

# **TRPA Project Impact Assessment Tool User Guidelines**

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## 1. **Purpose**

The tool implements the Tahoe Regional Planning Agency's Project Impact Assessment Process for Transportation using vehicle miles traveled (VMT). The full framework can be found [here](#):

The tool provides initial screening for all project types and VMT analysis for residential, tourist accommodation unit, and public service projects. Impact assessment for non-screened office, industrial, and unique project types should be conducted outside of the tool. All non-screened commercial, recreation, and other projects will need to complete a more detailed transportation analysis.

- Project screening – determining whether or not a project is exempt from further VMT analysis
- VMT analysis for residential, tourist accommodation, and public service projects that do not meet any screening criteria
- Identification of appropriate VMT mitigations for projects that exceed VMT standards of significance
- Calculation of mobility mitigation fees

CEQA is a process that is similar to TRPA's environmental review process. CEQA applies to most discretionary actions undertaken by a public agency in California. These actions may include authorizing development through land use permit approval. An applicant should consult the California city or county to determine whether CEQA applies to their project.

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### CALIFORNIA SENATE BILL 743

California Senate Bill (SB) 743 (2013) required that the Office of Planning and Research amend the CEQA Guidelines to establish a new transportation analysis alternative to Level of Service (LOS). OPR recommended the use of Vehicle Miles Travelled (VMT) as "the most appropriate measure for transportation impacts."<sup>1</sup> The CEQA Guidelines were modified in 2018 and put into effect in 2020.

TRPA's standards and procedure for VMT analysis recognize and align with SB 743. This was done to ensure that there would not be two separate and possibly conflicting review procedures for project development in the region.

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### OTHER TRANSPORTATION STUDY GUIDELINES

In addition to TRPA, other agencies have established transportation study guidelines. Applicants are advised to consult other applicable transportation study guidelines and scope their transportation analysis to cover all relevant topics.

Applicable transportation study guidelines include:

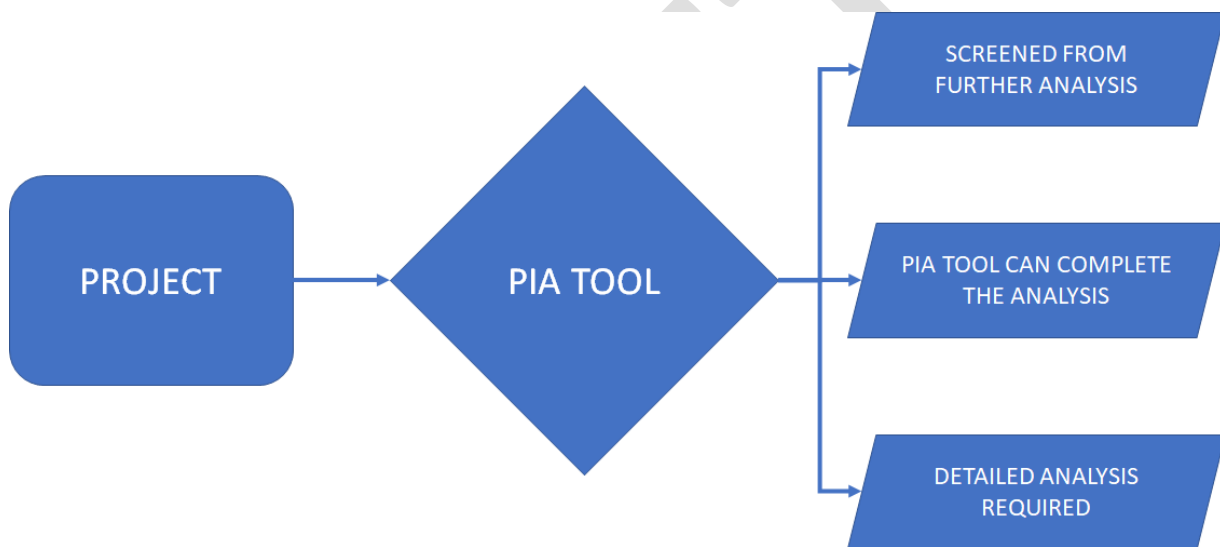
- *County of Placer Transportation Study Guidelines* (County of Placer 2020) defines general requirements for transportation studies in Placer County.
- *Transportation Impact Study Guidelines* (County of El Dorado 2014) defines general requirements for transportation studies in El Dorado County.
- *Technical Advisory on Evaluating Transportation Impacts in CEQA* (California Governor's Office of Planning and Research 2018).

- *Vehicle Miles Traveled-Focused Transportation Impact Study Guide* (Caltrans 2020) provides guidance about Caltrans review of VMT analysis for projects on or near the California State Highway System.
- *Updated Interim LD-IGR Safety Review Guidance* (Caltrans 2020) provides guidance about safety analysis for projects on or near the California State Highway System.

## 2. **Limitations**

### a. Project Types & Sizes:

- Mixed use redevelopment
- non-screened commercial or recreation projects
- other projects not defined



**b. Geographic Coverage:** The tool encompasses the area with the official boundary of the Tahoe Regional Planning (which can be found [here](#)) and cannot be used to analyze projects in adjacent area such as Truckee, Squaw Valley, and Kirkwood. In some rare cases, a proposed project may be located in an area within the Tahoe region where existing tool data does not cover. In that case, the applicant should contact TRPA staff to determine the best course of action.

**c. VMT types:** the project tool evaluates VMT generated by proposed projects. Generated VMT can be used to determine if a project meets the screening criteria, and if certain project types meet the defined standards of significance (i.e., Residential, Tourist Accommodation Unit, and Public Service projects). Commercial, Recreation, and other project types not defined here, and more complex projects, such as mixed-use redevelopment, that do not meet the screening criteria must evaluate their project's VMT effect through a more detailed analysis. Any applicant can choose to conduct a more detailed analysis if they believe it would more accurately reflect the project's effect on VMT. The

tool relies on data from existing conditions to forecast project generated VMT. The tool cannot estimate a project's effect on VMT (i.e., how existing trips would re-distribute as a result of the project). If the proposed land use(s) have substantially different characteristics than the existing built environment (e.g., very high density development in an existing rural, low density area) the applicant should consider analyzing impact on VMT outside of the tool.

### **3. Conditions for Using Tool**

These Terms of Use, as well as any and all terms associated with the Tahoe Regional Planning Agency ('TRPA'), apply to the Project Impact Analysis Tool (the 'App'; collectively the 'Terms of Use'). The App is the property of TRPA and its licensors. By using the App, you agree to the terms of use, and confirm that you have read and accepted the following information. If you do not agree to the terms, do not use the App. TRPA reserves the right at any time - and with its sole discretion - to modify these Terms of Use. You are responsible for periodically reviewing the Terms of Use. These Terms of Use override any others relating to the TRPA where a conflict in terms may exist. Compliance with these Terms of Use grants you a non-exclusive, non-transferable, limited privilege to use the App.

#### **Tool Disclaimer:**

**TRPA developed this tool to provide initial screening for residential, tourist accommodation unit, and public service project's impact assessment for office, industrial, and unique project types should be conducted outside of the tool. All non-screened commercial, recreation, and other projects will need to complete a more detailed transportation analysis. By accessing this Tool, you agree to the following:**

**By clicking "Accept" below and/or using the Online Project Impact Assessment Tool, you agree to the terms of this Agreement.**

**TRPA shall retain all rights, titles, and interests in the Tool and its content, as well as all inventions, improvements, discoveries, methodologies, models, formats, software, algorithms, processes, procedures, designs, specifications, findings, other intellectual properties developed, gathered, compiled, or produced by TRPA in developing the Tool, or which is otherwise incorporated in the Tool. TRPA grants you only a limited, non-exclusive, non-transferable, royalty-free, license to review, promote, use, disclose, create outputs from the Tool, but only in order to evaluate the Tool's functionality and capabilities. TRPA retains rights to all of the data contained in this tool.**

You use the Tool at your own risk. TRPA makes no promise and gives no guarantee regarding the accuracy, completeness, reliability, or functionality of the Tool. The Tool should not be used in the performance of your professional services or for any other purpose than initial screening for all project types and more detailed analysis for some project types. TRPA does not assume responsibility for any impact that the use of the Tool may have on your or any third party's operational environment or CPU performance. TRPA does not promise that the Tool, TRPA's server, or TRPA's other electronic, digital, computing, or communication system, is free of bugs, viruses, Trojan horses, or other harmful, unlawful, or malicious materials. TRPA may change the data, functionality, interface, or availability of the Tool at any time in its sole discretion, but TRPA does not promise to update or debug the Tool.

THE TOOL AND ANY ASSOCIATED DOCUMENTATION ARE MADE AVAILABLE "AS IS," WITHOUT ANY WARRANTY OF ANY KIND. THERE IS NO WARRANTY THAT THE TOOL OR DOCUMENTATION WILL MEET YOUR EXPECTATIONS OR REQUIREMENTS, OR THAT THE OPERATION OF THE TOOL WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT THE TOOL WILL FUNCTION AS DESCRIBED IN THE DOCUMENTATION. TRPA HEREBY DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, OR INFRINGEMENT. IN NO EVENT WILL TRPA HAVE ANY LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSSES OR DAMAGES YOU MAY SUFFER DIRECTLY OR INDIRECTLY, OR FOR ANY EXPENSE OR COSTS YOU MAY INCURRED, IN CONNECTION WITH THE USE OF THE TOOL. TRPA SHALL HAVE NO LIABILITY TO YOU OR ANY OTHER PARTY FOR LOST DATA, LOST PROFITS, BUSINESS INTERRUPTION, TIME, MONEY, GOODWILL AND ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT, TORT, STRICT LIABILITY OR OTHERWISE, ARISING OUT OF THE USE OR INABILITY TO USE THE TOOL, EVEN IF YOU HAVE ADVISED TRPA OF THE POSSIBILITY OF SUCH LOSS OR DAMAGES. YOUR SOLE AND EXCLUSIVE REMEDY SHALL BE TO TERMINATE THE USE OF THE TOOL.

Furthermore, in accessing TRPA's website, server, or on the Tool, you agree not to:

1. access any other website or web content through TRPA's server;
2. decompile, or reverse engineer any portion of the Tool or any other content on TRPA's server;
3. attempt unauthorized access to the Tool, TRPA's server, or any other content, on TRPA's server, or in any way interfere with their access control devices, integrity, or performance;

**4. perform load, technical security, or other vulnerability testing on any content on TRPA's server other than the Tool;**

**5. store, transmit, or produce libelous, slanderous, lewd, or lascivious, viruses, Trojan horses, or other harmful, unlawful, or malicious materials;**

**6. violate any person's privacy rights, access information of or on any person, or determine the person's identity or location;**

**7. violate any intellectual property rights; or**

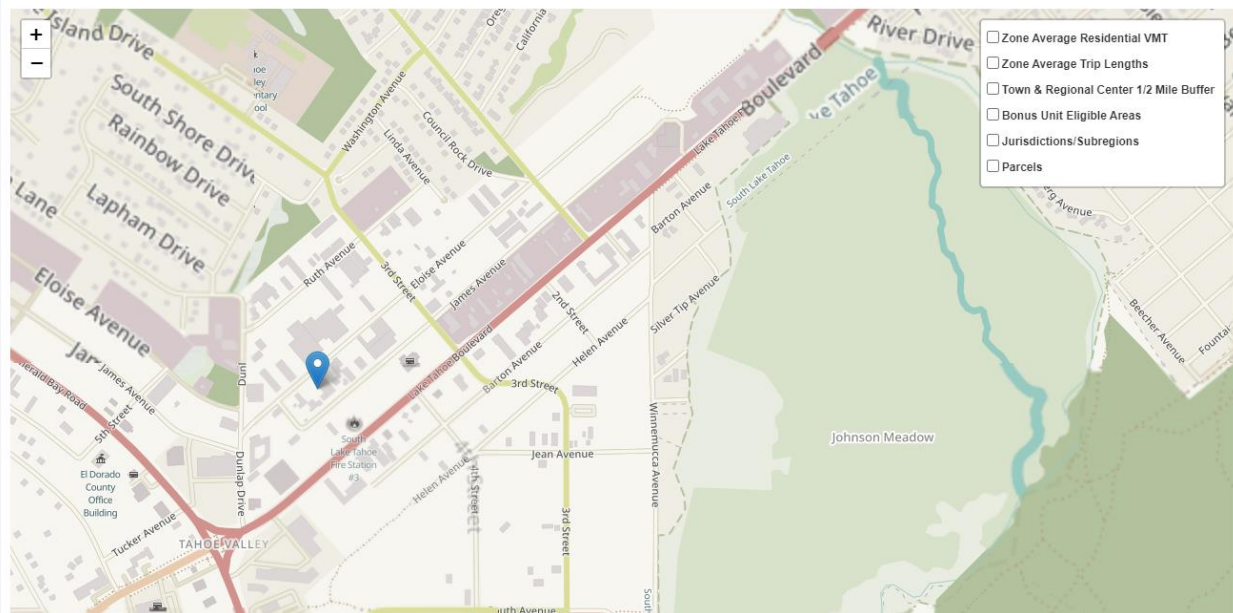
**8. mass download or batch data.**

#### **4. How to Use the Tool**

1. Go to [trpa.shinyapps.io/PIA\\_Tool/](https://trpa.shinyapps.io/PIA_Tool/)

2. Read the instructions, disclaimer, and agree to the conditions of use.
3. Using the map, zoom into your project area and click on the map to identify your project site location. You may utilize the GIS layers found on the top right of the screen to better understand the characteristics of your project location.

Select Project Location



- From the panel on the far left of the screen, select your project type from the dropdown “Proposed Project Type”.

## DRAFT - Project Impact Analysis Tool - DRAFT

TRPA Analysis  
 SB 743 Analysis  
 User Guidelines

**Proposed Project Name**

**Proposed Project Type**

Auto Parts and Service Center

Auto Parts and Service Center  
Bowling Alley  
Building Materials/Lumber  
Church  
Daycare Center  
Developed Campground/RV Park  
Drinking Place

- Below the proposed project type dropdown, enter the number of units for your project.




## DRAFT - Project Impact Analysis Tool - DRAFT



TRPA Analysis

SB 743 Analysis

User Guidelines



**Proposed Project Name**

**Proposed Project Type**

**Proposed Square Feet**

6. If the project involves a change in operation from existing development on the site, select “Yes” on the “Change in Operation” toggle and then enter the characteristics of the existing land use (e.g. type and size) and the proposed land use. 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.



The tool provides initial screening for all project types and more detailed analysis for residential, tourist accommodation, transit, and public service projects. All non-screened commercial, recreation, and other projects will need to complete a more detailed transportation analysis.

Follow the steps below to analyze your project. For detailed information on the VMT framework, tool usage, and calculations select the User Guidelines tab.

- 1) Select your project type from the dropdown.
- 2) Select your project location on the map.
- 3) Enter the number of proposed units.
- 4) Select mitigation strategies if applicable.

#### Change in Operation

- ☒ Yes  
☐ No

#### Existing Land Use

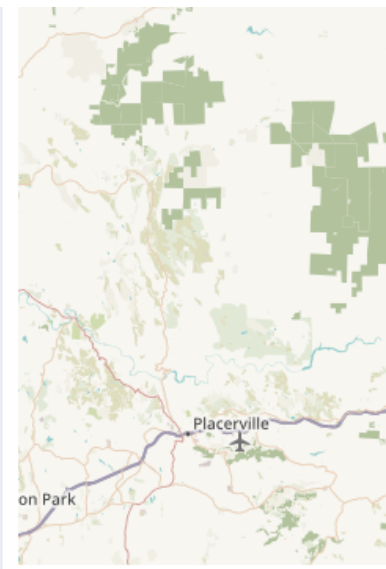
Auto Parts and Service Center ▼

#### Existing Square Footage

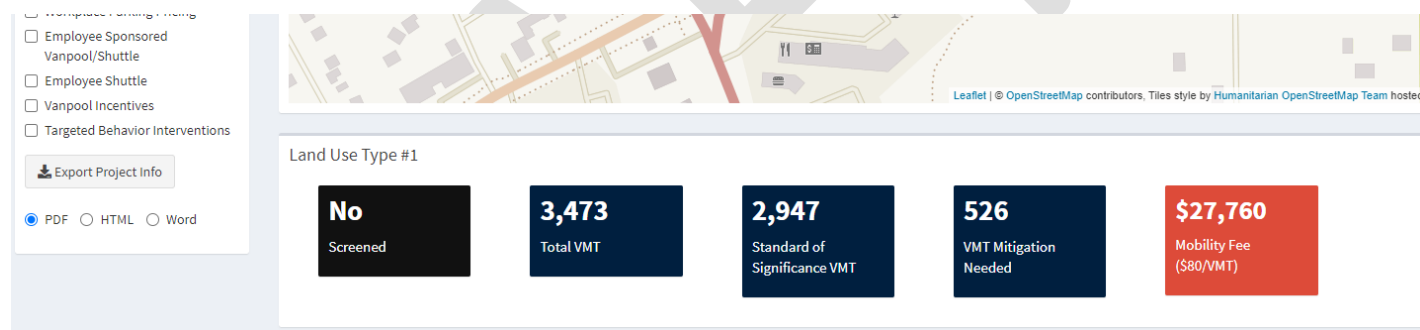
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#### Select Mitigations

- ☐ Unbundle Parking Costs from Property Cost  
☐ Traffic Calming  
☐ End of Trip Facilities



### 7. Review the summary data in the boxes below the map.



- **Summary of Outputs:**
- **Screening Status** - The first box indicates if the project's screening status. The box will display a "Yes" if the project meets the screening criteria, and "No" if it is not screened.
- **Total VMT** - The estimated total amount of VMT generated by the project.
- **Standard of Significance VMT** - A standard of significance is the maximum amount of VMT that a project can generate and not create a significant impact for implementing the VMT per Capita Threshold at the project level. The standard of significance VMT expresses the project's VMT in absolute terms. The Standard of Significance is better determined through a more detailed analysis for non-screened office, industrial, commercial, recreation, and other project types.
- **VMT Mitigation Needed** - The amount of VMT the project needs to mitigate to be below the standard of significance. Screened projects, and projects where the VMT generated is less than the standard of significance will indicate zero VMT mitigation is needed. The VMT Mitigation Needed is better determined through a more

detailed analysis for non-screened office, industrial, commercial, recreation, and other project types.

- **Mobility Fee** – The mobility mitigation fee the project must pay, based on the VMT generated by the project. The mitigation fee is better determined through a more detailed analysis for non-screened office, industrial, commercial, recreation, and other project types.
8. VMT mitigations are design features or programs that can be incorporated into a project to reduce the VMT generated by the project. To incorporate mitigations and reduce the project generated VMT, select the available mitigation check boxes under “Select Mitigations.” For more information on associated requirements (i.e., permit conditions) for each mitigation, refer to the Appendix E for more information. Adding mitigation strategies can help reduce the VMT for a project to below the standard of significance and will reduce the project’s mobility mitigation fee.

The tool provides initial screening for all project types and more detailed analysis for residential, tourist accommodation unit, and public service projects. All non-screened commercial, recreation, and other projects will need to complete a more detailed transportation analysis.

Follow the steps below to analyze your project. For detailed information on the PIA framework, tool usage, and calculations select the User Guidelines tab.

1) Select your project type from the dropdown.

The tool provides initial screening for all project types and more detailed analysis for residential, tourist accommodation unit, and public service projects. All non-screened commercial, recreation, and other projects will need to complete a more detailed transportation analysis.

Follow the steps below to analyze your project. For detailed information on the PIA framework, tool usage, and calculations select the User Guidelines tab.

1) Select your project type from the dropdown.

#### Change in Operation

☐ Yes

☒ No

#### Select Mitigations

☐ Unbundle Parking Costs from Property Cost

☐ Traffic Calming

☐ End of Trip Facilities

☐ Implement CTR Program - Voluntary

 Export Project Info

#### Change in Operation

☐ Yes

☒ No

#### Select Mitigations

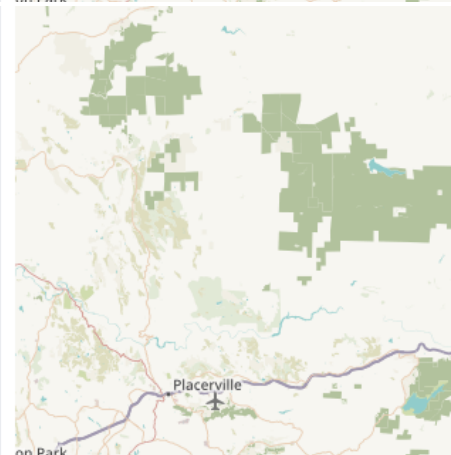
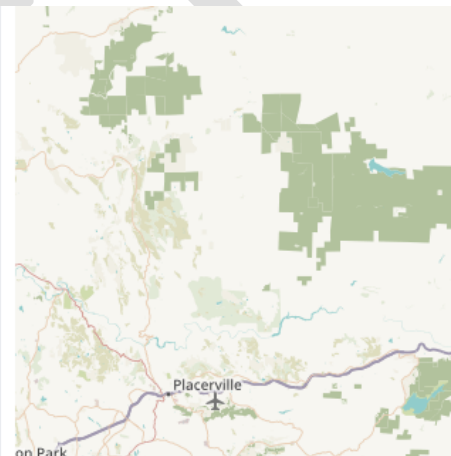
☐ Unbundle Parking Costs from Property Cost

☐ Traffic Calming

☐ End of Trip Facilities

☐ Implement CTR Program - Voluntary

 Export Project Info



9. The VMT reduction of some mitigation measures scales with the project population that is targeted by the mitigation measure and the VMT they generate. Where that

is the case the “percentage eligible” sliders will appear and should be adjusted to the appropriate level.

☐ Traffic Calming

☒ Implement CTR Program - Voluntary

☐ Implement CTR Program - Required Implementation/Monitoring

**Percent (%) of Total Employees Eligible (if applicable)**

0 100

0 10 20 30 40 50 60 70 80 90 100

**Employee Percent (%) of Total VMT (if applicable)**

0 100

0 10 20 30 40 50 60 70 80 90 100

Export Project Info

Land Use Type #1

**Yes**

10. Once you are finished entering your project data per the instructions above and you have reviewed the input data for accuracy, click the “Export Project Info” button to export your project analysis for incorporation into your TRPA permit packet. It may take a few seconds to download the file.

The tool provides initial screening for all project types and more detailed analysis for residential, tourist accommodation unit, and public service projects. All non-screened commercial, recreation, and other projects will need to complete a more detailed transportation analysis.

Follow the steps below to analyze your project. For detailed information on the PIA framework, tool usage, and calculations select the User Guidelines tab.


- 1) Select your project type from the dropdown.
- 2) Select your project location on the map.
- 3) Enter the number of proposed units
- 4) Select mitigation strategies if applicable

#### Redevelopment Project

- ☐ Yes  
☒ No

#### Select Mitigations

- ☐ Ride Sharing Program  
☐ Telecommuting/Alternative Work Schedules  
☒ Trip Reduction Marketing  
☒ Traffic Calming  
☐ Workplace Parking Pricing  
☐ Employee Sponsored Vanpool/Shuttle  
☐ Employee Shuttle  
☐ Vanpool Incentives  
☐ Targeted Behavior Interventions

 Export Project Info

- ☒ PDF ☐ HTML ☐ Word



#### Land Use Type #1

**No**

Screened

**3,473**

Total VMT

## 5. Reading the Project Report

The exported project report contains the details of the VMT project impact assessment. The first part of the export contains basic project details entered by the user: project name, land-use type, project size, and existing land use on the site. The report indicates if the project met screening criteria. For projects that do not screen, the report indicates that additional analysis will be required.

**Proposed Project Gross VMT** - The estimated total amount of VMT generated by the project

**Existing Use VMT** – VMT of the existing use on site. Only reported where the applicant indicates a change of use.

**Project Total Net VMT** – Project VMT after summing the difference between Existing Use VMT and Proposed Project Gross VMT, and after mitigation strategies are applied, if any.

**Standard of Significance VMT** – A standard of significance is the maximum amount of VMT that a project can generate and not have a significant impact to implementation of the VMT per Capita Threshold at the project level. The Standard of Significance VMT expresses the project's VMT in absolute terms.

**VMT Mitigation Needed** – The amount of VMT the project needs to mitigate to be at or below the Standard of Significance. Screened projects, and projects where the VMT generated is less than the Standard of Significance, will indicate zero VMT mitigation is needed.

**Mobility Fee** – The mobility mitigation fee the project must pay, based on the VMT generated by the project.

**Zone ID** – The project impact assessment zone in which the project is located. Project impact assessment zones may be a single travel analysis zone or a group of travel analysis zones. In some cases, travel analysis zones were grouped into one project impact assessment zone to better reflect the underlying land use and transportation context, such as neighborhoods.

**Zone Average Trip Length** – The average trip length for the project impact assessment zone in which the project is located.

**Project ITE Trip Rate (if applicable)** – ITE trip generation for the project land use type.

Located in Town/Regional Center – Yes or no field indicating if the project is located within a town or regional center or a half-mile buffer around it.

Located in Bonus Unit Eligible Area - Yes or no field indicating if the project is located in an area eligible for bonus units, per 52.3.4 Affordable, Moderate, and Achievable-Income Housing in the TRPA Code of Ordinances.

Jurisdiction – Indicates the jurisdiction in which the project is located.

Parcel Number (APN) – Assessor's parcel number.

Mitigation Strategy– Indicates the mitigation strategies applied to the project

Mitigations Values – Indicates the VMT reduction associated with each applied mitigation strategy.

## **6. Tool Calculations**

### **Residential Projects**

*Project VMT* – Project VMT is the estimated amount of VMT generated from a proposed project. The data behind the calculations is drawn directly from the Tahoe travel demand model. The total VMT is calculated by multiplying the average amount of residential VMT per resident in each zone by the regional average number of people per household by the number of proposed units. This amount is then adjusted downward by 10% if the project contains low, moderate, or achievable housing units.

$$\text{Residential Project VMT} = ((\text{Zone VMT Per Resident}) * (\text{Regional Average Persons per Household}) * (\text{Number of Proposed Units}) * (\text{Low Income Factor, if applicable})) - \text{Mitigations}$$

*Standard of Significance VMT* = (15% Below Jurisdiction Average VMT Per Resident) \* (Persons per Household) \* (Number of Proposed Units)

### **Non-Residential Projects**

*Project VMT* – Project VMT is the estimated amount of VMT generated from a proposed project. The data behind the calculations is drawn from the Tahoe travel demand model trip length data and ITE trip generation rates. The total VMT is calculated by multiplying the average trip length of the zone where the project is located by the ITE trip generation rate by the size of the proposed project. This amount is then adjusted for any mitigations that the project applicant chooses to implement.

$$\text{Non-Residential Project VMT} = (\text{ITE trip rates}) * (\text{Trip Length}) * (\text{Project Size}) - \text{Mitigations}$$

*Standard of Significance VMT* = (ITE trip rates) \* (15% Below Jurisdiction Average Trip Length) \* (Project Size)

## Mixed-Use Projects

*Project VMT – Project VMT is estimated by calculating VMT for each land use according to the Residential and Non-Residential project calculation definitions above. The VMT from each land use is summed to determine the total mixed-use project VMT. Affordable housing that meets the screening criteria should be excluded from mixed-use project VMT generation calculations.*

*For mixed-use projects, the tool does not currently incorporate reductions for internal trip capture. This may be incorporated in future version of the tool.*

*Mixed-Use Project VMT = Project Generated VMT for Land Use 1 + Project Generated VMT for Land Use 2 + ...*

## All Project Types

*VMT Mitigation Needed = (Project VMT) – (Standard of Significance VMT (non-screened projects))*

- *Mobility Fee* - The mobility fee calculation is based on a project's net, unmitigated VMT. Fee Calculation - (Project VMT) \* [\\$Current Mobility Mitigation Fee Rate](#) = Project Mobility Mitigation Fee

## Redevelopment Projects

Projects that analyze a single change of use can be analyzed within the tool. Larger scale redevelopment projects that involve the removal of multiple uses (e.g., restaurant and a hotel) and transition to another set of uses (eg. residential and bank) cannot currently be analyzed in the tool. These projects require a detailed analysis to determine screening, evaluate for standards of significance, identify mitigations needed (if any), and determine mobility mitigation fees.

### **7. Tool Metadata**

*Residential VMT* – TRPA travel demand model, 2018. See appendix A for full data tables.

*Trip lengths* – TRPA travel demand model, 2018. See appendix B for full data tables.

*Trip generation (non-residential projects)* – ITE, 2018. See appendix C for full data tables.

*GIS Map Layers* – TRPA, 2018

- *PIA Zones*: These polygons were created through the aggregation of the Tahoe travel demand model transportation analysis zones (TAZs). The 282 TAZs were aggregated into 79 larger PIA zones in order to better account for similarities between neighborhoods.

*Mitigations* – CAPCOA. See appendix E for full data tables.

### **8. Tool Components**

*Screening*



- Low Income Screen: 100% deed restricted low, moderate, and achievable<sup>1</sup> Residential Units when a project is located in a bonus unit eligible area. More information on the bonus unit, see the Housing Programs & Incentives section within the Achievable Housing in the Lake Tahoe Region webpage: [Achievable Housing in the Lake Tahoe Region \(arcgis.com\)](http://arcgis.com).
- Low VMT screen: uses the location, land use type, and size of a project to determine if the generated VMT is screened: less than 1,300 project generated average daily VMT if located within or within ½ mile of a Town or Regional Center; less than 715 Project generated average daily VMT for all other locations.

### *Standards of Significance*

*A standard of significance is the maximum amount of VMT that a project can generate and have a significant impact to implementation of the VMT per Capita Threshold at the project level. The Standard of Significance VMT expresses the project's VMT in absolute terms.*

**Mitigations** – The tool includes mitigations that an applicant may select to decrease their project's VMT. The available mitigations are available to specific project types and trip types and vary in the assumed amount of VMT reduction. In general, the formula for the mitigation reductions is Project VMT – (Project VMT \* mitigation %). See appendix E for a full table of mitigations and background information.

**Low Income Housing Factor** – The tool includes a VMT reduction factor that is applied to projects which include low-income housing units. This factor is set at 10% of the project VMT and is based upon research from California Housing Partnership<sup>2</sup>.

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<sup>1</sup> Per 52.3.4 Affordable, Moderate, and Achievable-Income Housing in the TRPA Code of Ordinances

<sup>2</sup> <https://www.cnt.org/sites/default/files/publications/CNT%20Working%20Paper%20revised%202015-12-18.pdf>

## 9. Appendix A – Zone Model Data – in-region travel online

Zone	Avg Zone Trip Length	Trip Length Standard of Significance	Avg Zone Residential VMT Per Capita	Residential Standard of Significance
Zone 1	9.15	5.53	22.73	13.11
Zone 2	9.62	5.69	20.58	14.51
Zone 3	11.38	5.69	30.41	14.51
Zone 4	13.9	5.69	24.27	14.51
Zone 5	14.05	5.69	25.91	14.51
Zone 6	4.97	3.62	8.1	9.25
Zone 7	11.14	5.69	17.17	14.51
Zone 8	3.96	3.62	9.63	9.25
Zone 9	4.51	3.62	11.95	9.25
Zone 10	4.51	3.62	11.52	9.25
Zone 11	8.51	5.69	17.43	14.51
Zone 12	4.11	3.62	10.31	9.25
Zone 13	3.67	3.62	10.43	9.25
Zone 14	5.31	3.62	13.44	9.25
Zone 15	3.85	3.62	10.76	9.25
Zone 16	8.13	5.69	NA	14.51
Zone 17	4.01	3.62	11.24	9.25
Zone 18	4.13	3.62	NA	9.25
Zone 19	4.21	3.62	10.87	9.25
Zone 20	3.92	3.62	12.36	9.25
Zone 21	4.42	3.62	8.66	9.25
Zone 22	4.69	5.69	12.76	14.51
Zone 23	4.31	3.62	11.33	9.25
Zone 24	5.98	5.69	18.68	14.51
Zone 25	7.29	5.69	14.88	14.51
Zone 26	11.25	5.69	38.78	14.51
Zone 27	6.38	5.69	15.27	14.51
Zone 28	5.8	5.69	17.57	14.51
Zone 29	NA	5.69	NA	14.51
Zone 30	6.42	5.69	17.67	14.51
Zone 31	6.67	5.69	NA	14.51
Zone 32	4.78	5.69	14.93	14.51
Zone 33	7.2	5.69	20.05	14.51
Zone 34	8.76	5.69	23.15	14.51
Zone 35	NA	5.69	NA	14.51
Zone 36	10.26	5.69	23.77	14.51
Zone 37	9.9	5.41	25.56	13.08
Zone 38	6.53	5.41	16.31	13.08

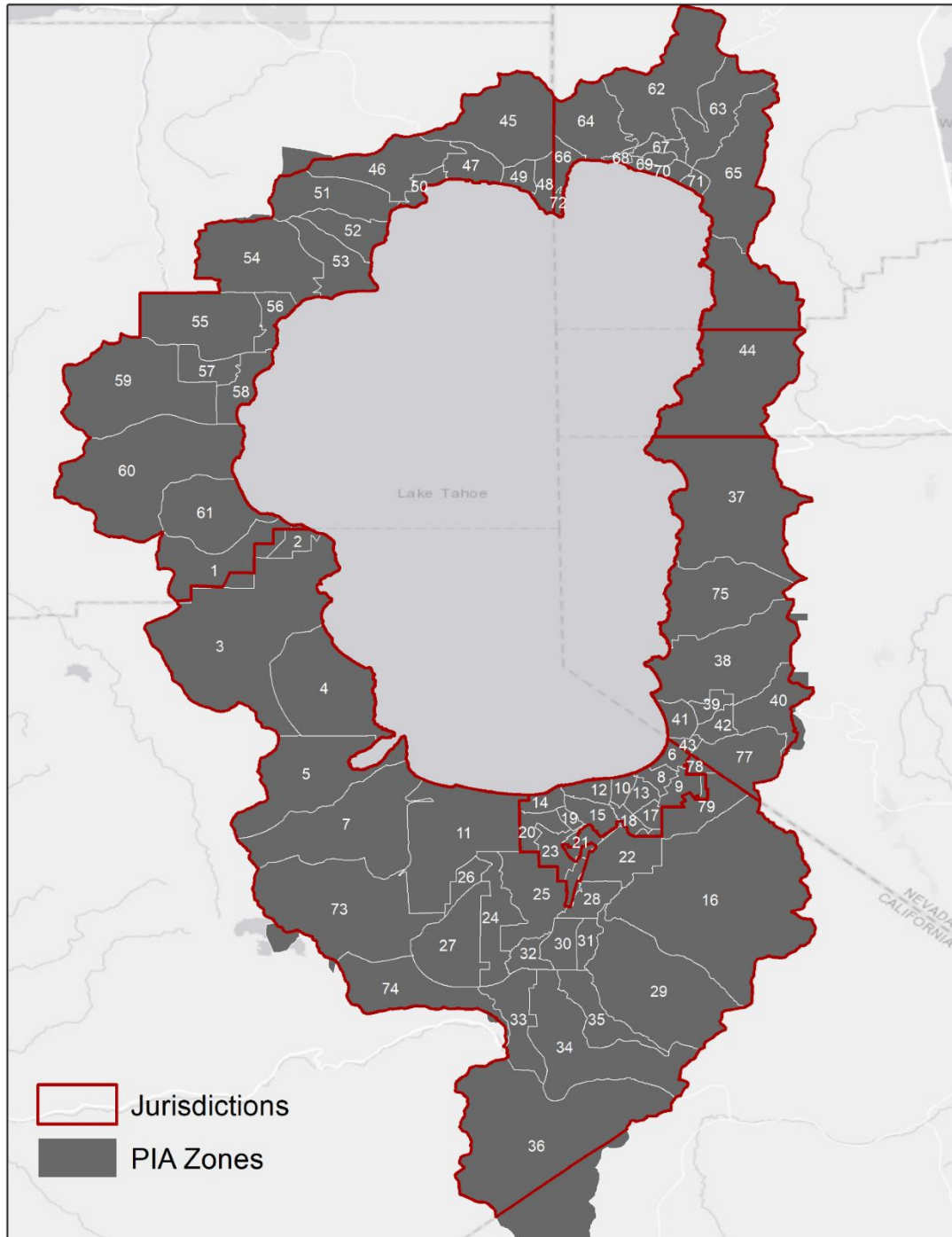
Zone	Avg Zone Trip Length	Trip Length Standard of Significance	Avg Zone Residential VMT Per Capita	Residential Standard of Significance
Zone 39	4.83	5.41	13.15	13.08
Zone 40	7.11	5.41	16.57	13.08
Zone 41	4.96	5.41	11.44	13.08
Zone 42	4.78	5.41	12.32	13.08
Zone 43	6.2	5.41	4.9	13.08
Zone 44	12.39	11.13	NA	NA
Zone 45	6.42	5.53	15.2	13.11
Zone 46	6.25	5.53	17.99	13.11
Zone 47	6.46	5.53	14.15	13.11
Zone 48	5.06	5.53	14.83	13.11
Zone 49	5.38	5.53	13.57	13.11
Zone 50	6.79	5.53	16.27	13.11
Zone 51	6.01	5.53	16.7	13.11
Zone 52	6.33	5.53	17.54	13.11
Zone 53	6.35	5.53	16.47	13.11
Zone 54	7.71	5.53	15.44	13.11
Zone 55	7.48	5.53	12.14	13.11
Zone 56	6.7	5.53	11.84	13.11
Zone 57	6.89	5.53	20.03	13.11
Zone 58	6.44	5.53	15.02	13.11
Zone 59	10.22	5.53	22.58	13.11
Zone 60	9.31	5.53	21.03	13.11
Zone 61	9.03	5.53	20.86	13.11
Zone 62	5.54	4.73	14.78	11.02
Zone 63	6.14	4.73	14.23	11.02
Zone 64	4.65	4.73	15.48	11.02
Zone 65	6.57	4.73	13.5	11.02
Zone 66	4.97	4.73	17.35	11.02
Zone 67	5.1	4.73	12.24	11.02
Zone 68	7.26	4.73	15.34	11.02
Zone 69	4.08	4.73	9.24	11.02
Zone 70	6.27	4.73	11.64	11.02
Zone 71	4.79	4.73	13.71	11.02
Zone 72	6.52	4.73	16.59	11.02
Zone 73	10.65	5.69	20.33	14.51
Zone 74	9.21	5.69	20.67	14.51
Zone 75	8.51	5.41	20.88	13.08
Zone 76	NA	5.53	NA	NA
Zone 77	6.37	5.41	17.9	13.08
Zone 78	2.95	5.69	11.35	14.51
Zone 79	5.17	5.69	NA	14.51

# 10. Appendix B – Zone Model Data – full trip lengths (SB 743)

Zone	Avg Zone Trip Length	Trip Length Standard of Significance	Avg Zone Residential VMT Per Capita	Residential Standard of Significance
Zone 1	11.86	11.22	38.42	21.84
Zone 2	11.79	8.5	30.12	19.55
Zone 3	15.26	8.5	31.03	19.55
Zone 4	16.98	8.5	33.81	19.55
Zone 5	19.7	8.5	NA	19.55
Zone 6	7.98	5.4	13.52	13.06
Zone 7	15.77	8.5	16.48	19.55
Zone 8	6	5.4	14.74	13.06
Zone 9	6.43	5.4	15.8	13.06
Zone 10	6.91	5.4	16.86	13.06
Zone 11	12.32	8.5	18.64	19.55
Zone 12	6.01	5.4	14.92	13.06
Zone 13	5.06	5.4	15.06	13.06
Zone 14	7.55	5.4	19.92	13.06
Zone 15	5.51	5.4	15.22	13.06
Zone 16	15.35	8.5	NA	19.55
Zone 17	5.56	5.4	17.03	13.06
Zone 18	5.06	5.4	NA	13.06
Zone 19	5.64	5.4	15.41	13.06
Zone 20	5.44	5.4	16.78	13.06
Zone 21	7.14	5.4	14.29	9.25
Zone 22	6.12	8.5	16.32	19.55
Zone 23	6.81	5.4	13.99	13.06
Zone 24	8.61	8.5	25.75	19.55
Zone 25	13.34	8.5	20.47	19.55
Zone 26	17.31	8.5	88.18	19.55
Zone 27	12.02	8.5	10.18	19.55
Zone 28	7.76	8.5	23.09	19.55
Zone 29	NA	8.5	NA	19.55
Zone 30	10.32	8.5	24.01	19.55
Zone 31	16.78	8.5	NA	19.55
Zone 32	7.77	8.5	19.92	19.55
Zone 33	10.84	8.5	27.11	19.55
Zone 34	13.37	8.5	29.38	19.55
Zone 35	NA	8.5	NA	19.55
Zone 36	16.79	8.5	30.64	19.55
Zone 37	19.15	9.69	44.33	20.64
Zone 38	10.48	9.69	26.89	20.64

Zone	Avg Zone Trip Length	Trip Length Standard of Significance	Avg Zone Residential VMT Per Capita	Residential Standard of Significance
Zone 39	7.29	9.69	23.45	20.64
Zone 40	9.81	9.69	24.28	20.64
Zone 41	8.23	9.69	19.61	20.64
Zone 42	7.34	9.69	17.47	20.64
Zone 43	12.91	9.69	4.9	20.64
Zone 44	23.65	21.59	NA	NA
Zone 45	14.41	11.22	25.86	21.84
Zone 46	11.01	11.22	30.04	21.84
Zone 47	13.82	11.22	23.43	21.84
Zone 48	9.01	11.22	26.77	21.84
Zone 49	11.37	11.22	26.63	21.84
Zone 50	13.24	11.22	25.56	21.84
Zone 51	12.45	11.22	19.67	21.84
Zone 52	9.7	11.22	25.27	21.84
Zone 53	11.57	11.22	21.12	21.84
Zone 54	15.78	11.22	32.22	21.84
Zone 55	19.77	11.22	24	21.84
Zone 56	16.49	11.22	24.42	21.84
Zone 57	9.36	11.22	35.78	21.84
Zone 58	10.87	11.22	24.65	21.84
Zone 59	13.82	11.22	38.97	21.84
Zone 60	13.36	11.22	30.1	21.84
Zone 61	14.62	11.22	30.84	21.84
Zone 62	10.23	10.2	26.34	20.66
Zone 63	11.68	10.2	26.47	20.66
Zone 64	7.55	10.2	28.96	20.66
Zone 65	12.29	10.2	26.87	20.66
Zone 66	8.61	10.2	27.83	20.66
Zone 67	10.21	10.2	23.87	20.66
Zone 68	15.94	10.2	25.25	20.66
Zone 69	9.35	10.2	18.18	20.66
Zone 70	16.04	10.2	23.18	20.66
Zone 71	9.07	10.2	24.73	20.66
Zone 72	18.86	10.2	15.19	20.66
Zone 73	17.83	8.5	20.75	19.55
Zone 74	21.01	8.5	27.9	19.55
Zone 75	14.54	9.69	31.63	20.64
Zone 76	NA	11.22	NA	NA
Zone 77	8.7	9.69	28.98	20.64
Zone 78	4.02	8.5	17.02	19.55
Zone 79	7.51	8.5	NA	19.55

## 11. Appendix C – Map of PIA Zones



## 12. Appendix D – ITE trip rates

Land Use	ITE Code	Rate	Variable
Single-Family Detached	210	9.44	DU
Multi-Family (low-rise, one or two levels)	220	7.32	DU
Senior Adult Housing – Attached	252	3.7	DU
Congregate Care Facility (Residential Care)	253	2.02	DU
Hotel	310	8.36	Units
Motel	320	3.35	Units
Timeshare	265	9.73	Units
General retail	820	37.75	KSF
Furniture Store	890	6.3	KSF
Pharmacy/Drugstore	880	90.08	KSF
Supermarket	850	106.78	KSF
Drive-In Bank	912	100.03	KSF
High Turnover Sit-Down Restaurant (<1 hr. turnover)	932	112.18	KSF
Fast Food Restaurant	933	346.23	KSF
Quality Restaurant (>1 hr. turnover)	931	83.84	KSF
Drinking Place	925	11.36	KSF
Auto Parts and Service Center	943	16.28	KSF
Building Materials/Lumber	812	18.05	KSF
Free-Standing Discount Store	815	53.12	KSF
General Office Building (GFA of more than 5,000 sf)	710	9.74	KSF
Medical –Dental Office Building	720	34.8	KSF
Light industrial	110	4.96	KSF
Warehouse	151	1.51	KSF
Public Park	411	0.78	Acres
Developed Campground/RV Park	416	12.57	Sites
Marina	420	2.41	Berths
Golf Course	430	30.38	Holes
Bowling Alley	437	1.48	Bowling Lanes
Movie Theater (traditional)	444	220	Movie Screens
Health and Fitness Club	492	38.97	KSF
Recreational Community Center	495	28.82	KSF
University/College	550	1.56	Students
High School	530	2.03	Students
Middle School/Junior High School	522	2.13	Students
Elementary School	520	1.89	Students
Private School (K-12)	536	2.48	Students
Church	560	9.9	KSF



Land Use	ITE Code	Rate	Variable
Daycare Center	565	47.62	KSF
Library	590	72.05	KSF
Hospital	610	10.723	KSF

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### 13. Appendix E – Mitigation Measures

This appendix provides an overview of VMT mitigation measures included in the Tahoe Region Project Impact Assessment tool. The identified measures and evidence for the effectiveness of individual measures relies heavily on the work presented in the 2010 report by the California Air Pollution Control Officers Association (CAPCOA) entitled *Quantifying Greenhouse Gas Mitigation Measures*<sup>3</sup>. Appendix D in the [TRPA Project Impact Assessment Guidelines](#) also provides detailed information, including any permitting conditions, for each mitigation strategy.

A brief description of each mitigation strategy, including considerations and level of estimated effectiveness, is included below. Where an applicant believes that an individual strategy will have a greater impact than identified below, or that the suite of proposed mitigation measures will, in aggregate, result in greater VMT mitigation than identified, the applicant may provide evidence to TRPA in support of higher VMT reduction. TRPA will consider the submitted material and adjust mitigation effectiveness at the project level (and within the tool), where appropriate.

Inclusion of a mitigation measure in the project's VMT estimate indicates the applicant's willingness to include the measure as a condition the project permit.

#### Combining Mitigation Strategies

Where multiple mitigation strategies are selected for a project, the total impact of the strategies is estimated through an aggregation process that utilizes "multiplicative dampening." Multiplicative dampening is a conservative approach to estimating the net impact of multiple strategies with the same goal. The approach is conservative in that it is intended to avoid overestimation of the potential reduction from including multiple strategies.

The total percent VMT reduction for a project that employs multiple mitigation strategies is estimated through the formula below:

$$(1) \text{ Total \% VMT Reduction} = 1 - ((1 - M_1) * (1 - M_2) * (1 - M_3) * \dots)$$

Where:  $M_x$  = percent reduction of each VMT mitigation strategy

$M_x$  = percent reduction of each VMT mitigation strategy

#### Maximum VMT reduction

The total VMT reduction for all mitigation strategies is capped for individual projects based on the project location. The maximum VMT reduction that can be achieved by combining TDM strategies is

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<sup>3</sup> [www.capcoa.org/wp-content/uploads/downloads/2010/09/CAPCOA-Quantification-Report-9-14-Final.pdf](http://www.capcoa.org/wp-content/uploads/downloads/2010/09/CAPCOA-Quantification-Report-9-14-Final.pdf)

75%. For compact infill locations, the maximum reduction is 40%. Within town and regional centers and a half mile buffer around them, the maximum reduction is 20%. In all other parts of the Region, the maximum reduction is 15%. Full transportation project impact assessment guidelines, including additional detail on the specific requirements for each mitigation strategy are available at: <https://www.trpa.gov/wp-content/uploads/documents/PIA-Guidelines-Draft.pdf> The rationale for establishing maximum VMT reduction caps at the project level, and additional evidence for the selected caps, are included in the CAPCOA document.

## Mitigation Measures

### 1. Unbundle Parking

Unbundle parking refers to dissociation of parking costs from other property costs, requiring those who wish to park to pay for parking separately from the cost of the property itself. The parking cost is set by the project applicant. For residential projects including this measure, the parking rate set by the applicant must be consistent in with the guidelines for impact analysis. The full guidelines are available here: <https://www.trpa.gov/wp-content/uploads/documents/PIA-Guidelines-Draft.pdf>

The current maximum VMT reduction from this strategy is 2.6% of project VMT. The maximum reduction is lower than the theoretical maximum cited in much of the literature because there is limited residential permit parking and priced on-street parking in the Tahoe Region. The presence of these strategies would limit spillover from the unbundle parking mitigation measure implementation.

Eligible land use types: Residential

Maximum reduction: 2.6%

### **Relevant literature**

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.

Litman, T., 2021. Parking Requirement Impacts on Housing Affordability. Victoria Transport Policy Institute, Victoria, BC, Canada.

## 2. Voluntary Commute Trip Reduction Program

Voluntary Commute Trip Reduction Programs are programs implemented by employers and designed to reduce staff commuting by automobile. The measure applies only to commute trip VMT. Voluntary programs must include all of the following: 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 and lockers).

VMT reduction from voluntary commute trip reduction programs cannot be combined with reductions from required commute trip reduction programs or end of trip facilities.

The maximum VMT reduction from this strategy is 5.0% of commute VMT. The 5.0% expected reduction is lower than the suggested possible 5.2% reduction in the CAPCOA review, but consistent with the 5.0% reduction estimated effectiveness in the Trip Reduction Impact Assessment (TRIA) tool used to support regional planning<sup>4</sup>.

VMT reduction of the mitigation measure is estimated through the formulas below.

Commercial / TAU / Recreation Projects:

$$\text{VMT Reduction} = (5\%) \times (50\% - \text{Percent of employees eligible}) \times (\text{Proportion of project VMT from Employees})$$

Office Projects:

$$\text{VMT Reduction} = (5\%) \times (\text{Percent of employees eligible})$$

The first release of the tool includes the embedded assumption that at least 50% of employees will be eligible. Future releases will allow for the applicant to select from a range of employees that are eligible.

Eligible land use types: Commercial, Public Service, Recreation, Tourist Accommodation

Maximum reduction: 5.0%

### **Relevant literature**

Cambridge Systematics, Moving Cooler Steering Committee (Eds.), 2009. Moving Cooler: an analysis of transportation strategies for reducing greenhouse gas emissions. Urban Land Institute, Washington, D.C.

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.

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<sup>4</sup> See Appendix G Data and Forecast in the 2020 Regional Transportation Plan for more information on TRIA: [2020 Regional Transportation Plan \(trpa.org\)](https://trpa.org)

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### 3. Required Commute Trip Reduction Program

Required Commute Trip Reduction Programs are programs implemented by employers and designed to reduce staff commuting by automobile. The measure applies only to commute VMT.

Required programs are differentiated from voluntary programs because they include an employer commitment that a specific fraction of employees will participate in the program, and that the employer will monitor and report program effectiveness on an annual basis. The program is required to submit a monitoring and evaluation program to TRPA that identifies specific metrics to evaluate program success, a data collection and reporting plan that identifies how information is collected, and the schedule for submitting that information to TRPA.

VMT reductions from required commute VMT reduction programs cannot be coupled with reductions taken through voluntary commute reduction programs or end of trip facilities.

Office projects are not yet evaluated in the tool but will be eligible for the mitigation measure when they are included.

VMT reduction of the mitigation measure is estimated through the formulas below.

Commercial / TAU / Recreation Projects:

$$VMT\ Reduction = (21\%) \times (Percent\ of\ employees\ eligible) \times (Proportion\ of\ project\ VMT\ from\ Employees)$$

Eligible land use types: Commercial, Public Service, Recreation, Tourist Accommodation

Maximum reduction: 21.0%

#### **Relevant literature**

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.

#### 4. End of Trip Facilities

Provision of end of trip facilities is a strategy that includes elements that promote biking to and from the destination. These can include showers, secure bike parking or bike racks, and changing rooms. The measure applies only to commute trip VMT. The maximum VMT reduction from the strategy is 0.625%, when all employees are eligible and employees account for all of the project's VMT.

VMT reduction from provision of end of trip facilities cannot be combined with reductions from required or voluntary commute trip reduction programs.

VMT reduction of the mitigation measure is estimated through the formulas below.

Commercial / TAU / Public Service / Recreation Projects:

$$VMT\ Reduction = (0.625\%) \times (Percent\ of\ employees\ eligible) \times (Proportion\ of\ project\ VMT\ from\ Employees)$$

Eligible land use types: Commercial, Public Service, Recreation, Tourist Accommodation

Maximum reduction: 21.0%

#### **Relevant literature**

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.



## 5. Telecommute Program

Promoting telecommuting is designed to reduce the need for employees to commute to and from a place of work by allowing employees to work from home. The measure applies only to commute trip VMT.

Telecommute programs must include 25% of staff telecommuting at least three days every two weeks to qualify. The maximum reduction available in the tool is a 4.5% reduction in VMT.

This mitigation option is only available for office projects. Office projects are not yet evaluated in the tool, but will be eligible for the mitigation measure when they are included.

VMT reduction of the mitigation measure is estimated through the formula below.

Office Projects: <i>VMT Reduction = 4.5%</i>
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Eligible land use types: Commercial, Public Service, Recreation, Tourist Accommodation

Maximum reduction: 4.5%

### **Relevant literature**

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.

## 6. Employee Shuttle

Employee shuttle programs provide employees with an alternative way to go to and from work through provision of shuttle service. The measure applies only to commute trip VMT.

VMT reduction of the mitigation measure is estimated through the formulas below.

Commercial / TAU / Recreation Projects:

*VMT Reduction = (5%) x (50% - Percent of employees eligible) x (10% - Proportion of project VMT from Employees)*

Office Projects:

*VMT Reduction = (5%) x (50% - Percent of employees eligible)*

Eligible land use types: Commercial, Public Service, Recreation, Tourist Accommodation

Maximum reduction: 4.5%

### **Relevant literature**

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.

## 7. Traffic Calming Measures

Traffic Calming Measures includes implementation of traffic calming measures within the project site or in the immediate vicinity of the project site. Traffic calming measure should be designed to encourage people to safely walk, bike, or take transit. Traffic calming features may include: marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, and others. Strategy only applies to bicycle facilities that provide a dedicated lane for bicyclists or a completely separated right-of-way for bicycles and pedestrians. Traffic calming measures are appropriate for all project types and locations.

Eligible land use types: All land use types

Maximum reduction: 1%.

VMT reduction of the mitigation measure is estimated through the formulas below.

All project:

$$VMT\ Reduction = (1\%) \times Project\ VMT$$

### **Relevant literature**

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.

## **References**

(Cambridge Systematics and Moving Cooler Steering Committee, 2009; CAPCOA, 2010; Litman, 2021)

Cambridge Systematics, Moving Cooler Steering Committee (Eds.), 2009. Moving Cooler: an analysis of transportation strategies for reducing greenhouse gas emissions. Urban Land Institute, Washington, D.C.

CAPCOA, 2010. Quantifying Greenhouse Gas Mitigation Measures. California Air Pollution Control Officers Association / Northeast States for Coordinated Air Use Management / National Association of Clean Air Agencies / Environ / Fehr & Peers.

Litman, T., 2021. Parking Requirement Impacts on Housing Affordability. Victoria Transport Policy Institute, Victoria, BC, Canada.