SB 743 Implementation Guidelines

City of Hawthorne

April 2023

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Background

In 2013, SB 743 was signed into law by California Governor Jerry Brown with a goal of reducing Greenhouse Gas (GHG) emissions, promoting the development of infill land use projects and multimodal transportation networks, and to promote a diversity of land uses within developments. One significant outcome resulting from this statue is the removal of automobile delay and congestion, commonly known as level of service (LOS), as a basis for determining significant transportation impacts under the California Environmental Quality Act (CEQA).

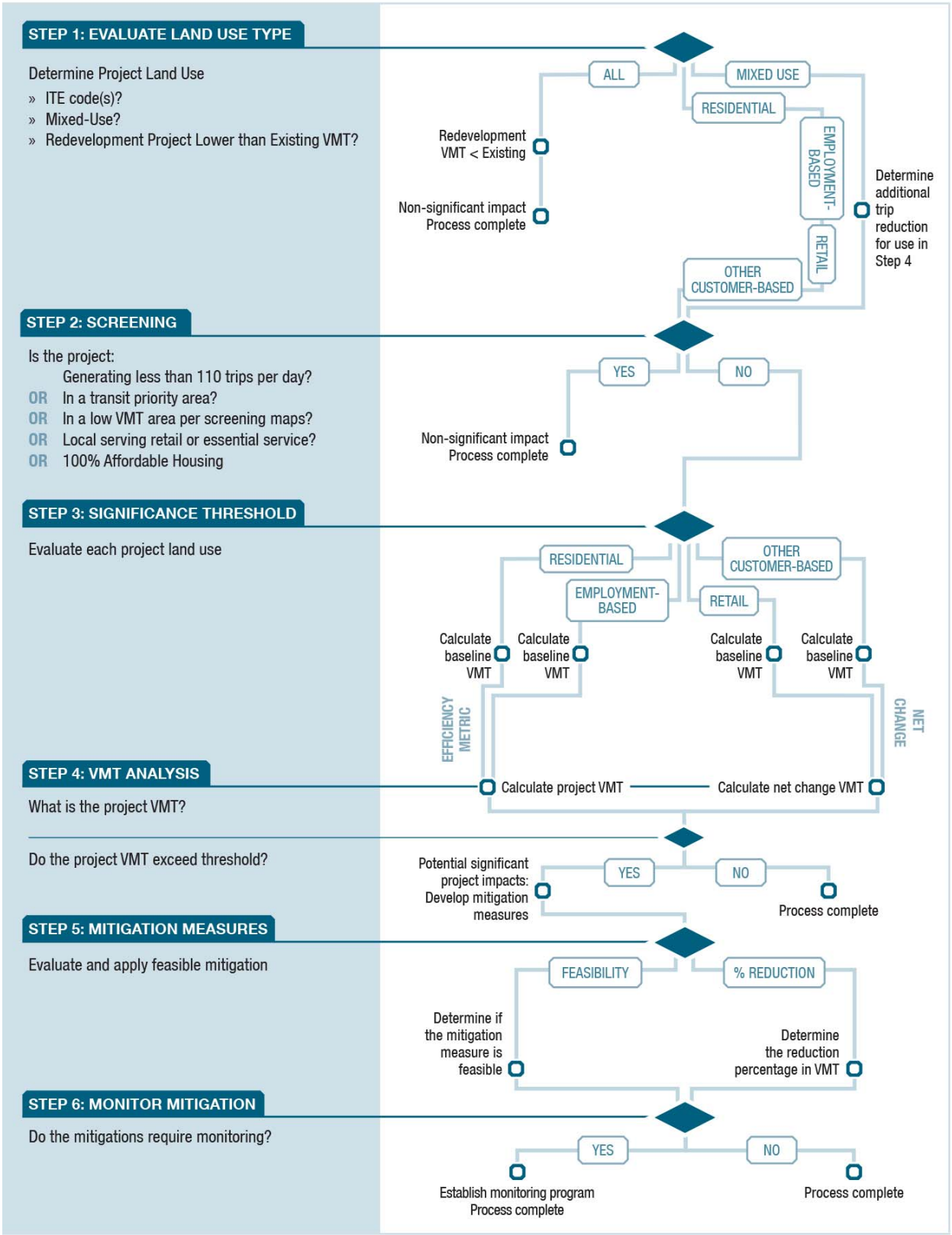
The Governor's Office of Planning and Research (OPR) selected Vehicle Miles Traveled (VMT) as the principal measure to replace LOS for determining significant transportation impacts. VMT is a measure of total vehicular travel that accounts for the number of vehicle trips and the length of those trips. OPR selected VMT, in part, because jurisdictions are already familiar with this metric. VMT is already used in CEQA to study other potential impacts such as GHG, air quality, and energy impacts and is used in planning for regional Sustainable Communities Strategies (SCS).

VMT also allows for an analysis of a project's impact throughout the jurisdiction rather than only in the vicinity of the proposed project allowing for a better understanding of the full extent of a project's transportation-related impact. It should be noted that SB 743 does not disallow an agency to use LOS for other planning purposes outside the scope of CEQA.

Land Use Projects

The City has developed an approach to identify transportation impacts under CEQA for land-use that aligns with guidance provided within the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* (2018). While the OPR guidance related to SB 743 has been a helpful introduction to using VMT to evaluate projects, it does not provide a complete solution. There are a multitude of complex practical issues that are not addressed by the OPR guidance. OPR Guidance does not specifically address land uses beyond residential, office and retail, and it provides latitude on some elements of implementation. In response to this, a specific series of analysis steps for SB 743 project evaluation have been developed to clarify requirements and reduce potential confusion. **Exhibit 1** provides a graphical representation of this analysis process.

Exhibit 1 – Process for CEQA VMT Analysis for Land Use Projects



Step 1: Evaluate Land Use Type

During the initial step the land use projects will need to be evaluated for the following considerations:

- ***Land use type.*** For the purposes of analysis, the Institute of Transportation Engineers (ITE) land use codes serve as the basis of land use definitions. Although it is recognized that VMT evaluation tools and methodologies are typically not fully sensitive to some of the distinctions between some ITE categories, the use of ITE land use codes is useful for maintaining consistency across analyses, determining trip generation for other planning level tools, and maintaining a common understanding of trip making characteristics amongst transportation professionals and City staff. The ITE land use code is also used as an input into the sketch planning tool.
- ***Mixed Use.*** If there are multiple distinct land uses within the project (residential, office, retail, etc.), they will be required to be analyzed separately unless they are determined to be insignificant to the total VMT. Mixed use projects are permitted to account for internal capture which depending on the methodology may require a distinct approach not covered in this documentation.
- ***Redevelopment projects.*** As described under the Non-Significant Screening Criteria section, redevelopment projects which have lower VMT than the existing on-site use can be determined to have a non-significant impact.

Step 2: Screen for Non-Significant Transportation Impact

The purpose of this step is to determine if a presumption of a non-significant transportation impact can be made on the facts of the project. The guidance in this section is primarily intended to avoid unnecessary analysis and findings that would be inconsistent with the intent of SB 743. A detailed CEQA transportation analysis will not be required for land use elements of a project that meet the screening criteria shown in **Exhibit 2**. If a project is mixed use in nature, only those elements of the project that do not comply with the elements in **Exhibit 2** would require further evaluation to determine transportation significance for CEQA purposes.

Exhibit 2 – Screening Criteria

Screening Criteria	OPR Guidance
Small Projects[1] This applies to projects with low trip generation per existing CEQA exemptions. Note that this includes any land use type (residential, office, open space, neighborhood parks, etc.)	**Project is presumed to cause a less-than-significant impact if it would:** ▪ Generate less than 110 trips per day per the ITE Manual or other acceptable source determined by City of Hawthorne. **Unless:** ▪ Be inconsistent with the Sustainable Communities Strategy as determined by the City of Hawthorne.
Projects Near High Quality Transit[2] High quality transit provides a viable option for many to replace automobile trips with transit trips resulting in an overall reduction in VMT.	**Project is presumed to cause a less-than-significant impact if it would:** ▪ Be within a ½ mile of an existing major transit stop[3]. **Unless:** ▪ Has a Floor Area Ratio (FAR) of less than 0.75; or ▪ Includes more parking, excluding on-street parking, for use by residents, customers, or employees of the project than required by the City of Hawthorne zoning code; or ▪ It is inconsistent with the Sustainable Communities Strategy as determined by the City of Hawthorne; or ▪ Replaces affordable residential units with a smaller number of moderate- or high-income residential units.
Affordable Housing[4] Lower-income residents make fewer trips on average, resulting in lower VMT overall.	**Project is presumed to cause a less-than-significant impact if it would:** ▪ Provide a high percentage of affordable housing, as determined by the City of Hawthorne.

[1] *2018 OPR Guidance*, page 12
[2] *2018 OPR Guidance*, page 13. Refer to Appendix C for City specific detail on high-quality transit.
[3] *Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").*
[4] *2018 OPR Guidance*, page 14. As described, "Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed-use projects) containing a particular amount of affordable housing, based on local circumstances and evidence."

Screening Criteria	OPR Guidance
Local-Serving Retail[5] The introduction of new Local-serving retail has been determined to reduce VMT by shortening trips that will occur out of necessity (groceries, other essentials, etc.).	**Project is presumed to cause a less-than-significant impact if it would include:** ▪ A local serving retail development as determined by the City of Hawthorne[6]. **Unless:** ▪ The nature of the service is regionally focused as determined by the City of Hawthorne.
Local Essential Service[7] As with Local-Serving Retail, the introduction of new Local Essential Services shortens non-discretionary trips by putting those goods and services closer to residents, resulting in an overall reduction in VMT.	**Project is presumed to cause a less-than-significant impact if it would:** ▪ **Include a building that is less than 50,000 square feet; and** ▪ **Land Use is :** • Day care center; or • Public K-12 School; or • Police or Fire facility; or • Medical/Dental office building; or • Hospital and clinics; or • Government offices (in-person services such as post office, library, and utilities) **Unless:** ▪ The nature of the service is regionally focused as determined by the City of Hawthorne.

[5] *2018 OPR Guidance*, page 16

[6] Local-serving retail is where no single on-site store exceeds 50,000 square feet and its customer base is the surrounding area that were previously making trips further away to a store offering similar products.

[7] Based on assumption that, like local-serving retail, the addition of necessary local in-person services will reduce VMT given that trips to these locations will be made irrespective of distance given their non-discretionary nature.

Screening Criteria	OPR Guidance
Map-Based Screening This method eliminates the need for complex analyses, by allowing existing VMT data to serve as a basis for the screening smaller developments. Note that screening is limited to residential and office projects utilizing the maps.	**Project is presumed to cause a less-than-significant impact if it would:** ▪ Be located in an area of development that is under the threshold as shown on a screening map as allowed by City of Hawthorne[8]. **Unless:** ▪ Represent significant growth as to substantially change regional travel patterns as determined by the City of Hawthorne.
Redevelopment Projects[9] Projects with lower VMT than existing on-site uses, can under limited circumstances, be presumed to have a non-significant impact. In the event this screening does not apply, projects should be analyzed as though there is no existing uses on site (project analysis cannot take credit for existing VMT).	**Project is presumed to cause a less-than-significant impact if it would:** ▪ Replaces an existing VMT-generating land use and does not result in a net overall increase in VMT. **Unless:** ▪ The project replaces an existing VMT-generating land use and results in a net overall increase in VMT; or ▪ The existing land use has been vacant for more than 2 years.

[8] Refer to Appendix A for screening maps.
[9] *2018 OPR Guidance*, Page 18

Step 3: Significance Threshold and Methodology

The purpose of this step is to determine the threshold of significance for application to a land use project. Significance thresholds are based on land use type, broadly categorized as efficiency and net change metrics. Efficiency metrics include VMT/Capita and Work VMT/employee. As described in **Exhibit 3**, "Net Change" refers to the net change in regional VMT. "Net Change" is used for elements that include a significant customer base, such as commercial uses, although it can extend to a variety of uses that have similar characteristics as shown in **Exhibit 3**.

Exhibit 3 - Significance Threshold and Methodology

Threshold Basis	Efficiency	Net Change
Example Land Use	Residential, Professional Office, Industrial	Retail, Hotel, Sports Venue
Example VMT Thresholds	Per capita, per employee	Regional VMT change
Customer Component	No	Yes
Allowable Methods	Non-Significant Screening Criteria, The City of Hawthorne Sketch Planning Tool, Travel Demand Model	Non-Significant Screening Criteria, Travel Demand Model

For projects with a significant customer base, it is typically appropriate to separately calculate the change in VMT related to the customers and employees unless the customer base is minimal in nature. Under the circumstances in which the project has a significant customer base, first evaluate the total difference in regional VMT resultant from the customer base. Then calculate the difference in VMT resultant from employees using the following formula:

(number of employees) x (estimated VMT/employee – threshold VMT/employee)

The threshold of significance for projects with a significant customer base will accordingly correspond to the "Net Change" threshold as described in **Exhibit 3**. Under these circumstances, also use "Net Change" when evaluating the outcomes of mitigations as well. If a project includes a mixture of land use types (mixed-use), each element of the project should be evaluated separately for the purposes of clarity.

For non-typical land use projects, the project applicant will need to work with the City to determine which metric and methodology should be used for analyzing the project's VMT impact.

VMT Thresholds of Significance

The thresholds of significance, as they relate to the City of Hawthorne, are summarized in **Exhibit 4**.

Exhibit 4 - VMT Thresholds of Significance

Land Use	Threshold of Significance
Residential	15% below existing Los Angeles county VMT per capita.
Office	15% below existing Los Angeles county Work VMT per employee.
Retail	Net increase in total VMT.

Based on these criteria the VMT thresholds of significance shown in **Exhibit 5** have been established.

Exhibit 5 - VMT Thresholds of Significance

Land Use	VMT Threshold	Basis
Residential	11.9 VMT/capita[10]	15% below existing county-wide average residential VMT per capita
Office	18.7 Work VMT/Employee[11]	15% below existing county-wide average Work VMT per employee
Retail	Net regional change	Using the Los Angeles County as the basis
Other Employment	18.7 Work VMT/Employee[11]	15% below existing county-wide average Work VMT per employee
Other Customer	Net regional change	Using the Los Angeles County region as the basis

Note that the inclusion of "Other Employment" and "Other Customer" refers to all other service and goods providers that are not included in the basic office/retail categories. Examples of "Other Employment" include industrial uses such as warehouses and distribution centers. Examples of "Other Customer" include hotels, event spaces, post offices, and wineries.

Based on improvements to methods and data as well as other modeling modifications, there will be periodic updates to the numerical threshold values shown, however the relative approach for calculating them should remain the same. The values in the current sketch planning tool, discussed in the next section, will supersede the information provided in the table above. Additional thresholds for various employment types are also provide in the sketch planning tool.

[10] Residential VMT specifically applies to all Home-Based trips as represented in the Replica Big Data Model. Refer to Appendix A for additional information.

[11] Work VMT specifically applies to commute trips as represented in the Replica Big Data Model. Refer to Appendix A for additional information

Sketch Planning Tool

The City of Hawthorne has developed an online sketch planning VMT assessment tool for use in SB 743 land use project analysis, which can be accessed at: https://tredlite.kimley-horn.com/sites/hawthorne/. The primary use for this tool is to provide a streamlined approach to analyzing potential projects for VMT impacts. The source data of the tool was developed from the Replica big data model using the methodology described in **Appendix A**. As with any sketch planning tool, there are distinct limitations in terms of its application including limits on the type and size of development that can be applied to. Note that it is anticipated that the tool will continue to evolve in response to updates to data or methodological changes adopted by the City. Broadly, the sketch planning tool provides the following information:

- Institute of Transportation Engineers (ITE) Trip Generation
- VMT Threshold Analysis
- Greenhouse Gas (GHG) Estimation
- Transportation Demand Management (TDM) Evaluation

The VMT assessment tool would not be appropriate to use for projects other than residential and employment-based land uses. Other project types that the VMT assessment tool would not be appropriate to use include very large projects (projects generating more than 2,500 daily trips), project that can potentially shift regional travel patterns, or projects with land use types that are not present within the project vicinity considered for the VMT assessment. For projects in which the VMT assessment tool would be inappropriate to use, the travel demand model maintained by the Southern California Association of Governments (SCAG) would be required for the VMT analysis based on a preliminary review of the project. The VMT analysis methodology using the SCAG travel demand model is summarized in **Appendix B.**

Step 4: VMT Analysis

Prior to undertaking VMT analysis, a scope compliant with the City of Hawthorne's requirements should be prepared and submitted for approval. Given the potential complexities of some uses, particularly those not identified as residential, retail, or office, an agreement regarding the threshold and methodology is important to avoid analysis that is not compliant with the City of Hawthorne's requirements.

During this step the analysis should be completed consistent to the methodology approved by the City in the scoping agreement. Relevant documentation providing enough detail that assumptions are clearly understandable, and methods that can be replicated should be provided along with the results of the VMT analysis for the proposed project.

Step 5: Mitigation

If a significant transportation impact is identified in the VMT analysis, feasible mitigation measures to avoid or reduce the impact must be identified. CEQA requires that the mitigation measures are included in the project's environmental assessment. OPR provides a list of potential measures to reduce VMT but gives the lead agency full discretion in the selection of mitigation measures.

The type and size of the project will determine the most appropriate mitigation strategies for VMT impacts. For large projects such as general plans or specific plans, VMT mitigations should concentrate on

the project's density and land use mix, site design, regional policies, and availability of transit, bicycle, and pedestrian facilities. For smaller projects such as an individual development project, VMT mitigations will typically require the preparation of a transportation demand management (TDM) program. A TDM program is a combination of strategies to reduce VMT. The program is created by an applicant for their land use project based on a list of strategies agreed to with the City of Hawthorne.

The City of Hawthorne has developed a list of potential TDM strategies appropriate for their jurisdiction and what magnitude of VMT reduction could be achieved. The selection process was guided by the California Air Pollution Control Officers Association (CAPCOA) recommendations found in the January 2022 publication Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity. The area context of the City of Hawthorne also influenced the type of TDM strategies that were selected.

Appendix D summarizes available TDM strategies along with the maximum VMT reduction, applicable land use application, and complementary strategies. The City of Hawthorne's sketch planning tool includes the TDMs summarized in **Appendix D**.

If feasible mitigation measures cannot be identified to mitigate the impact of the Project, a Cumulative analysis will be required. A land development project or transportation project that can be sufficiently mitigated to not have a significant impact under Baseline Plus Project conditions would not have to undertake Cumulative analysis. If Cumulative analysis is determined to be required, the Cumulative analysis should consider the effect of any planned mitigation measures identified during the Baseline analysis even if those mitigation measures do not fully mitigate the impact. If the Cumulative conditions analysis also results in a finding of a significant impact with previously identified mitigation measures, this Cumulative impact shall result in a finding of a significant and unavoidable impact and must therefore be called out in the project's Environmental Impact Report (EIR) and subject to a Finding of Overriding Consideration.

Step 6: Mitigation Monitoring

As required by CEQA, the City of Hawthorne will require ongoing mitigation monitoring and reporting. The specifics of this will be developed on a project basis.

Transportation Projects

Depending on the specific nature of a transportation project; it can alter trip patterns, trip lengths, and even trip generation. Research has determined that capacity-enhancing projects can and often do increase VMT. This phenomenon is commonly referred to as "induced demand". While methods are generally less developed for the analysis of induced demand compared to other areas of transportation analysis, there is still the need to quantify and understand its impact to the transportation system considering the requirements of SB 743.

Similarly to land use projects, the approach to transportation project analysis closely aligns with the 2018 OPR Guidance. In terms of analysis, the analyst should first determine whether the transportation project has been prescreened and determined to have a non-significant impact as described in the following section.

Screen for Non-Significant Transportation Impact

The following non-significant impact examples are provided directly from the 2018 OPR Guidance[12]:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts).
- Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity.
- Roadside safety devices or hardware installation such as median barriers and guardrails.
- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes.
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety.
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes.
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit.
- Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel.
- Addition of a new lane that is permanently restricted to use only by transit vehicles.
- Reduction in number of through lanes.
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles.
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features.
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow.
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow.
- Installation of roundabouts or traffic circles.
- Installation or reconfiguration of traffic calming devices.
- Adoption of or increase in tolls.

[12] *2018 OPR Guidance*, Page 20

- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase.
- Initiation of new transit service.
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes.
- Removal or relocation of off-street or on-street parking spaces.
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs).
- Addition of traffic wayfinding signage.
- Rehabilitation and maintenance projects that do not add motor vehicle capacity.
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way.
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve nonmotorized travel.
- Installation of publicly available alternative fuel/charging infrastructure.
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor.

Significance Threshold and Methodology

Criteria in the prior section, the significance criterion should be change in regional VMT. A finding of a significant impact would be determined if a transportation project results in a net increase in regional VMT.

Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include those that:

- Add through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges.

Appendix A – VMT Analysis Methodology Using Replica Big Data Model

The use of big data platforms has increased in the recent years with the advancement of technology and available resources. The Replica big data platform, which was used to develop the City of Hawthorne's VMT Analysis Tool, provides detailed trip and demographic data that can be used to understand existing travel patterns.

Replica data representing Fall 2019 conditions were used to establish the baseline conditions in the City. The dataset includes the entirety of the states of California and Nevada, and therefore, all trips that originate in, or are destined for, areas outside of Los Angeles County, but have one leg of their trip within the City of Hawthorne were accounted for in the VMT analysis to establish efficiency thresholds.

Replica Model Zone Structure

The smallest geographic area that Replica trip origin-destination data is available for is at the Census block group level. Therefore, the VMT analysis to determine the City's efficiency thresholds (VMT per capita and VMT per employee) were computed at the block group level as well.

Census Data

The population and employment data associated with each block group was derived from data provided by the U.S. Census. The VMT analysis was completed using data from the U.S. Census for population and the total number of employees located in each block group, and trip characteristic data (length, origin-destination location, and trip purpose) from Replica.

Replica Trip Purpose and Travel Mode

The Replica platform provides trip origin and destination data, along with trip distance for various trip purpose and travel mode. These trip purposes and mode are listed below.

Trip Purpose:

- Home
- Work
- Shop
- Eat
- Errands
- Lodging (hotels etc.)
- Pass-through traffic
- Recreation
- Airport
- School
- Freight
- Other

Trip Mode:

- Private Auto (Drive Alone)
- Auto Passenger (Carpool)
- Biking
- Walking
- Freight
- Public Transit
- Taxi/TNC
- Other

Trip productions and attractions for every block group, both within the City of Hawthorne and within Los Angeles County, were compiled from the larger Replica dataset using the home-based and work-based trip purposes for private auto (driver) and carpool (passenger) trips.

Replica Person Trips, Vehicle Occupancy, Trip Distance

Average vehicle trip lengths were computed for each block group using the total number of private auto person trips, carpool person trips and trip distances that are available from the Replica big data for the year 2019 Fall conditions. Average vehicle occupancy rates were computed by dividing the total auto person trips (private auto + carpool) by carpool person trips for each block group.

Replica VMT by Land Use Type

Once the average trip lengths and occupancy rates were calculated, and population and employment totals were determined, the total residential and work VMT for each block group was computed. The total residential VMT was computed by summing the production VMT for the Home-Based trip purposes at the Census block group level. VMT for non-residential land uses was computed by summing the attraction VMT by work trip purpose at the Census block group level.

VMT per capita and VMT per employee for each Census block group was computed by dividing the total residential VMT by the total population and the total work VMT by the total employment, respectively. The average VMT per capita and VMT per employee efficiency metrics were determined at the City, County and SCAG Region levels to determine the City of Hawthorne's thresholds.

VMT Screening Maps

As part of the screening analysis for the residential and office projects, VMT thematics maps were developed to screen out low VMT generating areas within the City.

Exhibit A1 - Thematic Map – Replica Big Data Model (2019) Daily Residential Home Based VMT per Capita

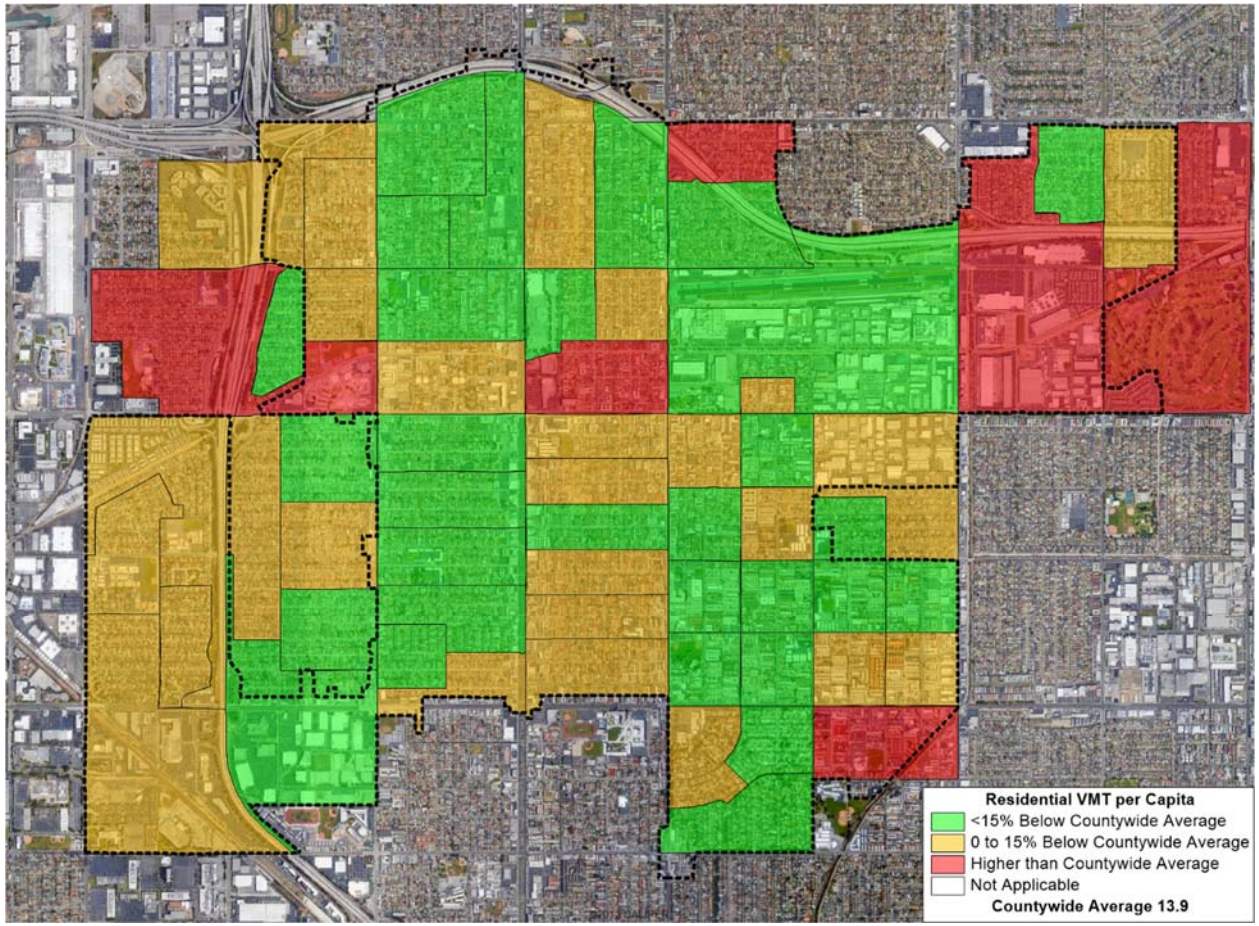
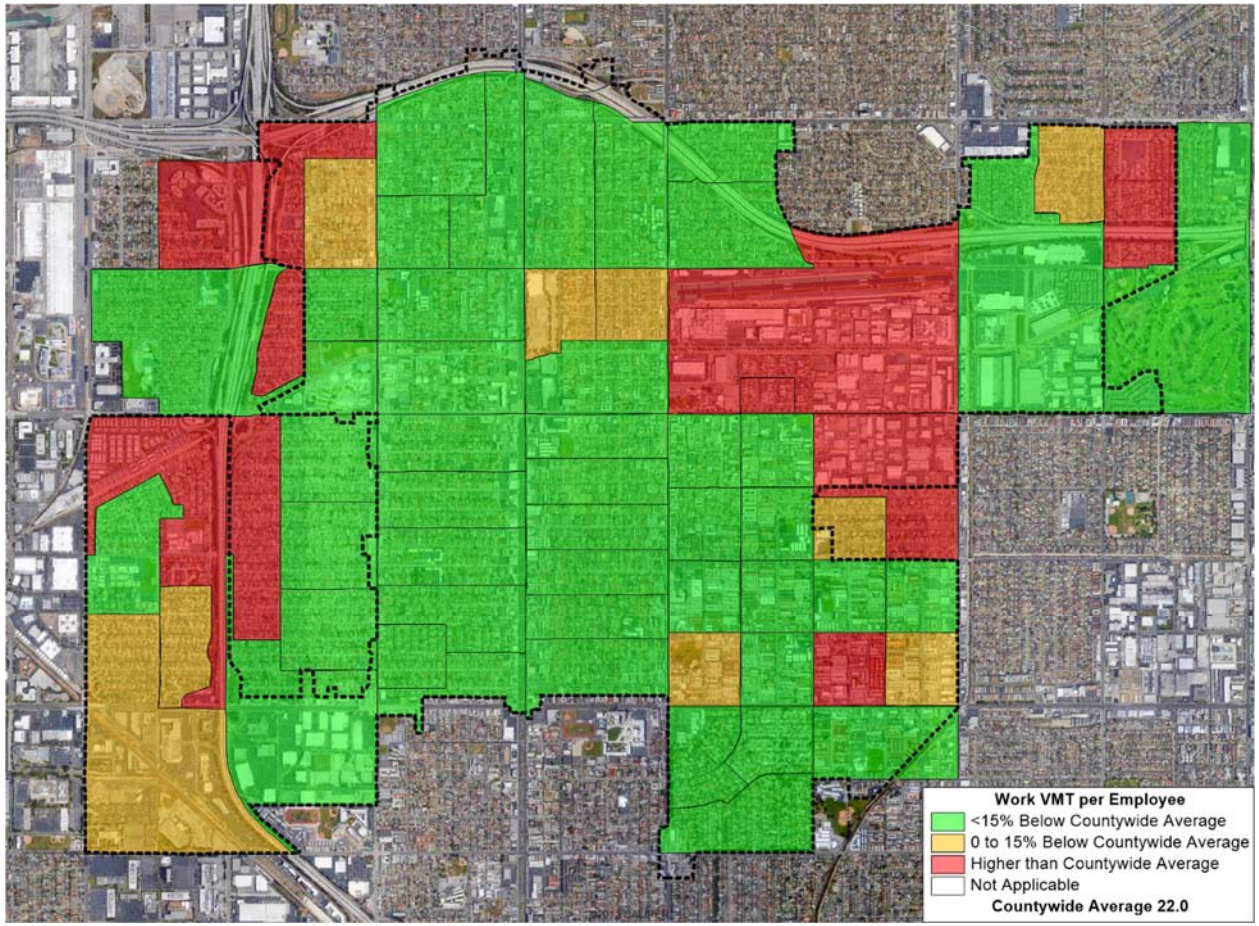


Exhibit A2 - Thematic Map – Replica Big Data Model (2019) Daily Home Based Work VMT per Employee



Appendix B – VMT Analysis Methodology Using SCAG Travel Demand Model

When a VMT analysis is required to use the travel demand model based on the requirements described in the Section 3 of this document, the project's VMT efficiency metrics (VMT per capita or VMT per employee) should be calculated for baseline conditions. The travel demand model and VMT analysis methodology used for the baseline and project conditions should be consistent using the SCAG travel demand model. The appropriate VMT efficiency metric for the Traffic Analysis Zones (TAZ) representing the project should be calculated with and without the proposed project, and the percent change for the respective VMT efficiency metric should also be calculated. Once the percent change in the respective VMT efficiency metric is determined, it should then be applied to the project's VMT efficiency metric that was determined using the VMT Analysis Tool. Once a factored VMT efficiency metric is determined, it can then be compared to the City's thresholds provided in Section 3 to make an impact determination.

The methodology to calculate a project's VMT efficiency metric based on the project type (residential or non-residential) using SCAG travel demand model is described below. For projects that cannot be evaluated using either the VMT Analysis Tool or SCAG travel demand model due to the project type or other unique circumstances, an evaluation methodology should be established in coordination with the City on a case-by-case basis.

Southern California Association of Governments (SCAG) maintains the regional travel demand model as part of the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which consists of six counties (Los Angeles, Ventura, Orange, San Bernardino, Riverside, Imperial) in the southern California region. The latest available version of the SCAG model should be used in consultation with City staff and the most recent Base Year and Future Year model scenarios should be used for the baseline and cumulative conditions in the City. SCAG maintains two types of regional travel demand model, trip-based and activity-based models. The VMT analysis methodology described below is for the trip-based travel demand model and will vary slightly for the activity-based model.

SCAG Model Zone Structure

VMTs is computed at Traffic Analysis Zone (TAZ) level to determine the thresholds as well as compare City's performance against the County and entire SCAG region. SCAG model uses two-tiered zone structure the allows for micro and macro-scale analysis and reporting. The first tier contains 4,109 internal zones, while the second tier contains 11,267 internal zones. All Tier 2 zones nest within Tier 1 zones. The model generates outputs for different components that vary by the two tiers. The analysis is conducted at the Tier 2 TAZ level.

SCAG Socio-Economic Data

Socioeconomic data (SED) and other model inputs are contained in each TAZ. Out of several different variables in the model's SED, the VMT analysis mainly focuses on population, number of households and types of employment that are used in the trip generation component. VMT computation is focused on the fact that the model uses employment variables by 3 income levels to determine commute trips and employment variables by 13 industries to determine rest of the trips. Employment variables used in the model are listed below.

Employment by Income Level:

1. Low Income Employment (less than $34,999)
2. Medium Income Employment ($35,000 to $74,999)
3. High Income Employment ($75,000 or more)

Employment by Industry type:

1. Agriculture and mining
2. Construction
3. Manufacturing
4. Wholesale trade
5. Retail trade
6. Transportation, warehousing, and utility
7. Information
8. Financial activities
9. Professional and business services
10. Education and health services
11. Leisure and hospitality services
12. Other services
13. Public administration

It should be noted that not all of the employment variables by industry type in the model are used for trip generation, therefore commute VMT is calculated for few land use types were applicable using the trip generation rates that were used in the model.

Trip Generation

The model runs a series of complex steps to estimate daily trip productions and attractions by various trip purposes and market sectors for each TAZ. The trip purposes are listed below.

Model Trip Purpose:

1. Home-Based Work Direct (HBWD)
2. Home-Base Work Strategic (HBWS)
3. Home-Based School (HBSC)
4. Home-Based College and University (HBCU)
5. Home-Based Shopping (HBSH)
6. Home-Based Social-Recreational (HBSR)
7. Home-Based Serving-Passenger (HBSP)
8. Home-Based Other (HBO)
9. Work-Based Other (WBO)
10. Other-Based Other (OBO)

The production model uses several variables such as number of workers, household income, age, household size and car availability depending on the trip purpose. Trip productions for every TAZ in the model are compiled separately by each trip purpose. The attraction model uses income categories of employment for the HBW trip purpose, whereas it uses 13 categories of employment for all non-HBW trip purposes. The attraction model estimates trip attractions to each TAZ by regression coefficients that

varies by employment type. Trip attractions for every TAZ are compiled by each purpose and by each employment type based on these regression coefficients.

Person Trips, Vehicle Occupancy, Trip Distance

Trip productions and attractions are compiled after the mode choice step, and only auto trips are used for the analysis. Since these auto trips are person trips, vehicle occupancy factors are applied for carpool 2 and carpool 3+ auto person trips. Model uses separate factors for carpool 3+ for each trip purpose. After the vehicle trip productions and attractions are computed for each trip purpose, trip lengths are applied for each zone pair from the skim matrices in the model to compute the production and attraction VMT by purpose.

VMT by Land Use Type

The residential VMT is computed by combining the production VMT for all the Home-Based trip purposes. VMT for non-residential land uses is computed from the attraction VMT for only the Home-Based-Work trip purpose.

VMT Calculations

The residential VMT is computed by combining the production VMT for all the Home-Based trip purposes. Commute VMT is computed from the attraction VMT by Home-Based Work trip purposes.

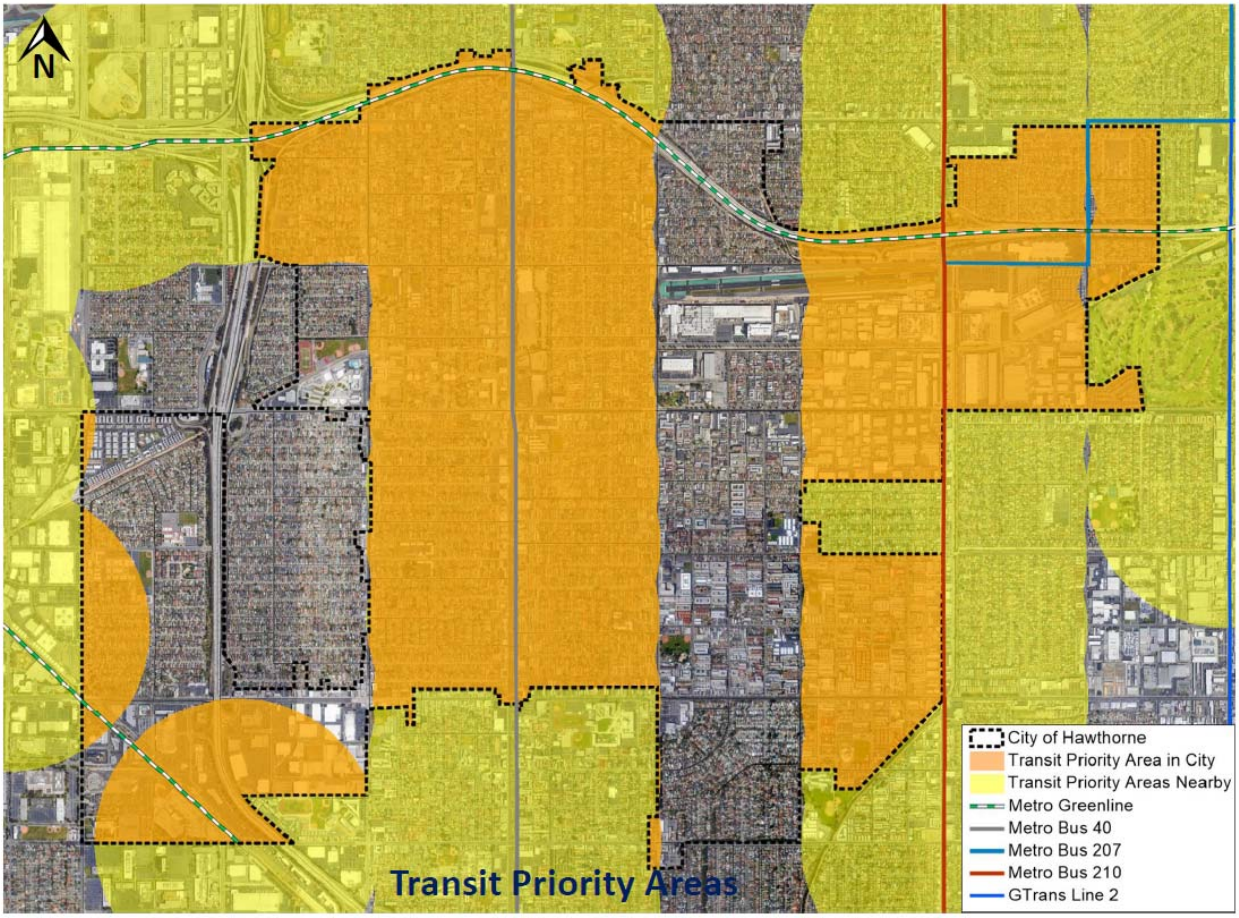
Residential and commute VMT by each TAZ are computed and average VMT were determined by City County, and Region levels to determine the thresholds. A step-by-step process is described below to recalculated average VMT using the SCAG model if required.

Steps to Recalculate average VMT:

1. Run the SCAG model with desired network and SED data
2. Compile Population and Total Employment by each TAZ from SED
3. Use peak and off-peak person trip matrices by trip purpose and combine into daily person trips. These matrices are saved in \msplit\Outputs\. The files are "PK_HBW_HAUPAdTrips_Tier2.mtx", "PK_HBSC_HAUPAdTrips_Tier2.mtx","PK_HBNW_HAUPAdTrips_Tier2.mtx", "PK_NHB_HAUPAdTrips_Tier2.mtx", and similarly for off-peak.
4. Use the occupancy factors used in the model for each trip purpose to convert the daily person trips to vehicle trips.
5. Use lengths from the respective Skim matrices and multiply to the daily vehicle trips for Drive Alone, Carpool 2, and Carpool 3+ trips to compute daily VMT by purpose. These skim matrix files are “SPMATPK_DA.mtx”, “SPMATPK_SR2”, “SPMATPK_SR3”, and similarly for off-peak.
6. Extract the daily VMT sum of productions by each TAZ and by trip purpose.
7. Extract the daily VMT sum of attractions by each TAZ and by trip purpose.
8. Combine the sum of productions by each TAZ for all the Home-Based trip purposes, i.e. “HBW”, ”HBSC”, ”HBNW”. This will be the Residential VMT for internal auto trips.
9. Combine the sum of attractions by each TAZ for only the Home-Based-Work trip purpose, i.e. “HBW”. This will be the Work VMT for internal auto trips.

10. Use the VMT sum of productions and attraction and internal share of the SED by each TAZ to determine Residential VMT per Capita and HBW VMT per Employee average rates at the City, County, or Regionwide levels.

Appendix C – High-Quality Transit



Appendix D – Transportation Demand Measures

City of Hawthorne					
TDM Measure #	**Transportation Demand Management Measure**	**Description**	**TDM Type**	**Max VMT Reduction**	**VMT Reduction Type**
Trip Reduction Programs – Group Max Reduction 20%					
T-5	Implement Commute Trip Reduction Program (Voluntary)	This measure will implement a voluntary commute trip reduction (CTR) program with employers. CTR programs discourage single occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing VMT and GHG emissions.	Incentive	4.0%	All
T-6	Implement Commute Trip Reduction Program – (Mandatory) Includes T-7,T-8,T-9,T-10,T-11	This measure will implement a mandatory CTR program with employers. CTR programs discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing VMT and GHG emissions.	Incentive	20.0%	All

City of Hawthorne					
TDM Measure #	**Transportation Demand Management Measure**	**Description**	**TDM Type**	**Max VMT Reduction**	**VMT Reduction Type**
T-7	Implement Commute Trip Reduction Marketing	This measure will implement a marketing strategy to promote the project site employer's CTR program. Information sharing and marketing promote and educate employees about their travel choices to the employment location beyond driving such as carpooling, taking transit, walking, and biking, thereby reducing VMT and GHG emissions.	Incentive	4.0%	All
T-9	Subsidized Transit Program	This measure will provide subsidized or discounted, or free transit passes for employees and/or residents. Reducing the out-of-pocket cost for choosing transit improves the competitiveness of transit against driving, increasing the total number of transit trips and decreasing vehicle trips.	Incentive	1.2%	All
T-10	Provide End-of-Trip Bicycle Facilities	This measure will install and maintain end-of-trip facilities for employee use. End-of-trip facilities include bike parking, bike lockers, showers, and personal lockers.	Infrastructure	0.75%	All

City of Hawthorne					
TDM Measure #	**Transportation Demand Management Measure**	**Description**	**TDM Type**	**Max VMT Reduction**	**VMT Reduction Type**
T-11	Employer-Sponsored Vanpool	This measure will implement an employer-sponsored vanpool service. Vanpooling is a flexible form of public transportation that provides groups of 5 to 15 people with a cost-effective and convenient rideshare option for commuting.	Incentive / Infrastructure	20.0%	Commute
T-12	Price Workplace Parking (Includes T-13)	This measure will price onsite parking at workplaces. Because free employee parking is a common benefit, charging employees to park onsite increases the cost of choosing to drive to work.	Incentive	20.0%	Commute
Parking or Road Pricing / Management - Group Max Reduction: 20%					
T-14	Provide Electric Vehicle Charging Infrastructure	Install onsite electric vehicle chargers in an amount beyond what is required by the 2019 California Green Building Standards (CALGreen) at buildings with designated parking areas (e.g., commercial, educational, retail, multi-family).	Infrastructure	11.9%	All

Neighborhood Design - Group Max Reduction: 6.4%					
T-18	Pedestrian Network Improvement	This measure will increase the sidewalk coverage to improve pedestrian access. Providing sidewalks and an enhanced pedestrian network encourages people to walk instead of drive.	Infrastructure	5.0%	All
T-19-A	Construct or Improve Bike Facility	This measure will construct or improve a single bicycle lane facility (only Class I, II, or IV) that connects to a larger existing bikeway network. Providing bicycle infrastructure helps to improve biking conditions within an area.	Infrastructure	0.6%	All