacque Chandler	Sustainable Tahoe	3/11/2020	Webinar - 1000% support TRANSIT	3/17/2020
2	Dale Roberts	Resident	9/14/2020	more transit - Meyers via Pioneer Trail	9/21/2020
3	Gary Himes	Resident	9/15/2020	more transit - to Carson City	9/21/2020
4	Eric C Paine	Resident	9/14/2020	more transit - Meyers before 2036	9/18/2020
5	Carol Black	Resident	10/25/2020	Include short term rental data and trends, address impacts of day trippers, only include project specificity if a comprehensive review and process is complete, Evacuation plan needed; apposed Incline mobility hub as TTD proposed	10/14/2020
6	Ed Hancock	Resident	9/11/2020	Meyers hub and transit needed	9/11/2020
7	TTD Hearing Comments	Various			
8	Pete Todoroff	Resident	9/11/2020	Evacuation plan needed	9/11/2020
9	Andy Chapman	Incline Village/Crystal Bay Visitor's Bureau	10/21/2020	Questions about prioritizing Tahoe Trail segment between Kings Beach and Incline Village through Crystal Bay	10/21/2020
10	Jack Hubbard	Resident	10/19/2020	opposed Incline mobility hub as proposed by TTD	10/19/2020
11	Niobe Burden	Resident	10/21/2020	supports charging at recreation sites, paid parking and reservation systems	10/21/2020
12	Ronda Tycer	Resident	10/9/2020	opposed Incline mobility hub as proposed by TTD	10/9/2020
13	Chris McNamara	Resident	9/12/2020	supports increasing bike and walk trips	9/12/2020
14	Kathie Julian	Resident	10/12/2020	opposed Incline mobility hub as proposed by TTD; work force housing needed there	10/21/2020
15	Jennifer Quashnick	Friends of West Shore	10/21/2020	RTP doesn't meet VMT capacity standard; doesn't adequately address visitor traffic (day use); fails to ID adequate funding; Checklist fails to incorporate new significant information	10/21/2020
15a		Friends of West Shore	10/21/2020	concerned with elimination of absolute VMT standard	
15b		Friends of West Shore	10/21/2020	IS/IEC is unclear regarding VMT impacts	
15c		Friends of West Shore	10/21/2020	Day visitor VMT is underestimated and no adequate mitigation provided to address this	
15d		Friends of West Shore	10/21/2020	Support GHG metric but this does not replace capacity based standard	
15e		Friends of West Shore	10/21/2020	Uncapped VMT affects water quality, noise, and public safety	
15f		Friends of West Shore	10/21/2020	RTP funding is inadequate	
15g		Friends of West Shore	10/21/2020	residents should not bare cost of visitor induced impacts	
15h		Friends of West Shore	10/21/2020	IEC fails to consider new relevant info re: climate change, visitation, gps app based travel, increased demand for recreation, short term rentals. Should not rely on previous analysis.	
15i		Friends of West Shore	10/21/2020	Peak congestion should be used instead of averages	
16	Jay Buelton	Resident	10/12/2020	supports Incline mobility hub as proposed by TTD	10/21/2020
17	Doug Flaherty	Resident	10/12/2020	opposed Incline mobility hub as proposed by TTD; work force housing needed there	10/21/2020
18	Karen Johnson	Resident	10/15/2020	opposed Incline mobility hub as proposed by TTD	10/15/2020
19	Patricia Moser Morris	Resident	10/12/2020	opposed Incline mobility hub as proposed by TTD	10/12/2020
20	Carina Cutler	Resident	10/15/2020	supports water transit sooner, supports toll stations, prioritize safety	10/15/2020
21	Emily Setzer	Resident	10/15/2020	Kings Beach Brockway Trail to be built by 2025; North Tahoe Regional Trail pushed up to be built by 2035	10/15/2020
22	Tobi Tyler	Resident	10/23/2020	concerned about development increases conflicting with transportation challenges	10/15/2020
23	Sarah Miller	Resident	10/19/2020	opposed to: charging resident fees, new parking lots along shoreline for tourists, Incline mobility hub	10/23/2020
24	Ian Gover	Resident	10/20/2020	favors trail connections and bike paths, more crossings on SR28 near Cedar Flats are needed	10/22/2020
25	Kathryn Kelly	Resident	10/20/2020	Supports: free and frequent transit, ferry, bikeshare, trail connections, Incline hub as proposed by TTD, charging fees at rec sites and for cars entering the region	10/22/2020
26	Teri Thuma	Resident	10/21/2020	evacuation plan needed w/ associated corridor parking management; programs needed for responsible tourism	10/22/2020
27	Jerry Winters	Resident	10/22/2020	concerned with VMT standard and proposed change; RTP does not adequately address visitors and day use (FOWS Form letter)	10/22/2020
28	Alex Padilla	Caltrans	10/22/2020	Make sure performance measures section references MPO requirements (23 CFR Parts 450 and 771 and 49 CFR Part 613). Needs a system performance report evaluating performance targets	10/22/2020
28a		Caltrans		Include description of TRPA coordination efforts with Caltrans and NDOT in Chapter 5	
28b		Caltrans		Include summary of requirements for PM1, PM2, and PM3 - Look at Amendment 1 to Caltrans/NDOT/TRPA MOU. Include descriptions and explanation of all 18 of the PMs listed in the MOU	
28c		Caltrans		Need discussion on how TRPA will plan and program projects to achieve CA performance targets. Should be done for each PM	
28d		Caltrans		Need discussion on Transit Asset Management in Chapter 5. TRPA TAM requirements, local/state targets for TAM, discussion on how TRPA incorporates TAM into planning	
28e		Caltrans		Chapter 5 needs section summarizing PTASP PM requirements including timeline, links to investment priorities, etc.	
28f		Caltrans		Clarify new local/regional funding sources in financial section and how they are reasonably foreseeable	

Draft 2020 Regional Transportation Plan Public Comment Record					
Number	Name	Organization Type	Date Received	Summary of Comment	Date of Response
28g		Caltrans		Need more clarity on what the regional revenue source will be - One Tahoe or something else (i.e. user fee, basin entry fee, etc.). Also concerned these are listed as "constrained"	
28h		Caltrans		List which projects are "regionally significant" based on p. 136 in Regional Transportation Plan guidelines	
28i		Caltrans		Explain how federal land management agencies participated in development of RTP	
28j		Caltrans		Checklist should be updated to capture full discussion on highways and interregional connectivity	
28k		Caltrans		Add RTP checklist as new appendix J in RTP. Appendix I should also be included in RTP checklist	
28l		Caltrans		Cite new CA Freight Mobility Plan on page 194	
28m		Caltrans		Provide model files to Caltrans for review	
28n		Caltrans		Double check page numbers on RTP w/ and w/o appendices to make sure they match	
28o		Caltrans		Add list of Caltrans projects to the project list (US 50 safety project, SR89/Fanny Bridge, SR 28 RSA at Grove Street, SR28 Gateway to Kings Beach)	
29	Alex Padilla	Caltrans	10/22/2020	Add US 50 and Fanny Bridge projects to list and financial plan appendices	10/22/2020
30	Lori Cress	Resident	10/23/2020	concerned with VMT standard and proposed change; RTP does not adequately address visitors and day use (FOWS Form letter)	10/22/2020
31	Sue Gaskill	NV Dept. of Water Resources	10/23/2020	Comply with all NV water laws; water used for construction shall be provided by a utility or under permit	10/23/2020
32	Dana Schneider	Resident	10/23/2020	concerned with VMT standard and proposed change; RTP does not adequately address visitors and day use (FOWS Form letter)	10/23/2020
33	Ellie Waller	Resident	10/23/2020	Opposed to Elimination of VMT cap; plan gives up on controlling visitor traffic; need real solutions for parking and transit; outcomes and goals must be practical; day use analysis needed; carrying capacity is an issue; need to revisit RPU and correlation to Goals and Policies; recreation can be a double-edged sword	10/23/2020
34	Tom Mooers	Sierra Watch	10/23/2020	Adopt an RTP that complies with the absolute VMT standard	10/23/2020
35	Mark Costa	NDOT	10/23/2020	Specific comments on NV projects and revenue assumptions. Asking for clarification on certain goals, policies, projects, and funding assumptions.	10/23/2020
36	Nicole Rinke	Cal AG	10/23/2020	AG claims the RTP has separated VMT generated by visitor/population growth	Several Mtgs
36a		Cal AG	10/24/2020	the RTP/SCS does not meet or achieve TRPA's existing environmental threshold for VMT	
36b		Cal AG	10/25/2020	IS/IEC does not appropriately analyze the RTP/SCS's VMT impacts	
36c		Cal AG	10/26/2020	IS/IEC inappropriately tiers off of the 2012 RTP/SCS Regional Plan Update EIR/EIS	
36d		Cal AG	10/27/2020	IS/IEC fails to conclude that VMT is a significant impact that requires mitigation	
36e		Cal AG	10/28/2020	IS/IEC fails to substantiate the RTP/SCS's compliance with CARB's required GHG reductions	
36f		Cal AG	10/29/2020	IS/IEC's VMT analysis relies on reductions calculated through the Trip Reduction Impact Analysis (TRIA) tool,3 but these reductions are not adequately explained, quantified, or substantiated.	
37	Steve Teshera	Tahoe Chamber	10/23/2020	Recognize substantial funding shortfall and need for regional revenue work plan. Would like to see transit improvements accelerated beyond incremental timeline outlined in RTP. Need clarity on travel behavior and a call out on day-visitors.	10/23/2020 & 2/21/21
38	Kelly Beede	Town of Truckee	10/23/2020	transit distinction between Truckee and Tart, clarification on mobility hubs and intercept lots, clarification on 267/28 managed lane project	10/23/2020
39	Doug & Valerie Welch	Resident	10/23/2020	concerned w/VMT standard and day visitor impacts	10/23/2020
40	Mimi Morris	Resident	10/23/2020	VMT Standard (FOWS Form Letter)	10/26/2020
41	Ron Grassi	Resident	10/24/2020	VMT Standard	10/26/2020
42	Gavin Feiger	Bicycle Coalition	10/25/2020	Add Caltrans SHOPP project 4210 to project list (https://www.laketahoeinfo.org/Project/Detail/4210)	10/21/2020
42a		Bicycle Coalition	10/25/2020	Enhance discussion on SRTS projects and planning. Need more focus on this beyond South Shore	
42b		Bicycle Coalition	10/25/2020	Would like to see more bicycle and pedestrian counters proposed for pre and post project monitoring	
43	Gavin Feiger	League to Save Lake Tahoe	10/25/2020	Constrained vs Unconstrained project lists hard to follow in RTP App. B	Several Mtgs
43a		League to Save Lake Tahoe	10/25/2020	would like to see schedule, work plan, and progress reports for Commute Tahoe	
43b		League to Save Lake Tahoe	10/25/2020	Would like to see specific parking management strategies, including code changes for parking maximums	
43c		League to Save Lake Tahoe	10/25/2020	Plan should contain flexibility/adaptive management to prioritize transit projects based on performance based measures using TDA authority	
43d		League to Save Lake Tahoe	10/25/2020	micro-transit should be priority. Recommends Camp Rich/Emerald Bay pilot be implemented as part of SR 89 or stand alone project as it is not in the RTP	

Draft 2020 Regional Transportation Plan Public Comment Record					
Number	Name	Organization Type	Date Received	Summary of Comment	Date of Response
43e		League to Save Lake Tahoe	10/25/2020	Wants to add project to move bus stop near new housing project-Sugar Pine Village in CSLT	
43f		League to Save Lake Tahoe	10/25/2020	TRPA should play regional role to promote implementation of trails projects	
43g		League to Save Lake Tahoe	10/25/2020	TRPA should play lead role and prioritize developing technology such as trip planning tools	
43h		League to Save Lake Tahoe	10/25/2020	smaller mobility hubs may be better approach to ensure implementation and funding	
43i		League to Save Lake Tahoe	10/25/2020	strongly support community priority zones concept. Would like to see how unmet transit needs are reflected and overlap with town centers. Update maps to show community priority zones more closely	
43j		League to Save Lake Tahoe	10/25/2020	Wants clarification on funding sources (local, regional); prioritize unconstrained projects based on VMT cost-effectiveness and mode share goals; include flexibility on phasing/timing based on performance measures	
43k		League to Save Lake Tahoe	10/25/2020	focus fundraising to address \$3M deficit for active transportation projects	
43l		League to Save Lake Tahoe	10/25/2020	clarify farebox revenue is from ferries and regional transit, not in Basin transit	
43m		League to Save Lake Tahoe	10/25/2020	clarify revenue generated from rental car mitigation fee and if fees are collected from rideshare services	
43n		League to Save Lake Tahoe	10/25/2020	clarify TIP update schedule and how it incorporates bi-state consultation or other priorities	
43o		League to Save Lake Tahoe	10/25/2020	TRPA should enhance monitoring protocols (provides specific suggestions)	
43p		League to Save Lake Tahoe	10/25/2020	League wants to be involved in developing schedule and integrating performance measures for tracking VMT generation by user type	
43q		League to Save Lake Tahoe	10/25/2020	Would like to see more of App. D recommendations in plan	
43r		League to Save Lake Tahoe	10/25/2020	Emphasize environmental justice more in plan. Supportive of adopting definition for DAC specific to Tahoe	
43s		League to Save Lake Tahoe	10/25/2020	Stalene Community Priority Zone missing from Table 23	
43t		League to Save Lake Tahoe	10/25/2020	Clarify how TRIA RTP trip rates compare to Placer County and interim project level guidance	
43u		League to Save Lake Tahoe	10/25/2020	Clarify TRIA GHG benefits, how intercept lots/parking mgmt. applies; conduct sensitivity analysis	
43v	IS/IEC Comments	League to Save Lake Tahoe	10/25/2020	Need to acknowledge if degree of water quality benefits will be reduced due to road maintenance being deferred in 2020 plan vs 2017. Additional mitigation may be required	
43w		League to Save Lake Tahoe	10/25/2020	Impacts of displacement of housing units from US 50 project should be disclosed	
43x		League to Save Lake Tahoe	10/25/2020	Additional mitigation needed to offset VMT impacts	
43y		League to Save Lake Tahoe	10/25/2020	VMT threshold is pre-determined and has not been adequately vetted	
43z		League to Save Lake Tahoe	10/25/2020	Concerned that allocations are not withheld when VMT exceeded - propose early triggers and gradual responses	
44	Sierra Club	Organization	10/25/2020	VMT Standard; Support GHG standard only if doesn't increase VMT; support AG & FOWS position	10/26/2020
45	Christine Maley-Grubl	Truckee North Tahoe Transportation Management Association (TNT/TMA)	10/26/2020	Supports regional revenue momentum, including One Tahoe for funding shortfall and inclusion of Truckee and out of basin ski resorts; suggestion to use resident, commuter and visitor for user groups; need more intercity transit improvements; supports one-stop communication tool; emphasized importance of collaboration with Placer Co., Town of Truckee, Placer Co. Transportation Planning Agency and Nevada Co. Transportation Commission	10/26/2020
46	Julie Hutchinson	Resident	10/25/2020	VMT threshold standard should not be based on per capita	10/26/2020
47	Steve Teshera	Fire Chiefs	10/26/2020	Emergency Evacuation enhanced in RTP and future	2/26/2021
48	Stephanie Holloway	Placer PW	10/24/2020	Update mobility hub map, regional transit service, add parking management to map @ Kings Beach and Tahoe City; updates needed to project list	10/15/2020
49	Ann Nichols	North Tahoe Preservation Alliance	10/24/2020	concerned with new funding proposal that includes "one Tahoe" and connections with "2020 Prosperity Center Report" tax increases; ineffectively addresses visitor travel and day only users; safety concerns with unrestricted VMT;	10/28/2020
50	Layne McAvoy	Resident	10/25/2020	opposed to Incline bus hub as proposed by TTD; make better plans for the old elementary school than a bus hub	10/28/2020
51	Carl Hasty	Tahoe Transportation District	10/28/2020	Policies need to include importance of technology to emergency management; suggests prioritizing policies and developing crosswalk that connects projects to policies	Several Mtgs
51a		Tahoe Transportation District	10/28/2020	project list missing TTD technology projects, specifically broadband and emergency management/evacuation projects	
51b		Tahoe Transportation District	10/28/2020	Technology needs to reflect TTD goals and projects	
51c		Tahoe Transportation District	10/28/2020	RTP should include entirety of Long Range Transit Master Plan to achieve transit goals	
51d		Tahoe Transportation District	10/28/2020	Need better explanation of Microtransit services - how will they be funded so that they are free? What are performance measures for Microtransit? How can TRPA encourage private investment in transportation?	
51e		Tahoe Transportation District	10/28/2020	Crosslake ferry should be public/private partnership - could not operate with private funding alone	

Draft 2020 Regional Transportation Plan Public Comment Record					
Number	Name	Organization Type	Date Received	Summary of Comment	Date of Response
51f		Tahoe Transportation District	10/28/2020	Enhance discussion on transit capital investments. Need to build transit capital before increasing transit service	
51g		Tahoe Transportation District	10/28/2020	Correct US 50 SSCR cost from \$100 million to \$156 million	
51h		Tahoe Transportation District	10/28/2020	Want regional revenue included in first five years of plan	
51i		Tahoe Transportation District	10/28/2020	Want clear association of fund source to specific projects and services. Need more robust discussion on required match funds for discretionary sources	
51j		Tahoe Transportation District	10/28/2020	Enhance explanation of farebox revenue - distinguish free local services from regional services that will collect fares	
51k		Tahoe Transportation District	10/28/2020	Enhance revenue section: explain assumptions on expected discretionary sources (Nevada, FLAP, USFS, BUILD, ARB, CA Energy Commission). Discuss these assumptions more broadly with TTIC partners	
51l		Tahoe Transportation District	10/28/2020	Environmental Justice appendix: include Tahoe Verde stops, clarify driving limits due to age	
51m		Tahoe Transportation District	10/28/2020	Reconcile shifts in Everyday, Discover, Visit Tahoe trips from 2017 plan to 2020 plan (discuss updated data source, refined/more accurate data)	
51n		Tahoe Transportation District	10/28/2020	Want explanation of population growth assumptions as they do not link up with AirSage assumptions on growth	
51o		Tahoe Transportation District	10/28/2020	Provide clear link between goals and objectives in RTP with VMT threshold update. Concerned the VMT mitigation for SB375 and SB743 will not capture visitor impacts. Also concerned that VMT update is focused on new development, rather than redevelopment. Suggests developing VMT fee structure and data system through Smart Cities approach	
51p		Tahoe Transportation District	10/28/2020	Expand congestion management section to reflect shrinking shoulder system and typical seasonal congestion in winter and summer	
51q		Tahoe Transportation District	10/28/2020	Suggest future RTP development include chapter review by TTIC partners prior to public release of draft	
52	Joe Shaefer	Resident	10/25/2020	opposed to bus hub as proposed by TTD	10/28/2020
53	Denise Davis	Resident	10/25/2020	Get the visitor authorities involved to help promote transportation options; important that buses are frequent and reliable, won't work otherwise; commuters from Reno/Carson need transit options; evacuation concerns; opposed Incline mobility hub as proposed by TTD	2/5/2020
54	Jon Davidson	Resident	10/25/2020	opposed to bus hub as proposed by TTD; including using the site for Sr28 Corridor staging	10/28/2020
55	Indra S. Winquest	IVGID GM	10/25/2020	opposed to transit ferry stop in Incline	10/28/2020
56	Michele Koch	Resident		opposed to bus hub as proposed by TTD	10/26/2020

Attachment K

Draft Findings – Threshold Amendments

Threshold Standard Amendment Adoption Findings

This document contains required findings per Chapter 3 and 4 of the TRPA Code of Ordinances for amendments to Air Quality Threshold Standard 14 (“Threshold Standard Amendment”).

TRPA Code of Ordinances Section 3.3: Determination of need to prepare Environmental Impact Statement

Finding: TRPA finds that the Threshold Standard Amendment will not have a significant effect on the environment.

Rationale: TRPA staff prepared an Initial Environmental Checklist (IEC) pursuant to Article VI of TRPA Rules of Procedure and Chapter 3: *Environmental Documentation* of the TRPA Code of Ordinances to evaluate potential environmental effects of the adoption of an updated Vehicle Miles Travelled Threshold. The IEC tiered from the TRPA 2012 *Regional Plan Update* (RPU) Environmental Impact Statement (EIS) and the TRPA *Mobility 2035: Regional Transportation Plan/Sustainable Communities Strategy* (RTP) EIS/Environmental Impact Report (EIR) in accordance with Sections 6.12j of the TRPA Rules of Procedure.¹

Based on information contained within the IEC, the proposed Threshold Standard Amendment would not have a significant effect on the environment and TRPA staff prepared a finding of no significant effect in accordance with TRPA’s Rules of Procedure Section 6.6 and Code of Ordinances Section 3.3.2.

TRPA Code of Ordinances Section 4.4: Threshold Related Findings

Finding: The Threshold Standard Amendment is consistent with and will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies, plan area statements and maps, the Code, and other TRPA plans and programs;

Rationale: Based on the analysis in the TRPA staff reports and the IEC for the Threshold Standard Amendment the Governing Board finds the Amendment is consistent with and will not adversely affect the Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, and local planning areas, the Code, and other TRPA plans and programs (as amended).

As described in the accompanying Staff Report and the IEC, the Threshold Standard Amendment sets forth a standard that will be attained principally by implementing the Regional Plan and the 2020 Regional Transportation Plan, including existing goals and policies that promote compact, mixed-use development, and walkable, bikeable, transit-friendly communities.

¹ The TRPA Governing Board certified the RPU EIS and RTP EIR/EIS on December 12, 2012.

The proposed Threshold Standard Amendment will enhance the implementation of the Regional Plan by aligning with the following Regional Plan strategies:

- **Redeveloping Town Centers**
Policies LU-1.2, LU-3.3, Transportation Policy 1.1 encourage the redevelopment of Town Centers into mixed-use walkable and bikeable destinations. Such development is consistent with lower trip lengths and therefore reduced vehicle miles travelled. By establishing a system that assesses and mitigates impacts relating to vehicle miles travelled, the updated threshold incentivizes locating in areas that already have low trip lengths (i.e., walkable and bikeable places like the designated Town Centers).
- **Directing Development Away from Distant Areas**
Policy LU-3.5 discourages new development in areas that are distant from services. Such development correlates with higher trip lengths, and therefore higher vehicle miles travelled. The proposed threshold, which is based on per capita VMT, would therefore disincentivize locating in distant areas where trip lengths would be higher.
- **Mitigating Adverse Impacts**
Policy LU-5.1 requires that adverse impacts generated by the plan be mitigated. The updated threshold and corresponding implementing measures will ensure that impacts from VMT will be fully offset.
- **Increasing Connectivity**
Transportation Goal 2 promotes reducing reliance on the automobile by creating transit and active transportation (e.g., bike and pedestrian paths) connections within and between Town Centers.
- **Aligning with Greenhouse Gas Reduction Efforts**
Policy AQ-1.3 requires that TRPA seek to reduce greenhouse gas emissions from sources such as motor vehicles. As stated above, the updated threshold standard will help to incentivize redevelopment of Town Centers and will promote compact walkable and bikeable communities. This type of land use form promotes use of alternative transportation and is correlated with reduced automobile use.

As outlined above and in the Staff Report and the IEC, these amendments will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, the Code, and other TRPA plans and programs.

Finding: The Threshold Standard Amendment will not cause the environmental threshold carrying capacities to be exceeded; and

Rationale: Based on the rationale for the foregoing finding, the analysis in the IEC, the Staff Report, and TRPA Compact V(g) Findings below, and the 2015 Threshold Evaluation (November 2016), the Governing Board finds that the Threshold Standard Amendment will not cause the environmental threshold carrying capacities to be exceeded.

As described in the accompanying Staff Report and the IEC, the Amendments will compliment and accelerate implementation of the Regional Plan and its objectives: achievement and maintenance of Thresholds while planning for reasonable growth. As explained in the approval consistency findings below and in the IEC, the Amendments are consistent with the Regional Plan, including all applicable Goals and Policies, plan area statements and maps, the Code and other TRPA plans and programs with the mitigation measures included in the project. The approval findings relating to consistency and IEC consistency analyses are incorporated herein by reference.

The Amendments will replace Air Quality Threshold Standard 14 with Transportation and Community Sustainability (TCS) Threshold Standard 1, and the amended standard will be achievable and result in nearly zero growth in VMT over the next 25 years.

With respect to the remaining threshold standards, the Threshold Standard Amendment is consistent with and will not adversely affect all applicable compliance measures, indicators, additional factors and supplemental compliance measures and attainment of target dates as identified in the 2015 Threshold Evaluation.

Based on the foregoing and findings 2, 3 and 4 below, the Governing Board finds that adopting the Threshold Standard Amendment will not adversely affect implementation of the entire Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, the Code and other TRPA plans and programs (as amended).

Finding: Wherever federal, state, or local air and water quality standards apply for the region, the strictest standards shall be attained, maintained, or exceeded pursuant to Article V(d) of the Tahoe Regional Planning Compact.

Rationale: Based on the rationale for the foregoing findings, the analysis in the IEC and TRPA Compact V(g) Findings below, and the 2015 Threshold Evaluation, the Governing Board finds the Threshold Standard Amendment will not cause the federal, state and local air and water quality standards applicable for the Region to be exceeded.

The Threshold Standard Amendment is designed to reduce reliance on the automobile and support the attainment of the greenhouse gas emissions reduction goals of California and Nevada. The Threshold Standard Amendment itself will not affect or change the federal, state or local air and water quality standards applicable for the Region. As disclosed in the IEC, these standards

were used as criteria of significance where applicable and no unmitigable impacts were found.

The Compact requires TRPA to make findings before taking certain actions. In addition, the Regional Plan, including the Code and Plan Area Statements, sets forth other findings that must be made. The following specific findings shall be made in writing, pursuant to Planning Compact Article V(c), (g) and VI(b) prior to the approval of any Threshold Standard amendments.

Ordinance 2019-03 Findings:

Finding: The pertinent environmental threshold standards shall be amended where scientific evidence and technical information indicate either:

- (a) Two or more threshold standards are mutually exclusive.
- (b) Substantial evidence to provide a basis for a threshold standard does not exist.
- (c) A threshold standard cannot be achieved.
- (d) A threshold standard is not sufficient to maintain a significant value of the Region or additional threshold standards are required to maintain a significant value.

Rationale: The updating of the threshold standards to reflect a more relevant VMT standard is consistent with criteria “b” and “d” (above). Currently adopted Threshold Standard (Air Quality Threshold Standard 14) for vehicle miles travelled direct the agency to reduce vehicle miles travelled to 10 percent below 1981 levels. This standard has its basis in subregional visibility concerns resulting from nitrate deposition and was set based on a 10 percent reduction in emissions as a target for lake clarity. While some interpret this standard to control VMT growth by stopping development, such actions cannot feasibly achieve material reductions in VMT. Because the Tahoe Region is nearly at buildout under the Regional Plan’s growth control system, new development accounts for a very small portion of VMT. As a result, limiting development over and above Regional Plan caps does little to reduce VMT.

This existing standard is proposed to be replaced with a new standard for a 6.8 percent reduction in VMT per capita by 2045 below 2018 levels. Rather than orienting around nitrate deposition, the revised standard focuses on mobility and sustainable communities. The updated standard places an emphasis on accelerating VMT reduction through implementation of transportation programs and projects. The revised standard aligns with the Region’s longstanding ambition to achieve its regional transportation vision. When implemented through the strategies and funding in the Regional Transportation Plan, it will achieve nearly zero growth in per capita VMT and is fully consistent with and even more progressive than related statewide greenhouse gas emissions reduction goals.

The Threshold Standards amendments therefore meet the criteria of, and are otherwise consistent with, Ordinance 2019-03.

Finding: The Threshold Standard amendments will not cause the environmental thresholds to be exceeded.

Rationale: The Threshold Standard amendments are designed to further enhance and protect environmental quality in the Region and, based on the IEC and Threshold Indicators and Compliance Measures tables, will not result in the exceedance of environmental thresholds. The amendments will improve the function of environmental thresholds and better align them with Regional objectives related to land use, transportation, and air quality.

Finding: Wherever federal, state and local air and water quality standards applicable for the Region, whichever are strictest, must be attained and maintained pursuant to Article V(d) of the Compact, the Threshold Standard amendments meet or exceeds such standards.

Rationale: Proposed Threshold Standard amendments related to air and water quality are consistent with state and federal air and water quality standards. The Threshold Standard Amendment is designed to reduce reliance on the automobile and support the attainment of the greenhouse gas emissions reduction goals of California and Nevada. The Threshold Standard Amendment itself will not affect or change the federal, state or local air and water quality standards applicable for the Region. As disclosed in the IEC, these standards were used as criteria of significance where applicable and no unmitigable impacts were found.



STATEMENT OF NO SIGNIFICANT EFFECT

Project Description: Amendment to Threshold Standard AQ-14

Staff Analysis: In accordance with Article IV of the Tahoe Regional Planning Compact, as amended, and Section 6.6 of the TRPA Rules of Procedure, TRPA staff reviewed the information submitted with the subject project.

Determination: Based on the Initial Environmental Checklist, Agency staff found that the subject project will not have a significant effect on the environment.

TRPA Executive Director/Designee

Date

DRAFT

Attachment L

Draft Findings - Regional Plan Amendments & Code Changes

**Required Findings & Finding of No Significant Effect
for Regional Plan and Code of Ordinances Amendments
to Implement Amendments to the Thresholds and Regional
Transportation Plan and to Adopt Revisions to the
Transportation Project Impact Assessment and Air Quality
Mitigation Fee Framework**

This document contains required findings per Chapter 3 and 4 of the TRPA Code of Ordinances for amendments to the TRPA Regional Plan Goals and Policies Chapters 2 (Land Use), 3 (Transportation), and 7 (Implementation) and TRPA Code of Ordinances Chapters 2, 3, 22, 34, 39, 50, 65, 82, and 90 as part of the adoption of the Regional Transportation Plan and revision to the Thresholds, and to update the Transportation Project Impact Assessment and Air Quality Mitigation Fee framework.

TRPA Code of Ordinances Section 3.3: Determination of need to prepare Environmental Impact Statement

Finding: TRPA finds that the Regional Plan and code amendments will not have a significant effect on the environment.

Rationale: TRPA staff prepared an Initial Environmental Checklist (IEC) pursuant to Article VI of TRPA Rules of Procedure and Chapter 3: *Environmental Documentation* of the TRPA Code of Ordinances to evaluate potential environmental effects of the proposed policy and code amendments related to the adoption of an updated Vehicle Miles Travelled Threshold and Regional Transportation Plan. The IEC tiered from the TRPA 2012 *Regional Plan Update* (RPU) Environmental Impact Statement (EIS) and the TRPA *Mobility 2035: Regional Transportation Plan/Sustainable Communities Strategy* (RTP) EIS/Environmental Impact Report (EIR) in accordance with Sections 6.12j of the TRPA Rules of Procedure.¹

Under the proposed amendments, the Regional Plan's strategy and general approach to land use, transportation, conservation, recreation, and public services and facilities will remain in place unchanged. The changes are focused on (1) aligning with the updated Threshold for a per capita vehicle miles travelled standard; (2) aligning with the Regional Transportation Plan; and (3) updating the Transportation Project Impact Assessment and Air Quality Mitigation Fee framework. Based on information contained within the IEC, the proposed amendments would not have a significant effect on the environment and TRPA staff prepared a finding of no significant effect in accordance with TRPA's Rules of Procedure Section 6.6 and Code of Ordinance Section 3.3.2.

¹ The TRPA Governing Board certified the RPU EIS and RTP EIR/EIS on December 12, 2012.

TRPA Code of Ordinances Section 4.4: Threshold Related Findings

Finding: The project (i.e., amendment of the Regional Plan and Code of Ordinances) is consistent with and will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies, plan area statements and maps, the Code, and other TRPA plans and programs;

Rationale: Based on the analysis in the TRPA staff reports and the IEC for the proposed amendment of the Regional Plan and Code of Ordinances the Governing Board finds the amendments are consistent with and will not adversely affect the Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, and local planning areas, the Code, and other TRPA plans and programs (as amended).

As described in the accompanying Staff Report and the IEC, the proposed amendments would align the Regional Plan and Code of Ordinances with the Regional Transportation Plan and the Thresholds. In doing so, the amendments are consistent with Regional Plan goals and policies that promote redevelopment of Town Centers (Policies LU-1.2, LU-3.3, and Transportation Policy 1.1), direct development away from distant areas (Policy LU-3.5), mitigate adverse impacts (Policy LU-5.1), promote affordable housing (Policy HS-3.1), reduce dependency on the automobile (Transportation Goal 2), and align with state and regional greenhouse gas reduction efforts (Policy AQ-1.3).

The proposed amendments were evaluated against all adopted threshold compliance measures. The proposed amendments will not negatively impact any compliance measures, including Air Quality/Transportation. See Exhibit B attached hereto.

Finding: The project will not cause the environmental threshold carrying capacities to be exceeded; and

Rationale: Based on the rationale for the foregoing finding, the analysis in the IEC, the Staff Report, and TRPA Compact V(g) Findings below, and the 2015 Threshold Evaluation (November 2016), the Governing Board finds that the proposed amendment of the Regional Plan and Code of Ordinances will not cause the environmental threshold carrying capacities to be exceeded.

The Regional Plan EIS analyzed full development build out potential within the Tahoe region. The findings for adoption of the Regional Plan demonstrated that

implementation of the Regional Plan would not cause Environmental Threshold Carrying Capacities to be exceeded.

As described in the accompanying Staff Report and the IEC, the proposed amendment of the Regional Plan and Code of Ordinances will compliment and accelerate implementation of the Regional Plan and its objectives: achievement and maintenance of Thresholds while planning for reasonable growth. As explained in the approval consistency findings below and in the IEC, the amendments are consistent with the Regional Plan, including all applicable Goals and Policies, plan area statements and maps, the Code and other TRPA plans and programs with the mitigation measures included in the project. The approval findings relating to consistency and IEC consistency analyses are incorporated herein by reference.

The proposed amendments include changes to the Transportation Project Impact Assessment and Air Quality Mitigation Fee framework by basing impact assessment and mitigation on vehicle miles travelled (VMT) rather than daily vehicle trip ends (DVTE). The revised policies and standards were designed to be environmentally neutral, if not positive. The proposed amendments will not alter the requirement for project-level environmental review for subsequent development.

Based on the foregoing and findings 2, 3 and 4 below, the Governing Board finds that adopting the amendments will not adversely affect implementation of the entire Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, the Code and other TRPA plans and programs (as amended).

Finding: Wherever federal, state, or local air and water quality standards apply for the region, the strictest standards shall be attained, maintained, or exceeded pursuant to Article V(d) of the Tahoe Regional Planning Compact.

Rationale: Based on the rationale for the foregoing findings, the analysis in the IEC and TRPA Compact V(g) Findings below, and the 2015 Threshold Evaluation, the Governing Board finds the proposed amendment of the Regional Plan and Code of Ordinances will not cause the federal, state and local air and water quality standards applicable for the Region to be exceeded.

The proposed amendment of the Regional Plan and Code of Ordinances itself will not affect or change the federal, state or local air and water quality standards applicable for the Region. As disclosed in the IEC, these standards

were used as criteria of significance where applicable and no unmitigable impacts were found.

TRPA Code of Ordinances Section 4.5: Findings Necessary to Amend the Regional Plan, Including Goals and Policies and Plan Area Statements and Maps

Finding: The Regional Plan, as amended, achieves and maintains the thresholds.

Rationale: In 1980, Congress amended the Compact to accelerate the pace of environmental progress in the Tahoe Region by tasking TRPA with adopting a regional plan and implementing regulations that protect the unique national treasure that is Lake Tahoe. First, Article V (b) required that TRPA, in collaboration with Tahoe’s other regulatory agencies, adopt “environmental threshold carrying capacities” (thresholds or standards) establishing goals for a wide array of environmental criteria, including water quality, air quality, and wildlife. Second, Article V(c) directed TRPA to adopt a regional plan to “achieve and maintain” these thresholds, and to “continuously review and maintain” implementation of the plan.

The 1980 Compact instated an era of establishing and enforcing rigorous controls on new development. In 1982, TRPA adopted the necessary thresholds for the Tahoe Region. These thresholds are a mix of both long- and short-term goals for the Tahoe Region. The Region was in attainment of a number of these thresholds shortly after the adoption of the Regional Plan and remains in attainment today. Other thresholds address more intractable issues; for example, TRPA established numeric water quality standards that, even under best-case conditions, could not be attained for decades. *See, e.g., League to Save Lake Tahoe v. Tahoe Reg’l Planning Agency*, 739 F. Supp. 2d 1260, 1265 (E.D. Cal. 2010).

The second phase in this process was establishing a regional plan that, when implemented through rules and regulations, would ultimately achieve and maintain these thresholds over time. In 1987, following years of negotiation and litigation, TRPA adopted its Regional Plan. The 1987 plan employed a three-pronged approach to achieve and maintain the adopted environmental standards. First, the plan established a ceiling on development in the Region and restricted the placement, timing, and extent of new development. Second, the plan sought to prevent new harm to the environment as well as repair the environmental damage caused by existing development, particularly for projects that pre-dated TRPA’s existence. To this end, the plan created incentives to redevelop urbanized sites under more protective regulations and to transfer development out of sensitive areas that would then be restored. Third, TRPA adopted a capital investment program that was largely but not exclusively publicly funded to achieve and maintain thresholds by improving infrastructure and repairing environmental damage. In 1997, TRPA replaced this program with its Environmental Improvement Program (EIP). In subsequent years, TRPA generated investments of well over \$1 billion in public and private money to

restore ecosystems and improve infrastructure under the EIP. Recent litigation confirmed that the Regional Plan as established in 1987 and subsequently amended over time will achieve and maintain the adopted environmental thresholds. *Sierra Club v. Tahoe Reg'l Planning Agency*, 916 F.Supp.2d 1098 (E.D. Cal. 2013).

The proposed amendment of the Regional Plan and Code of Ordinances does not alter the findings made regarding the previously certified RPU EIS and RTP EIR/EIS's, and the findings made on December 12, 2012 for the RPU and RTP; TRPA finds the Regional Plan and all its elements, as amended by the 2021 RTP/SCS, will achieve and maintain the thresholds. The proposed amendment of the Regional Plan and Code of Ordinances would support existing Regional Plan policies and programs and would result in no significant impacts to thresholds. The proposed amendment of the Regional Plan and Code of Ordinances is also designed to promote and accelerate attainment of Regional Plan goals and policies, as well as the remaining thresholds. Thus, the Threshold Standard Amendment, will support the continued ability of the Regional Plan to achieve and maintain the thresholds.

As note above, in 2012, TRPA found that the Regional Plan as revised would achieve and maintain thresholds. Those findings are incorporated by reference herein and hereby readopted. No changed circumstances have occurred to require amendment.

The proposed amendments do not conflict with any Regional Plan provision designed to achieve and maintain thresholds. As discussed in finding 4.4 above, the proposed amendments will improve the implementation of threshold attainment strategies by incentivizing environmentally beneficial redevelopment, reducing reliance on the automobile, and aligning with state and regional greenhouse gas reduction efforts.

As analyzed in the IEC, the proposed amendments would ensure environmental neutrality despite converting to a Project Impact Assessment framework that focuses on VMT rather than DVTE.

As a result of the foregoing, the Regional Plan, as amended, will continue to achieve and maintain the adopted thresholds.

TRPA Code of Ordinances Section 4.6: Findings Necessary to Amend or Adopt TRPA Ordinances, Rules, or Other TRPA Plans and Programs

Finding: The Regional Plan and all of its elements, as implemented through the Code, Rules, and other TRPA plans and programs, as amended, achieves and maintains thresholds.

Rationale: As discussed within Section 4.4 and 4.5 above, the Regional Plan and all of its elements, as amended, achieves and maintains thresholds. The proposed amendments will improve the implementation of threshold attainment strategies by encouraging environmentally beneficial redevelopment, reduced dependence on the automobile, and greenhouse gas reduction.



STATEMENT OF NO SIGNIFICANT EFFECT

Project Description: Amendment to Regional Plan Chapters 2, 3, and 7; and amendment to the TRPA Code of Ordinances Chapter 2, 3, 22, 34, 39, 50, 65, 82, and 90 to align the Regional Plan and Code of Ordinances with the 2021 Regional Transportation Plan and revisions to the Threshold Standards.

Staff Analysis: In accordance with Article IV of the Tahoe Regional Planning Compact, as amended, and Section 6.6 of the TRPA Rules of Procedure, TRPA staff reviewed the information submitted with the subject project.

Determination: Based on the Initial Environmental Checklist, Agency staff found that the subject project will not have a significant effect on the environment.

TRPA Executive Director/Designee

Date

Attachment M

Draft Findings – 2020 RTP/SCS

REGIONAL TRANSPORTATION PLAN AND SUSTAINABLE COMMUNITIES STRATEGY: LINKING TAHOE

APPROVAL FINDINGS

SECTION A. CHAPTER 3 -- REQUIRED FINDINGS:

1. Finding: The proposed project could have a significant effect on the environment, but due to the listed mitigation measures which have been added to the project, could have no significant effect on the environment and a mitigated finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedure.

Rationale: Based on the completed California Environmental Quality Act Initial Study/Negative Declaration and TRPA Initial Environmental Checklist/Finding of No Significant Effect (IS/IEC), no significant environmental impacts have been identified as a result of the proposed Regional Transportation Plan/Sustainable Communities Strategy (2020 RTP/SCS). The IS/IEC evaluated the potential environmental impacts of the 2020 RTP/SCS and tiers from the TRPA/Tahoe Metropolitan Planning Organization (TMPO), *Mobility 2035: Regional Transportation Plan/Sustainable Communities Strategy EIR/EIS*, certified by the TMPO Board and the TRPA Governing Board on December 12, 2012 (RTP EIR/EIS).

The 2020 RTP/SCS evaluated by the IS/IEC makes some changes to the constrained project list, the vision, goals, policies, and programs of the 2017 RTP and includes the 2012 RPU land use strategy. The IS/IEC therefore analyzed the environmental impacts arising from changes over the existing 2012 and 2017 RTPs.

The IS/IEC is a program-level environmental document. All future projects identified in the IS/IEC are subject to the appropriate project-level environmental review and permitting. Project-level environmental documents will require identification of, and mitigation for, any potentially significant environmental impacts.

SECTION B: TRPA CODE CHAPTER 4/COMPACT ARTICLE V(G) – REQUIRED FINDINGS:

TRPA Code Section 4.4 – Findings to Amend the Regional Plan, Including Goals and Policies, Code of Ordinances or Other Implementing Plans:

1. Finding: The 2020 Regional Transportation Plan/Sustainable Communities Strategy is consistent with and will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, the Code and other TRPA plans and programs.

Rationale: Based on the analysis in the TRPA Staff Reports for the 2012 and 2017 Regional Transportation Plans, the 2020 RTP/SCS IS/IEC, and the 2015 Threshold Evaluation (November 2016) the Governing Board finds the amendments to the Linking Tahoe: Regional Transportation Plan(RTP), are consistent with, and will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, the Code, and other TRPA plans and programs (as amended).

As described in the accompanying Staff Report and the IS/IEC, the RTP amendments to TRPA’s Transportation Goals and Policies, and the RTP itself complement and accelerate implementation of the Regional Plan and its objectives: achievement and maintenance of Thresholds while planning for reasonable growth. As explained in the approval consistency findings below and in the IS/IEC, the 2020 RTP/SCS is consistent with the Regional Plan, including all applicable Goals and Policies, plan area statements and maps, the Code and other TRPA plans and programs with the mitigation measures included in the project. The approval findings relating to consistency and IS/IEC consistency analysis are incorporated herein by reference.

The Goals and Policies amendments and the 2020 RTP/SCS are otherwise consistent with and will not adversely affect all applicable compliance measures, indicators, additional factors and supplemental compliance measures and attainment of target dates as identified in the 2015 Threshold Evaluation.

For the 2020 RTP/SCS and the amendments’ specific mitigation measures, TRPA has identified in the IS/IEC an adequate means by which the mitigation measure’s effectiveness will be

evaluated. To the extent that the amendments or the 2020 RTP/SCS would result in direct or indirect physical environmental effects, the IS/IEC addressed all such effects. Therefore, no further mitigation is required.

Based on the foregoing and findings 2, 3 and 4 below, the Governing Board finds that adopting the 2020 RTP/SCS and RTP amendments will not adversely affect implementation of the entire Regional Plan, including all applicable Goals and Policies, Plan Area Statements and maps, the Code and other TRPA plans and programs (as amended).

2. Finding: The Goals and Policies amendments and the project itself will not cause the environmental threshold carrying capacities to be exceeded.

Rationale: Based on the rationale for the foregoing finding, the analysis in the IS/IEC, the Staff Report, and TRPA Compact V(g) Findings below, and the 2015 Threshold Evaluation, the Governing Board finds Goals and Policies amendments and the 2020 RTP/SCS will not cause the environmental threshold carrying capacities to be exceeded.

This conclusion is based on the status review of the Threshold Standards in the 2015 Threshold Evaluation including target dates, interim targets, and compliance measures needed to achieve and maintain thresholds and the IS/IEC.

As discussed in the IS/IEC, there are no unmitigated adverse impacts to the Thresholds. The IS/IEC evaluated the proposed Goals and Policies amendments' potential impacts on environmental threshold carrying capacities. As explained in the Compact Article VII(d) and Chapter 3 Findings, which are incorporated herein by reference, changes or alterations have been required in or incorporated into the proposed amendments and project which avoid or reduce any significant adverse environmental effects of proposed amendments to a less than significant level.

3. Finding: Wherever stricter federal, state or local air and water quality standards apply for the Region, pursuant to Article V(d) of the TRPA Compact, the Goals and Policies amendments and the project itself meets or exceed such standards.

Rationale: Based on the rationale for the foregoing findings, the analysis in the IS/IEC and TRPA Compact V(g) Findings below, and the 2015 Threshold Evaluation, the Governing Board finds the Goals and Policies amendments and the 2020 RTP/SCS will not cause the federal, state and local air and water quality standards applicable for the Region to be exceeded.

Neither the Goals and Policies amendments, nor the RTP, themselves, affect or change the federal, state or local air and water quality standards applicable for the Region. As disclosed in the IS/IEC, these standards were used as criteria of significance where applicable and no unmitigable impacts were found.

4. Finding: The Regional Plan, as amended, achieves and maintains the thresholds.

Rationale: **I. Introduction**

In 1980, Congress amended the Compact to accelerate the pace of environmental progress in the Tahoe Region by tasking TRPA with adopting a regional plan and implementing regulations that protect the unique national treasure that is Lake Tahoe. First, Article V (b) required that TRPA, in collaboration with Tahoe's other regulatory agencies, adopt "environmental threshold carrying capacities" (thresholds or standards) establishing goals for a wide array of environmental criteria, including water quality, air quality, and wildlife. Second, Article V(c) directed TRPA to adopt a regional plan to "achieve and maintain" these thresholds, and to "continuously review and maintain" implementation of the plan.

The 1980 Compact instated an era of establishing and enforcing rigorous controls on new development. In 1982, TRPA adopted the necessary thresholds for the Tahoe Region. These thresholds are a mix of both long- and short-term goals for the Tahoe Region. The Region was in attainment of a number of these thresholds shortly after the adoption of the Regional Plan and remains in attainment today. Other thresholds address more intractable issues; for example, TRPA established numeric water quality standards that, even under best-case conditions, could not be attained for decades. *See, e.g., League to Save Lake Tahoe v. Tahoe Reg'l Planning Agency*, 739 F. Supp. 2d 1260, 1265 (E.D. Cal. 2010).

The second phase in this process was establishing a regional plan that, when implemented through rules and regulations, would ultimately achieve and maintain these thresholds over time. In 1987, following years of negotiation and litigation, TRPA adopted its Regional Plan. The 1987 plan employed a three-pronged approach to achieve and maintain the adopted environmental standards. First, the plan established a ceiling on development in the Region and restricted the placement, timing, and extent of new development. Second, the plan sought to prevent new harm to the environment as well as repair the environmental damage caused by existing development, particularly for projects that pre-dated TRPA's existence. To this end, the plan created incentives to redevelop urbanized sites under more protective regulations and to transfer development out of sensitive areas that would then be restored. Third, TRPA adopted a capital investment program that was largely but not exclusively publicly funded to achieve and maintain thresholds by improving infrastructure and repairing environmental damage. In 1997, TRPA replaced this program with its Environmental Improvement Program (EIP). In subsequent years, TRPA generated investments of well over \$1 billion in public and private money to restore ecosystems and improve infrastructure under the EIP. Recent litigation confirmed that the Regional Plan as established in 1987 and subsequently amended over time will achieve and maintain the adopted environmental thresholds. *Sierra Club v. Tahoe Reg'l Planning Agency*, 916 F.Supp.2d 1098 (E.D. Cal. 2013).

(1) Regional Plan Update Process

Even though implementation of the 1987 Regional Plan would achieve and maintain the thresholds, in 2004 TRPA began public outreach and analysis of the latest science and monitoring results to identify priority areas in which the Regional Plan could be comprehensively strengthened to accelerate the rate of threshold attainment. TRPA's policymakers realized that the challenges facing the region differed from those confronting the agency when it adopted its original Regional Plan in 1987. Uncontrolled new growth that had been the primary threat decades earlier had been brought into check by the strict growth limitations in the 1987 Plan. Contemporary problems differed, resulting from the continuing deterioration and lack of upgrades to existing legacy development. In essence, to make the greatest

environmental difference, the Tahoe Basin needed to fix what was already in place. In addition, TRPA realized some existing land-use controls could be improved to remove barriers to redevelopment that would address ongoing environmental degradation caused by sub-standard development constructed before TRPA had an adopted Regional Plan or even came into existence. Land use regulations and public and private investment remain essential to attaining the thresholds for Lake Tahoe.

Furthermore, TRPA recognized that the social and economic fabric of the Tahoe Region could not support the level of environmental investment needed. The economic foundation of gaming had fallen away, and the level of environmental investment needed could not be supported solely by an enclave of second homes for the wealthy. Businesses and the tourism sector were faltering. Affordable housing and year-round jobs were scarce. Local schools were closing, and unemployment was unusually high. In light of these realities, TRPA sponsored an ongoing outreach program to obtain input on how to advance TRPA's environmental goals. Between 2004 and 2010, TRPA conducted over 100 public meetings, workshops, and additional outreach. More than 5,000 people provided input regarding their vision for TRPA's updated Regional Plan. Based on this input, TRPA identified a number of priorities to be addressed by the updated Regional Plan, including:

1. Accelerating water quality restoration and other ecological benefits by supporting environmental redevelopment opportunities and EIP investments.
2. Changing land-use patterns by focusing development in compact, walkable communities with increased alternative transportation options.
3. Transitioning to more permitting by local governments to create one-stop and one permit for small to medium sized projects, where local government wanted to assume these duties.

On December 12, 2012, TRPA's nine-year effort culminated with the approval of the Regional Plan Update.

(2) Regional Plan Update Amendments

The Regional Plan Update (RPU) uses multiple strategies targeting environmental improvements to accelerate achieving and maintaining threshold standards in the Region. First, the

RPU maintained both regulatory and implementation programs that have proven effective in protecting Lake Tahoe's environment. TRPA's regional growth control regulatory system, strict environmental development standards, and inter-agency partnerships for capital investment and implementation (e.g., EIP) remain in place.

Second, the RPU promotes sensitive land restoration, redevelopment, and increases the availability of multi-modal transportation facilities. The implementation of the RPU facilitates transferring existing development from outlying, environmentally-sensitive areas into existing developed community centers. The RPU provides incentives so that private capital can be deployed to speed this transformation.

Third, the RPU authorizes the Area Plan process, pursuant to Chapter 13: *Area Plans* of the TRPA Code of Ordinances, for local jurisdictions in the Lake Tahoe Region in order to address the local issues and opportunities of unique communities in the Region, and to eliminate duplicative and unpredictable land use regulations that deterred improvement projects.

(3) The 2020 Regional Transportation Plan

Every four years TRPA prepares a regional transportation plan that outlines the overall vision for developing, operating, and maintaining the Lake Tahoe Region's transportation system. The 2020 Regional Transportation Plan offers strategies to address the routine travel demands of residents and commuters, as well as the recreational travel demands of visitors that during peak periods stress and cause congestion on Lake Tahoe's transportation system. Strategies focus on projects and programs that dynamically meet the needs of all roadway users by offering better travel mode options, creating incentives that spread out the times, places, and ways people travel to improve traffic flow, and by providing safe and equitable access to all the places people want to go.

The plan in its implementation is a threshold attainment program that delivers increments of improvement to many threshold categories. The plan also serves as the Region's Sustainable Communities Strategy, describing the land-use scenarios and transportation investments that allow the Tahoe

Region to meet its mobile source greenhouse gas emissions reductions targets.

As noted above, a variety of strategies in the Regional Plan and RTP work together to accelerate needed environmental gains in the categories where threshold benefits are most needed – water quality, restoration of sensitive lands, scenic quality advances in developed roadway units, and efforts to continue maintenance and attainment of air quality standards.

(4) The 2015 Threshold Evaluation

In 2016, TRPA completed the 2015 Threshold Evaluation Report. This report considers conditions relative to 178 standards in nine threshold categories. In general, compared to 2011, more standards showed improvement with attainment moving from 63 percent (58 standards) to 70 percent (77 standards). Status continued to improve for water clarity, air quality, scenic and soil conservation. Areas needing continued focus include removal of land coverage on sensitive lands, new threats to forest vegetation, deepwater plant communities, and the need for continued emphasis on water quality conditions (macroinvertebrates, periphyton (algae) and AIS control).

The next section of this finding establishes how implementation of the 2020 RTP is expected to result in further threshold gain.

II. RTP and Threshold Gain

The RTP accelerates threshold gain, including water quality restoration and other ecological benefits, by supporting environmental redevelopment opportunities and EIP investments. The 2020 RTP does not alter the Regional Plan's established growth control system, the incentives for property owners to hasten the transfer of development rights from sensitive lands or from outlying areas to the Town Center where redevelopment is better suited and will have beneficial or reduced adverse environmental impacts, or any of the EIP restoration program. The RTP will help to promote a sustainable and more efficient transportation system connecting communities and recreation sites.

As described in more specific detail below, the RTP beneficially affects multiple threshold areas.

A. Water Quality

Lake clarity has continued to improve in recent years. The five-year running average from 2010 to 2015 was 22.3 meters (73.2 feet), 18 feet better than forecasted in 2000. The continued improvement is a strong indication that the actions of partners in the Region are contributing to improved clarity and helping TRPA attain one of its signature goals.

The success of the aquatic invasive species (AIS) prevention program is another notable achievement. Thanks to the inspection of more than 200,000 watercraft prior to launch and the decontamination of more than 44,000 boats, no new AIS have been discovered in Lake Tahoe since the program's inception in 2007.

Signals of improving environmental health are also visible in other water quality parameters. The Threshold Evaluation report shows for the first time that pollutant loads from the non-urban uplands are likely decreasing as the watersheds recover from past disturbance.

The 2020 RTP/SCS benefits water quality thresholds by implementation of projects that will prevent sediment and other pollutant deposition into waterways. The 2020 RTP/SCS includes several operations and maintenance improvement policies and projects aimed at improving water quality in the region. The Tahoe Valley Greenbelt includes water quality enhancements such as improving existing drainage systems to spread, treat, infiltrate, and retain flows from roadways, commercial areas, and other high priority or urbanized areas. Additionally, several shared use and complete streets projects included in the 2020 RTP/SCS include source control, conveyance, and treatment facilities for stormwater runoff as well as improvements to address urban stormwater quality and flooding. Similar to the 2012 and 2017 RTP/SCS, any new development or redevelopment project would be required to comply with existing TRPA, federal, and state regulations pertaining to the protection of surface and ground water quality. In addition, individual projects would be required to complete project specific environmental review and comply with local jurisdictional standards, which would further reduce impacts.

Therefore, the Regional Plan, as amended, will achieve and maintain the water quality thresholds.

B. Air Quality

The Tahoe Basin has made significant air quality gains. The majority of air quality indicators in the Lake Tahoe Basin were at or better than attainment with adopted thresholds and standards. In total 15 of 16 indicators were in attainment with almost all having improving trends. Two indicators had insufficient data to make a determination (2015 Threshold Evaluation Report, Chapter 3, *Air Quality*). Federal and state tailpipe and industrial emission standards have likely contributed to this achievement along with local projects which delivered walkable, transit-friendly improvements such as the Heavenly Gondola (See 2011 Threshold Evaluation Report at pages 3-14, 3-16, and 3-18; Yang et al. 2010, Park Avenue/U.S. 50 Redevelopment Phase 1, Case Study, available at: <http://lafoundation.org/myos/my-uploads/2012/10/31/park-ave-methodology.pdf>). The Regional Plan and Regional Transportation Plan include a suite of strategies to help the Region meet air quality threshold standards (TRPA Goals and Policies: Air Quality Sub element at pages 2-33 to 2-35; 2020 RTP/SCS Chapter 3, *The Plan*, Appendix B, *Project List and Appendix C, Revenue Narrative*). While there are many programs and policies that contribute to air quality threshold attainment, the two primary regional strategies are:

- 1) Supporting environmental redevelopment. Land Use policies outlined in the Regional Plan support clustering population and employment in compact Town Centers that are well served by transit, pedestrian, and bicycle infrastructure. The Regional Plan achieves this by incentivizing redevelopment and transfers of development from outlying and sensitive areas into existing Town Center areas. (TRPA Goals and Policies: Chapter 2, *Land Use*.)
- 2) Creating walkable communities and increased alternative transportation options. The Regional Plan and the 2020 RTP/SCS, outlines the policies, programs and projects that provide a transportation system that supports this compact form of development and that will help to

create an environment where walking, biking, and transit are convenient modes of transportation.

The 2020 RTP/SCS would implement VMT-reducing projects and programs that are designed to reduce associated air pollutant emissions by promoting more efficient travel patterns, facilitating the use of active transportation, and enhancing and expanding transit service. The combination of compact land-uses and convenient, diverse transportation options is intended to allow more travel to be conducted on foot, by bike, or by transit, resulting in fewer and shorter vehicle trips per person and reducing negative impacts to air quality associated with motor vehicle travel. The benefits of these strategies are further articulated in the 2020 RTP/SCS.

Additionally, the RPU EIS and 2020 RTP/SCS IS/IEC demonstrated that the combination of improvements would allow the Region to achieve and maintain air quality thresholds (see Regional Plan Update Draft EIS, Chapter 3.3: *Transportation*, and Chapter 3.4: 2017 RTP/SCS IS/IEC, Chapter 3.4.5: *Transportation* and Chapter 3.4.2: *Air Quality*).

The 2020 RTP/SCS policies are focused on making connections to recreational access areas, prioritizing public and active transit, making efficient use of the existing system through technology, monitoring, and transportation demand management, increasing safety and security, and supporting economic vitality and high quality of life for residents and experience for visitors. These policies build from the 2017 RTP/SCS which focused on bikeable and walkable town centers and now focuses on connections between town centers, neighborhoods, and recreation sites.

As described above, the 2020 RTP/SCS includes new provisions that will build upon existing provisions of the Regional Plan and will support accelerated attainment and maintenance of air quality thresholds.

C. Soil Conservation

The Soil Conservation environmental thresholds include standards for each Land Capability District (LCD) and a standard for SEZs. The LCD standards are all in attainment (at or better than target, i.e. Bailey LCD limitations) with the exception of LCD 1b, which is considerably worse than target with a trend toward

moderate improvement, and LCD 2, which is somewhat worse than target with little to no change. The SEZ standard, “Preserve and Restore Stream Environment Zones” is described as Considerably Worse than Target with a trend toward moderate improvement. The threshold for SEZs is as follows:

Preserve existing naturally functioning SEZ lands in their natural hydrologic condition, restore all disturbed SEZ lands in undeveloped, unsubdivided lands, and restore 25 percent of the SEZ lands that have been identified as disturbed, developed or subdivided, to attain a 5 percent total increase in the area of naturally functioning SEZ lands.

The Goals and Policies in the Regional Plan that provide direction for attainment of the SEZ Threshold are contained in the SEZ, Soils, and Land Use Sub elements. (TRPA Goals and Policies: Chapter 4: *Conservation* at pages 4-14 to 4-16 and 4-24 to 4-27; TRPA Goals and Policies Chapter 2: *Land Use* at pages 2-2 to 2-19.) The SEZ Sub element currently contains one goal and eight associated policies. The goal calls for the long-term preservation, enhancement, and restoration of SEZ lands as a means of achieving various environmental thresholds. The policy statements direct the restoration, preservation, and management of SEZ lands by setting numeric goals for restoration of degraded/developed SEZ lands and requiring their protection and management for natural functions and values. The TPRA Code implements this policy and includes regulatory strategies and measures to achieve the goals listed in the SEZ Sub element of the Regional Plan.

The IS/IEC analyzed potential impacts to soils and found that the impacts would be less than significant as a result of implementation of the plan (Chapter 4.7, *Geology and Soils*). The 2020 RTP/SCS does not include provisions to alter or revise regulations pertaining to grading and soil disturbance or requirements related to coverage and protection of SEZ lands. Furthermore, implementation of transportation infrastructure projects would include drainage and soil retention infrastructure on project sites which could result in improved SEZ function.

Therefore, the Regional Plan, as amended by the 2020 RTP/SCS, will achieve and maintain the soils thresholds.

D. Scenic Quality

The Tahoe Basin continues to make gains in scenic quality (2015 Threshold Evaluation Report: Chapter 9: *Scenic Resources*.) All six of the scenic threshold categories are overall in attainment, with two categories showing an improving trend (2015 Threshold Evaluation Report, page ES-3). As described in the RPU EIS (at page 3.9-17), the increasing trend in scenic quality is primarily due to redevelopment activities that replace old structures with updated, more scenically compatible design and the undergrounding of utilities. Examples of documented scenic improvement from redevelopment activities include the Heavenly Village/Gondola, the Chateau, and South Lake Tahoe Safeway projects.

The IS/IEC analyzed potential impacts to scenic resources and found the impacts would be less than significant (Chapter 4.1, *Aesthetics*). The 2020 RTP/SCS maintains provisions related to design standards and scenic attainment. Furthermore, the 2015 Threshold Evaluation found that scenic resources at a regional scale were shown to improve as a result of development of recreation and bike trails. Construction and operation of new transportation projects would be required to comply with design, shielding, and lighting standards.

Therefore, the Regional Plan, as amended by the 2020 RTP/SCS, will achieve and maintain the scenic thresholds.

E. Vegetation

The Regional Plan and partner agencies have successfully protected sensitive plant species and kept those thresholds in attainment (2015 Threshold Evaluation Report: Chapter 6, *Vegetation Preservation*). A few uncommon plant communities fell short of attainment primarily because of non-native species. Aquatic invasive species, noxious weeds, and beaver were identified as potential threats to the integrity of uncommon plant communities. Progress is being made on fuels reduction and forest ecosystem restoration. (2015 Threshold Evaluation Report: Chapter 6, *Vegetation Preservation*; Environmental Improvement Program Accomplishments 1997-2012 available at: http://www.trpa.org/wp-content/uploads/EIP_1pager_Summit2013_FINAL2.pdf).

The 2020 RTP/SCS IS/IEC analyzed potential impacts to vegetation and found that the impacts would be less than significant (Chapter 4.4, *Biological Resources*). The RTP/SCS does not include provisions to alter or revise regulations pertaining to native vegetation protection during construction, vegetation removal or groundwater management, new vegetation, unique, rare, or endangered species of plants, stream bank or backshore vegetation, or tree removal.

Therefore, the Regional Plan as amended by the 2020 RTP/SCS, will achieve and maintain the vegetation thresholds.

F. Recreation

Both Recreation Thresholds have been implemented and are in attainment. (2015 Threshold Evaluation Report: Chapter 11, *Recreation*.) TRPA partners have made substantial progress in upgrading recreational facilities through the EIP. (2015 Threshold Evaluation Report at pages 11-11 to 11-16.)

The 2020 RTP/SCS IS/IEC analyzed potential impacts to recreation and found the impacts would be less than significant for some impact areas, and beneficial to others (Chapter 4.16, *Recreation*). Projects in the 2020 RTP/SCS would further result in improved capacity of the recreational system through more frequent transit, traffic management and information technology, as well as pedestrian and bicycle amenities that will enable residents and visitors to more easily access and connect to recreation locations and experiences.

Therefore, the Regional Plan as amended by the 2020 RTP/SCS, will achieve and maintain the recreation thresholds.

G. Fisheries

TRPA and partner agencies have implemented a robust aquatic invasive species control and prevention program; however, aquatic invasive species continue to be a major area of concern because of their threat to fisheries and other aquatic biota (2015 Threshold Evaluation Report: Chapter 7, *Fisheries*).

The 2020 RTP/SCS will not alter the resource management and protection regulations, Chapters 60 through 68, or shorezone regulations, Chapters 80 through 85, of the TRPA Code of Ordinances. Chapter 63: *Fish Resources*, of the Code of

Ordinances includes the provisions to ensure the protection of fish habitat and provide for the enhancement of degraded habitat.

The 2020 RTP/SCS IS/IEC analyzed potential impacts to biological resources, including fisheries, and found impacts to be less than significant (Chapter 4.4, *Biological Resources*). Projects contained within the 2020 RTP/SCS would not affect fisheries, and for sites where infrastructure projects include stormwater retention improvements, the water quality would be improved for receiving water bodies that provide fish habitat.

Therefore, the Regional Plan as amended by the 2020 RTP/SCS, will achieve and maintain the fisheries thresholds.

H. Wildlife

Indicators for special interest wildlife species show stable or improving conditions (2015 Threshold Evaluation Report: Chapter 8, *Wildlife*). TRPA's development regulations have protected riparian wildlife habitats, and partner agencies are making progress restoring these valuable habitats (2015 Threshold Evaluation Report at pages 8-34 to 8-36).

The 2020 RTP/SCS will not alter the resource management and protection regulations, Chapters 60 through 68, of the TRPA Code of Ordinances. In addition, any future projects contemplated by the 2020 RTP/SCS would be subject to additional project-level environmental review and permitting. Consistent with existing conditions, permit applicants would be required to demonstrate that any proposals would occur consistent with TRPA Code provisions related to resource management, including specifically the provisions of Chapters 62 and 63 that address protection of wildlife and fish resources, respectively.

The IS/IEC analyzed potential impacts to biological resources, including wildlife, and found the impacts would be less than significant. The RTP/SCS does not include provisions to alter or revise regulations related to wildlife habitat, monitoring and disturbance during construction.

Therefore, the Regional Plan as amended by the 2020 RTP/SCS, will achieve and maintain the wildlife thresholds.

I. Noise

TRPA has adopted noise standards for the Tahoe Basin. The noise thresholds are Community Noise Equivalent Level (CNEL) values for the various land use categories and single event (Lmax) standards for specific noise sources. CNEL is the metric used by TRPA for determining land use compatibility. No one activity, nor combination of activities, can exceed the applicable CNEL level. CNELs are calculated pursuant to Chapter 68 of the TRPA Code of Ordinances.

The IS/IEC analyzed potential impacts related to noise and found the impacts to be less than significant, although the noise models in the IS/IEC estimated minor increases in traffic noise levels. Because implementation of the 2020 RTP/SCS would not result in substantially louder traffic noise levels in 2045 than the baseline levels and 2040 levels presented in the 2017 RTP/SCS EIR/EIS, this would not be a significantly more severe impact.

Therefore, the Regional Plan, as amended by the 2020 RTP/SCS will achieve and maintain the noise thresholds.

III. Conclusion

Based on the rationale described above, the 2020 RTP/SCS IS/IEC, the attached Compliance Measures and Threshold Status spreadsheets, the previously certified RPU EIS and RTP EIR/EIS's, and the findings made on December 12, 2012 for the RPU and RTP; TRPA finds the Regional Plan and all its elements, as amended by the 2020 RTP/SCS, will achieve and maintain the thresholds. The 2020/SCS RTP would maintain existing Regional Plan policies and programs and would result in no significant impacts to thresholds. The 2020 RTP/SCS also includes specific policies and implementation measures that would accelerate attainment and maintenance of thresholds. Thus, the Regional Plan, as amended by the 2020 RTP/SCS, will continue to achieve and maintain the thresholds.



STATEMENT OF NO SIGNIFICANT EFFECT

Project Description: 2020 Regional Transportation Plan / Sustainable Communities Strategy

Staff Analysis: In accordance with Article IV of the Tahoe Regional Planning Compact, as amended, and Section 6.6 of the TRPA Rules of Procedure, TRPA staff reviewed the information submitted with the subject project.

Determination: Based on the Initial Environmental Checklist, Agency staff found that the subject project will not have a significant effect on the environment.

TRPA Executive Director/Designee

Date

Attachment N

Draft Adopting Ordinances

1) Threshold Amendments

TAHOE REGIONAL PLANNING AGENCY
ORDINANCE 2021-___

AN ORDINANCE UPDATING AIR QUALITY THRESHOLD STANDARD 14
TO ESTABLISH AND REFLECT THE REGIONAL GOALS OF PROMOTION
OF MOBILITY, REDUCE GREENHOUSE GAS EMISSIONS, AND REDUCE
DEPENDENCY ON THE AUTOMOBILE.

The Governing Board of the Tahoe Regional Planning Agency does ordain as follows:

Section	Findings
1.00	
1.05	The Tahoe Regional Planning Compact (P. L. 96-551, 94 Stat. 3233, 1980) created the Tahoe Regional Planning Agency (TRPA) and empowered it to set forth environmental threshold carrying capacities (“threshold standards”) for the Tahoe Region.
1.10	The Compact defines “environmental threshold carrying capacity” 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”.
1.15	The Compact directs TRPA to adopt and enforce a Regional Plan that, as implemented through agency ordinances, rules and regulations, will achieve and maintain such threshold standards while providing opportunities for orderly growth and development consistent with such thresholds.
1.20	The Compact further requires that the Regional Plan attain and maintain federal, state, or local air and water quality standards, whichever are strictest, in the respective portions of the region for which the standards are applicable.
1.35	In August 1982, pursuant to Compact Article V(c), the TRPA Governing Board adopted Resolution 82-11, which set forth in its Exhibit A the threshold standards for the Tahoe Region.
1.30	Compact Art. V(c) states that the TRPA Governing Board and Advisory Planning Commission shall continuously review and maintain the Regional Plan. Resolution 82-11 also states that TRPA should review and update the threshold standards from time to time.

- 1.35 In April 2019, the TRPA Governing Board adopted Ordinance 2019-03, superseding and replacing Resolution 82-11 by collocating the environmental threshold standards with the Regional Plan Goals and Policies.
- 1.40 Ordinance 2019-03 specified numerical standards, management standards, and policy statements to assist in the achievement and maintenance of such thresholds standards.
- 1.45 Ordinance 2019-03 states that the established threshold standards serve as the basis for a long-term program to protect and enhance the significant environmental values of the Tahoe Region and that said “program will be reviewed from time to time to ensure its consistency with the currently available scientific evidence and technical and other information.”
- 1.50 Ordinance 2019-03 requires the amendment of the pertinent threshold standard where scientific evidence and technical information indicate: (1) two or more threshold standards are mutually exclusive; (2) substantial evidence to provide a basis for a threshold standard does not exist; (3) a threshold standard cannot be achieved; or (4) a threshold standard is not sufficient to maintain a significant value of the Region or additional threshold standards are required to maintain a significant value.
- 1.55 TRPA has determined that the threshold standard (Air Quality Threshold Standard 14) to be amended meets the criteria of Ordinance 2019-03, and, further, TRPA may amend the threshold standards pursuant to its discretion as provided in the Compact.
- 1.60 It is necessary and desirable to amend TRPA Ordinance 2019-03, as amended, by amending the threshold standard pursuant to Article V(c) and other applicable provisions of the Tahoe Regional Planning Compact.
- 1.65 TRPA has made the necessary findings required by Article V of the Compact, Chapter 4 of the Code, and all other applicable rules and regulations, and incorporates these findings fully herein.
- 1.70 The Advisory Planning Commission (APC) and Regional Plan Implementation Committee (RPIC) conducted a public hearing on the amendment and issued a recommendation regarding the adoption of the amendment. The Governing Board has also conducted a noticed public hearing on the amendment. At the hearings, oral testimony and documentary evidence were received and considered.
- 1.75 The Governing Board finds that the amendment adopted here will satisfy Compact requirements and that Air Quality Threshold Standard 14 , as amended by this Ordinance, is “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.”

- 1.80 The Amendment to Air Quality Threshold Standard 14 adopted by this Ordinance will be achieved and maintained through implementation of TRPA’s Regional Plan as implemented through agency ordinances, rules and regulations.
- 1.82 Nitrogen is a pollutant of concern in the Lake Tahoe Basin, and Air Quality Threshold Standard 14 was adopted in 1982 to reduce in basin nitrogen emissions from the transportation sector.
- 1.84 Current in basin nitrogen emissions from the transportation sector are less than 50% of what they were in 1981 and far in exceedance of the 10% reduction established by AQ 14.
- 1.86 Future nitrogen emissions from the transportation sector are likely to decline further as a result of cleaner cars.
- 1.90 Air Quality Threshold Standard 14 lacks a quantifiable baseline, and no longer conforms to the adopted requirements for a threshold standard.
- 1.92 Existing Air Quality Threshold Standard 14 reads as follows: (AQ14) Reduce vehicle miles of travel in the Basin by 10% of the 1981 base year values.”
- 1.94 Each of the foregoing findings is supported by substantial evidence in the record.

Section
2.00 – Update of Air Quality Threshold Standard 14

- 2.10 As amended, Air Quality Threshold Standard 14 sets forth an efficiency based VMT standard that better aligns with identified policies goals and affords consistency with California and Nevada state policies with respect to greenhouse gas emissions reduction and aligns with and is responsive to meaningful change in the regional land use and the transportation system.
- 2.20 Now, therefore, existing Air Quality Threshold Standard 14 is hereby amended to read as follows: “Transportation and Community Sustainability 1) A 6.8% reduction in per capita VMT from the 2018 baseline by 2045 and interim reduction targets to assess progress.”

3.00 – Interpretation and Severability

3.10 The provisions of this ordinance adopted hereby shall be liberally construed to affect their purpose. If any section, clause, provision, or portion thereof is declared unconstitutional or invalid by a court of competent jurisdiction, the remainder of this ordinance shall not be affected thereby. For this purpose, the provisions of this ordinance are hereby declared respectively severable.

4.00 – Effective Date

4.10 The provisions of this ordinance shall be effective immediately upon adoption.

PASSED AND ADOPTED by the Governing Board of the Tahoe Regional Planning Agency at a regular meeting held _____ by the following vote:

- Ayes:
- Nays:
- Abstain:
- Absent:

Mark Bruce, Chair
Tahoe Regional Planning Agency
Governing Board

Attachment N

Draft Adopting Ordinances

2) Regional Plan Amendments & Code Changes

TAHOE REGIONAL PLANNING AGENCY
ORDINANCE 2021-__

AN ORDINANCE AMENDING ORDINANCE 2019-03, AS AMENDED, AND
ORDINANCE 87-9, AS AMENDED, TO AMEND TRPA'S GOALS AND
POLICIES, CODE OF ORDINANCES, AND OTHER MATTERS RELATED
THERE TO

The Governing Board of the Tahoe Regional Planning Agency does ordain as follows:

Section 1.0

Findings

- 1.10 The Tahoe Regional Planning Compact (P. L. 96-551, 94 Stat. 3233, 1980) created the Tahoe Regional Planning Agency (TRPA) and empowered it to set forth environmental threshold carrying capacities ("threshold standards") for the Tahoe Region.
- 1.15 The Compact directs TRPA to adopt and enforce a Regional Plan that, as implemented through agency ordinances, rules and regulations, will achieve and maintain such threshold standards while providing opportunities for orderly growth and development consistent with such thresholds.
- 1.20 The Compact further requires that the Regional Plan attain and maintain federal, state, or local air and water quality standards, whichever are strictest, in the respective portions of the region for which the standards are applicable.
- 1.25 Compact Art. V(c) states that the TRPA Governing Board and Advisory Planning Commission shall continuously review and maintain the Regional Plan.
- 1.30 In June 1987, the TRPA Governing Board adopted Ordinance 87-9, which established the Regional Plan and included, amongst other things, the Goals & Policies and the Code of Ordinances ("Code").
- 1.35 In April 2019, the TRPA Governing Board adopted Ordinance 2019-03, superseding portions of Ordinance 87-9 by collocating the environmental threshold standards with the Regional Plan Goals and Policies.
- 1.40 Concurrent with this Ordinance, the TRPA Governing Board will approve Ordinance 2021-__, An Ordinance Updating Air Quality Threshold Standard 14 to Establish and Reflect the Regional Goals of Promotion of Mobility, Reduce Greenhouse Gas Emissions, and Reduce Dependency on the Automobile.
- 1.45 It is necessary and desirable to amend TRPA Ordinance 2019-03, as amended, which ordinance relates to the Regional Plan of the Tahoe Regional Planning Agency (TRPA) by amending the Goals & Policies pursuant to Article VI(a) and other applicable provisions of the Tahoe Regional Planning Compact in order to accelerate attainment and ensure maintenance of the threshold standards, as amended.

- 1.50 It is necessary and desirable to amend the TRPA Code of Ordinances (“Code”) to effectuate the amendments to the Goals & Policies pursuant to Article VI(a) and other applicable provisions of the Tahoe Regional Planning Compact.
- 1.55 TRPA has made the necessary findings required by Article V of the Compact, Chapter 4 of the Code, and all other applicable rules and regulations, and incorporates these findings fully herein.
- 1.60 Each of the foregoing findings is supported by substantial evidence in the record.

Section 2.0 Amendment of the TRPA Regional Plan Goals and Policies

- 2.10 Ordinance 2019-03, as previously amended, is hereby amended as shown in Exhibit D.

Section 3.0 Amendment of the TRPA Code of Ordinances

- 3.10 Ordinance 87-9, as previously amended, is hereby amended as shown in Exhibit E.

Section 4.0 Interpretation and Severability

- 4.10 The provisions of this ordinance adopted hereby shall be liberally construed to affect their purpose. If any section, clause, provision, or portion thereof is declared unconstitutional or invalid by a court of competent jurisdiction, the remainder of this ordinance shall not be affected thereby. For this purpose, the provisions of this ordinance are hereby declared respectively severable.

Section 5.0 Effective Date

- 5.10 Section 2.0 of this ordinance shall be effective immediately upon adoption; Section 3.0 shall be effective 60 days after adoption.

PASSED AND ADOPTED by the Governing Board of the Tahoe Regional Planning Agency at a regular meeting held _____ by the following vote:

Ayes:
Nays:
Abstain:
Absent:

Mark Bruce, Chair
Tahoe Regional Planning Agency
Governing Board

Attachment N

Draft Adopting Ordinances

3) RTP

TAHOE REGIONAL PLANNING AGENCY
ORDINANCE 2021-____

AN ORDINANCE AMENDING ORDINANCE 2019-03, AS AMENDED, TO ADOPT
THE 2020 LINKING TAHOE: REGIONAL TRANSPORTATION PLAN /
SUSTAINABLE COMMUNITIES STRATEGY

The Governing Board of the Tahoe Regional Planning Agency does ordain as follows:

Section 1.0 Findings

- 1.05 The Tahoe Regional Planning Compact (P. L. 96-551, 94 Stat. 3233, 1980) created the Tahoe Regional Planning Agency (TRPA) and empowered it to set forth environmental threshold carrying capacities (“threshold standards”) for the Tahoe Region.
- 1.10 The Compact directs TRPA to adopt and enforce a Regional Plan that, as implemented through agency ordinances, rules and regulations, will achieve and maintain such threshold standards while providing opportunities for orderly growth and development consistent with such thresholds.
- 1.15 The Compact further requires that the Regional Plan attain and maintain federal, state, or local air and water quality standards, whichever are strictest, in the respective portions of the region for which the standards are applicable.
- 1.20 Compact Art. V(c) states that the TRPA Governing Board and Advisory Planning Commission shall continuously review and maintain the Regional Plan.
- 1.25 In June 1987, the TRPA Governing Board adopted Ordinance 87-9, which established the Regional Plan and included, amongst other things, the Goals & Policies and the Code of Ordinances (“Code”).
- 1.30 In April 2019, the TRPA Governing Board adopted Ordinance 2019-03, superseding portions of Ordinance 87-9 by collocating the environmental threshold standards with the Regional Plan Goals and Policies.
- 1.35 It is necessary and desirable to amend TRPA Ordinance 2019-03, as amended, which ordinance relates to the Regional Plan of the Tahoe Regional Planning Agency (TRPA) by amending the Goals & Policies pursuant to Article VI(a) and other applicable provisions of the Tahoe Regional Planning Compact in order to accelerate attainment and ensure maintenance of the threshold standards.
- 1.40 TRPA has made the necessary findings required by Article V of the Compact, Chapter 4 of the Code, and all other applicable rules and regulations, and incorporates these findings fully herein.

1.45 The Advisory Planning Commission (APC) and Regional Plan Implementation Committee (RPIC) conducted public meetings on the amendments and recommended adoption of these amendments. The Governing Board has also conducted a noticed public hearing on the amendments. At these hearings, oral testimony and documentary evidence were received and considered.

1.50 The Governing Board finds that the amendments adopted here will continue to implement the Regional Plan, as amended, in a manner that achieves and maintains the adopted environmental threshold carrying capacities as required by Article V(c) of the Compact.

1.55 Each of the foregoing findings is supported by substantial evidence in the record.

Section 2.0 Amendment of the TRPA Regional Plan Goals and Policies

2.10 Ordinance 2019-03, as previously amended, is hereby amended as shown in Exhibit F.

Section 3.0 Interpretation and Severability

3.10 The provisions of this ordinance adopted hereby shall be liberally construed to affect their purpose. If any section, clause, provision, or portion thereof is declared unconstitutional or invalid by a court of competent jurisdiction, the remainder of this ordinance shall not be affected thereby. For this purpose, the provisions of this ordinance are hereby declared respectively severable.

Section 4.0 Effective Date

4.10 The provisions of this ordinance shall be effective immediately upon adoption.

PASSED AND ADOPTED by the Governing Board of the Tahoe Regional Planning Agency at a regular meeting held _____ by the following vote:

Ayes:

Nays:

Abstain:

Absent:

Mark Bruce, Chair
Tahoe Regional Planning Agency
Governing Board