TAHOE REGIONAL PLANNING AGENCY (TRPA)
AND TRPA COMMITTEE MEETINGS

NOTICE IS HEREBY GIVEN that on **Wednesday, August 28, 2019,** commencing at **9:45 a.m.,** at the **Tahoe Regional Planning Agency, 128 Market Street, Stateline, NV** the Governing Board Regional Plan Implementation Committee of the Tahoe Regional Planning Agency will conduct its regular meeting. The agenda is attached hereto and made part of this notice.

August 21, 2019

Joanne S. Marchetta, Executive Director

This agenda has been posted at the TRPA office and at the following locations: Post Office, Stateline, NV, North Tahoe Event Center in Kings Beach, CA, IVGID Office, Incline Village, NV, North Tahoe Chamber of Commerce, Tahoe City, CA, and South Shore Chamber of Commerce, Stateline, NV

TAHOE REGIONAL PLANNING AGENCY	
REGIONAL PLAN IMPLEMENTATION COMMITTEE	
TRPA	August 28, 2019
Stateline, NV	9:45 a.m.

All items on this agenda are action items unless otherwise noted. Items on the agenda, unless designated for a specific time, may not necessarily be considered in the order in which they appear and may, for good cause, be continued until a later date.

All public comments should be as brief and concise as possible so that all who wish to speak may do so; testimony should not be repeated. The Chair of the Committee shall have the discretion to set appropriate time allotments for individual speakers (3 minutes for individuals and 5 minutes for group representatives as well as for the total time allotted to oral public comment for a specific agenda item). No extra time for speakers will be permitted by the ceding of time to others. Written comments of any length are always welcome. So that names may be accurately recorded in the minutes, persons who wish to comment are requested to sign in by Agenda Item on the sheets available at each meeting. In the interest of efficient meeting management, the Chairperson reserves the right to limit the duration of each public comment period to a total of 2 hours. In such an instance, names will be selected from the available sign-in sheet. Any individual or organization that is not selected or otherwise unable to present public comments during this period is encouraged to submit comments in writing to the Governing Board. All such comments will be included as part of the public record.

"Teleconference locations for Board meetings are open to the public ONLY IF SPECIFICALLY MADE OPERATIONAL BEFORE THE MEETING by agenda notice and/or phone message referenced below."

In the event of hardship, TRPA Board members may participate in any meeting by teleconference. Teleconference means connected from a remote location by electronic means (audio or video). The public will be notified by telephone message at (775) 588-4547 no later than 6:30 a.m. PST on the day of the meeting if any member will be participating by teleconference and the location(s) of the member(s) participation. Unless otherwise noted, in California, the location is 175 Fulweiler Avenue, Conference Room A, Auburn, CA; and in Nevada the location is 901 South Stewart Street, Second Floor, Tahoe Hearing Room, Carson City, NV. If a location is made operational for a meeting, members of the public may attend and provide public comment at the remote location.

TRPA will make reasonable efforts to assist and accommodate physically handicapped persons that wish to attend the meeting. Please contact Marja Ambler at (775) 589-5287 if you would like to attend the meeting and are in need of assistance.

AGENDA

I. CALL TO ORDER AND DETERMINATION OF QUORUM

II. PUBLIC INTEREST COMMENTS – All comments may be limited by the Chair

Any member of the public wishing to address the Governing Board Regional Plan Implementation Committee on any item listed or not listed on the agenda may do so at this time. TRPA encourages public comment on items on the agenda to be presented at the time those agenda items are heard. Individuals or groups commenting on items listed on the agenda will be permitted to comment either at this time or when the matter is heard, but not both. The Governing Board Regional Plan Implementation Committee is prohibited by law from taking immediate action on or discussing issues raised by the public that are not listed on this agenda.

III. APPROVAL OF AGENDA

IV. APPROVAL OF MINUTES

V. PUBLIC HEARINGS

A. VMT Threshold standard update: Workplan, Preliminary Research on Mobility Metrics, and Interim Approach to Project-Level Analysis	**Discussion, Approval and Possible Direction to Staff**	**Page 1**

VI. PLANNING MATTERS

A. Upcoming Topics	**Informational Only**	**Page 33**

VII. COMMITTEE MEMBER REPORTS

VIII. PUBLIC COMMENT

IX. ADJOURNMENT

TAHOE REGIONAL PLANNING AGENCY
REGIONAL PLAN IMPLEMENTATION COMMITTEE

TRPA June 26, 2019
Stateline, NV

Meeting Minutes

I. CALL TO ORDER AND DETERMINATION OF QUORUM

Chair Mr. Shute called the meeting to order at 8:31 a.m.

Members present: Ms. Aldean, Mr. Bruce, Ms. Laine, Mr. Lawrence, Mr. Sevison, Mr. Shute, Mr. Yeates

II. PUBLIC INTEREST COMMENTS

Leo Schools said in addressing the Zebra mussels it is not a biological issue but rather an economy problem. He's disappointed that the dogs trained to detect Zebra mussels are not being used here. There is a trainer in Fresno, CA that will come to Lake Tahoe to perform the training. One Zebra mussel detected by a dog will save Lake Tahoe. One Zebra mussel will cause a loss to Lake Tahoe of $14 million per year according to the Department of Fish and Wildlife. He said the loss would be $100 to $200 million because the beaches will be covered with the Zebra mussel shells that are like razor blades and the eco system would be destroyed, therefore, no one will purchase a home in Lake Tahoe.

III. APPROVAL OF AGENDA

Mr. Shute deemed the agenda approved as posted.

IV. APPROVAL OF MINUTES

Ms. Aldean said she provided Ms. Ambler with a minor clerical edit and moved approval of the May 22, 2019 as amended.

Motion carried unanimously.

V. Item 4: Discussion and possible direction on Draft City of South Lake Tahoe Tourist Core Area Plan Amendments

TRPA team member Ms. Self and Ms. Stowell, City of South Lake Tahoe provided the presentation.

Ms. Self said in 2013 the City of South Lake Tahoe and the Governing Board adopted the City's Tourist Core Area Plan. This area plan boundary runs from the Stateline area to Lakeland Village, Bijou Golf Course area and down to Ski Run Boulevard. There's been a lot of transformation in this area such as the Heavenly Village where there are tourist-oriented uses with lodging and retail shops and Ski Run Boulevard which has mostly local business.

Ms. Stowell said the Tourist Core Area Plan amendment was brought before the City of South Lake Tahoe last year by private property owners within the proposed amendment area. The intent of this proposed amendment is to include comparable uses within the tourist core area plan gateway zoning district that are already permitted uses within the Bijou, Al Tahoe Community Plan. This amendment would take a portion of District 1 of the existing Bijou, Al Tahoe Community Plan. It would revise the height standards in the existing gateway zoning district of the Tourist Core Area Plan to be consistent with the town center height standards that were created with the Regional Plan that was adopted by TRPA in 2012. Much of the development in that area was built in the 1950s through the 1970s and is over covered with aging infrastructure.

It expands the gateway zoning district with picking up 49 parcels or 18 acres and would amend the permissible uses in the gateway zoning district. They wanted to ensure that if they bring in the uses that are now allowed by right or special use in the Bijou, Al Tahoe District 1 that they wouldn't be creating non-conforming uses. It would increase the maximum height from 42 to 56 feet which is consistent for the town center standards for tourist, commercial, multi-family, and single-family condominiums. Single-family detached dwellings would not be permitted to go up to the proposed 56 feet. The proposed amendment would also include technical and administrative revisions including bringing in shorezone tolerance district standards that were not included in the existing Tourist Core Area Plan.

They held a scoping workshop in July 2018 and the next steps will be for additional public outreach to the individual property owners within the amendment area and to receive TRPA staff comments. Then there would be the California Environmental Quality Act circulation starting in the summer of 2019. The public hearing process would start with the City Planning Commission and the City Council in late summer and then to TRPA in the fall of 2019.

The City is addressing the housing issue both internally and externally. They are generating request for proposals to hire a consultant to do the housing condition survey required for the housing element that must be prepared no later than 2021. The City is working with several developers for large multi-family projects either within or outside the Tourist Core Area Plan. Currently, they do not have a waiting list for multi-family allocations. The City is not aware of any within this amendment area; however, they are working with several developers to move forward with affordable housing projects throughout all areas of the City of South Lake Tahoe. The City is the only jurisdictions that reserves allocations specifically for the development of housing in its area plans. The proposed amendment would not have impact on the Bijou area wide erosion control project. The area incorporated is included in the treatment project area and future redevelopment would have the option to participate in the area wide treatment system. The proposed redevelopment would upgrade those over covered properties and would also look at recreation and access opportunities. The existing recreation element of the Tourist Core Area Plan could be amended to reflect the settlement agreements for Connolly Beach and possibly additional opportunities to upgrade that recreation element of the tourist core area plan.

Presentation can be viewed at:
RPIC Agenda Item No. 4 City of South Lake Tahoe Area Plan Amendment.pdf

Committee Comments & Questions

Mr. Shute asked who initiated this proposed amendment.

Ms. Stowell, City of South Lake Tahoe said the request was made by Urbana Tahoe who at that time was the owner of the Beach Retreat & Lodge and Lakeshore Lodge. Linchris Hotel Corporation now owns the Beach Retreat & Lodge.

Mr. Lawrence said there are many opportunities for environmental gain in this area particularly water quality, reducing coverage, and scenic. He asked if there are standards that need to be met to go up to the 56 feet.

Ms. Stowell, City of South Lake Tahoe said any development on the shorezone would still be under TRPA's jurisdiction. The Tourist Core Area Plan has specific and detailed design standards. Any redevelopment that is next to existing residential properties would have to meet those step back and buffering standards in the existing area plan. For the viewsheds there are a lot of protections within the existing Tourist Core Area Plan to address those kinds of issues.

Ms. Self said there are existing height findings within the Tourist Core Area Plan for any property redeveloped within this amendment area or in the area plan that would have to make those findings to protect the viewsheds, etc. Any property going up to three or four stories would have to make additional findings per TRPA's Code of Ordinances and the area plan.

Mr. Lawrence said if all the standards for scenic qualities, viewsheds, etc. were met, theoretically, the redevelopment could be 56 foot tall single-family residential along the Lake.

Ms. Stowell, City of South Lake Tahoe said it would not allow single-family detached residential.

Mr. Marshall said there's the addition of the territory out of the community plan into the area plan and there's a general lifting from 42 to 56 feet for the entire gateway district. This area being added would be become a part of that. It would still have to meet TRPA's code on additional height. The Initial Environmental Checklist being drafted to support this will look at any impacts between what use to be a 42-foot height requirement and now is going to 56 feet.

Mr. Shute said for example, someone may construct 56-foot-high condominiums, but it may not be good policy in terms of promoting the goal of removing legacy development, although, it meets the height findings. He suggested that when this area plan comes back for approval that there's a preliminary plan.

Ms. Aldean said philosophically TRPA hasn't wanted to amend the Code of Ordinances based on the needs of individual projects but rather doing it if it makes sense from a general planning standpoint. Assuming that from the City of South Lake Tahoe's perspective, this makes good planning sense because of the legacy development, the over coverage, and because there's redevelopment opportunities. Even if it makes sense from a general planning standpoint, it would be helpful to know what the preliminary thinking is from the development perspective.

Mr. Yeates said he's concerned with the height because this area is lakeward of Highway 50 and 56-foot-high buildings would have a significant scenic impact.

Ms. Laine said she supported extending the tourist core area to take in this particular area because it's in need of an upgrade. It's not that close to the Lake so the height issue is not necessarily of concern to her. She did question whether it was a good idea to leave the area

across the street out of the plan when making these adjustments to the boundaries and the tourist core area. We may want to consider adding that area across the street into the plan. This is important to the City of South Lake Tahoe to be able revamp old properties in this area.

Public Comments & Questions

Lew Feldman on behalf of the Beach Retreat & Lodge and Lakeshore Lodge who sponsored this amendment. He said there's been environmental analysis that's been paid for and done by the private proponents of this. The document prepared has addressed traffic and other significant issues. After one year and thousands of dollars of analysis he hopes there are no delays and not expand this inquiry at this point in time. He supported the idea but in terms of getting to the finish line, he's unsure that the other side of the street wants to commit the resources to join in. They were invited to a town hall meeting months ago and did not participate and hopes this moves forward with the proposed boundaries. There is no peek a boo views to the Lake in the existing condition. When initiated, this process was project driven. The prior owners of the Beach Retreat & Lodge had committed some resources to reinvent that property. Through the exploratory effort, they realized to make the investment worthwhile, additional height would be required. There was an ordinance amendment that allowed 60 feet in height to the Edgewood Tahoe hotel redevelopment. If a project comes forward in this proposed area it will be highly scrutinized in terms of its scenic impact. Rather than a project driven amendment, he suggested to clear the playing field and encourage a broader participation and propose a plan that meets the requirements for scenic. This plan will not result in an increase for density. Most of the units are legacy developed units that are 350 square feet or smaller and typically the redevelopment of the newer units is larger which is a reduction in density.

Committee Comments & Questions

Mr. Shute said he's still concerned with what type of use would go in there with a 56-foot height limit. He suggested that as this moves forward the type of use needs to be given priority and a vision developed.

Lew Feldman said the Zalanta resort across the street from the Heavenly Village Gondola are whole ownership condominiums and every unit purchased is in a rental program and would be public accommodations for tourist amenities. Recently completed was the 22-unit Gondola Vista property which are whole ownership condominiums operated as a tourist product.

Ms. Aldean suggested that there be a vision even if it's a preliminary one that provides information to the approvers to conclude that these changes make sense from a general planning and project standpoint.

Lew Feldman said the Connolly beach is subject to a public use easement and accessing that beach has been a conversation and debate. The California Tahoe Conservancy owns a strip of land that provides access to that beach. Urbana Tahoe, the prior owner of the Beach Retreat & Lodge had been working with the Conservancy to formalize that. The Conservancy wants to construct a more formal trail to access the beach and the new ownership is working with the Conservancy to improve access to that beach.

Mr. Bruce asked if there's any planning that's already been done. Maybe there's something in those plans that might be helpful.

Lew Feldman said the analysis is what are the potential impacts from these changes in land use. That work has been completed and because there's no increase in density, there didn't seem to be the need for a more intensive level of environmental analysis regarding the land use impacts.

Public Comments & Questions

Deepak Sharma, Hotel Elevation said he wasn't an owner when the Beach Retreat & Lodge and Lakeshore Lodge brought this proposal forward but does support it. Lakeland Village next door to Hotel Elevation has a height of 56 feet and he doesn't feel it visually impairs what's in the proposed area. It's over covered and most of it's a parking lot and is the worst coverage for being next to the Lake. If the height is allowed it will eventually lead to private money redevelopment.

Pat Ronan, Lakeshore Lodge said his property is 40 feet at four stories. If this 56-foot height allowance is not done, it will limit what the investors can do. His property is over 80 percent covered and the Bijou Center is 100 percent covered. He's spending $50,000 just to enhance the parking lot. Their biggest complaint from guests is the view of the property when driving up to the building.

Alison Sperry, the Beach Retreat & Lodge said they supported this proposal.

Committee Comments & Questions

Mr. Yeates said it's the location that makes many sensitive to what is going to be put in this area.

Public Comments & Questions

Ed Moser, South Lake Tahoe resident said a lot of the primary interest in this is to increase the tax base. The idea was to create the town center in this area and are now looking at extending it further. He doesn't agree with taller buildings on the Lake, they should be shorter. He also doesn't agree with extending the town center. This is not intended to develop affordable housing but rather to increase the size and density.

Ben Dosseff, Incline Village resident said they have a bad trash issue in Incline Village and along the east shore. He's called Washoe County and the state, and they don't have people to pick it up. In 2017 and 2018, he found massive amounts of plastic in the Lake. Our lake and lands are being polluted.

Dan Brown, South Lake Tahoe resident said how many cars and traffic does this equate to for this proposed increase in height of 14 feet. What impacts will it have on Highway 50 and the egress into Connolly Beach? Answers need to be provided for the cars, traffic, and people.

VI. Item 5: Discussion and Possible Direction on Amendments to Chapter 36 of the Code of Ordinances regarding outdoor lighting

TRPA team member Mr. Conger provided the presentation.

Mr. Conger said the regulations in the Code of Ordinances help to implement the Regional Plan which help achieve the thresholds. The exterior lighting standards in section 36.8 relate to the

scenic resources and recreation thresholds. One of the pertinent thresholds states that the Regional Plan shall ensure that design elements including lighting are compatible with the natural scenic and recreational values of the region. Section 36.8 lays outs several types of lighting regulations, but the one standard of today's focus is the prohibition of lighting fixtures projecting light above the horizontal (uplighting). Prohibiting uplighting is a common practice used to preserve the integrity of the night sky by reducing glare and light pollution. Lighting of the US Flag is a topic that comes up in communities with dark sky-oriented lighting codes. The US Flag code states that it is customary to display the flag between sunrise and sunset, however, when a patriotic effect is desired it can be displayed 24 hours per day if properly illuminated during the hours of darkness. There are a wide variety of products to properly illuminate a flag. The two most common forms of flag lighting are down lighting and uplighting. This discussion has come up as a result of a proposal at Happy Homestead Cemetery in South Lake Tahoe, CA. A flagpole was erected there in 2015 in tribute to veterans. The community now wishes to display the flag 24 hours per day and to accomplish this the flag would need to be properly illuminated. There's been substantial concerns raised that downward directed lighting required by TRPA's Code of Ordinances would not properly illuminate the flag. As a result, an exception from that standard is being requested. The proposed amendment would provide for a limited exception to the uplighting prohibition and the exception would be limited to certain criteria for example, it would only apply to the lighting of the US Flag within the veteran's section of an existing cemetery. In reviewing dark sky ordinances from other jurisdictions that do allow for uplighting of flags, staff realized that it was a common practice to limit the lighting output that helps to minimize the potential for localized light pollution impacts. Staff recommends that the output be limited to 2500 lumens which is equivalent to a 125-watt halogen lamp. Because the criteria limit its applicability and potential lighting output, staff does not anticipate that this amendment will have a measurable effect on threshold attainment. Based on that analysis, staff recommends that the Regional Plan Implementation Committee recommend approval of the proposed amendment to Chapter 36 to the Governing Board.

Presentation can be viewed at:
RPIC Agenda Item No. 5 Outdoor Lighting Flags.pdf

Committee Comments & Questions

Ms. Aldean asked if the radius of the upward lighting will be sufficient to cover the flag when it is fully unfurled.

Mr. Conger said the lighting design is planned for the full radius of the flag.

Public Comments & Questions

Dan Brown, South Lake Tahoe resident said at the Happy Homestead Cemetery that flag only flies if there's an employee to put it up and take it down and it never flies on Saturdays, Sundays, or holidays. The City of South Lake Tahoe was instrumental in trying to down light the flag with solar lighting. The lighting component doesn't receive enough light to keep the flag lit for more than about 1 to 1.5 hours and is not compatible with the US Flag code.

Committee Comments & Questions

Ms. Laine made a motion to recommend approval of the Required Findings, as described in Attachment B, including a Finding of No Significant Effect, for adoption of the Code of Ordinance amendments as described in the staff report.

Motion carried unanimously.

Ms. Laine made a motion to recommend adoption of Ordinance 2019-__, amending Ordinance 87-9, as previously amended, to amend the Code of Ordinances as shown in Attachment A.

Motion carried unanimously.

VII. Item 6: Discussion and recommendation on amendments to Chapters 84 and 90 regarding the determination of property boundary projection lines for shorezone purposes and number of boatlifts per multiple use pier

TRPA team member Mr. Conger provided the presentation.

Mr. Conger said the proposed amendments are to help with the implementation of the shoreline plan. The Shoreline plan was adopted by the Governing Board in October 2018. The mooring registration program began in March 2019 and in June, staff started accepting proposals for new private piers. As the plan is being implemented, staff has identified several topics where code amendments would be needed to maintain clarity and consistency. In developing the amendment proposal staff consulted with a number of sources including the implementation program, the stakeholder committee, and the environmental impact statement for the shoreline program. The amendments fall into two categories: Parcel boundary projection lines and boatlifts on multiple-use piers. When an informational presentation was provided to this committee last month, staff also discussed three additional amendments for approval authority for multiple-use piers, stream mouth protection zones, and commercial boating. Based on feedback, staff has removed these items from consideration pending further evaluation. In the future, staff will bring forward additional amendments for shorezone implementation.

Parcel boundary projection lines: These are important because piers and moorings are required to maintain a 20-foot setback. Presently the Code of Ordinances uses a few variations on the term, and it lacks a definition. Staff's proposing that the term be standardized as parcel boundary projection lines. Since the code doesn't define how the parcel boundary projection lines are set, staff's proposing to use the definition that's consistent with both California and Nevada State Lands. That definition is a projection of the parcel boundary lakeward from the low water line perpendicular to the tangent of the shoreline.

Boat lifts on multiple-use piers: The Code of Ordinances presently identifies a limit of one boat lift per parcel for a total of four. This limitation was listed in a figure in the Code of Ordinances and is not included in the text. Staff is proposing to add this limitation to the multiple-use pier design standards.

The proposed amendments were reviewed by the Advisory Planning Commission in June. The APC recommended moving forward with these two amendment packages for projection lines and boatlifts. The APC also considered commercial boating amendments and recommended that

those be further evaluated.

Presentation can be viewed at:
RPIC Agenda Item No. 6 Shorezone Amendments.pdf

Committee Comments & Questions

Ms. Aldean referred to page 72 of the staff packet, Other Structures, 84.8.1.b where it states, "Floating platforms shall be located at least 20 feet from adjacent littoral parcel boundary projection lines and no closer than 50 feet from another mooring buoy." She feels that it implies that platforms are moorings. She suggested that it read "From a mooring buoy" as opposed to "another" because the implication is that platforms can be used as moorings.

Public Comments & Questions

None.

Committee Comments & Questions

Ms. Aldean made a motion to recommend Governing Board approval of the Required Findings, as described in Attachment B, including a Finding of No Significant Effect, for adoption of the Code of Ordinance amendments as described in the staff summary.

Motion carried unanimously.

Ms. Aldean made a motion to recommend Governing Board approval to adopt Ordinance 2019-__, amending Ordinance 87-9, as previously amended, to amend the Code of Ordinances as shown in Attachment A and further amend to reflect the amendment suggested by Ms. Aldean.

Motion carried unanimously.

VIII. Item 7: Upcoming Topics

No further report.

IX. COMMITTEE MEMBER REPORTS

None.

X. PUBLIC INTEREST COMMENTS

None.

XI. ADJOURNMENT

Chair Mr. Shute adjourned the meeting at 9:40 a.m.

Respectfully Submitted,

Marja Ambler

Marja Ambler
Clerk to the Board

The above meeting was taped in its entirety. Anyone wishing to listen to the tapes of the above mentioned meeting may call for an appointment at (775) 588-4547. In addition, written documents submitted at the meeting are available for review

TAHOE REGIONAL PLANNING AGENCY

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STAFF REPORT

Date: August 21, 2019

To: TRPA Regional Plan Implementation Committee

From: TRPA Staff

Subject: VMT Threshold Update

Summary and Staff Recommendation:
At its May 2019 meeting, the Regional Plan Implementation Committee (RPIC) directed staff to develop a work plan to update the VMT threshold standard. Staff prepared the work plan in Attachment A. Staff recommends the RPIC approve the work plan. Staff will also present preliminary findings for mobility metrics.

Required Motion:
In order to recommend approval of the requested action, the Regional Plan Implementation Committee should make the following motion based on the staff summary:

1) A motion to approve the VMT Threshold Update work plan as shown in Attachment A.

Background:
The VMT threshold standard was established in 1982 to improve water quality by reducing deposition from in-basin NOx emissions from mobile sources (e.g., cars and trucks). The VMT threshold standard established a goal for in-basin mobile source NOx emissions at 10 percent below 1981 VMT levels. Nitrogen emissions from mobile sources in the Region have declined more than 66% since the standard was adopted, far in exceedance of the standard's goals (additional background on the standard is provided in attachment B).

While the VMT Threshold itself no longer serves the purpose for which it was adopted, transportation related issues remain salient for stakeholders and policy makers in the Region. At RPIC's direction, staff prepared this work plan to address mobility and mobile source greenhouse gas (GHG) related concerns in the Region. The work plan includes three elements for each concern. First, ensuring that the right measures and targets are in place for both mobility and mobile-source GHG emissions. Second, that the monitoring and evaluation system provides decisions makers with information on where the Region stands today relative to its goal, and how future projects or programs may affect attainment. The last element of the workplan focuses on the implementation structure to ensure that the appropriate mechanisms are in place to support attainment of the goal.

While the work plan to update the VMT threshold standard focuses on identifying appropriate measures and targets for the concerns more salient today, it does not mean that TRPA is moving away from VMT as a measure. Reducing VMT will remain a central focus of TRPA's Regional Plan, and transportation and

air quality programs. TRPA will also continue to report on and target reductions for regional VMT and per capita VMT as part of its Metropolitan Planning Organization responsibilities.

The work plan contains three elements that begin with goal identification, then measurement and evaluation, and finally address implementation. A brief description of each element is included below.

1 – Update Indicators and Targets. The first element of the workplan includes review and evaluation of metrics and a proposed target for mobility and mobile source GHG. The focus on mobility is consistent with the Bi-State Compact directive that one of the Region's transportation plan goals shall be "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."

2 – Update Models and Tools. The second element focuses on enhancing the tools and data used to evaluate mobility and mobile source GHG to ensure they provide the information necessary to make informed decisions. Work will include evaluation of the TRPA Travel Demand Model, land use models, big data sources, and roadway monitoring. The evaluation will include an independent peer review under the Federal Highway Administration Travel Model Improvement Program (TMIP). The Model Working Group was first convened in October of 2018 and will continue to provide input throughout this work plan element.

3 – Air Quality Mitigation Fee Update. The final element focuses on the implementation program to promote achievement of the goals identified in the first element. An air quality mitigation fee is paid by all projects in the Basin to help mitigate their air quality impacts. The fee provides local jurisdictions with resources to support implementation the Regional Transportation Plan and other related projects, including local matching funds for bike trails, transit facilities, and street sweepers. The fee has not been updated since 2007 and should be updated. The element will review all parts of the air quality mitigation fee program to ensure alignment with goals identified in the first element.

Within transportation planning, mobility is a concept that expands the focus beyond simply the automobile, to include the variety of transportation options (e.g., walking, biking, transit), and the quality of those options. The concept is consistent with the Bi-State Compact guidance that the Regional Transportation Plan reduce dependence on the automobile. In 2017, the TRPA Advisory Planning Commission convened a transportation measures working group to review the landscape of performance measures. Building on that review, six metrics were identified for additional consideration as part of the VMT threshold update work plan. Staff is preparing additional background on each metric, including where and how the metrics are currently being used, as well as factors that should be considered when deciding what metrics to use in the Tahoe Region. The background material will help inform RPIC consideration of potential regional application of individual metrics. The presentation and discussion at the August 28, 2019 meeting of the RPIC will also include preliminary findings for the mobility metrics.

As part of the VMT Threshold update, RPIC also directed staff to develop a work plan to harmonize the disparate work and frameworks addressing GHG emissions. Staff is still in the process of working with partners to ensure the design and reach of that work is consistent with the policies and programs of the

two states. The consideration of a target for mobile source GHG emissions under this work plan, including a tie to VMT, will also be a part of the larger forthcoming GHG work plan.

Contact Information:
For questions regarding this agenda item, please contact Dan Segan, Principal Natural Resource Analyst, at dsegan@trpa.org or (775) 589-5233 or John Marshall, General Counsel, at jmarshall@trpa.org or (775) 303-4882.

Attachments:

A. VMT Threshold Update Workplan
B. Vehicle miles traveled threshold standard primer

Attachment A

VMT Threshold Update Workplan

Work Plan

August 2019

Threshold Update: Vehicle Miles Traveled (VMT)

TAHOE REGIONAL PLANNING AGENCY

A Voice for Lake Tahoe

AGENDA ITEM NO. V.A

Introduction

The Vehicle Miles Traveled (VMT) threshold standard is overdue for an update. This work plan outlines the need for change and a work process to complete the revisions.

The current VMT threshold standard established a goal of reducing NOx emission by 10% from 1981 levels, as measured by VMT. It was established in 1982 to improve water quality by reducing nitrogen deposition from in-basin mobile source (e.g., cars and trucks) NOx emissions. Nitrogen emissions from mobile sources in the Region have declined more than 66% since the standard was adopted, far in exceedance of the standard's goal. Regional NOx emissions have been steadily decreasing since 1989 and reductions far exceed the 10% reduction initially envisioned by the standard. NO_x emissions are likely to continue to decline even further as a result of increasingly strict tailpipe emissions standards. In summary, empirical observations over the last 30 years establish:

- Current in-basin NO_x emissions from mobile sources are substantially below 1981 levels.
- The goal established by the VMT standard, a 10% reduction in NOx emissions from in-basin mobile source, was likely achieved more than 15 years ago.
- Atmospheric deposition of nitrogen hasn't changed significantly in the last 20 years.
- Nitrogen emissions from mobile sources in the Region have declined by >66%, far in exceedance of the standard's goals. Despite this decline, no significant change in atmospheric deposition of nitrogen has been observed.
- A 14-fold increase in VMT from 1981 levels would be required to equal the 1981 NOx emissions levels.[1]

Understanding of the drivers of clarity loss has also improved significantly since the standard was adopted in 1982. The motivating concern at the time was algal growth in the lake which was thought to be primarily responsible for declining clarity.

- The TMDL demonstrated that clarity loss is primarily driven by fine sediment particle accumulation.
- The TMDL found that excess algal growth is responsible for roughly a third of clarity loss.
- TMDL implementation focuses on reduction of FSP load
- Preliminary TMDL science suggested that VMT reduction was unlikely to be a cost-effective strategy to reduce nitrogen loading.

The declines in emissions from mobile sources mean that functionally the VMT standard no longer provides additive water quality benefits to the load reduction targets established by Air Quality threshold standard

[1] Calculations based on the difference between 1981 and 2009 model year tailpipe emissions standards. Using the 2025 model year emissions standard the necessary increase would be a 33 increase in VMT.

13 (transport and emission of nitrates and NOx) and Water Quality standards 36 (total nitrogen load) and 41 (dissolved inorganic nitrogen load), which directly address nitrogen from all sources.
In addition, on-going processes such as the transportation model update and project level review have brought to light several issues with the analysis of the VMT threshold, as well as its utility as a tool to understand and mitigate environmental impacts. These issues include:

Better methods exist for assessing project effects on regional VMT. Traditionally, project applicants have used an off-model, spreadsheet calculation to identify VMT impacts of a project. In most cases, the number of trips generated is simply multiplied by an average trip length for those trips, producing a "project-level" VMT. This "project-level" VMT may not accurately capture the effect of the project on regional VMT, because certain types of projects, such as locally-serving commercial uses, workforce housing, and even tourist uses, can reduce region-wide VMT if they provide a more localized alternative to what was previously only offered outside or in distant parts of the Basin.

VMT as an indicator does not fully capture the environmental and community impacts of vehicle travel. To determine compliance with the VMT threshold, VMT is analyzed for a "late summer day." Therefore, a project which generates a high amount of VMT in the winter or shoulder season, but a low amount of VMT during a late summer day is unlikely to impact threshold attainment. Projects are not required to disclose the off-peak effects on VMT. The impact of greenhouse gas emissions (GHG) associated with driving emissions are cumulative, and merely shifting project impacts to an off-peak time does not reduce impact.

Travel experience is a critical concern. Much of the Region's automobile congestion occurs on the last day of a busy weekend (often a Sunday or a Monday) and negatively impacts visitor experience and resident quality of life. The travel experience in Tahoe includes more than just a single mode, and the Regional Transportation Plan focuses on improving travel experience across a suite of modes and providing options that reduce reliance on the automobile. Neither the quality of the overall experience nor the utilization of other modes is captured by VMT.

To address this gap TRPA proposes the following work plan. The work plan is designed to move from a VMT standard adopted to enhance water quality to coherent measures of mobility and a mobile source GHG reduction target to inform transportation planning. The Regional Transportation Plan/Sustainable Communities Strategy is a related transportation program work element needing to be completed in 2020. There are significant dependencies and potential synergies between the work described in this work plan and the 2020 update to the Regional Transportation Plan. To minimize redundancy and foster efficiency, the tasks and timelines in this work plan have been aligned with the work plan for development of the Regional Transportation Plan/Sustainable Communities Strategy.

Interim VMT Guidance – While the VMT threshold update proceeds, an interim methodology that improves the evaluation of project level impacts has been developed and be applied until the threshold revision is adopted. The methodology strengthens project level VMT analysis, by providing a consistent framework for

applicants to follow when calculating VMT impacts of their projects. The guidance was refined through multiple rounds of stakeholder review and issued in March 2019.

VMT Update Work Plan Summary

The work plan below summarizes the elements, schedule, products, and process for this initiative.

Element 1 – Update Metrics and Targets. The first element of the work plan includes evaluation of metrics and proposed targets for mobility and mobile source GHG reduction. The focus on mobility is consistent with Bi-State Compact directive that one of the Region's transportation plan goals shall be; "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." The element will consider and seek to harmonize the multiple regulatory contexts (e.g., TRPA Compact guidance and new California planning and Federal MPO planning directions) to create a more straightforward regulatory framework.

PRODUCT: Mobility and mobile source GHG metrics and targets.

Element 2 – Update Models and Tools. The second element focuses on enhancing the tools and data used to evaluate the chosen metrics for mobility and mobile source GHG, to ensure they provide the information necessary to assess the metrics today and evaluate how development projects and mitigation strategies may affect future levels. Work will include evaluation of the TRPA travel demand model, land use models, big data sources, and roadway monitoring. The Model Working Group was first convened in October of 2018 and will continue to provide input throughout this work plan element.

PRODUCT: Refined modeling tools and data collection and integration strategy.

Element 3 – Air Quality Mitigation Fee Update. The third element focuses on the implementation program to promote achievement of the mobility and mobile source GHG goals identified in Element 1. This will include review and consideration of changes to what is currently known as the air quality mitigation fee to better align it with the new metrics and targets identified in Element 1.

PRODUCT: Mitigation program update.

Budget

TRPA has budgeted $200,000 from its 2019/2020 fiscal year funds for investment in data collection and modeling program improvements. TRPA staff costs comprise the remainder of the budget for this work plan at this time. Augmentation with consultant work can be considered if the need arises. Additional funding (in an amount that is yet unknown) will likely be needed for changes to TRPA's travel modeling program improvements.

Team

The overall work plan will be coordinated by Dan Segan. The senior leadership sponsor for the work plan is John Marshall. The work plan leads for each phase are identified below.

Element One: Update Metrics and Targets - Dan Segan & Michelle Glickert
Element Two: Update Models and Develop Measurement Tools - Reid Haefer
Element Three: Air Quality Mitigation Fee Update - Karen Fink

Consultants: Consultants will be used for developing modeling tools. Consultant support may also be leveraged to support metric development, best practices research, mitigation program design, and code drafting.

Stakeholder Engagement

Stakeholder engagement is essential to the critical review of changes to thresholds standards in order to ensure the chosen metrics reflect the collective vision of the broad partnership in the basin.
Stakeholder feedback will be solicited and incorporated throughout the process.

VMT Update Work Plan

Element One: Update Metrics and Targets

Discussion: Element one tasks will identify appropriate metrics and identify targets for regional mobility and mobile source GHG. The selection and target setting process will consider the need to assess and integrate metrics across multiple scales (project, regional, and super-regional) to promote a more holistic approach to target achievement.

2.1 Mobility metric and target setting: Mobility is key to the overall travel experience in the region, including providing alternative modes of transport and reducing reliance on the automobile. This task will identify appropriate metrics and establish targets for mobility. These metrics will also be used for development of the 2020 Regional Transportation Plan.

2.1.1: Mobility measure review scoping based on the 2017 State of the Practice (http://www.trpa.org/wp-content/uploads/TMWG-WhitePaperOutline_PostReleaseEdits-FINAL-8.9.17.pdf) (June 2019).

2.1.2: Background material on potential mobility metrics (June – September 2019)

2.1.3: Proposed mobility metric and recommended target to RPIC. Additional stakeholder vetting (October-November 2019).

2.1.4. Incorporate RPIC and stakeholder feedback and present mobility metric and target recommendations to the APC, RPIC, Governing Board (January 2020).

2.1.5: Integrate mobility metric and target recommendations into 2020 Regional Transportation Plan and Sustainable Communities Strategy (April 2020).

2.1.6: Environmental analysis of proposed metric and target (April – June 2020).

2.1.7: RPIC decision hearing on proposed metrics and measures and associated modifications to the Regional Plan (July 2020).

2.1.8: GB/APC decision hearing on adoption of proposed metrics and measures and associated modifications to the Regional Plan (August 2020).

2.2 Mobile source GHG target setting: Identify appropriate evaluation framework for mobile source GHG.

2.2.1: Proposed mobile source GHG target to RPIC and stakeholder vetting(January 2020).

2.2.2: Incorporate stakeholder feedback and present GHG metric and target recommendations to the APC, RPIC, Governing Board (April 2020).

2.2.3: Integrate GHG metric and target recommendations into 2020 Regional Transportation Plan and Sustainable Communities Strategy (June 2020).

2.2.4: Environmental analysis of proposed metric and target (April – June 2020).

2.2.5: RPIC decision hearing on proposed metrics and measures and associated modifications to the Regional Plan (July 2020).

2.2.6: GB/APC decision hearing on adoption of proposed metrics, measures, and associated modifications to the Regional Plan (August 2020).

Element Two: Update Models and Tools

Discussion: Element two of the work plan focuses on ensuring decision makers have the information necessary to make informed decisions that promote attainment of the mobility and mobile source GHG goals . This will be achieved through updated modeling and measurement tools. Based on recommendations from the model working group, a suite of initial model updates are underway and will be complete by January 2020. These updates include routine investment in data collection and updating, and the extension of the analytic capabilities to account for VMT outside of the region in accordance with California SB 743 requirements. The tasks described in element two, build on that work and establish the future course for transportation modeling.

Task Structure:

3.1 Determine appropriate tools for accurately measuring regionwide and project-level effects:

- 3.1.1**:** Coordination with partners to ensure regional consistency and a coordinated approach to addressing SB743 requirements.
- 3.1.2: Conduct Federal Highway Administration Travel Model Improvement Program (TMIP) peer review of Tahoe travel demand model.
- 3.1.3: Vet outcomes of peer review with Model Working Group and propose model improvements.

3.2 Develop a five-year tool(s) maintenance and investment strategy (on-going): The task will focus on developing a phased implementation strategy for the peer review recommended improvements as agreed to by the model working group.

- 3.2.1: Coordinate model investment and data collection with partners.
- 3.2.3: Develop estimates for developing, updating, and maintaining tool.
- 3.2.4: Identify and pursue potential funding sources.
- 3.2.5: Vet investment priorities with Model Working Group.
- 3.2.6: Finalize investment priorities and continue to seek funding.

Element Three: Air Quality Mitigation Fee Update

Discussion: The current air quality mitigation fee has not been adjusted since 2007 and thus the fee amount is not necessarily well indexed to the current Regional Transportation Plan project list. The third element of the work plan will consider an adjustment to the fee to align it the goals established in element one and the cost of the suite of projects in the mitigation program identified in the latest Regional Transportation Plan/Sustainable Communities Strategy. The fee supports implementation of projects to offset air quality impacts of minor commercial and residential development projects in the region. There are three elements to the mitigation fee; 1) Fee structure – identification of impacts subject to the fee, 2) Fee amount, and 3) Fee use – suite of projects that are supported by fee.

3.1: Mitigation program update:

3.1.1: Identify the purposes of the mobility mitigation fee.
3.1.2: Identify Regional Transportation Plan projects that align with the fee purpose.
3.1.3: Establish link between fee purpose and use and development types subject to the fee.
3.1.4: Design mitigation program – including consideration of fee structure and conditions for fee escalation (e.g., proposed project not included in current land use forecasts) and opportunities for fee reduction (e.g., proposed project includes elements the support attainment of mobility goal).
3.1.5: Review analysis triggers for impacts associated with transportation.
3.1.6: Apportion fee amount to align with current RTP project cost and outstanding funding need and impact nexus of development.
3.1.7: Proposed regional and project-level mitigation program to APC, RPIC, and Governing Board.
3.1.8: Environmental analysis of proposed mitigation program (April – June 2020).
3.1.9: RPIC decision hearing on proposed mitigation program (July 2020).
3.1.10: GB/APC decision hearing on adoption of proposed mitigation program (August 2020).

Attachment B

Vehicle miles traveled threshold standard primer

TAHOE REGIONAL PLANNING AGENCY

Threshold Update

VEHICLE MILES TRAVELED THRESHOLD STANDARD

CONTENTS

THRESHOLD UPDATE INITIATIVE

BACKGROUND

The vehicle miles traveled (VMT) threshold standard was adopted in 1982. At the time the standard was proposed, the study report explained, "Nitrates deposited from the atmosphere originate from automobile emissions generated within the basin and from sources upwind of the basin. Nitrates contribute to algal growth which affect the clarity of Lake Tahoe (TRPA 1982a)." At the time, increased algal growth was thought to be the primary driver of declining lake clarity[1].

The VMT standard was one of a suite of standards adopted to address loading of algal nutrients to the lake. While the motivation for the VMT standard was the clarity of the lake, the standard was adopted in the air quality category to reflect the pathway (the air) through which the nutrients reached the lake.

While still a concern, TMDL science revealed that the algal component forming the basis for the VMT threshold was of lesser importance than particulate matter for lake clarity. In the mid-2000s, over $10 million was invested in science to better understand declining lake clarity and to formulate a management response. That work established the foundation for the Lake Tahoe Total Maximum Daily Load (TMDL), the science-based plan to restore Lake Tahoe's historic clarity. TMDL development science found that fine sediment particles were responsible for approximately two-thirds of the lost clarity, and algae was responsible for the remaining third (Lahontan & NDEP 2010). Based on these findings and a thorough review of implementation opportunities, the TMDL established pollutant load reduction targets to be implemented over 65 years to restore the historic clarity of the lake. The TMDL implementation plan's primary focus is to reduce the load of the primary pollutant of concern, fine sediment particles from urban runoff sources. The TMDL is now in its sixth year of implementation. The Lake Tahoe TMDL Program 2018 Performance Report released in August 2018, found that local governments and highway departments collectively met or exceeded their 2017 water year pollutant load reduction targets. Pollutant controls reduced fine sediment particulate load by over 12 percent, total phosphorus by almost 10 percent, and total nitrogen loads by over seven percent.

While TMDL implementation focuses on reduction of fine sediment load, nitrogen remains a pollutant of concern in the Lake Tahoe Basin (Lahontan & NDEP 2010). The TMDL identified atmospheric deposition as the primary source (55 percent) of nitrogen reaching the lake (Lahontan & NDEP 2010).

[1] In 1982, a VMT standard was also adopted as a part of the sub-regional visibility standard (TRPA 1982b). The VMT standard was removed as a measure of sub-regional visibility as part of the 2012 threshold updates, when it was replaced with four direct measures of particulate matter concentration (AQ 9-12), that more closely measured the human health and regional visibility values for which the standard was adopted (TRPA 2012a, 2012b).

Emissions from on-road mobile sources were estimated to account for between 37 percent and 46 percent of nitrogen emissions in the Tahoe Basin (Pollard et al. 2012).

The adopted standards sometimes deal with emissions (source specific) and other times address deposition (multiple sources). The connection between regional NOx emissions, deposition, and associated VMT has been an issue since initial discussions of the VMT standard. At the time the VMT standard was proposed, the League to Save Lake Tahoe (League) submitted comments objecting to the establishment of 10 percent reduction in VMT as a threshold standard (League To Save Lake Tahoe 1982). The League wrote, "A 10% reduction is not a threshold standard. The threshold standard is the total number of miles traveled that maintains the nitrate deposition level below that which adversely affects the water quality of the lake and its tributaries (League To Save Lake Tahoe 1982)."

WHAT IS VMT?

Vehicle miles traveled (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 has expanded, and car ownership has increased. The Federal Highway Administration (FHWA) forecasts suggest that nationwide VMT will continue to grow by 1.07 percent annually through 2035. The FHWA forecast is influenced by projections for population growth, economic growth, and increased disposable income, all of which are positively associated with VMT (FHWA 2017).

VMT in the Tahoe Region 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 and access for recreational opportunities in the Region, and access to alternative forms of transportation. Higher unemployment, higher fuel prices, increased congestion, work from home programs, employer car pool programs, and concentration of development in centers are all linked to reductions in VMT. While 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 can reduce VMT.

NITROGEN RELATED THRESHOLD STANDARDS

The VMT standard was one of a package of threshold standards that establish goals for nitrogen emissions or loading. The overlap in nitrogen load reductions standards was identified as a potential issue in the assessment of threshold standards(TRPA 2017a, 2017b). Addressing overlapping standards, and development of a more straightforward threshold standard system, that clearly articulates what the Region's goal is with respect to nitrogen loading is one of the goals for the threshold update initiative.

Among the standards adopted in 1982, two standards were adopted to reduce nitrate deposition onto the lake (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 percent of the 1981 base year values.

A third standard established a goal of stabilizing NOx emissions to address ozone concentrations. Ozone is formed through a photochemical reaction between atmospheric oxygen, hydrocarbons and/or carbon monoxide, oxides of nitrogen, and sunlight:

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

Like many elements of the threshold standards system, numerous threshold standards TRPA adopted address concerns related to nitrogen loading. Two additional threshold standards were adopted in the water quality category that establish goals for reduction of nitrogen and nitrogen species:

WQ36) Reduce total annual nitrogen load to achieve long-term pelagic water quality standards (WQ1 and WQ2) and littoral quality standards (WQ5 and WQ6).

WQ41) 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[2]
   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).

VMT AND NOx

The relationship between VMT and NOx emissions has changed significantly over the last 40 years as a result of increasingly stringent tailpipe emissions standards. Nationally, VMT continues to increase while NOx emissions have drastically declined. Nationally, NOx emissions have decreased by 57 percent since 1980 despite a 49 percent increase in VMT since 1990 (TSAC 2018a). Locally these changes mean that a 14-fold increase in VMT from 1981 levels would be required to generate 1981 NO_x emissions levels.

Nitrogen in the Atmosphere

Molecular nitrogen (N_2) accounts for nearly 80% of the earth's atmosphere and is relatively stable. Nitrogen in the atmosphere occurs in smaller quantities in a variety of other forms, including nitrogen oxides (NOx), gaseous ammonia, organic nitrogen, particulate nitrate and ammonium compounds, and nitric acid vapor. Human activities have enriched the atmospheric concentrations of NOx, ammonia, and ammonium. Unlike N_2, both NOx and ammonia are reactive and are readily deposited onto terrestrial and aquatic systems enriching nitrogen concentrations.

NOx is a general term for a suite of nitrogen-based compounds that are air quality pollutants of concern, including nitrates. NOx are also precursors to the formation of ozone, which is harmful to human health and can damage trees and crops at elevated concentrations. The majority of NOx emissions originate from the transportation and power generation sectors as a byproduct of fuel combustion. There are a few natural sources of NO_x, such as lighting, but they do not add a substantial portion of global NOx emissions.

Application of nitrogen-based fertilizer on agricultural crops and keeping of livestock are responsible for 80% of ammonia emissions in the US. Ammonia and ammonium are produced naturally as a result of activity of soil microorganisms and account for 20% of global emissions. Atmospheric nitrogen is reactive and can be converted to nitric acid vapor or particulate nitrate, which are both readily deposited on land during precipitation events (NDAP 2001).

NOx Emissions

The California Air Resources Board (CARB) estimates that NOx emissions from mobile sources in the California side of the Region have decreased from 5.7 tons per day in 2000 to two tons per day in 2015 (Figure 1). The trend suggests that current emissions are approximately 25 percent of emissions in 2000. Current forecasts suggest that NOx emissions will continue to decrease to 0.6 tons per day by 2030 (CARB 2016).

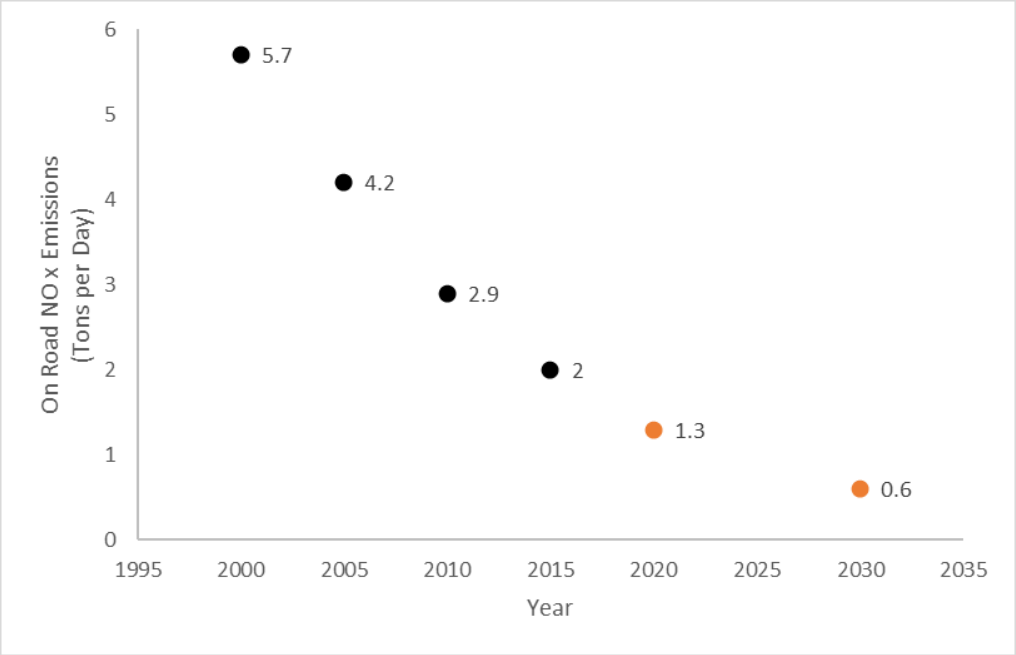

FIGURE 1: ON ROAD DAILY NO_x EMISSIONS IN THE TAHOE BASIN. SOURCE: CARB 2016

The reduction in transportation sector related NO_x emissions is the result of reduced tailpipe emissions from automobiles. In the 1950s, the average new car released 3.6 grams of NO_x for each mile it traveled (EPA 2018). The U.S. Environmental Protection Agency (EPA) established the first NO_x emission standard (3.1 grams per mile of NOx) for cars and light duty trucks in 1975 (EPA 1999). Since that time, NO_x emissions standards per mile have become increasingly strict (Figure 2).

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). The new fleet average emission standards establish an immediate 46 percent reduction from the tier 2 requirements and become increasingly stringent over the next seven years leading to a 81 percent reduction by 2025 (EPA 2014).

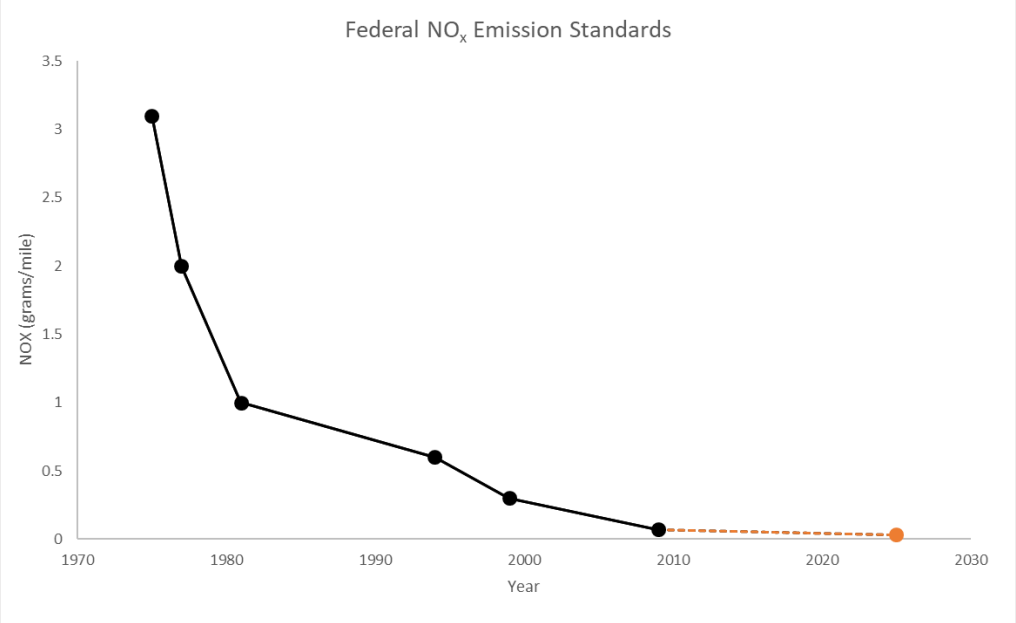

FIGURE 2: ON ROAD DAILY NO_x EMISSIONS IN THE TAHOE BASIN. SOURCE: CARB 2016

The majority of vehicle miles traveled in the Region are traveled by passenger cars and light duty trucks, which collectively account for nearly 80 percent of VMT, but account for just over half of NOx emissions in the Region (CARB 2016). On a per mile basis, NOx emissions from passenger cars and light duty trucks is less than a third of what it is from heavier vehicles. Thus, a 10 percent reduction in passenger cars' and light duty trucks' VMT would be expected to reduce NOx emissions by 5.2 percent.

NITROGEN DEPOSITION

The relationship between nitrogen emissions (local and non-local) and deposition in the Region is complex and governed by an interconnected set of factors. Deposition occurs in both dry and wet forms and in different species of nitrogen. Wet deposition is associated with precipitation events, while dry deposition refers to nitrogen deposited through interactions between airborne nitrogen species and the surface of rocks, plants, buildings, soil, and water (NDAP 2001). Nationally, nitrogen deposition is monitored by the National Atmospheric Deposition Program/National Trends Network. Monitoring suggests that there has been no significant change in nitrogen deposition in the Region over the last thirty years. The available lines of evidence are summarized below.

National Trends

Despite increasingly stringent emission standards over the last two decades of the 20th century, there was no observed response in deposition of nitrogen until 2000. Since 2000, there has been an

"unprecedented decrease in NOx deposition" across the United States, with the highest observed reductions occurring on the east coast where loading is substantially higher (Lloret & Valiela 2016; TSAC 2018a). Between 1990 and 2011, a 19 percent reduction in nitrogen deposition was observed in both California and Nevada (Lloret & Valiela 2016). Deposition rates in California decreased steadily (at roughly one percent annually) throughout the entire period of record, while deposition in Nevada increased between 1990 and 1999, but has been decreasing since 2000 by approximately three percent annually (Lloret & Valiela 2016).

Tahoe Region

Two sources of data are available for nitrogen deposition in the Tahoe Region, UC Davis Tahoe Environmental Research Center (TERC) and the National Atmospheric Deposition Network.

Tahoe Environmental Research Center

TERC has monitored nitrogen deposition onto the lake for last twenty years. The historic record includes water years 1994, 1998, 2000-2017 (TERC 2018). The monitoring program collects information on total nitrogen and dissolved inorganic nitrogen. Figures 3 and 4 are reproduced from the TERC summary of monitoring through 2017 (TERC 2018). While the red trend lines show an apparent downward trend in observed deposition, there is no statistically significant trend in deposition of either total nitrogen or dissolved organic nitrogen over the period of record.

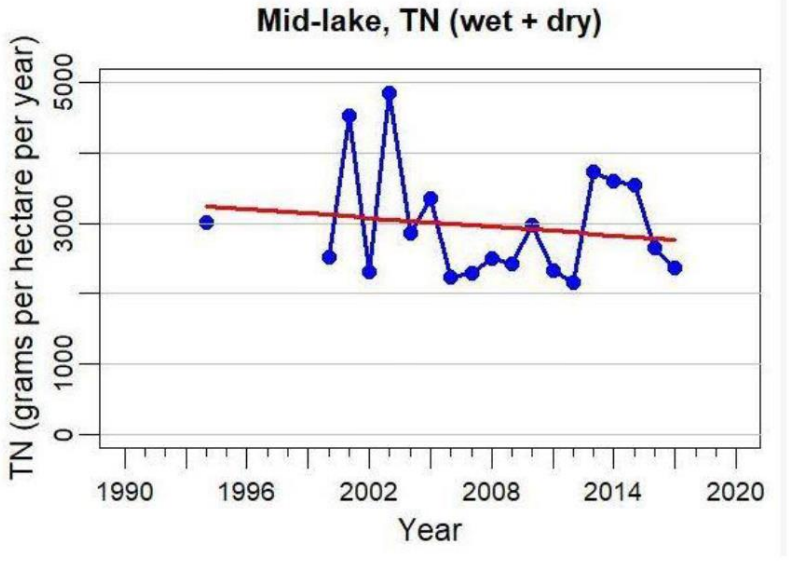

Figure 4. Annual total nitrogen (NO_3-N + TKN) loading at the mid-lake station WY1994, 2000-2017. Red line is GAM statistical line of fit. The results of the GAM analysis indicated there was no statistically significant trend for TN in atmospheric deposition at mid-lake for the period of record at the $p \leq 0.05$ level (r^2= -0.0313, p=0.509, n=19, K=3).

FIGURE 3: TOTAL NITROGEN DEPOSITION ON TO LAKE TAHOE (WATER YEARS 1994, 2000-2017). SOURCE: TERC 2018

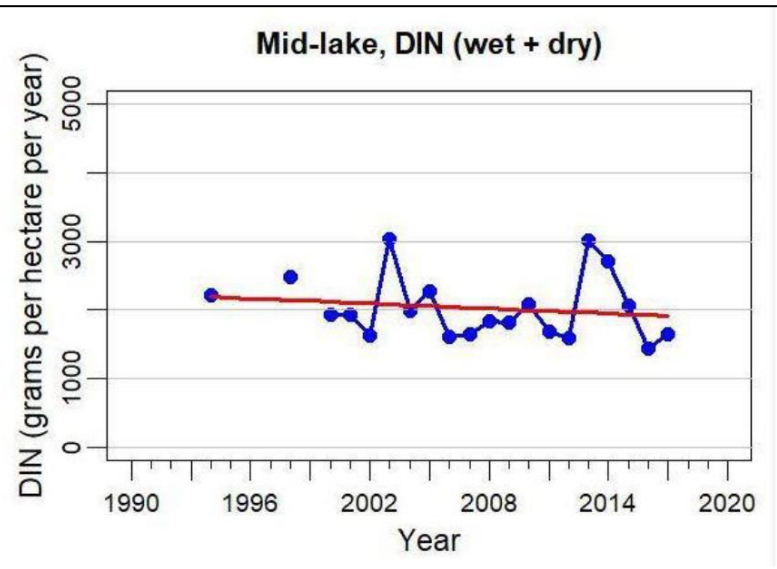

Figure 2. Annual Dissolved Inorganic Nitrogen "DIN" (NO_3-N + NH_4-N) loading at the mid-lake station WY1994, 1998, 2000-2017. Red line is GAM statistical line of fit. The results of the GAM analysis indicated there was no statistically significant trend for DIN in atmospheric deposition at mid-lake for the period of record at the $p \leq 0.05$ level (r^2= -0.0262, p=0.482, n=20, K=3).

FIGURE 4: DISSOLVED INORGANIC NITROGEN DEPOSITION ON TO LAKE TAHOE (WATER YEARS 1994, 1998, 2000-2017). SOURCE: TERC 2018

National Atmospheric Deposition Network

Wet deposition data were summarized from the National Atmospheric Deposition Program/National Trends Network (NDAP). To represent regional deposition trends, NDAP uses data collected from its network of sites and spatial interpolation and modelling to estimate wet deposition across the entire country. There are no NDAP sites in the Tahoe Region, but four NDAP sites exist in the greater region (NTN Site CA88 -Davis, CA / NTN Site CA99, Yosemite NP / NTN Site CA50 North of Truckee / NTN Site NV03, Smith Valley, NV).

Estimated average annual concentration of NO_3 in wet deposition within the Tahoe basin was summarized from NDAP data and is presented in Figure 5. The observations are consistent with the TERC data, the trend appears to be a decline, but the trend is not statistically significant.

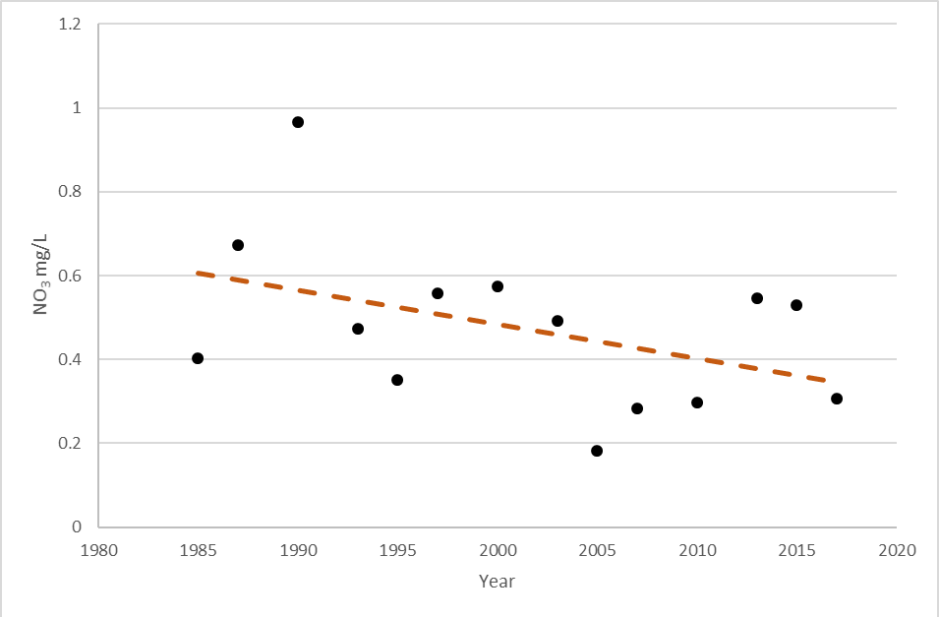

FIGURE 5: AVERAGE CONCENTRATION OF NO_3 IN WET DEPOSITION THE TAHOE BASIN. SOURCE: NADP/NTN 2018

The NADP National Trends Network (NTN) also provides estimates of total deposition (wet and dry), by leveraging air quality monitors and the Community Multiscale Air Quality (CMAQ) modeling system to estimate dry deposition (NDAP 2018). Estimates of total N deposition are available from 2000 – 2017. Estimated deposition within the Tahoe basin was summarized from NDAP data and is presented in Figure 6. In contrast to the TERC measurements and the NDAP wet deposition, total estimated total N deposition appears to be increasing, but like the other two measures, the trend is not statistically significant.

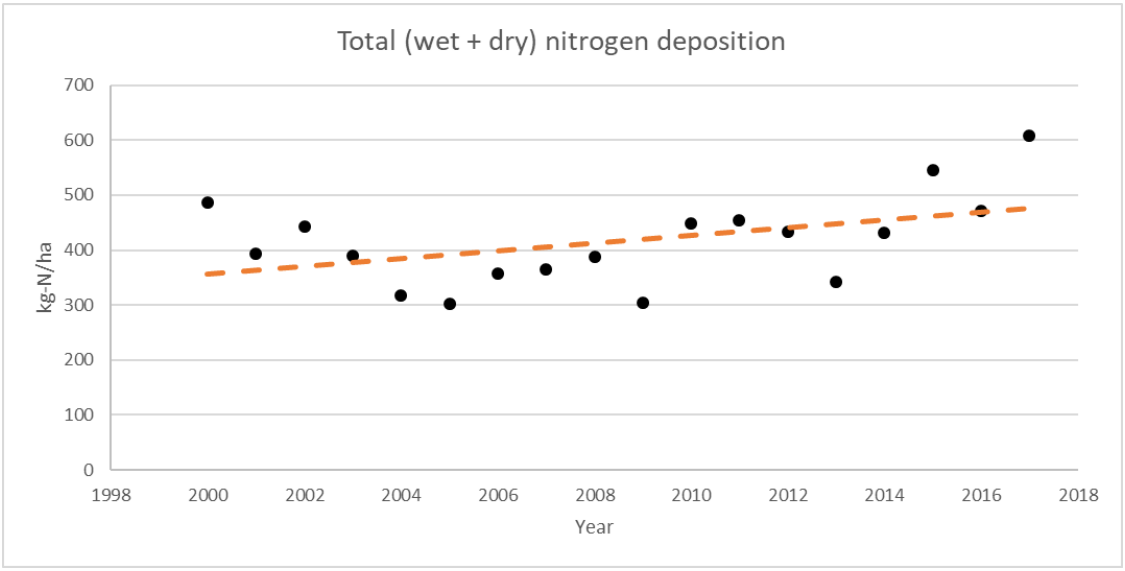

FIGURE 6: TOTAL N DEPOSITION IN THE TAHOE BASIN. SOURCE: NADP/NTN 2018 (VERSION 2018.02)

NITROGEN DEPOSITION AND EMISSIONS

The relationship between local emissions and deposition is complex as described above. While no significant pattern has been observed in deposition of total nitrogen or dissolved inorganic nitrogen onto the lake between 2000 and 2016, in basin emissions from mobile sources have declined by two-thirds over the same period (Figure 7, CARB 2016; TERC 2017).

In 2017, TRPA asked the Tahoe Science Advisory Council (TSAC) to investigate the relationship between vehicle miles traveled in Tahoe Region and pollutant loading to Lake Tahoe. Researchers at The Desert Research Institute, Division of Atmospheric Sciences used a series of model simulations to explore the impact of VMT reduction on nitrogen deposition in the Region. The preliminary research suggests that vehicles in the Region account for 20 percent of the nitrogen deposited in the Region. The research estimated that if emissions per mile were constant, nitrogen deposition would decline by 2.5 percent to 2.8 percent as a result of the 15 percent VMT reduction observed between 1981 and 2014. Actual emissions per mile have decreased significantly over the last 30 years, but exploring that change was beyond the scope of the TSAC research. The preliminary research findings suggest that if mobile emissions in the Region were reduced to zero, atmospheric deposition would be reduced by 13 percent to 14 percent (TSAC 2018b).

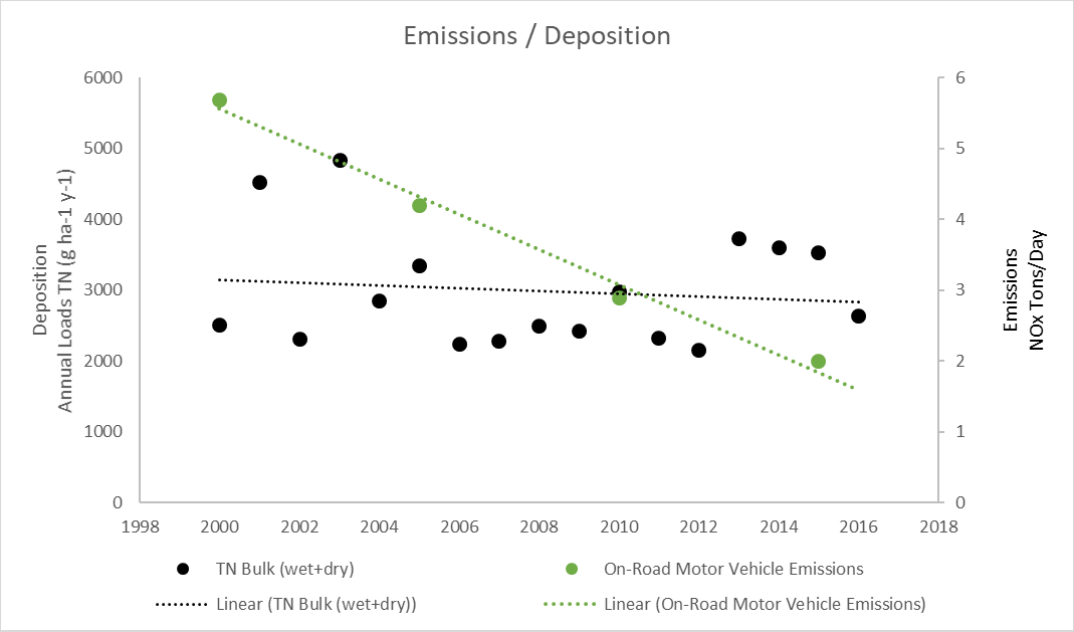

FIGURE 7: IN BASIN NITROGEN EMISSIONS AND DEPOSITION (2000-2016). SOURCE: TERC 2017, CARB 2016.

LAKE TAHOE TMDL

The Lake Tahoe Total Maximum Daily Load (TMDL) establishes the 65 year strategy to restore the historic clarity of Lake Tahoe (Lahontan & NDEP 2010). To restore that clarity, the TMDL identified three pollutants of concern (fine sediment particles, nitrogen, and phosphorus) and the sources and associated loads of those pollutants. The TMDL establishes the load reduction targets necessary for each pollutant of concern (a 65 percent 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.

Nitrogen Load Reduction

The TMDL target for reduction in total nitrogen load from all sources is 10 percent by 2076. Atmospheric deposition of nitrogen was estimated to account for 63 percent of total nitrogen load to the lake. The TMDL target for nitrogen load reduction from atmospheric sources is one percent by 15 years of implementation and two percent by 2076 (Lahontan & NDEP 2010). The Lake Tahoe TMDL Pollutant Reduction Opportunity Report analyzed pollutant load reductions and the costs associated with those controls (Lahontan & NDEP 2008).

The Lake Tahoe TMDL Program 2018 Performance Report estimated that TMDL implementors reduced nitrogen load from urban areas by 7.3 percent in the 2017 water year (Lahontan & NDEP 2018). The U.S. Geologic Survey, TERC, and independent statisticians analyzed over 30 years of stream loading data for the 2015 Threshold Evaluation Report. They found that over the 30 year period there had been 52.1 percent reduction in flow weighted nitrite, but found no significant trend in flow weighted total nitrogen load (TRPA 2016). Inter-annual variability in local weather and the resulting amount, timing, and type of precipitation have a strong influence on stream inflow and pollutant load. Flow weighted load analysis accounts for the variability in inflow and provides an estimate of the nutrient load carried by a set amount of water.

Fine Sediment Load Reduction

Fine sediment particle (FSP) accumulation is primarily responsible for declining clarity and reducing fine sediment load is the primary focus of the TMDL. TMDL development considered a number of options for fine sediment 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 findings of the TMDL work suggested that VMT reduction would likely not be a cost-effective strategy for FSP load reduction. The work estimated that a 25 percent reduction in VMT would reduce FSP loads by less than half of one percent (Lahontan & NDEP 2008).

CONCLUSION

The VMT standard was originally adopted as a policy to reduce emissions of nitrogen from mobile sources in the Region, and thereby reduce loading to the Lake. The understanding of the relationship between in-region nitrogen emissions and atmospheric deposition has progressed as a result of empirical observations over the last 30 years.

- Current in-basin NO_x emissions from mobile sources are substantially below 1981 levels.
- A 14-fold increase in VMT from 1981 levels would be required to equal the 1981 NOx emissions levels.[2]
- The goal established by the VMT standard, a 10% reduction in NOx emissions from in-basin mobile source, was likely achieved more than 15 years ago.
- NO_x emissions are likely to continue to decline even further as a result of increasingly strict tailpipe emissions standards.
- Atmospheric deposition of nitrogen hasn't changed significantly in the last 20 years.
- Nitrogen emissions from mobile sources in the Region have declined by >66%, far in exceedance of the standard's goals. Despite this decline, no significant change in atmospheric deposition of nitrogen has been observed.

Understanding of the drivers of clarity loss has improved significantly since the standards was adopted in 1982. The motivating concern at the time was algal growth in the lake which was thought to be primarily responsible for declining clarity.

- The TMDL demonstrated that clarity loss is primarily driven by fine sediment particle accumulation.
- The TMDL found that excess algal growth is responsible for roughly a third of clarity loss.
- TMDL implementation focuses on reduction of FSP load
- Preliminary TMDL science suggested that VMT reduction was unlikely to be a cost-effective strategy to reduce nitrogen loading.

The declines in emissions from mobile sources means that functionally the VMT standard no longer provides additive water quality benefits to the load reduction targets established by Air Quality standard 13 and Water Quality standards 36 and 41, which directly address nitrogen from all sources.

[2] Calculations based on the difference between 1981 and 2009 model year tailpipe emissions standards. Using the 2025 model year emissions standard the necessary increase would be a 33 increase in VMT.

REFERENCES

CARB. 2016. 2016 SIP Emission Projection Data: Annual Statewide Emissions Summaries. California Air Resources Board, Sacramento, CA. Available from https://www.arb.ca.gov/ei/emissiondata.htm.

EPA. 1999. The History of Reducing Tailpipe Emissions. Available from https://www.epa.gov/air-pollution-transportation/timeline-major-accomplishments-transportation-air-pollution-and-climate (accessed January 31, 2018).

EPA. 2014. Small Entity Compliance Guide for "Control of Air Pollution From Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards." Assessment and Standards Division Office of Transportation and Air Quality U.S. Environmental Protection Agency. Available from https://www.epa.gov/sites/production/files/2015-06/documents/compliance-tier3motorvehicle_emission_1.pdf.

EPA. 2018. Timeline of Major Accomplishments in Transportation, Air Pollution, and Climate Change. Available from https://www.epa.gov/air-pollution-transportation/timeline-major-accomplishments-transportation-air-pollution-and-climate (accessed January 31, 2018).

FHWA. 2017. FHWA Forecasts of Vehicle Miles Traveled (VMT): Spring 2017. Office of Highway Policy Information Federal Highway Administration. Available from https://www.fhwa.dot.gov/policyinformation/tables/vmt/vmt_forecast_sum.pdf.

Lahontan, NDEP. 2008. Lake Tahoe TMDL Pollutant Reduction Opportunity Report. California Regional Water Quality Control Board, Lahontan Region, Nevada Division of Environmental Protection, South Lake Tahoe, California. Carson City, Nevada.

Lahontan, NDEP. 2010. Final Lake Tahoe Total Maximum Daily Load Report. California Regional Water Quality Control Board, Lahontan Region, Nevada Division of Environmental Protection, South Lake Tahoe, California. Carson City, Nevada.

Lahontan, NDEP. 2018. Lake Tahoe TMDL Program 2018 Performance Report. California Regional Water Quality Control Board, Lahontan Region, Nevada Division of Environmental Protection, South Lake Tahoe, California. Carson City, Nevada.

League To Save Lake Tahoe. 1982, July 16. Comments Prepared by the League to Save Lake Tahoe. Environmental Impact Statement for the Establihsment of Environmental Threshold Carrying Capacites.

Lloret J, Valiela I. 2016. Unprecedented decrease in deposition of nitrogen oxides over North America: the relative effects of emission controls and prevailing air-mass trajectories. Biogeochemistry **129**:165–180.

NDAP. 2001. Nitrogen in the Nation's Rain. National Atmospheric Deposition Program, Champaign, Illinois.

NDAP. 2018. Total Deposition Estimates Using a Hybrid Approach with Modeled and Monitoring Data (version 2018.2). NADP National Trends Network (NTN). Available from ftp://ftp.epa.gov/castnet/tdep/Total_Deposition_Documentation_2018v02.pdf.

Pollard EK, Reid SB, Stilley JC. 2012. Development of a Regional Greenhouse Gas Emissions Inventory for the Lake Tahoe Basin. Prepared for California Tahoe Conservancy STI-911006-5371-DFR. Sonoma Technology, Inc., Petaluma, CA.

Salon D, Boarnet M, Mokhtarian P. 2013. Quantifying the effect of local government actions on VMT. Prepared for the California Air Resources Board and the California Environmental Protection Agency. Organization: Institute of Transportation Studies, University of California, Davis, Davis, CA. Available from https://www.arb.ca.gov/research/rsc/10-18-13/item3dfr09-343.pdf.

Salon D, Boarnet MG, Handy S, Spears S, Tal G. 2012. How do local actions affect VMT? A critical review of the empirical evidence. Transportation Research Part D: Transport and Environment **17**:495–508.

TERC. 2017. Atmospheric Pollutant Deposition Monitoring. UC-Davis, Tahoe Environmental Research Center, Incline Village, NV.

TERC. 2018. Atmospheric Pollutant Deposition Monitoring. UC-Davis, Tahoe Environmental Research Center, Incline Village, NV.

TRPA. 1982a. Study Report for the Establishment of Environmental Threshold Carrying Capacities. Tahoe Regional Planning Agency, Stateline, NV.

TRPA. 1982b. TRPA Governing Board Packets August 1982. Tahoe Regional Planning Agency, Stateline, NV.

TRPA. 2012a. TRPA Governing Board Packets December l 2012. Tahoe Regional Planning Agency, Stateline, NV.

TRPA. 2012b. Resolution No. 82-11. Tahoe Regional Planning Agency, Stateline, NV.

TRPA. 2016. 2015 Threshold Evaluation. Tahoe Regional Planning Agency, Stateline, NV.

TRPA. 2017a. Threshold Assessment Methodology v1.7. Tahoe Regional Planning Agency, Stateline, NV. Available from http://www.trpa.org/wp-content/uploads/ThresholdAssessmentMethodology_v17.pdf.

TRPA. 2017b. Draft Threshold Assessment Findings. Tahoe Regional Planning Agency, Stateline, NV. Available from http://www.trpa.org/wp-content/uploads/ThresholdAssessmentMethodology_v17.pdf.

TSAC. 2018a. TOPIC BRIEF: Nitrogen emissions from automobiles (historic perspective and projected); how have emissions changed between 1982 to the present, and as projected through 2050? Desert Research Institute.

TSAC. 2018b. Final report: Vehicle Miles Traveled Review. Desert Research Institute.


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STAFF REPORT

Date: August 21, 2019

To: TRPA Regional Plan Implementation Committee

From: TRPA Staff

Subject: Summary of Upcoming Topics for Regional Plan Implementation Committee Consideration

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Summary and Staff Recommendation:
This item is for informational purposes and no action is required.

Background:
This report provides a summary of topics anticipated to come before the Regional Plan Implementation Committee (RPIC) within the next three months based on priorities established by the Governing Board and current staff resources. All topics and dates are subject to change.

MONTH	ITEM(S)
September	Washoe County Tahoe Area Plan Informational Session New Pier Lottery Update
October	Douglas County Area Plans Informational Session City of South Lake Tahoe – Tourist Core Area Plan Amendment
November	No items scheduled at this point

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