DATE: September 11, 2014

TO: Transportation Advisory Commission

FROM: Frederick C. Dock, Director of Transportation

RE: NEW TRANSPORTATION PERFORMANCE MEASURES FOR TRANSPORTATION IMPACT ANALYSIS AND THRESHOLDS FOR CEQA

RECOMMENDATION:

It is recommended that the Transportation Advisory Commission provide comments to the City Council on the Transportation Performance Measures and Thresholds for CEQA.

Summary of Transportation Advisory Commission Actions on the Proposed Transportation Performance Measures and CEQA Thresholds

At their meeting on June 12, 2014 TAC reviewed and discussed the Proposed Transportation Performance Measures and CEQA Thresholds. The attached TAC staff report from June 12, 2014 contains a comprehensive discussion of the Proposed Transportation Performance Measures and CEQA Thresholds.

On June 12 TAC unanimously passed two motions;
1. TAC strongly supports all seven of the proposed transportation measures and CEQA thresholds.
2. 
   a. Support for an amended Street Segment Analysis as a tool for neighborhood protection
   b. Amend the High Pedestrian Activity Areas to remove the areas along Sierra Madre Blvd. east of Madre St. while adding the area between Colorado Blvd and Green St between El Molino and Lake Ave and the portion of South Lake, bordered by Colorado Blvd., California Blvd, Hudson Ave and Mentor Ave.
   c. Amend the definitions of Bike Facilities to change the ranking of a Bike Boulevard from Level 3 to Level 2

At the time of the June 12 TAC meeting the Governor’s Office of Planning and Research (OPR) had not yet released the draft revisions to the CEQA Guidelines as mandated by SB 743. Based on the Preliminary Evaluation of Alternative Transportation Measures released by OPR last December staff believed that both Vehicle Miles Traveled and Vehicle Trips per capita will be included in the revised CEQA Guidelines but could not provide a specific comparison until the revised
guidelines were released. On August 6, 2014 the Governor’s Office of Planning and Research (OPR) released a Preliminary Discussion Draft of Updates to CEQA Guidelines Implementing SB 743 (attached).

**SUMMARY OF THE OPR DRAFT CEQA GUIDELINES:**

The OPR report recommends amendments to the CEQA Guidelines to replace the Level of Service (LOS), auto delay based standard with a Vehicle Miles Traveled (VMT) in order to align CEQA analysis more closely with other state goals, most notably the greenhouse gas emission reduction goals contained in the state’s climate change law, AB 32.

The OPR report proposes the following amendments to the CEQA Guidelines:

- Eliminate Level of Service (LOS)/Delay as a CEQA Impact
- Proposes use of Vehicle Miles Traveled (VMT) Metric for CEQA Transportation Analysis
- Continued Analysis of Impacts Resulting from Transportation, such as Noise, Air Quality and Safety
- Required assessment of growth inducing impacts of roadway expansion
- Applies to CEQA Only and Does Not Preclude Addressing Traffic Congestion in Local General Plan Policies, Zoning Codes, Conditions of Approval, Thresholds, or Fee Programs
- Addresses Phase-in of New Guidelines

SB 743 did not authorize OPR to set thresholds, but did direct OPR to develop Guidelines for determining the significance of transportation impacts of projects. OPR recommends that a project that results in vehicle miles traveled that is greater than the regional average might be considered to have a significant impact. Average in this case could be measured using an efficiency metric such as per capita, per employee, etc.

OPR has proposed the following phase-in of the New CEQA Guidelines:

- The standards will not be retroactive: Approved projects will be subject to mitigations exacted under the old standard.
- The new standards will only apply to Transit Priority Areas (defined below.)
- Local governments may apply the standard to other areas on an “opt-in” basis at first.
- The new standards will apply statewide as of January 1, 2016.

**Transit Priority Areas**

“Transit priority area” means an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations.
“Major transit stop” includes rail transit stations, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with frequencies of service intervals of 15 minutes or less during the morning and afternoon peak commute periods.

According to OPR, planned major transit stops contained in a Regional Transportation Plan (RTP) comply with the definition above for transit priority areas.

Auto Level of Service

At the July 23, 2014 Planning Commission meeting Transportation Staff presented a modified staff recommendation for the Auto Level of Service (LOS) CEQA Threshold. Staff recommended and LOS E Threshold within the City’s adopted Transit Oriented Development (TOD) areas. This was a change from the original staff recommendation of not having a LOS standard as a CEQA Threshold in Transit Priority Areas and High Pedestrian Activity Areas. Given the guidance in the OPR Draft CEQA Guidelines of eliminating LOS as a CEQA Threshold in the first phase of implementing the new CEQA Guidelines staff is now recommending that the Citywide LOS CEQA Threshold for signalized intersections would be LOS D and that LOS would be eliminated as a CEQA threshold within the Transit Priority Areas as defined by SB 743 and discussed previously in this report.
The Auto Corridor Travel Time measure has been removed from the list of recommended new transportation measures. As previously proposed, the corridor travel time measure would have only been applied to the General Plan traffic analysis and not used as part of the project review. While this measure, from a technical standpoint, is functional at the General Plan level and can provide insights into the aggregate effect of development on travel times staff was not able to identify substantial technical evidence for establishing a threshold of significance to the extent required by the CEQA Guidelines (Section 15064.7). We pursued travel time as a balance to the continued use of LOS as it provides the means for viewing individual intersections in a broader corridor context and can be used to illustrate the relative effects of changes at individual locations.

**Modified Pasadena Street Segment Analysis for Neighborhood Protection**

At their June 12 meeting the Transportation Advisory Commission acknowledged the deficiencies of the City’s existing Street Segment Analysis methodology and suggested that staff consider amendments which would allow the analysis to be retained as a tool to protect neighborhood streets from increased traffic associated with development.

Pasadena currently employs a Street Segment Analysis metric to identify the amount of new auto trips a development project will add to adjacent streets. The traffic growth on a street segment is calculated as follows: Percentage of Traffic Growth on Street Segment = Net New Project Trips / Existing Daily Traffic

While the current Street Segment Analysis methodology identifies changes to vehicle volumes on all streets, including residential streets, the increase in traffic volumes on a street in itself is not an environmental impact. Absent physical barriers the City cannot reduce traffic volumes on streets.

In response to both the Planning Commission and Transportation Advisory Commission’s desire to retain a modified version of the Street Segment Analysis to address impacts to neighborhoods from traffic intrusion staff has developed the Modified Street Segment Analysis for Neighborhood Protection (attached). By setting a decreasing scale for the percent of project traffic on a street with a minimum Average Daily Traffic staff believes the proposed methodology can provide a tool to condition a project to implement neighborhood protection measures to manage the effects of traffic consistent with current policies for Neighborhood Traffic Management.

Staff is recommending that the Modified Street Segment Analysis for Neighborhood Protection outside of CEQA analysis because the measures identified to address traffic intrusion do not regulate traffic generation but rather provide measures to manage the effects of traffic in neighborhoods. The analysis would identify traffic management measures which fit with City Council adopted Neighborhood Traffic Management Program policies that are sensitive to not diverting traffic from one neighborhood street to another.
<table>
<thead>
<tr>
<th>METRIC</th>
<th>DESCRIPTION</th>
<th>CONSISTENT WITH STATE STATUTES?</th>
<th>IMPACT THRESHOLD</th>
<th>CONSISTENT WITH STATE STATUTES?</th>
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<tbody>
<tr>
<td>1. VMT Per Capita</td>
<td>Vehicle Miles Traveled (VMT) in the City of Pasadena per service population (population + jobs).</td>
<td>Yes</td>
<td>CEQA Threshold: An increase over existing Citywide VMT per Capita.</td>
<td>Yes – Consistent with 8/6/14 OPR guidance on SB 743 changes</td>
<td>No action taken</td>
<td>CEQA Threshold: An increase over existing Citywide VMT per Capita.</td>
<td>Yes – Consistent with 8/6/14 OPR guidance on SB 743 changes</td>
<td>Yes</td>
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<td>2. VT Per Capita</td>
<td>Vehicle Trips (VT) in the City of Pasadena per service population (population + jobs).</td>
<td>Yes</td>
<td>CEQA Threshold: An increase over existing Citywide VT per Capita.</td>
<td>No action taken</td>
<td>CEQA Threshold: An increase over existing Citywide VT per Capita.</td>
<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td>3. Auto Level of Service</td>
<td>Level of Service (LOS) as defined by the Transportation Research Board’s Highway Capacity Manual (HCM) 2010. Uses intersection control delay to evaluate auto congestion.</td>
<td>No - LOS precluded inside TPAs by SB 743 as of September 2013 LOS outside TPAs allowable until updated Guidelines adopted – current timing is January 2016.</td>
<td>CEQA Threshold: A decrease beyond the LOS D Threshold outside designated High Pedestrian Activity Areas Allowable outside TPAs until updated Guidelines are adopted by the state</td>
<td>Consistent only to the extent that HPAs mirror TPAs Up to and including LOS E will be accepted inside designated HPAs</td>
<td>No.</td>
<td>CEQA Threshold: A decrease beyond the LOS D Threshold outside designated High Pedestrian Activity Areas Allowable outside TPAs until updated Guidelines are adopted by the state in January 2016</td>
<td>Los will not be evaluated inside designated TPAs</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Proximity and Quality of Bicycle Network</td>
<td>Percent of dwelling units and jobs within a quarter mile of each of three bicycle facility types.</td>
<td>Yes</td>
<td>CEQA Threshold: Any decrease in % of units or employment within a ¼ mile of Level 1 or 2 Bike Facility</td>
<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>5. Proximity and Quality of Transit Network</td>
<td>Percent of dwelling units and jobs located within a quarter mile of each of three transit facility types.</td>
<td>Yes</td>
<td>CEQA Threshold: Any decrease in % of units or employment within a ¼ mile of Level 1 or 2 Transit Facility</td>
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<td>6. Pedestrian Accessibility</td>
<td>The Pedestrian Accessibility Score uses the mix of destinations, and a network-based walkshed to evaluate walkability.</td>
<td>Yes</td>
<td>CEQA Threshold: Any decrease in the Citywide Pedestrian Accessibility Score</td>
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<td>Yes</td>
<td>CEQA Threshold: Any decrease in the Citywide Pedestrian Accessibility Score</td>
<td>Yes</td>
</tr>
<tr>
<td>7. Modified Street Segment Analysis</td>
<td>The modified street segment analysis assesses traffic intrusion on local streets in residential neighborhoods.</td>
<td>No</td>
<td>Allowable outside TPAs until updated Guidelines are adopted by the state in January 2016</td>
<td>Not Included</td>
<td>4-4 vote; continued to 8/10/14</td>
<td>Not a CEQA measure of significance. Neighborhood traffic intrusion will be assessed for conditions of approval.</td>
<td>Yes – consistent with police powers granted to cities</td>
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Staff is seeking the Transportation Advisory Commission recommendations to the City Council on the Proposed Transportation Performance Measures and CEQA Thresholds and the modified Street Segment Analysis for Neighborhood Protection.

Prepared by:

Mark Yamarone
Transportation Administrator

Approved by:

Frederick C. Dock, PE AICP
Director of Transportation

ATTACHMENTS:

1. Transportation Advisory Commission Memo on the Proposed Transportation Performance Measures, June 12, 2014
2. OPR – Preliminary Discussion Draft of Updates to CEQA Guidelines Implementing SB 743, August 6, 2014
3. Modified Street Segment Analysis for Neighborhood Protection
RECOMMENDATION:

It is recommended that the Transportation Advisory Commission provide comments to the City Council on the Transportation Performance Measures and Thresholds for CEQA.

BACKGROUND:

At the May 22, 2014 Transportation Advisory Commission meeting staff presented an overview of the purpose and need for the development of new mobility measures. At that meeting the Commission reviewed the proposed measures and how they would be applied to the analysis of the General Plan Land Use and Mobility Element Updates. This memo responds to Transportation Advisory Commission comments from their previous meetings and detail how staff is proposing to apply the proposed performance measures along with proposed thresholds for CEQA to the analysis of mobility impacts associated with land use changes at the project level.

This memo describes seven proposed transportation performance measures that collectively assess the quality of walking, biking, transit, and vehicular travel in the City of Pasadena. The proposed update of the City’s performance metrics and thresholds addresses the new LOS policy in transportation studies, and defines how to analyze the quality of bicycle, pedestrian, and transit facilities and services. To better align transportation system and network analysis with community values as expressed in the general plan, the performance measures and methods presented in this memorandum are recommended for use in transportation analysis.

Overview of CEQA Approach to the Transportation Analysis

The following discussion provides a summary of CEQA-recommended practices related to transportation impact analysis as well as specific details related to performing this type of analysis for development projects such as specific plans. To start this discussion, the lead agency needs to have a clear philosophy about what constitutes an adequate level of analysis. Agency interpretations of CEQA requirements differ, so we
reflect on the statutes, guidelines, and case law to provide a recommended approach that achieves the following primary objectives:

- Accurately describe transportation conditions for the baseline, project, and cumulative conditions.
- Comply with regulatory guidelines and state-of-the-practice techniques when preparing technical analysis.
- Disclose limitations of the data, analysis methodology, and models used in the impact and mitigation analysis.
- Address competing objectives between travel modes (and other community objectives) when recommending mitigation.
- Include sufficient information to allow for general plan consistency to be evaluated.

While the CEQA guidelines in particular are clear about the general expectations for environmental analysis as noted below, they are silent about what data, analysis methods, models, and mitigation approaches are adequate for transportation impacts.

Policy Considerations

Pasadena currently employs a combination of vehicular performance measures and emerging multimodal measures for evaluating system performance and in reviewing the impacts of new development.

However, CEQA significance thresholds are only identified for the vehicular measures. Intersection vehicular volume-to-capacity (V/C) ratios and auto Level of Service (LOS) are the primary measures used in project level mitigation recommendations. The city also uses a vehicular volume-based analysis of change in traffic on street segments to assess impacts. Both methods result in recommended mitigations that have potential to conflict with other General Plan objectives and the intersection analysis method (ICU) is no longer considered state of the practice for LOS analysis.

The current significance thresholds are silent with regard to system performance of non-auto modes and tend to generate mitigation solutions that encourage widening of intersections and streets, which may compromise the performance of non-auto modes and are increasingly contrary to community values.

Transportation staff, understanding that the revised goals and objectives of the General Plan are not in accordance with the performance measures being used to evaluate development projects, has invested time to explore new methodologies and tools to better measure and manage multi-modal networks. In addition, the department has built sophisticated models, such as a Travel Demand Forecasting model and a DTA model, to better estimate vehicle miles of travel (VMT), travel times over typical routes, speed suitability by street type, and tools with the ability to forecast traffic at the intersection level. Each of these approaches is more consistent with General Plan goals and objectives than the current ICU and V/C methods. Moreover, the 2010 *Highway*
Capacity Manual is widely accepted as standard practice for analyzing auto LOS, and consistency with these methods is recommended.

In addition, emerging methodologies that evaluate quality of service for active transportation modes, such as the Pedestrian Environmental Quality Index (PEQI), the Bicycle Environmental Quality Index (BEQI) and Multi-Modal LOS (MMLOS) have been developed by various jurisdictions across the USA, and Pasadena Department of Transportation has studied and used them over the past year. Unlike the vehicular LOS methods, none of the emerging MMLOS approaches has proven effective enough to achieve this status among practitioners.

As part of the General Plan update transportation staff is proposing that the City Council adopt a new set of transportation performance measures and thresholds that help meet its objectives for transportation and mobility. With the expanded emphasis on sustainability and a continued focus on livability, the newly adopted performance measures will have the ability to assist in determining how to balance trade-offs among travel modes and among the mobility needs of different members of the community.

Traffic impact studies must serve the dual purpose of General Plan consistency and compliance with CEQA; therefore, consistent performance measures and thresholds of significance must be established. Thus, any inconsistencies in performance measures and thresholds of significance between the General Plan and the development review analysis would be resolved. Both the General Plan and the traffic study guidelines should identify the desired resolution between conflicting modal impact analysis findings. A context sensitive approach to resolution of conflicts is recommended, along with explicit guidance for modal priority, and a policy-based exemption framework. The City’s street typologies and/or land use planning areas could inform a context sensitive approach. Having consistent performance measure promotes a defensible and harmonious framework for the transportation analysis the City will undertake in the future; first in the General Plan EIR, and then in the development review process.

The changes recommended here are not monumental, but instead they seek to effectively and efficiently align the revised mobility policies to the transportation performance measures and thresholds of significance used to serve everyone using Pasadena’s transportation system.

New Transportation Performance Measures

A key challenge facing the City is the current set of Performance Measure and Metrics, used in the 2004 General Plan and the Transportation Impact Review Current Practice and Guidelines, place a considerable emphasis on the automobile operations. If these measures continue to be used in their current form, it would present a conflict with the proposed Mobility Element objectives.

Pasadena is currently using a conventional set of performance measures for evaluating system performance and in reviewing the impacts of new development. Intersection
volume to capacity ratios and Level of Service (LOS) are the primary measures. The city also uses a volume-based analysis of change in traffic on street segments to assess impact. The 1994 General Plan update went as far as to include a measure of the environmental capacity of residential streets, essentially an estimate of the level of traffic volume that would be acceptable on residential streets as opposed to the operational capacity. This measure was replaced in the 2004 update by the street segment analysis. A explanation of why Street Segment Analysis is not recommended by staff to be continued as a transportation performance measure is included later in this report.

When looked at in the above context, the current measures are silent with regard to system performance of non-auto modes and tend to generate mitigation solutions that encourage widening of intersections and streets, which may compromise the performance of non-auto modes and are increasingly contrary to community values. Consequently, a more robust set of measures has been developed that decreases the emphasis on additional vehicle capacity and on reducing individual intersection delay in favor of increasing the emphasis on the “efficiency” of travel by analyzing the per capita length and number of trips associated with changes in land use.

Of the seven transportation measures developed staff is proposing that three would be set as thresholds to determine significant impacts under California Environmental Quality Act (CEQA) analysis at both the General Plan and project analysis level. These are:

- Vehicle Miles Traveled Per Capita
- Vehicle Trips Per Capita
- Auto Level of Service.

The other four measures would be used to determine impacts under CEQA only at the General Plan/Specific Plan level but would not be used to determine impacts at the project level. These are:

- Proximity and Quality of the Bicycle Network
- Proximity and Quality of the Transit Network
- Pedestrian Accessibility
- Corridor Travel Times

These thresholds would guide system-wide bike and local transit improvements in the General Plan and guide pedestrian improvements in Specific Plan Updates. The bike and transit improvements identified would be included in a nexus study to the update of the Traffic Reduction and Transportation Improvement Fee (TRTIF) following the adoption of the Land Use and Mobility Element updates. An analysis at the project level impacts to the various citywide network is not necessary because projects would address their proportionate impacts in these areas by paying their fees.
The table below summarizes the metrics and the proposed CEQA thresholds for determining an impact. See Appendix A for detailed descriptions and existing values for each metric.

<table>
<thead>
<tr>
<th>METRIC</th>
<th>DESCRIPTION</th>
<th>IMPACT THRESHOLD (GENERAL PLAN)</th>
<th>IMPACT THRESHOLD (PROJECT LEVEL)</th>
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<td>1. VMT Per Capita</td>
<td>Vehicle Miles Traveled (VMT) in the City of Pasadena per service population (population + jobs).</td>
<td>CEQA Threshold: An increase over existing VMT per Capita.</td>
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<td>2. VT Per Capita</td>
<td>Vehicle Trips (VT) in the City of Pasadena per service population (population + jobs).</td>
<td>CEQA Threshold: An increase over existing VT per Capita.</td>
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<td>3. Auto Level of Service</td>
<td>Level of Service (LOS) as defined by the Transportation Research Board's <em>Highway Capacity Manual (HCM) 2010</em>. Uses intersection control delay to evaluate auto congestion</td>
<td>CEQA Threshold: A decrease beyond the LOS D Threshold outside designated High Pedestrian Activity Areas Up to and including LOS F will be accepted inside designated HPA</td>
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<td>4. Proximity and Quality of Bicycle Network</td>
<td>Percent of dwelling units and jobs within a quarter mile of each of three bicycle facility types</td>
<td>CEQA Threshold: Any decrease in % of units or employment within a ¼ mile of Level 1 or 2 Bike Facility</td>
<td>Not a CEQA measure of significance. However project analysis of adjacent effects to the bike system will be included in a CEQA Document.</td>
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<tr>
<td>5. Proximity and Quality of Transit Network</td>
<td>Percent of dwelling units and jobs located within a quarter mile of each of three transit facility types.</td>
<td>CEQA Threshold: Any decrease in % of units or employment within a ¼ mile of Level 1 or 2 Transit Facility</td>
<td>Not a CEQA measure of significance. However project analysis of adjacent effects to the transit service will be included in a CEQA Document.</td>
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<td>6. Pedestrian Accessibility</td>
<td>The Pedestrian Accessibility Score uses the mix of destinations, and a network-based walk shed to evaluate walkability</td>
<td>CEQA Threshold: Any decrease in the Citywide Pedestrian Accessibility Score</td>
<td>Not a CEQA measure of significance. However project analysis of adjacent effects to the pedestrian system will be included in a CEQA Document.</td>
</tr>
<tr>
<td>7. Corridor Travel Times</td>
<td>Auto Travel Times for significant arterials in the City will be determined and forecasted using the Dynamic Traffic Assignment (DTA) Model.</td>
<td>CEQA Threshold: Any increase &gt; 20% in auto travel times for significant origin/destination pairs</td>
<td>Not applicable at the project analysis level. Not a CEQA measure of significance.</td>
</tr>
</tbody>
</table>
1. VMT PER CAPITA
The Vehicle Miles Traveled (VMT) per Capita measure sums the miles traveled for trips within the City of Pasadena citywide model. The Citywide VMT is calculated by adding: 1) 100% of VMT associated with trips traveling within the City of Pasadena boundaries that are generated or attracted by the City, and 2) 50% of VMT associated with trips with an end or origin outside of the City. The City’s VMT is then divided by the City’s total service population, defined as the population plus the number of jobs, per Capita.

Although VMT itself will likely increase with the addition of new residents, the City can reduce VMT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance of home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

**Proposed Threshold**
The proposed threshold of significance for the VMT/Capita metric when applied to the General Plan (or a Specific Plan) or project level analysis would be an increase over the existing (2013) Citywide VMT/Capita.

2. VT PER CAPITA
Vehicle Trips (VT) per Capita is a measure of motor vehicle trips associated with the City. The measure sums the trips with origins and destinations within the City of Pasadena, as generated by the Trip-Based citywide model. The regional VT is calculated by adding the VT associated with trips generated and attracted within the City of Pasadena boundaries, and 50 percent of the VT associated with trips that either begin or end in the City, but have one trip end outside of the City. The City’s VT is then divided by the City’s total service population, defined as the population plus the number of jobs, to calculate VT per Capita.

As with VMT, VT itself will likely increase with the addition of new residents, but the City can reduce VT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance of home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

**Proposed Threshold**
The proposed threshold of significance for the VT/Capita metric when applied to the General Plan (or a Specific Plan) or project level analysis would be an increase over the existing (2013) Citywide VT/Capita.

**AUTO LEVEL OF SERVICE (LOS)**
Auto LOS is a qualitative description of traffic flow from a vehicle driver’s perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six
levels of service are defined, ranging from LOS A (best operating conditions) to LOS F (operating conditions with delays for motorists). LOS E corresponds to operations “at capacity.” When volumes exceed capacity, stop-and-go conditions result and operations are designated to LOS F.

Traffic conditions at signalized intersections are evaluated using methodologies proposed by the Transportation Research Board (TRB), as documented in the 2010 Highway Capacity Manual (HCM 2010). The 2010 HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors and is currently state of the practice for analyzing LOS. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. These delay estimates are considered meaningful indicators of driver discomfort and frustration, fuel consumption, and lost travel time.

The proposed Auto LOS threshold is set at different grades based on the geographical location of the intersection. Consistent with policies adopted in several cities in California the two tier LOS threshold supports the General Plan policies of creating more walkable areas by not prioritizing improvements to reduce vehicle delays at the detriment to the pedestrian environment while acknowledging that adding vehicle capacity to intersections is not an option due to the mature and often historic urban environment surrounding the intersections.

**Proposed Threshold**
The proposed threshold of significance for the Auto Level of Service (LOS) would be applied the same way to both the General Plan, or a Specific Plan, and a project requiring an EIR. As proposed, the number of intersections analyzed as part of a traffic study would not change from current guidelines. For the General Plan Update 61 intersections citywide would be analyzed and assigned LOS letter grades for both existing and 2035 conditions. For intersections outside of the designated High Pedestrian Activity (HPA) areas the default minimum Level of Service to maintain in the City is LOS D. For intersections within the HPA areas any LOS up to and including LOS F would not be a significant impact. Figure 1 in the attached appendix identifies the HPPAs and the intersections to be analyzed as part of the General Plan Update EIR.

4. PROXIMITY AND QUALITY OF BICYCLE NETWORK
The Proximity and Quality of Bicycle Network provides a measure of the percent of the City’s dwelling units and work places within a quarter mile of each of three bicycle facility types. The facility types are aggregated into three hierarchy levels, obtained from the City’s 2012 (Draft) Bicycle Transportation Plan. For each bike facility level, a quarter-mile network distance buffer is calculated and the total dwelling units and work places within the buffer are added. The City can improve measures of Bike Facility Access by improving and expanding existing bike facilities and by encouraging residential and commercial development in areas with high-quality bike facilities.
Proposed Threshold
At the General Plan level the threshold of significance is any decrease in the percent of dwelling units or employment within a quarter mile of Level 1 or 2 Bike Facility (See Appendix A for Bike Facility Definitions).

5. PROXIMITY AND QUALITY OF TRANSIT NETWORK

The Proximity and Quality of Transit Network provides a measure of the percent of the City’s dwelling units and work places within a quarter mile of each of each of three transit facility types, as defined in the Draft Streets Types Plan. For each facility level, a quarter-mile network distance buffer is calculated and the total dwelling units and work places within the buffer are added.

The City can improve the measures of Transit Proximity and Quality by reducing headways on existing transit routes, by expanding transit routes to cover new areas, and by encouraging residential and commercial development to occur in areas with an already high-quality transit service.

Proposed Threshold
At the General Plan level the threshold of significance is any decrease in the percent of dwelling units or employment within a quarter mile of Level 1 or 2 Transit Facility (See Appendix A for Transit Facility Definitions).

6. PEDESTRIAN ACCESSIBILITY

The Proximity and Quality of Pedestrian Environment provides a measure of the average walkability in the Traffic Analysis Zone (TAZ) surrounding Pasadena residents, based on a Pedestrian Accessibility metric. The Pedestrian proximity metric is a simple count of the number of land use types accessible to a Pasadena resident or employee in a given TAZ within a 5-minute walk. The City can improve the Resident and Employment Pedestrian Accessibility Scores by:

- Encouraging residential development in areas with high existing Pedestrian Accessibility Scores;
- Encouraging commercial development in areas with high existing Pedestrian Accessibility Scores; and
- Attracting mixed development and new land use types to increase the Pedestrian Accessibility metric values of other areas.

Proposed Threshold
At the General Plan level the threshold of significance is any decrease in the Citywide Pedestrian Accessibility Score (See Appendix A for Land Uses which influence this metric).

7. CORRIDOR TRAVEL TIME

Auto Travel Time for significant corridors in the City was determined and forecasted using the City’s Dynamic Traffic Assignment (DTA) model which can estimate future
travel times along corridors in the City. The City has collected travel time runs for 16 significant arterials, and this travel time information was used to evaluate auto operation in the General Plan context. Travel Times along a set of 16 origin-destination pairs were determined, and forecast travel times were prepared using the City’s DTA model.

Proposed Threshold
At the General Plan level the threshold of significance is any forecast auto travel times increase between significant origin and destination pair by 20% over exiting travel times.

**Street Segment Analysis**

At the April 9 and May 28 Planning Commission meetings, the Commission expressed interest in retaining the use of Street Segment Analysis as one as a transportation performance measure.

Pasadena currently employs a Street Segment Analysis metric to identify the amount of new auto trips a development project will add to adjacent streets.

The traffic growth on a street segment is calculated as follows:
Percentage of Traffic Growth on Street Segment = Net New Project Trips/ Existing Daily Traffic

The table below is from adopted Traffic Impact Guidelines and shows the adopted thresholds for varying levels of traffic growth on a street segment.

<table>
<thead>
<tr>
<th>Traffic Growth on Street Segment</th>
<th>Required Multi-Modal Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 2.4% Daily Traffic Growth</td>
<td>Staff review and conditions</td>
</tr>
<tr>
<td>2.5% - 4.9% Daily Traffic Growth</td>
<td>• Initial study required if existing count is greater than 2,000 VPD</td>
</tr>
<tr>
<td></td>
<td>• Soft measures required</td>
</tr>
<tr>
<td>5.0% - 7.4% Daily Traffic Growth</td>
<td>• Initial study required</td>
</tr>
<tr>
<td></td>
<td>• Soft measures required</td>
</tr>
<tr>
<td></td>
<td>• Physical improvements may be required</td>
</tr>
<tr>
<td>7.5% + Daily Traffic Growth</td>
<td>• Initial study required</td>
</tr>
<tr>
<td></td>
<td>• Soft measures required</td>
</tr>
<tr>
<td></td>
<td>• Extensive physical improvements may be required</td>
</tr>
<tr>
<td></td>
<td>• Project alternatives may be considered</td>
</tr>
</tbody>
</table>
Pros
• Identifies changes to vehicle volumes on all streets including residential streets.

Cons
• No minimum threshold for street Average Daily Traffic (ADT) to establish impacts. A few cars added to a street with low ADT shows as an impact.
• Impact tied to a percentage increase in traffic resulting in small increases in traffic triggering impacts on streets with low ADTs.
• Does not accurately reflect perceptible changes to traffic volume on street with low ADT
• Metric is not consistent with the land use densities identified in the adopted General Plan and can cause project alternatives at densities lower than adopted General Plan land use.
• Forces projects to place new driveways on streets with higher vehicular traffic and pedestrian and bike volumes. Introductions of new driveways negatively impacts pedestrian and bicycle environments, and increases congestion on major travel corridors leading to potential cut-through traffic on residential streets.
• Mitigation measures proposed in 2005 for Street Segment impacts are no longer adequate under current CEQA Guidelines.
• Segment metric and impact threshold applies to both residential and commercial projects. Trips associated with residential projects in residential neighborhoods are not cut through traffic per se.

Examples of projects with Street Segment Impacts which could not be mitigated are included in Attachment 1.

APPENDIX

A. Descriptions of the Proposed Transportation Performance Metrics

ATTACHMENTS:

1. Examples of Projects with Street Segment Impacts That Could Not Be Mitigated
2. Summary of the City of Los Angeles Street Segment Impact Analysis
APPENDIX A - DESCRIPTIONS OF NEW TRANSPORTATION PERFORMANCE METRICS

1. VMT PER CAPITA
The Vehicle Miles Traveled (VMT) per Capita measure sums the miles traveled for trips within the City of Pasadena citywide model. The Citywide VMT is calculated by adding: 1) 100% of VMT associated with trips traveling within the City of Pasadena boundaries that are generated or attracted by the City, and 2) 50% of VMT associated with trips with an end or origin outside of the City. The City’s VMT is then divided by the City’s total service population, defined as the population plus the number of jobs, per Capita.

Although VMT itself will likely increase with the addition of new residents, the City can reduce VMT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance of home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

2. VT PER CAPITA
Vehicle Trips (VT) per Capita is a measure of motor vehicle trips associated with the City. The measure sums the trips with origins and destinations within the City of Pasadena, as generated by the Trip-Based citywide model. The regional VT is calculated by adding the VT associated with trips generated and attracted within the City of Pasadena boundaries, and 50 percent of the VT associated with trips that either begin or end in the City, but have one trip end outside of the City. The City’s VT is then divided by the City’s total service population, defined as the population plus the number of jobs, to calculate VT per Capita.

As with VMT, VT itself will likely increase with the addition of new residents, but the City can reduce VT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance of home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

3. AUTO LEVEL OF SERVICE (LOS)
Auto LOS is a qualitative description of traffic flow from a vehicle driver’s perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined, ranging from LOS A (best operating conditions) to LOS F (operating conditions with delays for motorists). LOS E corresponds to operations “at capacity.” When volumes exceed capacity, stop-and-go conditions result and operations are designated to LOS F.

Signalized Intersections
Traffic conditions at signalized intersections are evaluated using methodologies proposed by the Transportation Research Board (TRB), as documented in the 2010 Highway Capacity Manual (HCM 2010). The 2010 HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors and is currently state of the practice for analyzing LOS. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. These delay estimates are considered meaningful indicators of driver discomfort and frustration, fuel consumption, and lost travel time.
### TABLE A1 – SIGNALIZED INTERSECTION LOS CRITERIA

<table>
<thead>
<tr>
<th>LEVEL OF SERVICE</th>
<th>DESCRIPTION</th>
<th>DELAY IN SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.</td>
<td>&lt; 10.0</td>
</tr>
<tr>
<td>B</td>
<td>Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.</td>
<td>&gt; 10.0 to 20.0</td>
</tr>
<tr>
<td>C</td>
<td>Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.</td>
<td>&gt; 20.0 to 35.0</td>
</tr>
<tr>
<td>D</td>
<td>The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.</td>
<td>&gt; 35.0 to 55.0</td>
</tr>
<tr>
<td>E</td>
<td>This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor (vehicle) progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.</td>
<td>&gt; 55.0 to 80.0</td>
</tr>
<tr>
<td>F</td>
<td>This level is considered oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.</td>
<td>&gt; 80.0</td>
</tr>
</tbody>
</table>


As proposed, for intersections outside of the designated High Pedestrian Activity (HPA) areas the default minimum Level of Service to maintain in the City is LOS D. For intersections within the HPA areas there would be no minimum LOS.

**Figure 1** illustrates the High Activity Areas (HAAs) and high-frequency transit segments used for determining the LOS threshold applicable to each intersection.
4. PROXIMITY AND QUALITY OF BICYCLE NETWORK

The Proximity and Quality of Bicycle Network provides a measure of the percent of the City’s dwelling units and work places within a quarter mile of each of three bicycle facility types. The facility types are aggregated into three hierarchy levels, obtained from the City's 2012 (Draft) Bicycle Transportation Plan categories as shown in Table A4.

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>DESCRIPTION</th>
<th>FACILITIES INCLUDED</th>
</tr>
</thead>
</table>
| 1 (A) | Advanced Facilities | Bike Paths (P1)  
|       |               | Multipurpose Paths (PP)  
|       |               | Cycle Tracks/Protected Bike Lanes |
| 2 (B) | Dedicated Facilities | Buffered Bike Lanes  
|       |               | Bike Lanes (2, P2) |
| 3 (C) | Basic Facilities | Bike Routes (3, P3)  
|       |               | Enhanced Bike Routes (E3, PE3)  
|       |               | Bike Boulevards (BB)  
|       |               | Emphasized Bikeways (PEB) |

Source: City of Pasadena Bicycle Transportation Plan, 2012.

For each bike facility level, a quarter-mile network distance buffer is calculated and the total dwelling units and work places within the buffer are added.

The City can improve measures of Bike Facility Access by improving and expanding existing bike facilities and by encouraging residential and commercial development in areas with high-quality bike facilities.

5. PROXIMITY AND QUALITY OF TRANSIT NETWORK

The Proximity and Quality of Transit Network provides a measure of the percent of the City’s dwelling units and work places within a quarter mile of each of each of three transit facility types, as defined in the Draft Streets Types Plan and in Table A5.

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>FACILITIES INCLUDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (A)</td>
<td>Includes all Gold Line stops as well as corridors with transit service, whether it be a single route or multiple routes combined, with headways of five minutes or less during the peak periods.</td>
</tr>
<tr>
<td>2 (B)</td>
<td>Includes corridors with transit headways of between six and 15 minutes in peak periods.</td>
</tr>
<tr>
<td>3 (C)</td>
<td>Includes corridors with transit headways of 16 minutes or more at peak periods.</td>
</tr>
</tbody>
</table>

Source: Draft Streets Types Plan, Pasadena Department of Transportation, March 2013.
For each facility level, a quarter-mile network distance buffer is calculated and the total dwelling units and work places within the buffer are added.

The City can improve the measures of Transit Proximity and Quality by reducing headways on existing transit routes, by expanding transit routes to cover new areas, and by encouraging residential and commercial development to occur in areas with an already high-quality transit service.

6. PEDESTRIAN ACCESSIBILITY
The Proximity and Quality of Pedestrian Environment provides a measure of the average walkability in the TAZ surrounding Pasadena residents, based on a Pedestrian Accessibility metric. The Pedestrian proximity metric is a simple count of the number of land use types accessible to a Pasadena resident or employee in a given TAZ within a 5-minute walk. The ten categories of land uses are:

- Retail
- Personal Services
- Restaurant
- Entertainment
- Office (including private sector and government offices)
- Medical (including medical office and hospital uses)
- Culture (including churches, religious and other cultural uses)
- Park and Open Space
- School (including elementary and high schools)
- College

The resulting count of land use types is then assigned a letter grade from A to D based on the following structure:

- **A** – greater than or equal to 8 land use types
- **B** – greater than or equal to 5 land use types and less than 8 land use types
- **C** – greater than or equal to 2 land use types and less than 5 land use types
- **D** – greater than or equal to 0 land use types and less than 2 land use types

The City can improve the Resident and Employment Pedestrian Accessibility Scores by:

- Encouraging residential development in areas with high existing Pedestrian Accessibility Scores;
- Encouraging commercial development in areas with high existing Pedestrian Accessibility Scores; and
- Attracting mixed development and new land use types to increase the Pedestrian Accessibility metric values of other areas.

7. CORRIDOR TRAVEL TIME
Auto Travel Time for significant corridors in the City was determined and forecasted using the City’s Dynamic Traffic Assignment (DTA) model which can estimate future travel times along corridors in the City. The City has collected travel time runs for 16 significant arterials, and this travel time information was used to evaluate auto operation in the General Plan context. Travel
Times along a set of 16 origin-destination pairs were determined, and forecast travel times were prepared using the City’s DTA model.

The metric seeks to evaluate whether future condition auto travel times for significant arterials can be maintained within +/- 20% of exiting travel times. Travel time reliability, and the ability for the auto network to absorb new vehicle demand was evaluated with the DTA model.
### Examples of Projects with Street Segment Impacts That Could Not Be Mitigated

<table>
<thead>
<tr>
<th>Project Address</th>
<th>Project Size</th>
<th>Percentage of ADT increase</th>
<th>Impacted Street ADT</th>
<th>Impacted Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>550 E. Colorado Bl</td>
<td>16,201 sf retail; 96,051 sf med office</td>
<td>44.98%</td>
<td>1236</td>
<td>Oakland Ave n/o Colorado Blvd</td>
</tr>
<tr>
<td>680 E. Colorado Bl</td>
<td>159,971 sf general office</td>
<td>12.3%</td>
<td>6,528</td>
<td>El Molino Ave b/t Colorado Blvd and Playhouse Alley</td>
</tr>
<tr>
<td>880 E. Colorado Bl</td>
<td>156 room hotel; 5-unit condominium; 8,210 sf retail; 5,601 sf restaurant</td>
<td>8.9%</td>
<td>5,091</td>
<td>Mentor Ave b/t Green St and Cordova St</td>
</tr>
<tr>
<td>86 S. Fair Oaks Ave</td>
<td>64-res unit; 5,000 sf retail</td>
<td>35.4%</td>
<td>883</td>
<td>Dayton Street b/t Fair Oaks Ave and Raymond Ave</td>
</tr>
<tr>
<td>158 S. Sierra Madre Bl*</td>
<td>60 Units</td>
<td>22.3%</td>
<td>330</td>
<td>Oswego Street b/t Sierra Madre Bl and Altadena Dr</td>
</tr>
<tr>
<td>612 S Fair Oaks Ave</td>
<td>113K Office</td>
<td>8.2%</td>
<td>1125</td>
<td>Pico Street b/t Raymond and Edmonson Alley</td>
</tr>
<tr>
<td>1700 Lida St</td>
<td>319 student increase</td>
<td>8.1%</td>
<td>585</td>
<td>Wellington Ave s/o Lida St</td>
</tr>
</tbody>
</table>

- Applicant resubmitted the project circulation with driveways on Del Mar and Sierra Madre Bl
LADOT STREET SEGMENT IMPACT CRITERIA GUIDELINES

- Limited to commercial projects only
- Subjective- if major arterial is congested and there is potential for cut-through traffic.
- The following conditions must be present in order to analyze project-related impacts on residential streets:
  - the proposed project is a non-residential development and not a school
  - the arterial is sufficiently congested, such that motorists traveling on the arterial may opt to divert to a parallel route through a residential street; the congestion level of the arterial can be determined based on the estimated LOS under project conditions of the study intersection(s); LOS E and F are considered to represent congested conditions
  - the Project is projected to add a significant amount of traffic to the congested arterial that can potentially shift to an alternative route; Project traffic would need to exceed the daily minimum significance thresholds listed below under “Project-Related Increase in ADT”
  - the local residential street(s) provides motorists with a viable alternative route

- A local residential street shall be deemed significantly impacted based on an increase in the projected average daily traffic (ADT) volumes as follows:

<table>
<thead>
<tr>
<th>Projected ADT with Project (Final ADT)</th>
<th>Project-Related Increase in ADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 999</td>
<td>120 or more</td>
</tr>
<tr>
<td>1,000 to 1,999</td>
<td>12 percent or more of final ADT</td>
</tr>
<tr>
<td>2,000 or 2,999</td>
<td>10 percent or more of final ADT</td>
</tr>
<tr>
<td>3,000 or more</td>
<td>8 percent or more of final ADT</td>
</tr>
</tbody>
</table>

- Mitigation Measure- If project results in significant impacts, the applicant must develop a NTMP plan with input from affected residents, council districts and LADOT
  - NTMP plan may only consider non-restrictive traffic calming measures such as:
    - Traffic circles
    - Speed hump
    - Raised median
    - Curb extensions (traffic chokers)
    - Stop sign patterns
  - Restrictive traffic calming measures are not allowed
    - Turn restrictions
    - Physical barriers
    - Signal metering
Updating Transportation Impacts Analysis in the CEQA Guidelines

Preliminary Discussion Draft of Updates to the CEQA Guidelines Implementing Senate Bill 743 (Steinberg, 2013)
Senate Bill 743 (Steinberg, 2013)

Excerpt of Public Resources Code § 21099

(b) (1) The Office of Planning and Research shall prepare, develop, and transmit to the Secretary of the Natural Resources Agency for certification and adoption proposed revisions to the guidelines adopted pursuant to Section 21083 establishing criteria for determining the significance of transportation impacts of projects within transit priority areas. Those criteria shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. In developing the criteria, the office shall recommend potential metrics to measure transportation impacts that may include, but are not limited to, vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated. The office may also establish criteria for models used to analyze transportation impacts to ensure the models are accurate, reliable, and consistent with the intent of this section.

(2) Upon certification of the guidelines by the Secretary of the Natural Resources Agency pursuant to this section, automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any.

(3) This subdivision does not relieve a public agency of the requirement to analyze a project’s potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation. The methodology established by these guidelines shall not create a presumption that a project will not result in significant impacts related to air quality, noise, safety, or any other impact associated with transportation. Notwithstanding the foregoing, the adequacy of parking for a project shall not support a finding of significance pursuant to this section.

(4) This subdivision does not preclude the application of local general plan policies, zoning codes, conditions of approval, thresholds, or any other planning requirements pursuant to the police power or any other authority.

(5) On or before July 1, 2014, the Office of Planning and Research shall circulate a draft revision prepared pursuant to paragraph (1).

(c) (1) The Office of Planning and Research may adopt guidelines pursuant to Section 21083 establishing alternative metrics to the metrics used for traffic levels of service for transportation impacts outside transit priority areas. The alternative metrics may include the retention of traffic levels of service, where appropriate and as determined by the office.

(2) This subdivision shall not affect the standard of review that would apply to the new guidelines adopted pursuant to this section.
Executive Summary

On September 27, 2013, Governor Brown signed Senate Bill 743 (Steinberg, 2013). Among other things, SB 743 creates a process to change the way we analyze transportation impacts under the California Environmental Quality Act (Public Resources Code section 21000 and following) (CEQA). Currently, environmental review of transportation impacts focuses on the delay that vehicles experience at intersections and on roadway segments. That delay is often measured using a metric known as “level of service,” or LOS. Mitigation for increased delay often involves increasing capacity (i.e. the width of a roadway or size of an intersection), which may increase auto use and emissions and discourage alternative forms of transportation. Under SB 743, the focus of transportation analysis will shift from driver delay to reduction of greenhouse gas emissions, creation of multimodal networks and promotion of a mix of land uses.

SB 743 requires the Governor’s Office of Planning and Research (OPR) to amend the CEQA Guidelines (Title 14 of the California Code of Regulations sections and following) to provide an alternative to level of service for evaluating transportation impacts. The alternative criteria must “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” (New Public Resources Code Section 21099(b)(1).) Measurements of transportation impacts may include “vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated.” (Ibid.)

This document contains a preliminary discussion draft of changes to the CEQA Guidelines implementing SB 743. In developing this preliminary discussion draft, OPR consulted with a wide variety of potentially affected stakeholders, including local governments, metropolitan planning organizations, state agencies, developers, transportation planners and engineers, environmental organizations, transportation advocates, academics, and others. OPR released its preliminary evaluation of different alternatives for public review and comment in December 2013. Having considered all comments that it received, and conducted additional research and consultation, OPR now seeks public review of this preliminary discussion draft.

This document contains background information, a narrative explanation of the proposed changes, text of the proposed changes, and appendices containing more detailed background information.
Analyzing Transportation Impacts

Proposed New Section 15064.3 and Proposed Amendments to Appendix F

Background

Californians drive approximately 332 billion vehicle miles each year. That driving accounts for 36 percent of all greenhouse gases in the state. (California Air Resources Board, First Update to the Climate Change Scoping Plan (May 2014).) Meanwhile, existing roadway networks are deteriorating. While new development may pay the capital cost of installing roadway improvements, neither the state nor local governments are able to fully fund operations and maintenance. (See, e.g., Nichols Consulting Engineers, California Statewide Local Streets and Roads Needs Assessment (January 2013).) While the health benefits of walking, bicycling and transit use are becoming more well-known, planning has literally pushed those other modes aside. Why?

Traffic studies used in CEQA documents have typically focused on one thing: the impact of projects on traffic flows. By focusing solely on delay, environmental studies typically required projects to build bigger roads and intersections as “mitigation” for traffic impacts. That analysis tells only part of the story, however.

Impacts on pedestrians, bicyclists and transit, for example, have not typically been considered. Projects to improve conditions for pedestrians, bicyclist and transit have, in fact, been discouraged because of impacts related to congestion. Requiring “mitigation” for such impacts in the CEQA process imposes increasing financial burdens, not just on project developers that may contribute capital costs for bigger roadways, but also on taxpayers that must pay for maintenance and upkeep of those larger roads. Ironically, even “congestion relief” projects (i.e., bigger roadways) may only help traffic flow in the short term. In the long term, they attract more and more drivers (i.e., induced demand), leading not only to increased air pollution and greenhouse gas emissions, but also to a return to congested conditions. (Matute and Pincetl, “Use of Performance Measures that Prioritize Automobiles over Other Modes in Congested Areas;” Handy and Boarnet, “DRAFT Policy Brief on Highway Capacity and Induced Travel,” (April 2014).) Under current practice, none of these impacts are considered in a typical project-level environmental review.

Such impacts have not completely escaped notice, however. For many years, local governments, transportation planners, environmental advocates and others have encouraged the Governor’s Office of Planning and Research (OPR) to revise the CEQA Guidelines to reframe the analysis of transportation impacts away from capacity. In 2009, the Natural Resources Agency revised the Appendix G checklist to focus more on multimodal, “complete streets” concepts. (Natural Resources Agency, Final Statement of Reasons: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97 (December 2009).)
Just last year, the Legislature passed, and Governor Brown signed into law, Senate Bill 743 (Steinberg, 2013), which requires OPR to develop alternative methods of measuring transportation impacts under CEQA. At a minimum, the new methods must apply within areas that are served by transit; however, OPR may extend the new methods statewide. Once the new transportation guidelines are adopted, automobile delay will no longer be considered to be an environmental impact under CEQA. SB 743 requires OPR to circulate a first draft of the new guidelines by July 1, 2014. The preliminary discussion draft below satisfies that requirement.

Before turning to a detailed explanation of the proposed text, OPR urges reviewers to consider the following:

- This is a preliminary discussion draft of a proposal that responds to SB 743. It reflects the information and research contained in OPR’s Preliminary Evaluation of Alternative Methods of Transportation Analysis (December 2013), as well as comments submitted on that evaluation and informal consultation with stakeholder groups across the state. However, OPR expects this draft to evolve, perhaps substantially, in response to this larger vetting and review process.
- Because this is a preliminary discussion draft, reviewers may notice some terms that should be defined, or concepts that should be further explored. OPR invites your suggestions in that regard.
- This proposal involves changes to the CEQA Guidelines. Because the CEQA Guidelines apply to all public agencies, and all projects, throughout the state, they generally must be drafted broadly. Similarly, this proposal reflects CEQA’s typical deference to lead agencies on issues related to methodology. The background paper accompanying this proposal, however, provides additional detail on a sample methodology for conducting an analysis, lists models capable of estimating vehicle miles traveled, and ideas for mitigation and alternatives. We invite reviewers to let us know if greater or less detail should be included in the new Guidelines.

This preliminary discussion draft consists of several parts. First, it contains a proposed new section 15064.3 of the CEQA Guidelines, which itself contains several subdivisions. Second, it proposes amendments to Appendix F (Energy Impacts) to describe possible mitigation measures and alternatives. Each of these components is described below.

**Explanation of Proposed New Section 15064.3**

OPR proposes to add a new section 15064.3 to the CEQA Guidelines to provide new methods of measuring transportation impacts. OPR initially considered whether to put the new methods in an appendix or in a new section of the Guidelines. OPR chose the latter, because experience with Appendix F, which requires analysis of energy impacts, has shown that requirements in appendices may not be consistently applied in practice.

Having decided to add a new section to the Guidelines, the next question was where to put it. As required by SB 743, the new guidelines focus on “determining the significance of transportation impacts.” Section 15064 of the CEQA Guidelines contains general rules regarding “determining the
The proposed new section 15064.3 contains several subdivisions, which are described below.

**Subdivision (a): Purpose**

Subdivision (a) sets forth the purpose of the entire new section 15064.3. First, the subdivision clarifies that the primary consideration, in an environmental analysis, regarding transportation is the amount and distance that a project might cause people to drive. This captures two measures of transportation impacts: auto trips generated and trip distance. These factors are important in an environmental analysis for the reasons set forth in the background materials supporting vehicle miles traveled as a transportation metric. These factors were also identified by the legislature in SB 743. (Pub. Resources Code § 21099(b)(1).) Specifying that trip generation and vehicle miles traveled are the primary considerations in a transportation analysis is necessary because impacts analysis has historically focused on automobile delay.

The second sentence in subdivision (a) also identifies impacts to transit and the safety of other roadway users as relevant factors in an environmental analysis. Impacts to transit and facilities for pedestrians and bicyclists are relevant in an environmental impacts analysis because deterioration or interruption may cause users switch from transit or active modes to single-occupant vehicles, thereby causing energy consumption and air pollution to increase. Further, impacts to human safety are clearly impacts under CEQA. (Pub. Resources Code § 21083(b)(3) (a significance finding is required if “a project will cause substantial adverse effects on human beings, either directly or indirectly”).) Finally, SB 743 requires the new guidelines to promote “multimodal transportation” and to provide for analysis of safety impacts. (Pub. Resources Code § 21099(b)(1), (b)(3).)

The third sentence clarifies that air quality and noise impacts related to transportation may still be relevant in a CEQA analysis. (Pub. Resources Code § 21099(b)(3) (the new guidelines do “not relieve a public agency of the requirement to analyze a project’s potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation”).) However, those impacts are typically analyzed in the air quality and noise sections of environmental documents. Further, there is nothing in SB 743 that requires analysis of noise or air quality in a transportation section of an environmental document. In fact, the content of any environmental document may vary provided that any required content is included in the document. (State CEQA Guidelines § 15120(a).)

Finally, the last sentence clarifies that automobile delay is not a significant effect on the environment. This sentence is necessary to reflect the direction in SB 743 itself that vehicle delay is not a significant environmental impact. (Pub. Resources Code § 21099(b)(2) (“Upon certification of the guidelines by the Secretary of the Natural Resources Agency pursuant to this section, automobile delay, as described..."
solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any.

As noted above, traffic-related noise and air quality impacts, for example, may still be analyzed in CEQA and mitigated as needed. Mitigation would consist of measures to reduce noise or air pollutants, however, and not necessarily the delay that some vehicles may experience in congestion.

Subdivision (b): Criteria for Analyzing Transportation Impacts

While subdivision (a) sets forth general principles related to transportation analysis, subdivision (b) focuses on specific criteria for determining the significance of transportation impacts. It is further divided into four subdivisions: (1) vehicle miles traveled and land use projects, (2) induced travel and transportation projects, (3) safety, and (4) methodology.

The lead-in sentences to these subdivisions clarify two things. First, CEQA's general rules regarding the determination of significance apply to all potential impacts, including transportation impacts. These general rules include the necessity to consider context and substantial evidence related to the project under consideration, as well as the need to apply professional judgment. These rules are contained in section 15064 of the CEQA Guidelines, which is included as a cross-reference in subdivision (b). The second lead-in sentence clarifies that the new section 15064.3 contains rules that apply specifically to transportation impacts.

Subdivision (b)(1): Vehicle Miles Traveled and Land Use Projects

The first sentence in subdivision (b)(1) states that vehicle miles traveled is generally the most appropriate measure of transportation impacts. It uses the word “generally” because OPR recognizes that the CEQA Guidelines apply to a wide variety of project types and lead agencies. Therefore, this sentence recognizes that in appropriate circumstances, a lead agency may tailor its analysis to include other measures.

SB 743 did not authorize OPR to set thresholds, but it did direct OPR to develop Guidelines “for determining the significance of transportation impacts of projects[.]” (Pub. Resources Code § 21099(b)(2).) Therefore, to provide guidance on determining the significance of impacts, subdivision (b)(1) describes factors that might indicate whether the amount of a project’s vehicle miles traveled may be significant, or not.

For example, a project that results in vehicle miles traveled that is greater than the regional average might be considered to have a significant impact. Average in this case could be measured using an efficiency metric such as per capita, per employee, etc. Travel demand models can provide information on those regional averages. “Region” refers to the metropolitan planning organization or regional transportation plan area within which the project is located. Notably, because the proposed text states that greater than regional average “may indicate a significant impact,” this subdivision would not prevent a local jurisdiction from applying a more stringent threshold. (Pub. Resources Code § 21099(e) (the new Guidelines do not “affect the authority of a public agency to establish or adopt thresholds of
significance that are more protective of the environment”). Note, this potential finding of significance
would not apply to projects that are otherwise statutorily or categorically exempt.

Why regional average? First, the region generally represents the area within which most people travel
for their daily needs. Second, focusing on the region recognizes the many different contexts that exist in
California. Third, pursuant to SB 375, metropolitan planning organizations throughout the state are
developing sustainable communities strategies as part of their regional transportation plans, and as part
of that process, they are developing data related to vehicle miles traveled. Fourth, average vehicle miles
traveled per capita, per employee, etc., can be determined at the regional level from existing data.
Finally, because SB 375 requires all regions to reduce region-wide greenhouse gas emissions related to
transportation, projects that move the region in the other direction may warrant a closer look.

Subdivision (b)(1) also gives examples of projects that might have a less than significant impact with
respect to vehicle miles traveled. For example, projects that locate in areas served by transit, where
vehicle miles traveled is generally known to be low, may be considered to have a less than significant
impact. (See, e.g., California Air Pollution Control Officers Association, “Quantifying Greenhouse Gas
Mitigation Measures,” (August 2010).) Further, projects that are shown to decrease vehicle miles
traveled, as compared to existing conditions, may be considered to have a less than significant impact.
Such projects might include, for example, the addition of a grocery store to an existing neighborhood
that enables existing residents to drive shorter distances. Notably, in describing these factors, the
Guidelines use the word “may” to signal that a lead agency should still consider substantial evidence
indicating that a project may still have significant vehicle miles traveled impacts. For example, the
addition of regional serving retail to a neighborhood may draw customers from far beyond a single
neighborhood, and therefore might actually increase vehicle miles traveled overall. Similarly, a project
located near transit but that also includes a significant amount of parking might indicate that the project
may still generate significant vehicle travel.

Most of the examples in this subdivision are most relevant to specific development projects. Land use
plans, such as specific plans or general plans, might be considered to have a less than significant effect
at the plan level if they are consistent with an adopted sustainable communities strategy.

Subdivision (b)(2): Induced Travel and Transportation Projects
While subdivision (b)(1) addresses vehicle miles traveled associated with land use projects, subdivision
(b)(2) focuses on impacts that result from certain transportation projects. Specifically, research
indicates that adding new traffic lanes in areas subject to congestion tends to lead to more people
driving further distances. (Handy and Boarnet, “DRAFT Policy Brief on Highway Capacity and Induced
Travel,” (April 2014).) This is because the new roadway capacity may allow increased speeds on the
roadway, which then allows people to access more distant locations in a shorter amount of time. Thus,
the new roadway capacity may cause people to make trips that they would otherwise avoid because of
congestion, or may make driving a more attractive mode of travel. Research also shows that extending
new roadway capacity, like the addition of water or sewer infrastructure, may remove barriers to
growth in undeveloped areas. Subdivision (b)(2) would therefore require lead agencies that add new
physical roadway capacity in congested areas to consider these potential growth-inducing impacts.
Subdivision (b)(2) also clarifies that not all transportation projects would be expected to cause increases in vehicle miles traveled. For example, projects that are primarily designed to improve safety or operations would not typically be expected to create significant impacts. The same is true of pedestrian, bicycle and transit projects, including those that require reallocation or removal of motor vehicle lanes.

**Subdivision (b)(3): Local Safety**

Subdivision (b)(3) recognizes that vehicle miles traveled may not be the only impacts associated with transportation. While vehicle miles traveled may reflect regional concerns, transportation impacts may also be felt on a local level. The convenience of drivers and the layout of local roadway systems are issues that can, and likely will continue to be, addressed in local planning processes. Safety impacts, as noted above, are local impacts that are appropriate in a CEQA analysis.

Specifically, subdivision (b)(3) clarifies that lead agencies should consider whether a project may cause substantially unsafe conditions for various roadway users. The potential safety concern must be one that affects many people, not just an individual. Further, the potential safety concern must relate to actual project conditions, and not stem solely from subjective fears of an individual. Subdivision (b)(3) includes a non-exclusive list of potential factors that might affect the safety of different roadway users.

**Subdivision (b)(4): Methodology**

Subdivision (b)(4) provides guidance on methodology. First, it clarifies that analysis of a project’s vehicle miles traveled is subject to the rule of reason. In other words, a lead agency would not be expected to trace every possible trip associated with a project down to the last mile. Conversely, to the extent that available models and tools allow, a lead agency would be expected to consider vehicle miles traveled that extend beyond the lead agency’s political boundaries. (See, e.g., State CEQA Guidelines § 15151 (“An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible”).) This clarification is needed because under current practice, some lead agencies do not consider the transportation impacts of their own projects that may be felt within adjacent jurisdictions.

Subdivision (b)(4) also recognizes the role for both models and professional judgment in estimating vehicle miles traveled. Many publicly available models are available that can estimate the amount of vehicle miles traveled associated with a project. Models, however, are only tools. A model relies on certain assumptions and its use may, or may not, be appropriate given a particular project and its context. For similar reasons, model outputs may need to be revised. Thus, subdivision (b)(4) expressly recognizes the role of professional judgment in using models. Notably, this is consistent with general CEQA rules in determining significance. (See, e.g., State CEQA Guidelines § 15064(b) (determining significance “calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data”).) To promote transparency, subdivision (b)(4) requires that any adjustments to model inputs or outputs be documented and explained. Further, this documentation should be made plain in the environmental document itself.
Subdivision (c): Mitigation and Alternatives

Subdivision (c) restates the general rule that when a lead agency identifies a significant impact, it must consider mitigation measures that would reduce that impact. The selection of particular mitigation measures, however, is always left to the discretion of the lead agency. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel. Therefore, OPR proposes to identify several potential mitigation measures and alternatives in existing Appendix F (regarding energy impacts analysis), and include a cross-reference to Appendix F in subdivision (c). Subdivision (c) also makes explicit that this section does not limit any public agency’s ability to condition a project pursuant to other laws. For example, while automobile delay will not be treated as a significant impact under CEQA, cities and counties may still require projects to achieve levels of service designated in general plans or zoning codes. (Pub. Resources Code § 21099(b)(4) (“This subdivision [requiring a new transportation metric under CEQA] does not preclude the application of local general plan policies, zoning codes, conditions of approval, thresholds, or any other planning requirements pursuant to the police power or any other authority”).) Similarly, with regard to projects that have already undergone environmental review, subdivision (c) clarifies that nothing in these proposed rules would prevent a lead agency from enforcing previously adopted mitigation measures. In fact, within the bounds of other laws, including adopted general plans, lead agencies have discretion to apply or modify previously adopted mitigation measures. (Napa Citizens for Honest Government v. Napa County Bd. of Sup. (2001) 91 Cal. App. 4th 342, 358 (because “mistakes can be made and must be rectified, and ... the vision of a region’s citizens or its governing body may evolve over time... there are times when mitigation measures, once adopted, can be deleted”).) Notably, deletion of measures imposed solely to address automobile delay should not require any additional environmental review because section 21099 of the Public Resources Code states that automobile delay is not a significant impact under CEQA.

Subdivision (d): Applicability

OPR recognizes that the procedures proposed in this section may not be familiar to all public agencies. OPR also recognizes that this section proposes a new way to evaluate transportation impacts. Therefore, to allow lead agencies time to familiarize themselves with these new procedures, OPR proposes a phased approach to implementation. Doing so will also allow OPR to continue studying the application of vehicle miles traveled in the environmental review process, and to propose further changes to this section if necessary.

Subdivision (d) explains when these new rules will apply to project reviews. The first sentence restates the general rule that changes to the CEQA Guidelines apply prospectively to new projects that have not already commenced environmental review. (See State CEQA Guidelines § 15007.)

The second sentence provides that the new procedures will apply immediately upon the effective date of these Guidelines to projects located within one-half mile of major transit stops and high quality transit corridors. Those transit-served areas have been the focus of planning under SB 375 and jurisdictions containing such areas may be more likely to be familiar with tools that estimate vehicle miles traveled.
The third sentence allows jurisdictions to opt-in to these new procedures, regardless of location, provided that they update their own CEQA procedures to reflect the rules in this section. (See State CEQA Guidelines § 15022.) This is intended to provide certainty to project applicants and the public regarding which rules will govern project applications. Notably, a lead agency’s adoption of updates to its own CEQA procedures will not normally be considered a project that requires its own environmental review. (See California Building Industry Assn. v. Bay Area Air Quality Management Dist. (2014) 218 Cal. App. 4th 1171, 1183-1192 (certiorari granted on other grounds).)

Finally, the last sentence states that after January 1, 2016, the rules in this section will apply statewide.

**Explanation of Amendments to Appendix F: Energy Impacts**

OPR proposes to provide suggestions of potential mitigation measures and alternatives that might reduce a project’s vehicle miles traveled in Appendix F of the State CEQA Guidelines. Appendix F provides detailed guidance on conducting an analysis of a project’s energy impacts. Inclusion of the list of suggested measures in Appendix F is proposed for at least two reasons. First, vehicle miles traveled may be a relevant consideration in the analysis and mitigation of a project’s energy impacts. Second, the list of potential mitigation measures is lengthy and is more appropriate for an appendix than the body of the Guidelines.

Notably, the suggested mitigation measures and alternatives were largely drawn from the California Air Pollution Control Officers Association’s guide on Quantifying Greenhouse Gas Mitigation Measures. That guide relied on peer-reviewed research on the effects of various mitigation measures, and provides substantial evidence that the identified measures are likely to lead to quantifiable reductions in vehicle miles traveled.

**Explanation of Amendments to Appendix G: Transportation**

OPR proposes several changes to the questions related to transportation in Appendix G to conform to the proposed new Section 15064.3. First, OPR proposes to revise the question related to “measures of effectiveness” so that the focus is more on the circulation element and other plans governing transportation. Second, OPR proposes to revise the question that currently refers to “level of service” to focus instead on a project’s vehicle miles traveled. Third, OPR proposes to recast the question related to design features so that it focuses instead on whether a roadway project would tend to induce additional travel. Fourth, OPR proposes to revise the question related to safety to address the factors described in subdivision (b)(3) of the proposed new Section 15064.3.
Proposed New Section 15064.3. Determining the Significance of Transportation Impacts; Alternatives and Mitigation Measures

(a) Purpose.

When analyzing a project’s potential environmental impacts related to transportation, primary considerations include the amount and distance of automobile travel associated with the project. Other relevant considerations include the effects of the project on transit and non-motorized travel and the safety of all travelers. Indirect effects of project-related transportation, such as impacts to air quality and noise, may also be relevant, but may be analyzed together with stationary sources in other portions of the environmental document. A project’s effect on automobile delay does not constitute a significant environmental impact.

(b) Criteria for Analyzing Transportation Impacts.

Section 15064 contains general rules governing the analysis, and the determination of significance, of environmental effects. Specific considerations involving transportation impacts are described in this section. For the purposes of this section, “vehicle miles traveled” refers to distance of automobile travel associated with a project.

(1) Vehicle Miles Traveled and Land Use Projects. Generally, transportation impacts of a project can be best measured using vehicle miles traveled. A development project that is not exempt and that results in vehicle miles traveled greater than regional average for the land use type (e.g. residential, employment, commercial) may indicate a significant impact. For the purposes of this subdivision, regional average should be measured per capita, per employee, per trip, per person-trip or other appropriate measure. Also for the purposes of this subdivision, region refers to the metropolitan planning organization or regional transportation planning agency within which the project is located. Development projects that locate within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor generally may be considered to have a less than significant transportation impact. Similarly, development projects, that result in net decreases in vehicle miles traveled, compared to existing conditions, may be considered to have a less than significant transportation impact. Land use plans that are either consistent with a sustainable communities strategy, or that achieve at least an equivalent reduction in vehicle miles traveled as projected to result from implementation of a sustainable communities strategy, generally may be considered to have a less than significant impact.
(2) Induced Vehicle Travel and Transportation Projects. To the extent that a transportation project increases physical roadway capacity for automobiles in a congested area, or adds a new roadway to the network, the transportation analysis should analyze whether the project will induce additional automobile travel compared to existing conditions. The addition of general purpose highway or arterial lanes may indicate a significant impact except on rural roadways where the primary purpose is to improve safety and where speeds are not significantly altered. Transportation projects that do not add physical roadway capacity for automobiles, but instead are for the primary purpose of improving safety or operations, undertaking maintenance or rehabilitation, providing rail grade separations, or improving transit operations, generally would not result in a significant transportation impact. Also, new managed lanes (i.e. tolling, high-occupancy lanes, lanes for transit or freight vehicles only, etc.), or short auxiliary lanes, that are consistent with the transportation projects in a Regional Transportation Plan and Sustainable Communities Strategy, and for which induced travel was already adequately analyzed, generally would not result in a significant transportation impact. Transportation projects (including lane priority for transit, bicycle and pedestrian projects) that lead to net decreases in vehicle miles traveled, compared to existing conditions, may also be considered to have a less than significant transportation impact.

(3) Local Safety. In addition to a project’s effect on vehicle miles traveled, a lead agency may also consider localized effects of project-related transportation on safety. Examples of objective factors that may be relevant may include:

(A) Increase exposure of bicyclists and pedestrians in vehicle conflict areas (i.e., remove pedestrian and bicycle facilities, increase roadway crossing times or distances, etc.).

(B) Contribute to queuing on freeway off-ramps where queues extend onto the mainline.

(C) Contribute to speed differentials of greater than 15 miles per hour between adjacent travel lanes.

(D) Increase motor vehicle speeds.

(E) Increase distance between pedestrian or bicycle crossings.

(4) Methodology. The lead agency’s evaluation of the vehicle miles traveled associated with a project is subject to a rule of reason; however, a lead agency generally should not confine its evaluation to its own political boundary. A lead agency may use models to estimate a project’s vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project.

(c) Alternatives and Mitigation.

Examples of mitigation measures and alternatives that may reduce vehicle miles travelled are included in Appendix F. Neither this section nor Appendix F limits the exercise of any public agency’s discretion provided by other laws, including, but not limited to, the authority of cities and counties to condition project approvals pursuant to general plans and zoning codes. Previously adopted
measures to mitigate congestion impacts may continue to be enforced, or modified, at the discretion of the lead agency.

(d) Applicability.

The provisions of this section shall apply prospectively as described in section 15007. Upon filing of this section with the Secretary of State, this section shall apply to the analysis of projects located within one-half mile of major transit stops or high quality transit corridors. Outside of those areas, a lead agency may elect to be governed by the provisions of this section provided that it updates its own procedures pursuant to section 15022 to conform to the provisions of this section. After January 1, 2016, the provisions of this section shall apply statewide.

Appendix F

Energy Conservation

I. Introduction

The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

(1) decreasing overall per capita energy consumption,

(2) decreasing reliance on fossil fuels such as coal, natural gas and oil, and

(3) increasing reliance on renewable energy sources.

In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy (see Public Resources Code section 21100(b)(3)). Energy conservation implies that a project's cost effectiveness be reviewed not only in dollars, but also in terms of energy requirements. For many projects, cost effectiveness may be determined more by energy efficiency than by initial dollar costs. A lead agency may consider the extent to which an energy source serving the project has already undergone environmental review that adequately analyzed and mitigated the effects of energy production.

II. EIR Contents

Potentially significant energy implications of a project shall be considered in an EIR to the extent relevant and applicable to the project. The following list of energy impact possibilities and potential conservation measures is designed to assist in the preparation of an EIR. In many instances specific items may not apply or additional items may be needed. Where items listed below are applicable or relevant to the project, they should be considered in the EIR.

A. Project Description may include the following items:

1. Energy consuming equipment and processes which will be used during construction, operation and/or removal of the project. If appropriate, this discussion should consider the energy intensiveness of materials and equipment required for the project.

2. Total energy requirements of the project by fuel type and end use.
3. Energy conservation equipment and design features.

4. Identification of energy supplies that would serve the project.

5. Total estimated daily vehicle trips to be generated by the project and the additional energy consumed per trip by mode.

B. Environmental Setting may include existing energy supplies and energy use patterns in the region and locality.

C. Environmental Impacts may include:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials maybe discussed.

2. The effects of the project on local and regional energy supplies and on, requirements for additional capacity.

3. The effects of the project on peak and base period demands for electricity and other forms of energy.

4. The degree to which the project complies with existing energy standards.

5. The effects of the project on energy resources.

6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

D. Mitigation Measures may include:

1. Potential measures to reduce wasteful, inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal. The discussion should explain why certain measures were incorporated in the project and why other measures were dismissed.

2. The potential of siting, orientation, and design to minimize energy consumption, including transportation energy, increase water conservation and reduce solid-waste.

3. The potential for reducing peak energy demand.

4. Alternate fuels (particularly renewable ones) or energy systems.

5. Energy conservation which could result from recycling efforts.
6. Potential measures to reduce vehicle miles traveled include, but are not limited to:
   
a. Improving or increasing access to transit.

b. Increasing access to common goods and services, such as groceries, schools, and daycare.

c. Incorporating affordable housing into the project.

d. Improving the jobs/housing fit of a community.

e. Incorporating neighborhood electric vehicle network.

f. Orienting the project toward transit, bicycle and pedestrian facilities.

g. Improving pedestrian or bicycle networks, or transit service.

h. Traffic calming.

i. Providing bicycle parking.

j. Limiting parking supply.

k. Unbundling parking costs.

l. Parking or roadway pricing or cash-out programs.

m. Implementing a commute reduction program.

n. Providing car-sharing, bike sharing, and ride-sharing programs.

o. Providing transit passes.

E. Alternatives should be compared in terms of overall energy consumption and in terms of reducing wasteful, inefficient and unnecessary consumption of energy. **Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:**

1. Locating the project in an area of the region that already exhibits below average vehicle miles traveled.

2. Locating the project near transit.

3. Increasing project density.

4. Increasing the mix of uses within the project, or within the project’s surroundings.

5. Increasing connectivity and/or intersection density on the project site.
6. Deploying management (e.g. pricing, vehicle occupancy requirements) on roadways or roadway lanes.

F. Unavoidable Adverse Effects may include wasteful, inefficient and unnecessary consumption of energy during the project construction, operation, maintenance and/or removal that cannot be feasibly mitigated.

G. Irreversible Commitment of Resources may include a discussion of how the project preempts future energy development or future energy conservation.

H. Short-Term Gains versus Long-Term Impacts can be compared by calculating the project's energy costs over the project's lifetime.

I. Growth Inducing Effects may include the estimated energy consumption of growth induced by the project.

Text of Proposed Amendments to Appendix G

The following is an excerpt of Section XVI of existing Appendix G, as proposed to be amended to conform to proposed Section 15064.3:

[...]

XVI. TRANSPORTATION/TRAFFIC -- Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the addressing the safety or performance of the circulation system, including transit, roadways, bicycle lanes and pedestrian paths? taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

b) Cause vehicle miles traveled (per capita, per service population, or other appropriate measure) that exceeds the regional average for that land use? Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

c) Result in substantially unsafe conditions for pedestrians, bicyclists, transit users, motorists or other users of public rights of way by, among other things, increasing speeds, increasing exposure of bicyclists and pedestrians in vehicle conflict areas, etc.? a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

d) Substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow lanes) or by adding new roadways to the network? increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

e) Result in inadequate emergency access?

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

[...]
Providing Input
This is a preliminary discussion draft, which we expect to change for the better through public input. We hope that you will share your thoughts and expertise in this effort.

When and Where to Submit Comments
Input may be submitted electronically to CEQA.Guidelines@ceres.ca.gov. While electronic submission is preferred, suggestions may also be mailed or hand delivered to:

Christopher Calfee, Senior Counsel
Governor’s Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

Please submit all suggestions before October 10, 2014 at 5:00 p.m.

Tips for Providing Effective Input
OPR would like to encourage robust engagement in this update process. We expect that participants will bring a variety of perspectives. While opposing views may be strongly held, discourse can and should proceed in a civil and professional manner. To maximize the value of your input, please consider the following:

• In your comment(s), please clearly identify the specific issues on which you are commenting. If you are commenting on a particular word, phrase, or sentence, please provide the page number and paragraph citation.
• Explain why you agree or disagree with OPR’s proposed changes. Where you disagree with a particular portion of the proposal, please suggest alternative language.
• Describe any assumptions and support assertions with legal authority and factual information, including any technical information and/or data. Where possible, provide specific examples to illustrate your concerns.
• When possible, consider trade-offs and potentially opposing views.
• Focus comments on the issues that are covered within the scope of the proposed changes. Avoid addressing rules or policies other than those contained in this proposal.
• Consider quality over quantity. One well-supported comment may be more influential than one hundred form letters.
• Please submit any comments within the timeframe provided.
Appendices

Appendix A: Frequently Asked Questions
Appendix B: Vehicle Miles Traveled, Air Quality and Energy
Appendix C: Technical Considerations in Assessing Vehicle Miles Traveled
Appendix D: Sample Trip-Based VMT Calculation
Appendix E: Estimating VMT From Roadway Capacity Increasing Projects
Appendix F: Available Models for Estimating Vehicle Miles Traveled
Appendix A

Frequently Asked Questions

1. **What is “level of service” and how is it used in environmental review?**

   Many jurisdictions use “level of service” standards to measure potential transportation impacts of development projects and long range plans. Commonly known as LOS, level of service measures vehicle delay at intersections and on roadways and is represented as a letter grade A through F. LOS A represents free flowing traffic, while LOS F represents congested conditions. LOS standards are often found in local general plans and congestion management plans. LOS is also often used in traffic impact studies prepared under the California Environmental Quality Act (CEQA). Exceeding LOS standards can require changes in proposed projects, installation of additional infrastructure, or, in some cases, financial penalties.

2. **What is wrong with treating congestion as an environmental impact under CEQA?**

   Stakeholders have reported several problems with level of service, and congestion generally, as a measure of environmental impact under CEQA. First, as a measure of delay, congestion measures more of social, rather than an environmental impact. Second, the typical way to mitigate congestion impacts is to build larger roadways, which imposes long-term maintenance costs on tax-payers, pushes out other modes of travel, and may ultimately encourage even more congestion. Third, addressing congestion requires public agencies to balance many factors, including fiscal, health, environmental and other quality of life concerns. Such balancing is more appropriate in the planning context where agency decisions typically receive deference.

3. **How does SB 743 affect the use of level of service to measure transportation impacts?**

   SB 743 requires the Governor’s Office of Planning and Research (OPR) to amend the CEQA Guidelines to provide an alternative to level of service for evaluating transportation impacts. The alternative approach must “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” *(New Public Resources Code Section 21099(b)(1).* According to the statute, potential alternative measurements of transportation impacts may include “vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated.” *(Ibid.)* OPR must develop an alternative approach for areas near transit, but also has discretion to develop such alternative criteria beyond those areas, if appropriate. *(Iid. at subd. (c).*
Transportation impacts related to air quality, noise and safety must still be analyzed under CEQA where appropriate. (Id. at subd. (b)(3).)

4. **Will the new CEQA Guidelines eliminate the use of level of service in all cases?**

   No. Automobile delay will no longer be considered a significant environmental impact under CEQA in areas specified in the Guidelines. As currently proposed, those areas would initially include areas near transit, as well as those jurisdictions that wish to opt-in to this new approach. After a period of time, the new Guidelines would apply throughout the state. Level of service may still be used, however, for planning purposes outside of CEQA (see below).

5. **Some communities still use level of service to plan their transportation networks. Will the new guidelines prevent my city/county from using it for that purpose?**

   No. The Guidelines only address impacts analysis under CEQA. Many jurisdictions have level of service standards in their general plans, zoning codes and fee programs. These proposed Guidelines would not affect those uses of level of service. Maintaining level of service in planning allows a jurisdiction to balance automobile delay with other interests, e.g. mode share objectives, human health, fiscal health, etc.

6. **Doesn’t level of service help indicate whether the project will cause safety concerns? How will the new Guidelines address local safety?**

   Safety is an issue that both the statute and these proposed Guidelines identify as a potential area of study under CEQA. Level of service does not itself measure safety. For example, higher level of service often indicates higher vehicle speeds, which put all road users at greater risk in the event of a collision. On the other hand, it may indicate areas where large speed differentials might occur, for example an off ramp backing up onto a highway mainline. Where analysis is needed to determine the significance of potential safety impacts, that analysis will still be required under these proposed Guidelines.

7. **Traffic causes air quality and noise problems. How will those issues be addressed in the new Guidelines?**

   SB 743 and these proposed Guidelines explicitly specify that potential impacts from transportation other than delay, for example air quality and noise, continue to be analyzed under CEQA. The methods for addressing those factors remain unchanged.
8. **How will the new Guidelines affect fee programs in my community?**

SB 743 and these proposed Guidelines both recognize that jurisdictions maintain their ability to retain and enact fee programs, including those based on level of service. The proposed Guidelines explicitly state that they do not limit the discretion of public agencies in implementing other laws, including city and county general plans, zoning codes and other planning laws.

9. **Why not limit the change to just transit priority areas?**

OPR looked broadly, but did not find a geographic area of the state or project type for which use of level of service would do a better job of protecting the environment or human health, or achieving the interests specified in the statute (promoting reduction of greenhouse gas emissions, development of multimodal transportation networks, and a diversity of land uses) than vehicle miles traveled. However, as noted above, the proposed guideline would phase-in application of the new methodology, and would start in areas near transit.

10. **My community does not have frequent transit. What options are available for reducing VMT?**

Extensive research has been conducted on different ways that local governments can reduce vehicle miles traveled. Some useful sources of information include:

- California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures," (August 2010)
- Salon, Deborah, “Quantifying the effect of local government actions on VMT,” Prepared for the California Air Resources Board and the California Environmental Protection Agency (September 2013)

11. **Didn’t SB 743 make other changes to CEQA related to infill projects?**

Yes. SB 743 created a new exemption from CEQA for certain projects that are consistent with a Specific Plan. (See New Public Resources Code Section 21155.4.) SB 743 also provides that certain types of infill projects are not required to analyze aesthetic impacts or impacts related to parking. (New Public Resources Code Section 21099, subd. (d).) Those changes went into effect January 2014. Additional information regarding those provisions is available [here](#).
12. *When would the new rules go into effect?*

OPR released a *preliminary discussion draft* on August 6, 2014. That draft will likely undergo significant revisions in response to public input. After a full public vetting, OPR will then submit a draft to the Natural Resources Agency, which will then conduct a formal rulemaking process. That rulemaking process will itself entail additional public review, and may lead to further revisions. New rules would not go into effect until after the Natural Resources Agency adopts the new Guidelines, and the package undergoes review by the Office of Administrative Law. Notably, the new Guidelines would apply prospectively only, and would not affect projects that have already commenced environmental review.
Appendix B

Vehicle Miles Traveled, Air Quality and Energy
Vehicle travel leads to a number of direct and indirect impacts to the environment and human health. Among other effects, loading additional vehicle miles traveled, or VMT, onto the roadway network leads to increased emissions of air pollutants, including greenhouse gases, as well as increased consumption of energy. Some direct effects of increased VMT are described below.

Air Pollution
In California, transportation is associated with more greenhouse gas emissions than any other sector. Increased tailpipe emissions are a direct effect of increased VMT.

As VMT increases, so do carbon dioxide (CO2), (Chester and Horvath, 2009) methane (CH4), and nitrogen dioxide (N2O) emissions. (U.S. Environmental Protection Agency, Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle (February 2005).) The U.S. Environmental Protection Agency estimates that model 2005 passenger vehicles in the US emit an average of 0.0079 grams of N2O and 0.0147 grams of NH4 per mile. (U.S. Environmental Protection Agency, Climate Leaders Greenhouse Gas Inventory Protocol Core Module Guidance: Direct Emissions from Mobile Combustion Sources (May 2008).) Other air pollutants also directly result from increased VMT. Per mile traveled, California’s light vehicles emit:

- 2.784 grams of CO
- 0.272 grams of NOX
- 0.237 grams of ROC (reactive organic gases, similar to volatile organic compounds)

(California Air Resources Board, Methods to Find the Cost-Effectiveness of Funding Air Quality Projects (May 2013).) While technological improvements are reducing vehicle emissions, those improvements are being eroded by a dramatic increase in vehicle miles traveled. (U.S. Environmental Protection Agency, Our Built and Natural Environments 2nd Ed. (June 2013).)

Energy
In addition to generating air pollution, vehicle travel can consumes substantial amounts of energy. Over 40 percent of California’s energy consumption occurs in the transportation sector. (See California Energy Commission, “Energy Aware Planning Guide” (February 2011).) Passenger vehicles account for 74 percent of emissions from the transportation sector. (Ibid.)
Appendix C

Technical Considerations in Assessing Vehicle Miles Traveled
Many practitioners are familiar with accounting for vehicle miles traveled, commonly referred to as VMT, in connection with long range planning, or as part of the analysis of a project’s greenhouse gas emissions or energy impacts. This Appendix provides background information on how vehicle miles traveled may be assessed as part of a transportation impacts analysis under the California Environmental Quality Act.

What VMT to Count
The simplest and most straightforward counting method is to simply estimate VMT from trips generated or attracted by a project (i.e., from trips made by residents, employees, students, etc.). This method is known as trip-based VMT. Agencies with access to more sophisticated modeling capabilities have can examine VMT in a more comprehensive manner, examining projected travel behavior, including effects the project has on other trip segments. For projects that might replace longer trips with shorter ones, a lead agency might analyze total area-wide VMT to see whether it would decrease were the project to be built. These methods are described below. [Additional background information regarding travel demand models is available in the California Transportation Commission’s “2010 Regional Transportation Plan Guidelines,” beginning at page 35.]

Trip-based VMT
Trip-based VMT includes all VMT from trips that begin or end at the project. It answers the question, “How much driving would be needed to get people to and from the project?” Standard 4-step travel demand models can measure trip-based VMT. For residential development, trip-based VMT is called home-based VMT.

Tour-based VMT
A tour is defined as a series of trips beginning and ending at the residence. Tour-based VMT includes all VMT from the entire tour that includes a stop at the project. As such, it captures the influence the project has on broader travel choices; for example, a project which is accessible by automobile can influence a traveler to choose travel by automobile for their day’s needs, and this choice necessitates automobile use along the rest of their tour, which in turn can influence destination choices. Tour-based models, which are typically activity-based models, model entire tours rather than trips. Tour-based VMT for a residential development, for example, would count all the travel undertaken by its residents; this is called household VMT.
**A shortcut: mapping trip- and tour-based VMT**

Trip- or tour-based travel can be calculated on a project-by-project basis, but it is also possible to use a travel demand model to map the VMT of existing development. Because the travel behavior of new development tends to mimic that of existing development, such maps could be used to estimate VMT from new development in those locations.

**Area-wide VMT**

An area-wide analysis compares total VMT with and without the project. It answers the question, “What is the net effect of the project on area VMT?” The area for analysis should be chosen to capture the full VMT effects of the project; it should avoid truncating the analysis. In some cases, a strategically located project can reduce the total amount of VMT by substituting shorter trips for longer ones. For example, a grocery store in an area that previously had none could allow shorter shopping trips to substitute for longer ones. The area-wide VMT method should also be used when calculating the VMT impacts of transportation infrastructure projects.

**Choosing a Denominator**

A transportation analysis for a land use project should measure transportation efficiency, rather than the total amount of VMT generated. Therefore, a VMT metric used for trip- or tour-based assessments should include a denominator. Typical denominators include per capita for residential, per employee for office, and per trip for other uses. Per person-trip is another option that could be used for all land use types. Note, examination of area-wide VMT typically does not include a denominator, because the objective is to examine the magnitude of increase or decrease in total VMT.

**Measuring VMT for Land Use Projects**

The proposed Guidelines suggest that projects generating or attracting greater than regional average VMT may be an indication of a significant transportation impact. Similarly, the proposed Guidelines suggest that a net reduction in VMT may be an indication of a less than significant impact. The paragraphs below provide additional detail on how an agency might make those determinations.

**Calculating Regional Average VMT**

When comparing project VMT to regional average VMT, the same denominator and VMT counting method (trip-based or tour-based) should be used. For example, a trip-based VMT analysis for a residential project, which estimates home-based VMT per capita, should be compared with the regional total home based VMT divided by the total regional population. Totals should be taken over the entire region, i.e. the full geography of the MPO or RTPA.

**Demonstrating a Reduction in Area-Wide VMT**

The area-wide method of counting VMT may be used to determine whether total VMT increases or decreases with the project. The area chosen for analysis should cover the full area over which the project affects travel behavior.
Transportation projects should assess VMT using the area-wide method. Transit and active transportation projects can generally be presumed to reduce total VMT, unless substantial evidence demonstrates otherwise, because their largest effect on VMT is typically mode shift away from automobile use. Projects that increase physical roadway capacity typically induce additional vehicle travel, generally leading to increases in total VMT. However, a roadway project that improves connectivity can, in some cases, shorten trip lengths sufficiently to outweigh the induced travel effect, leading to an overall reduction in VMT.
Appendix D

Sample Trip-Based VMT Calculation

This sample describes the steps in estimating the vehicle miles traveled associated with a project. In this example, a 100 unit residential subdivision is proposed in a low-density large lot development pattern (i.e., one unit per 5 acres). This type of pattern has no mix of uses and relatively long distances to jobs, schools, and services. As such, residents typically have to rely on private vehicles for any trip and each trip is many miles. With no mix of uses, no ‘internal’ vehicle trips are projected to occur. To estimate daily VMT for the project, the following steps are used.

1. Multiply the number of residential units (100) by an average vehicle daily trip rate. This rate can be obtained by conducting local surveys of at least three similar sites, but in absence of this data, the analyst can rely on the ITE *Trip Generation Manual*. The manual contains an average daily vehicle trip rate for single family detached homes of 9.52. It should be noted that this rate only captures trip to/from the home (i.e., home-based work (HBW) and home-based other (HBO)) and not all trips made by the residents of the home.

   100 single-family detached residential dwelling units x 9.52 vehicle trips per unit =

   952 daily vehicle trips

2. Multiply the number of home-based trips by trip lengths. If trip lengths are available by trip purpose, then the trip generation estimate should be divided into purposes based on household survey data or travel forecasting model estimates. Potential sources for trip lengths by purpose are available through the California Household Travel Survey, the National Household Travel Survey, and MPO model estimates. In this simple estimate, only one trip length is assumed to be available and it represents the average weekday trip length for California based on the National Household Travel Survey.

   952 daily vehicle trips x 10 miles per trip = 9,520 daily VMT

   9,520 daily VMT/100 residential units =

   95.2 daily VMT per residential unit

3. Divide by the expected average project household occupancy. A specific estimate based on project characteristics (i.e. unit sizes and number of bedrooms) and location is preferable. Here we use the average for Sacramento County, 2.69 persons per household:

   95.2 daily VMT generated per residential unit / 2.69 persons per unit =

   35.4 daily VMT per capita
Appendix E

Estimating VMT From Roadway Capacity Increasing Projects

Introduction
CEQA requires analysis of a project’s potential growth-inducing impacts. (Public Resources Code § 21100(b)(5); State CEQA Guidelines, § 15126.2(d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer and other infrastructure. As part of its effort to reform the analysis of transportation impacts in the CEQA Guidelines, the Office of Planning and Research is proposing criteria for determining the significance of growth-inducing impacts related to transportation projects. This document provides additional background and information related to induced travel.

Because a roadway project can induce substantial vehicle miles traveled, or VMT, incorporating estimates of induced travel is critical to calculating both transportation and other impacts of a roadway expansion project. Induced travel also has the potential to reduce congestion relief benefits, and so any weighing of cost and benefit of a highway project will be inaccurate if it is not fully accounted for.

How Does Roadway Capacity Relate to Throughput?
The capacity of a road is the maximum number of vehicles per hour that the road can service. Throughput, meanwhile, is the number vehicles per hour that the road is servicing at any given time. In general, adding lanes to roads increases capacity. The magnitude of the increase depends on the type of lane (e.g. general purpose lanes, managed lanes, auxiliary lanes).

When a roadway is serving vehicles at capacity, adding more vehicles will disrupt traffic flow causing speed reductions (i.e., congestion) and reduce throughput. Conversely, reducing the number of vehicles entering a congested roadway will reduce congestion and increase throughput. So, travel demand management programs or traffic systems management programs that reduce vehicle miles traveled loaded onto a roadway can improve throughput without increasing capacity.

What is Induced VMT?
Additional roadway capacity may lead to additional VMT, a phenomenon known as induced travel, or induced VMT. It occurs when congestion is already present and a capacity expansion will lead to an appreciable reduction in travel time. With lower travel times, the modified facility becomes more attractive to travelers, resulting in the following trip-making changes, which have implications for total VMT:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are further away, increasing trip length and VMT.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases VMT.
● **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease VMT depending on whether it shortens or lengthens trips.

● **Newly generated trips.** Increasing travel speeds can add trips, which increases VMT. For example, an individual who previously telecommuted or purchased goods on the internet might choose to travel by automobile as a result of increased speeds.

● **Land Use Changes.** Faster travel times along a corridor lead to land development further along that corridor; that development generates and attracts longer trips, which increases VMT.

These effects operate over different time scales. For example, changes in mode choice might happen immediately or within a few years, while land use changes typically take a few years or longer.

**Has Induced VMT Been Studied?**

On the whole, evidence links highway capacity expansion to VMT increases. Numerous studies have estimated the magnitude of the induced travel phenomenon. Most of these studies express the amount of induced travel as an “elasticity,” which is a multiplier that describes the percent increase in VMT resulting from a given percent increase in lane miles of new roadway capacity. Many distinguish “short run elasticity” (increase in vehicle travel in the first few years) from “long run elasticity” (increase in vehicle travel beyond the first few years). Long run elasticity is typically larger than short run elasticity, because as time passes, more of the components of induced travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find long run elasticities between 0.6 and just over 1.0 ([California Air Resources Board DRAFT Policy Brief on Highway Capacity and Induced Travel](https://www.arb.ca.gov/tp/draft_policy_brief_induced_vmt.pdf), p. 2.)

**How Would an Agency Estimate Induced VMT for Proposed Projects?**

Transportation analysis undertaken for transportation infrastructure projects typically requires use of a travel demand model. Proper use of a travel demand model will yield a reasonable estimate of short run induced VMT, generally including the following components:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes towards automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT; note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary)

Estimating long run induced VMT requires consideration of changes in land use. At a minimum, VMT resulting from land use changes induced by the project should be acknowledged and discussed. The analysis should disclose any limitations related to VMT forecasting that may have not been sensitive to induced travel effects and how these effects could influence the analysis results. Quantitative analysis is also possible using integrated transport and land use models or by relying on expert panels employing techniques such as the Delphi method. Once developed, the estimates of land use changes can then be analyzed by the travel demand model to assess VMT effects.
Alternately, the travel demand model analysis can be performed without an estimate of land use changes, and then the results can be compared to empirical studies of induced travel found in the types of studies described above. If the modeled elasticity falls outside of that range, then the VMT estimate can be adjusted to fall within the range, or an explanation can be provided describing why the project would be expected to induce less VMT than the subjects of those studies. (For an example of an EIR that includes a number of these elements, see *Interstate 5 Bus/Carpool Lanes Project Final EIR*, pp. 2-52--2-56.)

**Example Outline for induced Travel Analysis**

The following is a sample outline for describing induced VMT in the analysis of a project which includes a roadway capacity increase:

- Description of potential sources of induced travel due to the project alternatives resulting from
  - Longer trips
  - Changes in mode choice
  - Route changes
  - Newly generated trips
  - Land Use Changes
- If an estimate of land use change resulting from project alternatives is available from an expert panel or a land use model, that estimate should be used in the travel demand model to estimate VMT. Alternately, include:
  - A calculation of the long run elasticity of induced VMT for each project alternative (change in VMT divided by change in lane miles)
  - A comparison of that elasticity to empirical studies OR an estimate of land use changes
  - A discussion of potential sources for error in the induced travel estimate made by the travel demand model
  - An estimate of induced VMT that provides a best estimate correction to the results from the travel demand model

**Variations in Induced VMT by Lane Type**

The amount of VMT induced by a roadway capacity expansion depends on the amount of capacity added. All else being equal, as capacity is added, more VMT would be induced. Different types of lanes induce different amounts of VMT because they have different capacities or different abilities to influence travel time. Travel demand models can reflect these distinctions, as the capacities of lane types are programmed into the model and they are sensitive to travel time.

General purpose lanes can be used by any vehicle, and tend to exhibit the greatest vehicle capacity. Managed lanes are designated for use by vehicles occupied by at least a certain number of passengers (HOV lanes), those vehicles plus ones that have paid a toll (HOT lanes), or only ones that have paid a toll (Toll lanes). They are typically managed to prevent congestion by placing a restriction on the vehicles that may use the lane. Typically the target throughput is somewhat below capacity, for the purpose of having the managed lane maintain a speed advantage over the general purpose lanes. Thus, effective capacity of a managed lane is typically reduced.
Auxiliary lanes are defined as lanes that are only one link in length (starting at an on ramp and terminating at the next off ramp). The purpose of an auxiliary lane is to provide additional roadway capacity to accommodate the weaving that takes place near ramps as vehicles maneuver to enter or exit the freeway. Auxiliary lanes add capacity to a roadway, but near ramps their capacity is reduced, because cars are weaving into and out of them require extra space. Portions of an auxiliary lane away from ramps behave like a general purpose lane. Auxiliary lanes of approximately 1 mile or less in length can generally be assumed to have a reduced capacity along their full length, but longer auxiliary lanes may function like general purpose lanes. (See, Sacramento Area Council of Governments, Sacramento Activity-Based Travel Simulation Model: Model Reference Report, at p. 3-3.)

Transit lanes, which are designated for transit vehicles only, and truck lanes, which are designated for freight vehicles only, do not directly provide capacity for private passenger vehicles. However, these lane types attract trucks or transit vehicles from general purpose lanes, freeing up capacity in those lanes, and as a result can induce private passenger vehicle travel.

**Mitigation and Alternatives**
Induced travel has the potential to reduce congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel. These effects may be considered potential impacts requiring consideration of mitigation or the development of alternatives. If the impact is determined to be significant, the lead agency must consider feasible measures to mitigate the impact, or consider project alternatives. In the context of increased travel induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include managing the new lane or improving the passenger throughput of existing lanes. For example, a planned general purpose lane could instead be built as an HOV or HOT lane, reducing induced VMT. Travel demand management off site can also reduce VMT.
Appendix F

Available Models for Estimating Vehicle Miles Traveled

Overview
Our ability to anticipate the transportation outcomes of land use development has increased greatly in recent years. Research undertaken by academics, consulting firms, and public agencies provide the basis for estimating future vehicle travel, and advances in computing power have allowed more sophisticated application of that research.

Models range in complexity and sensitivity to factors that can influence vehicle miles traveled, or VMT. Simpler tools make assumptions, but are easier to implement. More complex models consider more variables, but are not always necessary or feasible. Models generally fall into one of two categories:

Sketch models use statistical characterizations of land use projects and transportation networks to estimate project VMT. For example, a sketch model might characterize the transportation network using statistics like intersections per square mile and number of transit stops per day within a half mile, rather than actually containing a detailed representation of the network itself. They range in sophistication from simple spreadsheet tools, which often require a smaller number of inputs and are therefore easier to use but sensitive to fewer variables, to complex software packages. A number of sketch models can be downloaded free of charge.

Three sketch models commonly used in California include:

- Urban Emissions Model (URBEMIS) - California Air Resources Board
- California Emissions Estimator Model (CalEEMod) – California Air Pollution Control Officers’ Association
- EPA Mixed-Use Development Model (MXD) - U.S. EPA

Travel demand models represent links and nodes in the transportation network explicitly rather than statistically. As a result, they generally require more data, maintenance, and run time than sketch models. Because of their greater complexity, and because their use is typically required for various statutory functions (e.g. determining air quality conformity), travel demand models are maintained by all MPOs and RTPAs, and also by some cities and counties. For this reason, a regional travel demand model already exists in most locations and can be used to develop estimates of VMT. Because they represent the transportation network explicitly, travel demand models are required when analyzing the VMT impacts of transportation projects.

Travel demand models can supply inputs for sketch models, particularly trip lengths; a single travel demand model run can supply these inputs for sketch model runs throughout the region. Travel
demand models can also be used to develop maps depicting VMT generation across the model’s geography, providing a quick method for estimating VMT of a project in a certain location.

**Catalog of Models**

This section catalogs many of the models that generate estimates of VMT. Some were primarily designed to estimate project VMT, while others calculate VMT primarily in order to estimate GHG emissions and/or other outcomes. Please note, this inventory of possible models should not be construed as an endorsement of any particular model.

Name: VMT+

Developer: Fehr and Peers

Year: 2013

Accessibility: Free, only web browser and Internet access required

Description: This free website functions like a spreadsheet tool, estimating weekly VMT and GHG by the size and type of land uses developed. The calculation is based on trip generation. ITE data are provided as a default for “Average Western US City” and for four California metropolitan areas. All default data (including trip generation, average trip length, and internal trip rates) can be replaced with project specific information. This tool is useful for development projects or land use plans of various sizes.

URL: http://www.fehrandpeers.com/vmt

Name: RapidFire

Developer: Calthorpe Associates

Year: 2011

Accessibility: Paid, spreadsheet software (e.g. Microsoft Excel) required

Description: This spreadsheet tool can estimate VMT and GHG, among many other factors, and is appropriate for a neighborhood and larger scale development. RapidFire, as deployed during the Plan Bay Area project in the San Francisco Bay Area, applies a user-friendly web interface to allow the public to explore the VMT and GHG outcomes of their development preferences.

URL: http://www.calthorpe.com/scenario_modeling_tools


Name: Transportation Emissions Guidebook and Calculator
Developer: Center for Clean Air Policy

Year: 2007

Accessibility: Free, spreadsheet software (e.g. Microsoft Excel) required

Description: This spreadsheet tool uses a trip generation model to estimate neighborhood VMT and GHG, and then estimates the impact of 19 mitigation strategies. Required inputs include present day mode share, trip generation rates, and average trip length. This model is unique among those listed here in that it includes school siting as a potential VMT mitigation strategy.

URL: http://www.ccap.org/safe/guidebook/guide_complete.html

Documentation:

Name: Sketch7 VMT Spreadsheet Tool

Developer: UC Davis Institute of Transportation Studies

Year: 2012

Accessibility: Free, spreadsheet software (e.g. Microsoft Excel) required

Description: This Excel spreadsheet and online GIS application use elasticities for seven “D’s” (density, diversity, distance, design, destination, demographics, and development scale) to compare site or neighborhood plans, and estimate the VMT and GHG produced by each.


Documentation:
http://downloads.ice.ucdavis.edu/ultrans/statewidetools/Appendix_G_VMT_Spreadsheet_Tool.pdf

Name: COMMUTER

Developer: United States Environmental Protection Agency (U.S. EPA), Cambridge Systematics, Inc.

Year: 2011

Accessibility: Free, spreadsheet software (e.g. Microsoft Excel) required

Description: This spreadsheet tool estimates the impact on VMT and GHG of several common transportation demand management strategies, including pricing/subsidy, transit improvements, carpooling, and telecommute promotion. The model allows the user to provide baseline mode share, trip generation and length, and population as inputs, or alternately can provide defaults from MOBILE6.

URL: http://cfpub.epa.gov/crem/knowledge_base/crem_report.cfm?deid=74941
Name: Envision Tomorrow

Developer: Fregonese Associates, U.S. Office of Housing and Urban Development (HUD)

Year: 2014 (version 3.4)

Accessibility: Free, spreadsheet software (e.g. Microsoft Excel) required

Description: This suite of linked spreadsheets allows users to “paint” changes to land use and transportation at the neighborhood or site level and model the resulting impacts on travel behavior. Inputs include employment characteristics, intersection counts, transit coverage, and assumed average vehicle speeds. The spreadsheets use trip generation rates to estimate VMT and GHG. Envision Tomorrow is distributed under a Creative Commons license, is free to use, and is open source.

URL: http://www.envisiontomorrow.org/site-level-travel-model

Documentation:
http://www.envisiontomorrow.org/storage/user_manuals/20131029ENVISION%20TOMORROW%20PLU S_USER%20MANUAL_1st%20COMPLETE%20VERSION_updated_sm2.pdf

Name: Urban Emissions Model (URBEMIS)

Developer: California Air Resources Board (CARB)

Year: 2007

Accessibility: Free

The Urban Emissions Model (URBEMIS) was developed to model VMT and GHG from new development, and is appropriate for small and large site developments. The tool was developed with the support of California air districts, and is free to download and use. As it was designed with local data, URBEMIS is used across California, including in the San Joaquin Valley. It has faced and passed legal challenges. The model calculates impacts from many mitigation measures, including affordable housing, free transit passes, and transit availability, as well as decisions throughout the construction phase.

URL: http://www.urbemis.com


Name: California Emissions Estimator Model (CalEEMod)

Developer: California Air Pollution Control Officers Association (CAPCOA)

Year: 2013
Accessibility: Free

Description: This user-friendly tool is appropriate for any size site development, and estimates VMT and GHG based on the size and land use(s) of the project. The model integrates with the California Air Pollution Control Officers Association (CAPCOA) Quantification of GHG Mitigation Measures.

URL: http://www.caleemod.com

Documentation: http://www.aqmd.gov/caleemod/user's-guide

Name: Smart Growth INDEX 2.0

Developer: United States Environmental Protection Agency (U.S. EPA), Criterion Planners/Engineers

Year: 2002

Accessibility: Free

Description: This tool requires users to upload a map of the project’s surrounding neighborhood into a GIS system such as ESRI ArcMap. Inputs (shapefile format) include: land use, transportation, demographics, housing, and other community features. Once uploaded, users can configure and compare development scenarios, projecting 56 indicators that include VMT and GHG. Designed for stakeholder engagement, the tool can be set to rank the performance of multiple scenarios by community-defined metrics.

URL: http://www.epa.gov/smartgrowth/topics/sg_index.htm


Name: Low-Carb Land

Developer: Sonoma Technology, Inc., Washington State Department of Transportation

Year: 2011

Accessibility: Paid

Description: This sketch-planning tool is intended primarily for site development in suburban and rural areas because it uses simple and high-level inputs, and doesn’t account for the complexities of more centrally-located development. Users model a base case and one or more project scenarios. Aside from location, the other inputs are the “5 D’s” commonly discussed in VMT mitigation: density, diversity, destination, distance and design. The tool incorporates prevailing VMT rates and elasticities for the area.

URL: http://www.sonomatech.com/project.cfm?uprojectid=672

Name: CommunityViz
Developer: Placeways
Year: 2014 (version 4.4)
Accessibility: Paid, ESRI ArcGIS required

Description: CommunityViz is a model designed to facilitate an engaging experience between planners and the public. Optional inputs include demographic data, transportation network characteristics, land use, water use, and jobs. Outputs include VMT and GHG. The user-friendly, interactive interface was designed to invite community members step up during public meetings, enter their own preferences, and then model and display the results in real-time, using with 3-D visualizations, charts, and maps.

URL: http://placeways.com/communityviz/

Name: Transportation Impacts of Mobility Management Strategies (TRIMMS)
Developer: United States Environmental Protection Agency (U.S. EPA), Center for Urban Transportation Research, University of South Florida
Year: 2012
Accessibility: Free, spreadsheet software (e.g. Microsoft Excel) required

Description: Using constant elasticities of demand, TRIMMS predicts VMT and GHG changes brought about by the application of several mitigation strategies, including Smart Growth land use development, transit fare reduction, transit service enhancements, and parking pricing. TRIMMS also estimates GHG emissions.

URL: http://www.nctr.usf.edu/abstracts/abs77805.htm

Name: Emme
Developer: INRO (Canada)
Year: 2014 (version 4.1)
Accessibility: Paid

Description: Used in the United States and internationally, Emme is a desktop-based model that uses neighborhood-level household information to estimate the impacts of a variety of transportation policy and infrastructure decisions, including transit service, bicycle facilities, carpooling, and tolling. Emme is appropriate for neighborhood-level development and outputs VMT and GHG.
Name: I-PLACE3S
Developer: Parson Brinkerhoff, Freonese Calthorpe Associates
Year: 1996
Accessibility: Free, ESRI ArcGIS required
Description: I-PLACE3S was launched in 2002 as a web-based modeling tool commissioned by the California Energy Commission, and is appropriate for larger developments and plans. The model works by developing a comprehensive land use and transportation network for a base year, before estimating effects of the development on VMT and GHG, among other variables. I-PLACE3S has a user-friendly interface, and is currently being used in several cities across the United States.
URL: http://www.smartcommunities.ncat.org/articles/place3s.shtml

Name: Surface Transportation Efficiency Analysis System
Developer: Federal Highway Administration (FHWA), Cambridge Systematics, Inc.
Year: 1997
Accessibility: Free
Description: Though STEAM requires substantial base year data; it is well suited for exploring many VMT mitigation strategies in a sub-region or along a corridor. Inputs include baseline vehicle occupancy, trip length, and population as well as several elasticities. Outputs include VMT and GHG.
URL: https://www.fhwa.dot.gov/steam/products.htm

Name: Urban Footprint
Developer: Calthorpe Associates
Year: 2012
Description: Developed for the Vision California process, this web-based tool allows users to estimate VMT and GHG at a large site or neighborhood scale. Urban Footprint also outputs land consumption, fiscal impact (household and government), household resource use, and public health. Within California, Urban Footprint is currently being used by the Sacramento Area Council of Governments (SACOG), San
Diego Association of Governments (SANDAG) and the Southern California Association of Governments (SCAG).

URL: http://www.calthorpe.com/scenario_modeling_tools


Name: UrbanSim
Developer: Synthicity
Year: 2014 (ongoing open source improvements)
Accessibility: Free, ESRI ArcGIS required
Description: UrbanSim is an open-source transportation and land use scenario-planning tool, which can model VMT and GHG, among many other outcomes. The Metropolitan Transportation Commission (MTC) applied UrbanSim to forecast its Plan Bay Area outcomes. Modeling site and neighborhood development with UrbanSim is most feasible if the surrounding region already uses UrbanSim.

URL: http://www.urbansim.org/Main/UrbanSim
Documentation: https://github.com/synthicity/urbansim/wiki

Name: EPA Mixed-Use Development (MXD) Model
Developer: United States Environmental Protection Agency (U.S. EPA)
Year: 2007
Accessibility: Free, spreadsheet software and ESRI ArcGIS required
Description: The MXD Model is a spreadsheet tool designed to model VMT production from project sites and neighborhoods that apply Smart Growth principles. The model must integrate with a desktop GIS application, and for inputs, it requires household and employment characteristics, intersection density, and transit availability.

URL: http://www.epa.gov/smartgrowth/mxd_tripgeneration.html

Name: MXD+ / Plan+ / TDM+ Toolkit
Developer: Fehr and Peers
Year: 2013
Accessibility: Paid
Description: These proprietary tools build on the EPA MXD model, estimating VMT for site and neighborhood-scaled development. MXD+ adjusts trip generations rates downward for mixed use development. Plan+ introduces new land use mitigations (parking pricing, connection to transit, bicycle parking) to estimate further reductions. TDM+ models the effects of the CAPCOA Guideline mitigations.

URL: http://asap.fehrandpeers.com/tools/sustainable-development/plan

Name: CUTR_AVN
Developer: Federal Highway Administration (FHWA)
Year: 1999
Accessibility: Free
Description: The CUTR_AVN model is ideal for large office developments with 100 or more employees with innovative TDM programs. The model estimates the mode share and ridership effects of the TDM programs, which can be input into other models to estimate VMT and GHG. The model is based on a dataset including 7,000 employer TDM programs from three metropolitan areas in Arizona and California.

Information: http://www.fhwa.dot.gov/environment/air_quality/conformity/research/transportation_control_measures/emissions_analysis_techniques/descriptions_cutr_avr.cfm
Download: http://www3.cutr.usf.edu/tdm/registercutravr.htm
Documentation: http://www3.cutr.usf.edu/tdm/pdf/CUTRAVR.PDF

Name: National Energy Modeling System (NEMS): Transportation Sector Module (TSM)
Developer: United States Department of Energy (DOE) Energy Information Administration
Year: 2001
Accessibility: Free
Description: This model focuses exclusively on the impact of changes in the vehicle fleet on VMT and GHG. Input data includes the vehicle fleet (personal, transit, and freight), fuel prices, fuel economy, passenger miles, population, income, and changes in costs and income.

URL: http://www.eia.gov/bookshelf/models2002/tran.html
Documentation: http://www.eia.gov/FTPROOT/modeldoc/m0702001.pdf

Name: VMT Impact Tool
Developer: California Air Resources Board (CARB)

Year: 2014

Accessibility: Free, spreadsheet software (e.g. Microsoft Excel) required

Description: This spreadsheet tool calculates the effect of changes in seven factors on VMT: pricing, transit utilization, job access, activity mix, active mode share, road network connectivity, and mixing of uses. It does not calculate absolute VMT quantities, but can be used to estimate the change in VMT that would result from policy changes. The results can be exported to GIS to visualize spatial relationships.

URL (Tool and Documentation): http://www.arb.ca.gov/research/single-project.php?row_id=64861
Modified Pasadena Street Segment Analysis for Neighborhood Protection

Pasadena currently employs a Street Segment Analysis metric to identify the amount of new auto trips a development project will add to adjacent streets. The traffic growth on a street segment is calculated as follows: Percentage of Traffic Growth on Street Segment = Net New Project Trips / Existing Daily Traffic

While the current Street Segment Analysis methodology identifies changes to vehicle volumes on all streets, including residential streets, the increase in traffic volumes on a street in itself is not an environmental impact. Absent physical barriers the City cannot reduce traffic volumes on streets.

Staff is recommending that the Modified Street Segment Analysis for Neighborhood Protection outside of CEQA analysis because the measures identified to address traffic intrusion do not regulate traffic generation but rather provide measures to manage the effects of traffic in neighborhoods. The analysis would identify traffic management measures which fit with City Council adopted Neighborhood Traffic Management Program policies that are sensitive to not diverting traffic from one neighborhood street to another.

While proposed VMT and VT metrics are vehicular-based metrics to estimate project’s vehicular trips and trip lengths, the proposed modified street segment analysis is to protect the neighborhoods from traffic intrusion. To that end, the Department of Transportation recommends the following criteria for street segment analysis:

- Single family and multifamily residential projects are exempt
- The analysis would be limited to “Access” and “Neighborhood Connector” street types within a residential context (Street Types Map below)
- The vehicular trips estimates for street segment analysis would be based on the project’s DOT approved traffic-related trip distribution
- Project approval conditions would be imposed on developments based on a “Percentage net increase of project Average Daily Traffic (ADT) over Existing ADT” as follows:

<table>
<thead>
<tr>
<th>Existing ADT</th>
<th>Project-Related Vehicular Increase In ADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1500</td>
<td>150 or more</td>
</tr>
<tr>
<td>1,500 to 2,499</td>
<td>10 percent or more of final ADT</td>
</tr>
<tr>
<td>2,500 or 3,499</td>
<td>10 percent or more of final ADT</td>
</tr>
<tr>
<td>3,500 or more</td>
<td>8 percent or more of final ADT</td>
</tr>
</tbody>
</table>

Number of New Trips Requiring Neighborhood Traffic Calming Measures
Conditions of Approval - If project-related trips exceed caps set in the table above the applicant must develop and implement a targeted complete streets plan with input from the affected residents, council districts and DOT to encourage use of non-vehicular modes by the project's patrons, and implement measures to discourage use of residential streets to-and-from the project site. Below is a list of measures that the applicant must study and implement if feasible.

Project specific measures:

- Establish a more aggressive Average Vehicle Occupancy (AVO) target that exceeds city’s AVO average by enhancing the required TDM plan under City’s Trip Reduction Ordinance (TRO)
- Project turn-restrictions
- Revised project access and circulation

Complete Streets measures

- Curb Extensions
- Pedestrian and Bike Traffic signal upgrades/enhancements
- Turn-restrictions
- Neighborhood Gateways (raised medians)
- Traffic circles
- Speed humps
- Signal metering
The following is a comparison of the Existing Street Segment Analysis to the Modified Street Segment Analysis recommended by staff.

<table>
<thead>
<tr>
<th>Traffic Growth on Street Segment</th>
<th>Required Multi-Modal Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 2.4% Daily Traffic Growth</td>
<td>Staff review and conditions</td>
</tr>
<tr>
<td>2.5% - 4.9% Daily Traffic Growth</td>
<td>Initial study required if existing count is greater than 2,000 VPD</td>
</tr>
<tr>
<td></td>
<td>Soft measures required</td>
</tr>
<tr>
<td>5.0% - 7.4% Daily Traffic Growth</td>
<td>Initial study required</td>
</tr>
<tr>
<td></td>
<td>Soft measures required</td>
</tr>
<tr>
<td></td>
<td>Physical improvements may be required</td>
</tr>
<tr>
<td>7.5% + Daily Traffic Growth</td>
<td>Initial study required</td>
</tr>
<tr>
<td></td>
<td>Soft measures required</td>
</tr>
<tr>
<td></td>
<td>Extensive physical improvements may be required</td>
</tr>
<tr>
<td></td>
<td>Project alternatives may be considered</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Existing Street Segment Analysis</th>
<th>Modified Street Segment Analysis</th>
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</thead>
<tbody>
<tr>
<td>CEQA Threshold at &gt;4.9% increase in ADT</td>
<td>8% to 10% above 1500 ADT with a minimum of 150 for ADT &lt;1500</td>
</tr>
<tr>
<td>Applied to Commercial and Residential Projects</td>
<td>Applied only to Commercial Projects</td>
</tr>
<tr>
<td>Applied on All Street Types</td>
<td>Applied on “Access” and “Neigh. Con.” with Residential Context</td>
</tr>
<tr>
<td>No Minimum ADT Increase</td>
<td>Minimum of 150 ADT Increase</td>
</tr>
<tr>
<td>Required Measures No Longer Adequate as CEQA Mitigations</td>
<td>Traffic Intrusion into residential areas address with NTMP Traffic Calming Measures</td>
</tr>
</tbody>
</table>