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## MEETING OF THE

# TECHNICAL WORKING GROUP

*Thursday, May 17, 2018*  
*10:00 a.m. – 12:00 p.m.*

#### SCAG OFFICES

900 Wilshire Blvd., 17<sup>th</sup> Floor  
Policy Room B  
Los Angeles, CA 90017  
(213) 236-1800

**HOW TO PARTICIPATE IN MEETING  
ON NEXT PAGE**



# How to Participate

## **In Person**

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**SCAG Downtown Office Policy Room B**  
900 Wilshire Blvd., 17<sup>th</sup> Floor  
Los Angeles 90017  
213-236-1800

## **Videoconference**

**San Bernardino County**  
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## **Web Meeting**

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Join from PC, Mac, Linux, iOS or Android:  
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# Technical Working Group

May 17, 2018

10:00 a.m. – 12:00 p.m.

**SCAG Downtown Office – Policy Room B**

900 Wilshire Blvd., 17<sup>th</sup> Floor

Los Angeles 90017

## Agenda

### Information Items

- |  |                            |            |
|--|----------------------------|------------|
| 1. Draft 2020 RTP/SCS Goals and Guiding Policies               | C. Aguirre<br>S. Dominguez | Attachment |
| 2. CARB SB 150 Monitoring Report Data Request – SCAG Responses | P. Chang                   | Attachment |
| 3. SB 743 Implementation Update                                | P. Chang                   | Attachment |



## **Technical Working Group**

# **Agenda Item 2**

## **Attachment A: Data Request**

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California Air Resources Board (CARB) staff requests that you review and provide information to complete the attached data spreadsheet, as well as provide the following geographic information, to support our reporting under SB 150. Your assistance on this data request will help to support six of the indicators CARB staff have identified for its SB 150 work, as well as, confirm your MPO's scenario assumptions to which we intend to compare monitoring data. (See **Attachment C** for the full list of metrics CARB staff are working on.)

We ask that you submit this information to [SustainableCommunities@arb.ca.gov](mailto:SustainableCommunities@arb.ca.gov) as soon as possible, but no later than **May 7**. The GIS data can be provided later, by **July 1**. If you will not be able to provide this data, please let us know.

### **Data Spreadsheet (requested by May 7)**

Please review the attached spreadsheet, **confirm the information provided in the cells that are highlighted in green**, and **fill in blank cells highlighted in orange where the information has not been previously provided to CARB**. If you **update a green cell, please shade that cell blue**, and please provide a comment in the cell about the cause for the change (e.g., error correction, recently updated on your end).

The spreadsheet contains five tabs:

- The first tab labeled “READ ME” includes instructions and contact information.
- The second tab labeled “Basic Plan Data” serves to confirm basic information such as the base and horizon year of your most recent Regional Transportation Plan (RTP) and Transportation Improvement Program, as well as to learn about the public participation process used to develop the RTP.
- The third tab labeled “Spending Data” addresses the investment portfolio in the RTP and TIP.
- The fourth tab labeled “SCS Adopted Scenario Data” serves to confirm our understanding of your base year and modeled horizon year values. This information was taken from your plan and/or the data table that you most recently provided to CARB as part of your last SCS evaluation.
- The fifth tab labeled “TOD” requests observed data on housing and job growth near transit in recent years.

### **GIS Data (requested by July 1)**

- Regional transit network for your most recent RTP's base year, 2020, 2035, and horizon year.
- Transit Priority Areas for your most recent RTP's base year, 2020, 2035, and horizon year.
- Investments associated with your latest adopted RTP/SCS

## Attachment B: Interview Sheet

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To support our work on SB 150 (Allen, 2017), California Air Resources Board (CARB) staff invites your input on the following questions. We would be happy to receive your input either in writing or via a phone interview. If you would like to submit your answers in writing, we request that you email them to [SustainableCommunities@arb.ca.gov](mailto:SustainableCommunities@arb.ca.gov) by **May 7**. If you would like to schedule a phone interview, please contact Carey Knecht at [carey.knecht@arb.ca.gov](mailto:carey.knecht@arb.ca.gov) as soon as possible, but **no later than April 23**.

### **Overall Note about SCAG Responses:**

*As part of the 2020 RTP/SCS process, SCAG developed a Local Input Survey to collect information from all 197 local jurisdictions (6 counties and 191 cities) related to the implementation of the 2012 and 2016 RTP/SCS, as well as to inform jurisdictions regarding the development of the 2020 RTP/SCS. The Local Input Survey consists of approximately 60 questions which encompasses a variety of topics ranging from land use, transportation, climate change, sustainability, environmental planning, public health, housing and data. A weblink copy of the 2020 RTP/SCS Local Input Survey is available at:*

*<https://www.surveymonkey.com/r/FB6QFTT>*

*The SCAG Local Input Survey results are expected to further enhance the responses below particularly as related to local best practices and challenges. However, the Local Input Survey results won't be available until October 2018 which is after the SB 150 ARB submittal deadline of September 1, 2018. SCAG looks forward to incorporating its Local Input Survey results to responses for the next cycle of CARB SB 150 data request.*

### **Greenhouse Gas Reduction and Other Metrics**

1. How does your region monitor changing regional conditions and regional progress in implementing its SCS/RTP?

*SCAG has developed a comprehensive regional performance monitoring program to collect data and assess progress being made toward achieving a wide range of regional goals outlined in the 2016 RTP/SCS. During the RTP/SCS development process, SCAG identifies a set of overall regional goals to serve as a guiding framework for development of the RTP/SCS. These goals include higher level regional sustainability, economic, safety, mobility, and accessibility objectives, among others. Once the RTP/SCS goals are established, SCAG develops a corresponding set of specific performance measures to monitor progress toward those goals. While the regional goals are intentionally limited to no more than a dozen overall objectives, the performance measures include several discrete, measurable, and objective indicators selected to align with each of the overall goals of the Regional Plan.*

## Attachment B: CARB SB 150 Data Request – SCAG Responses

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*For example, for the 2016 RTP/SCS, one of the general performance outcome objectives was to improve coordination between land use and transportation planning in the region to enhance the mobility and accessibility of people to regional destinations. This 'Location Efficiency' outcome included a corresponding set of specific measureable performance measures which included the share of growth (population and employment) in designated High Quality Transit Areas (HQTAs), urbanization of previously undeveloped lands such as agricultural areas and other open spaces, vehicle miles traveled (a metric which is also useful for monitoring regional greenhouse gas emissions), mode share for transit and active transportation, average commute distance and travel time, and percentage of trips that are less than three miles in length. In addition, SCAG maps the bike network and aims to update its shape files to capture new active transportation projects as they occur.*

*While the performance measures are developed to evaluate regional progress being made toward achievement of specific outcomes defined in the RTP/SCS, SCAG also periodically develops a comprehensive Local Implementation Survey which is provided to each of our local jurisdictions to obtain information as to what steps our local agencies are taking to implement the objectives defined in the RTP/SCS within their communities. The feedback we receive from the Survey provides a wealth of information in regard to the types of plans, programs, and policies that are being implemented at the local level to promote the success of the RTP/SCS. The Survey includes questions regarding recent General Plan and zoning code updates; strategies, policies, and incentives to promote sustainable planning practices including infill and transit oriented development and active transportation enhancements; preservation of open space and natural resources; policies to promote greenhouse gas reduction and climate resilience; local activities in support of the provision of affordable housing; and development of Specific Plans within designated Transit Priority Areas. The Survey also tracks the adoption of active transportation plans in local jurisdictions, including pedestrian, bicycle, and safe routes to school plans. The information obtained in the regional survey serves as a valuable resource both for monitoring local implementation of the current RTP/SCS, as well as to inform development of the subsequent RTP/SCS.*

*Ultimately, SCAG's comprehensive performance monitoring program serves several important functions. While the program provides valuable feedback on the performance of the RTP/SCS over the duration of its tenure, it also provides a rich source of current data to inform other planning and programs here at SCAG and for our local jurisdictions. In addition, the new federal performance monitoring and reporting requirements introduced through MAP-21 and the FAST Act have been incorporated into the framework of SCAG's comprehensive*

## Attachment B: CARB SB 150 Data Request – SCAG Responses

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*regional monitoring program to ensure that we maintain current and accurate data in support of the newly established federal requirements.*

2. Please see the list of metrics included in **Attachment C** and provide any comments or feedback that you wish, including on any of the following questions:
  - a. Do you feel that these metrics will allow CARB to convey the progress and challenges in SB 375 implementation to the legislature?

*Some of the metrics in Attachment C, for example “jobs and unemployment rate” under Indicator 6 “A Fair and Vibrant Economy”, are influenced more by the national economy and business cycle and much less by the policies and strategies of the SCAG RTP/SCS. However, these metrics may serve to provide the context of our challenges and opportunities.*

*Other specific questions/comments:*

*Indicator 3: General question- will these indicators be used for comparative purposes between MPO's? If so, there should be an additional step to control for geography or some other equalizer.*

*Indicator 4: E- The use of jobs/housing balance at the county scale is too large/coarse to indicate any reduction in VMT given the complicating factors noted in ARB's policy brief ([https://arb.ca.gov/cc/sb375/policies/jhbalance/jhbalance\\_brief.pdf](https://arb.ca.gov/cc/sb375/policies/jhbalance/jhbalance_brief.pdf)). And when you consider the size of SCAG's counties, we could have 100% balance in each county and people still have 20+ mile commutes.*

*Indicator 5: C- This relates to the general question above about whether these indicators are meant to measure the SCAG region's progress. SCAG and our local jurisdictions have little control about the location decisions and operations of private businesses (e.g., in South LA there have been many grocery closures despite efforts by local organizations to incentivize new grocery businesses.)*

*Indicator 7: consider including meeting accessibility (transit where possible) and or meeting times of day (weekends/night are more conducive to community participation)*

*Overall the metrics will address most of the Social Determinants of Health either directly or indirectly. Therefore they will do a sufficient job of capturing the plan's impact on health. It should be noted however that there may be tradeoffs related to health outcomes that need to be*



## Attachment B: CARB SB 150 Data Request – SCAG Responses

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*carefully weighed prior to advocating any specific policy. For example, increased car ownership will provide greater access to jobs but it will also reduce physical activity rates.*

- b. Are there particular metrics for which you would like to provide caveats as to their interpretation?

*As indicated above, ARB should be clear which indicators are more contextual (e.g., jobs and unemployment rate) in nature. In addition, though most of the proposed indicators capture different characteristics of sustainable communities, they should be used carefully in evaluating the success of the Sustainable Communities Strategy. For example, an analysis of data from the FHWA Highway Statistics reports indicates the following statewide trends in VMT between 2012 and 2016 (<https://www.fhwa.dot.gov/policyinformation/statistics.cfm>):*

- VMT in California increased by 4.2%*
- Population increased by 3.4%*
- VMT/capita increased by 0.8%*
- The number of licensed drivers increased by 8.6%*
- The miles per driver decreased by 4.0%*

*Based on these statistics, and knowing that there was significant economic recovery in CA between 2012 and 2016, one could conclude that both economic growth (more jobs, more business activity, etc.) and an increase in the number of drivers were likely significant contributors to these trends. Actions taken under SB 375 may have had the intended effect on VMT, but it is extremely difficult to isolate those impacts from within the measured data. These impacts would likely have to be simulated.*

*For indicator 4C: The data monitoring year only goes to 2014. Since our first SCS was adopted in 2012, most development that occurred between 2012 and 2014 was likely planned or already entitled before our SCS was released. Therefore, this metric should have a caveat to clarify that the data would reflect little or no influence from the RTP/SCS.*

*Finally, the American Community Survey (ACS) bicycle/pedestrian journey to work data will only represent a very small portion of the actual walking and bicycling trips within the region. The California Household Travel Survey does a much better job of capturing the full range of active transportation trips. One would expect this number to grow slower than the overall number of active transportation trips since commute trips tend to be longer and more difficult to complete via active transportation. In the future we will need to estimate this using real time cellular data verified*

*from automated bicycle and pedestrian counting technologies deployed across the state.*

- c. Are there any metrics missing that would better convey changing regional conditions and the progress that has been made?

*There are a number of local plans and policies that have been adopted by local jurisdictions since our last plan (2012 RTP/SCS), some with funding from SCAG, that help to implement the SCS but are not yet reflected in built projects. SCAG will not have the full scope of these policies until the end of our local input process in October 2018. A summary of recently adopted general plans or specific plans that reflect the strategies of the SCS would help to show implementation, since it is too early to see much change on the ground.*

*Indicator 5A, In addition to Walk/Bike to Work, minutes of physical activity from California Health Interview Survey would be a better health related indicator for section 5.*

### **Best Practices for SCS Planning and Implementation Support**

CARB is seeking to identify best practices in regional planning practice and leadership. In particular, we would like to highlight best practices in regional RTP/SCS planning, and in MPOs' work to support plan implementation.

CARB would like to understand what best practices you feel have had the biggest potential to help California's regions move toward SB 375 greenhouse gas emissions reduction targets while advancing other regional benefits such as farmland conservation, clean air, access to affordable housing and transportation choices for people of all incomes, and more.

We recognize that no solution works in every region and that one regions' practices may not be appropriate for implementation in another. ***We encourage you to identify best practices that you feel are valuable, whether or not they apply to your region.***

3. What 3-5 practices would you suggest that CARB spotlight and share for possible adaptation in any regions that may deem them appropriate? These may be strategies from your own region or another.

### ***Sustainability Planning Grants***

*Funding successive stages of visioning, plan development, and climate action goals The Sustainability Planning Grant Program (formerly known as Compass Blueprint Grant Program) was established in 2005 as an innovative vehicle for promoting local jurisdictional efforts to test local planning tools. As of April 2018, 200 projects have been completed through the program, with approximately \$22*

*million in funding. A late 2016 call for projects has resulted in a commitment to fund 60 projects with approximately \$10.7 million in funding. By supporting exemplary projects, the Sustainability Planning Grants Program illustrates the value effective growth planning can bring to our regional partners and the region as a whole.*

**Go Human Campaign**

*Go Human is a region-wide active transportation safety and encouragement campaign initially funded by a non-infrastructure grant from the statewide competitive portion of 2014 Active Transportation Program (ATP) and from regional funding awarded by the Mobile Source Air Pollution Reduction Review Committee (MSRC). The primary goals of the Go Human campaign are to reduce collisions involving pedestrians and bicyclists, while increasing the levels of walking and biking in Southern California. To achieve these goals, SCAG and its partners have implemented a regional advertising campaign focused on promoting roadway safety, a series of open streets events and complete streets demonstration projects, and active transportation trainings for local champions. The campaign's multi-faceted approach has fostered wide participation from counties and cities across the SCAG region and has built greater awareness and support for local planning and project development.*

**Local Self-Help Transportation Funding**

*The SCAG region continues to rely heavily on local sales tax measures for the timely delivery of transportation projects—accounting for more than two-thirds of current revenue sources. While most counties impose a 0.5 percent sales tax to fund transportation projects, Los Angeles County levies a 2.0 percent tax—a combination of four permanent half-cent sales taxes. Riverside County's Measure A expires in 2039. Measure I in San Bernardino County expires in 2040, followed by Orange County's Measure M in 2041. Measure D in Imperial County expires in 2050. Ventura County is the only county in the region without an existing dedicated sales tax for transportation. Local sales taxes measures will generate nearly \$4 billion for transportation investments in the SCAG region in 2018.*

**Regional Managed Lane Network**

*Our region boasts one of the most comprehensive High Occupancy Vehicle (HOV) systems in the nation and substantial investments have been made to expand it. As part of the 2016 RTP/SCS, strategic HOV gap closures, highway-to-highway direct HOV connectors, and HOV direct access ramps were proposed as a strategy to complete the system. Consistent with our regional emphasis on the system management pyramid, recent planning efforts have focused on enhanced system management, including the integration of value pricing to better use existing capacity and offer users greater travel time reliability and*

*choices. Express lanes that are appropriately priced to reflect demand can outperform non-priced lanes in terms of throughput, especially during congested periods. Moreover, revenue generated from priced lanes can be used to deliver the needed capacity provided by the express lanes sooner and to support complementary transit investments. The regional express lane network included in the 2016 RTP/SCS builds on the success of the State Route 91 express lanes in Orange County, as well as the Interstate 10 and Interstate 110 express lanes in Los Angeles County. Additional efforts recently completed or underway include the extension of the State Route 91 express lanes to Interstate 15, as well planned express lanes on Interstate 15 in Riverside County. Express lanes are also planned for Interstate 15 and Interstate 10 in San Bernardino County and Interstate 405 in Orange County.*

***'REVISION' Performance Monitoring Tool for Local Jurisdictions***

*'REVISION' is a web-based regional performance monitoring tool developed by SCAG to provide enhanced technical support to our local jurisdictions for sustainability planning efforts and performance monitoring at the neighborhood level. Originally conceived as an online tool to assist in the identification of local infill and transit-oriented development opportunities, 'REVISION' has been transformed to provide a much wider array of analytical functions in support of sustainability planning, including neighborhood level time series and trends analysis. The tool offers a user-friendly online interface to facilitate analysis and visualization of neighborhood change over time and for seeking opportunities for local sustainable development.*

*'REVISION' utilizes an extensive array of demographic, land use, transportation, housing, and economic data sources to generate customized maps and reports specific to a particular location and analytical objective. 'REVISION' provides support to wide variety of users from local and regional policy and land development decision-makers (in both the public and private sectors), the general public, as well as for SCAG's on-going RTP/SCS performance monitoring program. <http://revision.lewis.ucla.edu>*

4. CARB is interested in identifying best practices in specific categories. Are there best practices that you would like to highlight in any of the following areas? (Feel free simply to name the program, highlight why you feel it is notable or successful, and provide any links for further information; we can research the program to gain a more comprehensive description.)
  - a. **Local implementation:** Fostering or incentivizing local growth that supports the success of your Sustainable Communities Strategy and regional health, equity, conservation, and climate goals

*As indicated before, as part of the 2020 RTP/SCS process, SCAG developed a Local Input Survey to collect information from local*

*jurisdictions related to the implementation of the 2012 and 2016 RTP/SCS, as well as to inform jurisdictions regarding the development of the 2020 RTP/SCS. Survey results will assist SCAG in monitoring implementation practices and will assist us in setting a baseline for the 2020 RTP/SCS. The Local Input Survey solidifies SCAG's approach for a bottom-up development process and will assist SCAG in our scenario planning efforts to develop a robust 2020 RTP/SCS. Additionally, the Local Input Survey goes beyond the 2020 RTP/SCS. Information collected will also allow us to provide better customer service to local jurisdictions. For example, if local jurisdictions indicate that they're having difficulties utilizing CEQA streamlining tools or would like examples of environmental best management practices; this is something that SCAG can look into and provide to jurisdictions in the near future.*

*Across the SCAG region, many local jurisdictions lack the resources to update their plans and policies to align with strategies adopted in the RTP/SCS. To address the gap, SCAG launched the Sustainability Planning Grant program and over the last 10 years has awarded more than \$20 million to local jurisdictions for sustainability planning. To continue to grow the resources available for planning, SCAG has successfully competed for funding from a variety of programs to support its Sustainability Planning Grant program and creatively partnered on pilot programs that leverage implementation funds to deliver programs that facilitate permanent infrastructure and policy change to reduce greenhouse gas emissions. These pilot programs include the Go Human demonstration project event series and the Future Communities Pilot Projects.*

*SCAG supports public health fellows at 20 local agencies each year to support the adoption of health focused policies related to the built environment.*

- b. **Walkable communities and TOD:** Supporting or encouraging growth that is compact, walkable, infill, equitable, transit-oriented and/or transit-ready

*The open streets events and complete streets demonstration projects completed as part of Go Human involve partnering with local jurisdictions to host events that inspire more people to walk and bike by transforming streets through temporary improvements (or pop-ups). These events offer the immediate benefit of encouraging walking and biking, while also engaging communities and building the elected leadership and support for permanent improvements. Approximately 1/3 of the events have already resulted in implementation of permanent improvements or significant action toward implementation, including grant awards or city council approval of plans and policy changes in the corridors where installations were showcased. SCAG has 19 events planned for 2018-2019 and has completed 17 events since 2016.*

## Attachment B: CARB SB 150 Data Request – SCAG Responses

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*Additionally, Sustainability Planning Grants have funded active transportation plans, TOD plans, and first-last mile connectivity. A broad range of innovative planning strategies, and implementation oriented techniques have been realized through SCAG funded plans. These include GIS pathway techniques to visualize more realistic walk and bike sheds, low speed mobility plans, and first-last mile infrastructure planning.*

*SCAG has undertaken a new program, the HQTA Pilot Program, to work directly with cities on defining and implementing HQTA districts around train stations. Initially, SCAG has selected five (5) partner cities to collaboratively develop compact mixed-use higher density neighborhoods around five (5) Metrolink stations. SCAG intends to select additional cities to work with in future years.*

- c. **Conservation:** Supporting conservation of natural resources or farmland

*Through the Natural & Working Lands Program, SCAG has worked with regional stakeholders to identify the most critical wildlife corridors, and engage regional partners in establishing preservation and rehabilitation policies; natural land conservation advanced mitigation strategies for local sales tax measures*

- d. **Affordable housing:** Encouraging the construction or preservation of homes affordable to residents of all income levels, and slowing displacement or regional re-segregation

*To help local jurisdictions meet their future housing need as identified by the Regional Housing Needs Assessment (RHNA) allocation, SCAG has developed a housing program to provide resources and support for local jurisdictions. These resources include a 50-page publication that serves as a guide to the housing crisis and solutions to address the issue, data and maps online that highlight affordable housing projects using tax credits, and an outline of resources available for communities facing gentrification and displacement. In 2016, SCAG also held a Housing Summit, which featured speakers from around the State to highlight the crisis and to share best practices and tools for communities to increase the supply of all types of housing. In addition, SCAG also provides Outreach and Capacity Building for the Affordable Housing and Sustainable Communities (AHSC) program.*

- e. **Funding low-carbon travel options:** Funding investments that have climate, health, conservation, or equity benefits and/or reducing spending on projects that will increase vehicle miles traveled

*SCAG initiated two new funding programs with the Mobile Source Air Pollution Reduction Committee recognizing that efforts to reduce vehicle miles travelled not only address greenhouse gas reduction goals but also serve to reduce criteria air pollutant emissions such as ozone and PM2.5. The MSRC/SCAG funding partnership can serve a best practice for other*

*SCS initiatives to access funding sources that are not earmarked for greenhouse gas emission reduction but have the potential of climate/GHG reduction co-benefits. In addition, the ease/efficiency of the MSRC funding administration is a best practice of grant administration.*

*Under its FY 2016-'18 Work Program, the Mobile Source Air Pollution Reduction Review Committee (MSRC) awarded \$2.5 million to SCAG to implement a Regional Active Transportation Partnership (Go Human) outreach, education, and demonstration program in approximately 25-30 cities within SCAQMD region with a program goal of engaging a minimum of 200,000 people. SCAG is responsible for program administration, and develop and release a Call for Proposals to select jurisdictions. For more information about the MSRC funding award, see Action Item #11 on the September 15, 2016 MSRC Meeting agenda at:*

*[http://www.cleantransportationfunding.org/sites/default/files/agendas/Sep\\_2016\\_MSRC\\_Retreat\\_Agenda\\_for\\_Web2.pdf](http://www.cleantransportationfunding.org/sites/default/files/agendas/Sep_2016_MSRC_Retreat_Agenda_for_Web2.pdf)*

*Also under its FY 2016-'18 Work Program, the MSRC awarded another \$2 million to SCAG to implement a Southern California Future Communities Partnership Program to support city and county agencies in implementing innovative pilot projects that reduce vehicle miles traveled from local travel and municipal operations through new technologies and enhanced data analytics. For more information about the MSRC funding award, see Action Item #8 on the November 16, 2017 MSRC Meeting agenda at:*

*[http://www.cleantransportationfunding.org/sites/default/files/agendas/2017-11/Nov\\_2017\\_MSRC\\_Agenda\\_for\\_Web.pdf](http://www.cleantransportationfunding.org/sites/default/files/agendas/2017-11/Nov_2017_MSRC_Agenda_for_Web.pdf)*

*In the RTP/SCS SCAG developed methods to identify Neighborhood Mobility Areas that feature connected low speed street networks, medium density single family home neighborhoods, and medium density of retail establishments. The RTP/SCS encourages planning and investment that covers active transportation, and replacement short automobile trips with low-carbon alternatives.*

*The SCAG Alternative Fuel Program has been working with public and private fleets since 1996 to transition from diesel and gasoline to natural gas, and from natural gas to electricity and hydrogen. Additionally, since 2012, SCAG has been encouraging deployment of Electric Vehicle charging stations through state wide and local utility funding programs.*

- f. **Aligning regional spending with RTP / SCS priorities:** promoting plan implementation, e.g., by aligning programming decisions with RTP goals including how funding is prioritized in terms of magnitude and timing.

*SCAG has been aligning its regional planning funds with RTP/SCS priorities. For example, SCAG's Sustainability Planning Grants fund local projects which contribute to RTP/SCS priorities.*



*For transportation programming decisions in the SCAG region, please note that they are made by each of the six county transportation commissions. Those programming decisions may be restrictive based on eligibility and criteria of specific fund sources and may not be “moved around” to other projects based on magnitude and timing. Those transportation programming decisions must meet with the conformity determination.*

- g. **Ensuring that transportation investments benefit the most vulnerable and/or under-served communities**, such as by expanding access to transportation choices or improving air quality, and that they avoid harms such as increased air pollution or increasing displacement pressures

*As a government agency that receives federal funding, SCAG is required to conduct an environmental justice (EJ) analysis for its RTP/SCS. SCAG’s 2016 RTP/SCS EJ Appendix analyzed RTP/SCS impacts in nine different geographical areas and identified 18 performance categories to assess the Plan and existing social equity in the region. Several performance areas specifically looked at benefits and burdens impacts on EJ communities. These analyses determined where the 2016 RTP/SCS is putting its investments and whether resources are being allocated equitably by comparing the total share of transportation funding borne by low-income households against other income groups. The EJ Appendix also maps transportation investments and identifies the geographic share of benefits in low income and minority communities. Results showed that transportation investments will go to modes that are most likely to be used by low-income households, and benefits will be equitably shared in neighborhoods that have the highest concentration of traditionally underserved residents. Additional analyses can be found in the 2016 RTP/SCS EJ Appendix:*

*[http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS\\_EnvironmentalJustice.pdf](http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_EnvironmentalJustice.pdf)*

*As part of SCAG’s Sustainability Grants Program and in its role implementing the regional portion of the Active Transportation Program, SCAG has continually supported new projects being funded in disadvantaged communities. In addition, SCAG has received an ATP grant to complete six active transportation plans in disadvantaged communities across the region recognizing that communities with the greatest need often have the least capacity to apply for competitive funding programs*

*As noted earlier, the Alternative Fuel Program has worked with state and local Alt Fuel Vehicle and EV Charging funds to target deployment in disadvantaged communities.*

- h. **Addressing innovative mobility choices:** planning for and/or taking policy steps to integrate Transportation Network Companies, shared-use mobility, and automated vehicles into the regional transportation network



*Through the Mobility Innovations program, SCAG has been participating in regional working groups and business alliances to encourage deployment of connected/automated vehicles (CV/AV) technologies in the region. Additionally, SCAG is participating in the Big 4 MPO Future Mobility Research Program which is pooling resources to create frameworks for policy and regional modeling efforts.*

*As noted earlier, Neighborhood Mobility Areas encourage planning and investment that covers active transportation and other slow speed transportation choices such as NEVs, electric bicycles, and electric scooters.*

*Several Transit best practices are included below: Metro Mobility-on-Demand first/last mile pilot (<https://www.metro.net/projects/mod/>); LADOT's microtransit pilot; OCTA's OC Flex microtransit pilot (<http://blog.octa.net/on-demand-shared-ride-service-coming-to-orange-county>; <http://www.octa.net/pdf/actions032618.pdf>); and San Clemente pilot with Lyft (<http://www.san-clemente.org/Home/ShowDocument?id=44556>)*

*Finally, the Future Communities Pilot Program is a partnership between SCAG and MSRC to support city and county agencies in implementing innovative pilot projects that reduce vehicle miles traveled (VMT) from local travel and municipal operations through the use of new technologies and enhanced data analytics. Key metrics of interest include the cost of program implementation compared to VMT/emissions reductions, opportunities for replication by other agencies, and opportunities for further refinement/lessons learned. The collaboration advances the Mobile Source Reduction Review Committee's goal of achieving immediate air quality benefits, while concurrently advancing long-term planning goals for exploring new and innovative strategies to meet SB 375 goals.*

- i. **Providing financial incentives:** Offering financial rewards or pricing signals in an equitable manner that encourage sustainable choices and/or fund mobility alternatives

*SCAG has been conducting technical analyses of potential mobility innovations and incentive strategies that incorporate a low-income mitigation measures. Operational projects that provide financial incentives in the SCAG region include the express lanes in Los Angeles County known as the Metro ExpressLanes. Specific ways that the Metro ExpressLanes offer financial rewards include a low-income assistance plan, transit rewards, and carpool loyalty programs. The low-income assistance plan provides a discount for qualified residents when setting up an account and waives the monthly account maintenance fee. The transit rewards program enables regular transit riders that use bus service on the*

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*Metro ExpressLanes to earn toll collects and the carpool loyalty program enables Metro ExpressLanes account holders a chance to win toll credits when they use the ExpressLanes as a carpooler.*

- j. **Improving public health**, e.g., fostering walkable communities or clean air

*As part of the 2016 RTP/SCS, SCAG significantly expanded the scope of its Public Health Analysis. SCAG included a Health in All Policies approach as well as an examination of the Social Determinants of Health. SCAG is expecting to expand this analysis to incorporate a health equity approach in the 2020 RTP/SCS. The Public Health Appendix includes analysis around seven focus areas including: Access to Essential Destinations, Affordable Housing, Air Quality, Climate Adaptation, Economic Opportunity, Physical Activity, and Transportation Safety. The 2016 RTP/SCS serves as an important planning lens for SCAG's Sustainable Planning Grants as well as other planning activities. For example, SCAG supports public health fellows at 20 local agencies each year to support the adoption of health focused policies related to the built environment.*

*Also please see Go Human campaign as described before.*

- k. **Promoting an equitable and robust economy**: Supporting regional growth and encouraging workforce development for underserved groups

*SCAG's 2016 RTP/SCS EJ Appendix analyzed accessibility to employment and services in the region for EJ communities. The Accessibility to Employment and Services section of the appendix measured how the 2016 RTP/SCS improves accessibility to important destinations such employment, shopping, parks and schools for environmental justice population groups throughout the region, specifically for areas with high concentrations of minority and low-income residents. Results from the analysis indicated that jobs and shopping accessibility will improve for all EJ groups as a result of the 2016 RTP/SCS. Additional analyses can be found in the 2016 RTP/SCS EJ Appendix:*

*[http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS\\_EnvironmentalJustice.pdf](http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_EnvironmentalJustice.pdf)*

*As noted earlier, SCAG's Mobility Innovations program has been working with regional stakeholders, academia, and business groups. Part of this work has been to attract and retain startup companies in the smart transportation sector in the SCAG region.*

- l. **Effectively engaging stakeholders**: Including community members from all backgrounds in the RTP / SCS process

*SCAG held a total of five environmental justice workshops for the development of the 2016 RTP/SCS EJ Appendix to ensure all members of the public had an opportunity to participate meaningfully in the planning*

*process. To maximize participation from a wide range of stakeholders, two of the workshops were held in the Inland Empire region and four of the five workshops were held in the evening hours to accommodate work schedules and other circumstances. Workshops held in SCAG's Los Angeles office were also available via videoconferencing at the other five SCAG regional offices (Imperial, Orange, Riverside, San Bernardino, and Ventura Counties) to ensure that geography would not be a limiting factor for participation.*

*In addition to workshops, SCAG also conducted focus groups and one-on-one interviews with stakeholders as part of the EJ outreach process. All focus groups and interviews were conducted by a third-party consultant contracted by SCAG to allow stakeholders to share their thoughts and concerns candidly and comfortably. More than 75 individual stakeholders were contacted and 23 participated in the focus groups. The focus groups were conducted on three different days, at SCAG's offices in Los Angeles and Riverside, and one focus group was conducted in the evening to accommodate work schedules of stakeholders. Stakeholders that were unable to participate in the set focus groups were invited to participate in one-on-one interviews with similar questions asked at the focus groups.*

*SCAG also translated the EJ factsheet and workshop flyers in various different languages (Chinese, Korean, Spanish, and Vietnamese) to accommodate for residents with limited English proficiency. The translations and all EJ outreach material from the 2016 RTP/SCS planning process can be found here:*

*<http://www.scag.ca.gov/programs/Pages/EnvironmentJustice.aspx>.*

*Because SCAG's EJ outreach efforts have historically been initiated every four years for the RTP/SCS planning process, SCAG also established an Environmental Justice Working Group (EJWG) beginning in May 2018 to provide stakeholders an opportunity to discuss EJ issues and concerns and facilitate on-going communication on a continuous basis. Similar to the EJ workshops, EJWG meetings will have videoconferencing capabilities at SCAG's regional offices and webinar capabilities to maximize participation. The EJWG should meet three to four times each fiscal year and more often if stakeholders express the need for more meetings.*

5. How does your MPO ensure that you are planning to meet the needs of low-income communities, communities of color, or other historically-underserved populations? Beyond the federal requirements to create a Title VI report and Limited English Proficiency Plan, what are you doing to engage under-served communities, disadvantaged groups, vulnerable populations, and communities that have historically been underrepresented, and to ensure that the regional plan and investments benefit them and do not disproportionately cause harms?

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For example, do you conduct a Needs Assessment that is focused on identifying local mobility needs? How do you ensure that these efforts reflect community knowledge? How have your efforts impacted your current transportation spending and/or long-term plans?

*See response to 21. It should also be noted that almost all of the transportation projects in the RTP Project List are not selected by SCAG but gathered from the CTCs.*

*SCAG ensures that we are planning to meet the needs of low-income communities, communities of color, and other historically-underserved populations through EJ technical analyses and outreach efforts as part of the development of the 2016 RTP/SCS EJ Appendix. The goal of the RTP/SCS is to ensure that when transportation decisions are made, low-income and minority communities have ample opportunity to participate (outreach element of SCAG's EJ Program) and receive an equitable distribution of benefits, rather than a disproportionate share of burdens (technical analysis element of SCAG's EJ Program). SCAG conducted analyses of various performance areas to identify any potential disproportionately high and adverse impacts for various EJ groups to measure outcomes of the 2016 RTP/SCS. Nine geographical areas (EJ areas, SB 353 Disadvantaged Communities, Communities of Concern, urban areas, rural areas, areas within 500 feet of highways, areas within ½ mile of existing rail transit stops and transit services, neighborhoods that fall within potential future emissions hotspots, and areas impacted by highway and aviation noise) and 18 performance categories were identified (i.e. distribution of transportation investments, jobs-housing imbalance, gentrification, public health, climate vulnerability, accessibility to parks, etc.). SCAG also conducted five environmental justice workshops to introduce and gather input on the development of the 2016 RTP/SCS EJ Appendix. As stated previously, two of the five workshops were held in the Inland Empire region and four of the five workshops were held in the evening hours to accommodate work schedules and other circumstances. Workshops held in SCAG's Los Angeles office were also available via videoconferencing at the other five SCAG regional offices (Imperial, Orange, Riverside, San Bernardino, and Ventura Counties) to ensure that geography would not be a limiting factor for participation. SCAG also translated the EJ factsheet and workshop flyers into various different languages (Chinese, Korean, Spanish, and Vietnamese) to reach a wider audience. All EJ related materials can be found here:*

*<http://www.scag.ca.gov/programs/Pages/EnvironmentJustice.aspx>*

*Input received during this outreach led to the expansion of SCAG's Environmental Justice technical analyses to ensure that the impacts of the RTP/SCS were assessed in ways that were meaningful to low income and*

*minority populations – including establishing a definition for Communities of Concern.*

*An additional example, is in our PEV charging station planning, after assessing station demand based on areas of high PEV registrations, we then look for the highest demand areas within Cal Enviro Screen DACs. This ensures that PEV station planning is not just targeted at high income households in more affluent areas. Additionally in our work on Mobility Innovations, we ensure that stakeholders are at the table who are holding the work accountable on questions of equity and access.*

**Challenges and Emerging Practice Areas**

6. Please discuss one or more areas where your region is falling short of goals that you have set for yourselves. What challenges have contributed to this? See below for a compilation of challenges CARB staff has collected through the recent target update process. Which ones would you say have had the most severe impact on your region’s ability to meet your goals (if not listed here, please identify others)?

|   |
|---|
| <b><u>Transportation Funding Challenges</u></b>                               |
| Lack of funds for roadway expansion needs                                     |
| Lack of funds for road repair and maintenance                                 |
| Lack of funds for public transit capital                                      |
| Lack of funds for public transit operations                                   |
| Lack of funds for active transportation                                       |
| Inflexibility of federal funding sources                                      |
| Inflexibility of state funding sources  |
| Inflexibility of local funding sources (e.g., voter-approved sales taxes)     |
| SCS projects not competing well against other projects                        |
| <b><u>Local planning challenges</u></b>                                       |
| Lack of local planning funds  |
| Loss of redevelopment tools (e.g., parcel acquisition)                        |
| Lack of funding for affordable housing  |
| Local development not included in RTP / SCS                                   |
| Neighborhood opposition to development  |
| Backlog of properties entitled for development                                |
| Local barriers to development (e.g., slow permit processing, high fees, CEQA) |
| <b><u>Macroeconomic challenges</u></b>  |
| Change in fuel prices or auto operating costs                                 |
| High housing costs / lack of affordable housing                               |

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|  |
|--|
| High unemployment / lack of local employment   |
| <b><u>Mobility innovation challenges</u></b>   |
| Expansion of ridehailing / Transportation Network Companies  |
| Concerns about Automated Vehicles  |
| Ridesharing  |
| Regulatory barriers to regional / local congestion pricing or incentives   |
| Need to shift from gas tax to VMT tax  |
| <i>Structural disincentives to PEV sales (dealer turn-over, lack of motivation for sales, cheap gas, persistent lack of information for buyers.)</i> |

*SCAG region has been facing significant challenges in transportation funding, local planning, macroeconomic and mobility innovation.*

***Transportation funding challenges*** have been wide in scope including most items listed above. Despite recent additional funding (e.g., SB 1 and Measure M in Los Angeles County), our region still will not likely achieve desired state of good repair. Further, the long-term funding picture is not adequately addressed by these sources. Because of lack of funds for road repair and maintenance, local agencies struggle to balance such expenditures with other capital improvement projects such as widening, signal synchronizations, and active transportation projects. The lack of funds for operations limits the ability to provide enhanced bus or rail service. For example, we lack funds for public transit operations for high frequency all-day service.

*While the region is moving forward with the implementation of Active Transportation projects, the speed of implementation will make it difficult to meet the goals of the RTP/SCS by the target dates. Implementation of these projects is often difficult due to public perceptions of safety and common misunderstandings of their impacts on the transportation system. Likewise, across the SCAG region, many local jurisdictions also lack the resources to update their active transportation plans and policies to align with strategies adopted in the RTP/SCS, which makes it difficult for them to access available funding. SCAG believes that additional funding is needed to educate and inform the public about the benefits of these projects and support outreach and planning activities.*

*Finally, having more flexibility in federal and state funding sources will allow for a more streamlined process for implementing projects and would improve project delivery timelines. For local funding sources (e.g., voter-approved sales taxes), in order to receive voter support, sales tax authorities need to provide voters assurances that portions of the tax will go towards a certain type of project expenditure.*



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*The most **local planning challenges** include lack of funding in affordable housing, neighborhood opposition to development and other barriers to development (e.g., CEQA).*

*Many of our RTP/SCS strategies are based on denser infill growth. Due to the complexity of infill development (physical and political) it's difficult to build affordable or even market rate housing in certain built-up areas. In addition, our region's housing affordability challenges creates outward growth pressure to our less dense areas where housing can be built quicker and cheaper. Yet these same growth areas have higher average VMT due to lack of sufficient transit service or longer distances to destinations. Another local planning challenge is quality schools. Even if we build the "missing middle" in our denser urban neighborhoods- families may prioritize moving to a suburban neighborhood with better schools.*

*One of the most significant barriers to development within the SCAG region is the CEQA process. Environmental review consumes a tremendous amount of time and money and is often followed up by litigation which results in the delay of projects. SCAG is promoting the usage of CEQA streamlining tools. One of these tools is the usage of SCEA's via SB 375, which allows for a project applicant to tier off SCAG's RTP/SCS Programmatic Environmental Impact Reports (PEIR). However, results have been mixed as the SCEA's themselves have been challenged in court. SCAG will continue working towards making tiering/streamlining easier for lead agencies using the PEIR.*

*Under **macroeconomic challenges**, the high housing cost and lack of affordable housing are major challenges for successful SCS implementation. Specifically, among the large metropolitan regions, SCAG region has experienced the highest share of households with housing costs exceeding 30 percent of their incomes.*

*As noted before, lack of affordable housing has shifted residential growth outside the urban core to the inland counties. This results in longer commute thereby increasing VMT. Although inland counties are trying to provide transportation alternatives via rail or BRT, it is not enough to handle the volume of trips to job rich centers. The local transportation system is limited and cannot keep up with the influx of residents moving to inland counties for the purpose of affordable housing.*

*Under **mobility innovation challenges**, transit ridership decline has been occurring in the SCAG region as well as statewide and research done by SCAG/UCLA has indicated rising auto ownership, particularly among the groups most likely to take transit, is a primary cause. For more information, please go to: [http://www.scag.ca.gov/Documents/ITS\\_SCAG\\_Transit\\_Ridership.pdf](http://www.scag.ca.gov/Documents/ITS_SCAG_Transit_Ridership.pdf)*

*We have barriers to local mechanisms to managing traffic (including overall VMT) demand from existing and emerging mobility innovations. We need the ability to adequately manage demand at the regional and local levels, e.g., through pricing to address safety, mobility, congestion, and meet emission reduction goals.*

7. What solutions are you exploring to overcome those challenges? Are there issues for which your region is seeking best practices or partnerships? Are there ways that State policies or funding could help address those challenges?

*In terms of solutions to the challenge of declining ridership, transit operators in the SCAG region have been or are in the process of restructuring their bus networks to better serve residents, including OCTA and LA Metro. At the same time, SCAG as part of its 2020 RTP/SCS update process, will be developing a Regional TDM strategic plan to identify multi-modal strategies to reduce VMT and greenhouse gas emissions. In terms of State policies or funding to help address the challenge, the State could provide funding to support local pilot projects, assistance on obtaining data, including perhaps, State leadership in purchasing 3rd party real-time traffic data (e.g. Inrix, Streetlight) to provide a universal license for local and regional agencies statewide to access the data to support planning efforts and provide State leadership in obtaining TNC data to allow planning agencies to understand the impact of TNC usage on the transportation system.*

*SCAG's Go Human campaign seeks to address some of these public perceptions around safety but funding for the program is supported through grant dollars from the Office of Traffic Safety which means ongoing programmatic support is tentative and subject to changes in funding priorities by other agencies. SCAG would support dedicated funding for ongoing programmatic and technical assistance efforts around traffic safety, public engagement, and behavior change. The state could support this goal by providing region's more flexibility in how they administer their ATP funding.*

### ***Affordable Housing***

8. What efforts has the MPO taken to provide leadership or support to local agencies in addressing regional affordable housing and/or displacement challenges?

*To help local jurisdictions meet their future housing need as identified by the Regional Housing Needs Assessment (RHNA) allocation, SCAG has developed a housing program to provide resources and support for local jurisdictions. Jurisdictions and stakeholders are encouraged to consider their local constraints and opportunities when determining which tools are best for their community.*



*These resources include a 50-page publication that serves as a guide to the housing crisis and solutions to address the issue, data and maps online that highlight affordable housing projects using tax credits, and an outline of resources available for communities facing gentrification and displacement. In 2016, SCAG also held a Housing Summit, which featured speakers from around the State to highlight the crisis and to share best practices and tools for communities to increase the supply of all types of housing. Housing-related events are ongoing and SCAG plans to continue outreach and resources beyond the development of the next RHNA process.*

9. What efforts are underway to quantify travel impacts related to housing affordability and/or displacement in your region:
- A. Affordability is incorporated within the transportation demand model
  - B. Affordability is quantified as an off-model strategy
  - C. Quantification methodology currently under development
  - D. Not currently quantifying affordability impacts**
  - E. Other: \_\_\_\_\_

If you selected “A” or “B” above, please provide a link to your Technical Methodology or other supporting material. If you selected “D,” please note why not (e.g., lack of staff time, lack of data).

*Note for D. Need further research and studies to quantify its effects*

10. Does your region track how many jurisdictions have anti-displacement policies?
- A. **Yes** If so, how many? \_\_\_\_\_ Out of ... ? **197**
  - B. No

*Currently SCAG is conducting its local input survey, which is used to help inform the RTP/SCS. The questions are not geared toward specifically anti-displacement policies but rather ask questions focusing on policies preserving affordable housing or increasing local supply, such as inclusionary zoning. These efforts can minimize or mitigate the effects of displacement and the survey results will indicate how many jurisdictions have these types of policies.*

**Induced Demand**

11. Are highway capacity projects posing a challenge to the region in meeting its SCS targets?

*The six-county SCAG region is a highly diverse region, geographically as well as demographically. As such, transportation needs of the region are also highly diverse so are the corresponding transportation investment. It should be noted at the beginning that SCAG’s 2012 and 2016 RTP/SCS, both included investment*

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*highway capacity projects in addition to transit, among others, and both well exceeded the SCS GHG target established by ARB.*

*Our transit investments are focused on highly urbanized parts of our region, where transit can be a viable and competitive mode for most travel needs. On the other hand, the parts of our region that are rural, low density and/or spread out, have limited potential to be served effectively and efficiently by transit. Roadway improvements are most likely the only means of serving the transportation needs of these communities in the near term. In some instances, vehicles travel longer distances because of the incomplete roadway network particularly in inland counties. The 2016 RTP/SCS recognizes this diverse nature of our region and the challenges associated with serving the transportation needs of such a region. As such, highway capacity projects proposed in the 2016 RTP/SCS are strategic and targeted to ensure maximum efficiency of the transportation system as a whole.*

*As a matter of fact, SCAG's highway capacity investments in the 2016 RTP/SCS were guided by a set of policies that was adopted by the Regional Council that served as a framework for these investments- those policies are as follows:*

- *Protect and preserve what we have first, supporting a “fix-it-first” philosophy, including the consideration of life cycle costs beyond construction;*
- *Support new funding for system preservation;*
- *Focus on achieving maximum productivity through strategic investments in system management and demand management;*
- *Focus on adding capacity primarily (but not exclusively) to:*
  - *Close gaps in the system;*
  - *Improve access where needed;*
- *Support policies and system improvements that will encourage seamless operation of our roadway network from the user's perspective;*
- *Develop any new roadway capacity project with consideration and incorporation of congestion management strategies, including demand management measures, operational improvements, transit and ITS, where feasible;*
- *Focus on addressing non-recurring congestion with new technology; and*
- *Support complete streets opportunities where feasible and practical.*

*So, the short answer, given this strategic approach taken by SCAG, is that the highway capacity projects are not expected to pose a major challenge to the region's ability to meet the prescribed GHG target. More recently, Caltrans has also made a greater effort to initiate technology (i.e., I-210 Pilot) as a means for addressing highway congestion. With rapid advancements in technology, we may*

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*see a shift beyond traditional means of addressing highway congestion. However, in the long term, if SCAG's land use assumptions and other sustainable community strategies do not come to fruition nor deliver the expected results, leading to more congestion and gridlock, the region may need to reassess and re-think how it meets the transportation needs of its growing population. One outcome of such a scenario could be greater reliance on new and clean technologies, system and demand management strategies, including greater penetration of shared mobility etc.*

*Finally, it should be noted that the achievement of GHG targets needs to be kept as a regional analysis, not a project by project analysis, taking the transit, ridesharing, active transportation, and highway projects together as a system that serves the needs of the region.*

12. How are you incorporating the short- and long-term impacts of capacity projects into MPO analysis?

- A. **Induced demand is incorporated within the transportation demand model.**
- B. Induced demand is quantified as an off-model strategy
- C. Quantification methodology currently under development
- D. Not currently quantifying induced demand impacts
- E. Other: \_\_\_\_\_

If you selected "A" or "B" above, please provide a link to your Technical Methodology or other supporting material.

SCAG's Technical Methodology for the 2016 RTP/SCS can be viewed at:

[https://www.arb.ca.gov/cc/sb375/scag\\_technical\\_methodology\\_submittal\\_11\\_11\\_15.pdf](https://www.arb.ca.gov/cc/sb375/scag_technical_methodology_submittal_11_11_15.pdf)

If you selected "D," please note why not (e.g., lack of staff time, lack of data).

### **Transportation Innovations**

13. What MPO efforts have been taken to integrate ridesourcing (Transportation Network Companies, TNCs) within the transportation system?

*SCAG's efforts include encouraging TNC First/Last Mile pilot projects and encouraging data collection efforts between transit agency partners and TNC companies. In addition, SCAG will be developing a Regional TDM Strategic Plan to address these topics, as part of the 2020 RTP/SCS.*

14. What efforts are underway to quantify travel impacts related to ridesourcing in your region:

- A. Ridesourcing is incorporated within the transportation demand model
- B. Ridesourcing is quantified as an off-model strategy**
- C. Quantification methodology currently under development
- D. Not currently quantifying ridesourcing impacts
- E. Other: \_\_\_\_\_

If you selected “A” or “B” above, please provide a link to your Technical Methodology or other supporting material. If you selected “D,” please note why not (e.g., lack of staff time, lack of data).

SCAG’s Technical Methodology for the 2016 RTP/SCS can be viewed at: [https://www.arb.ca.gov/cc/sb375/scag\\_technical\\_methodolgy\\_submittal\\_11\\_11\\_15.pdf](https://www.arb.ca.gov/cc/sb375/scag_technical_methodolgy_submittal_11_11_15.pdf)  
Also SCAG will be developing a Regional TDM Strategic Plan to address these topics, as part of the 2020 RTP/SCS.

15. What MPO efforts have been taken to plan for autonomous vehicles (AVs) in your region?

*Working closely with partners to form the Coalition for Transportation Technology, and with the private sector stakeholder group the e4 Mobility Alliance in order to pursue pilot projects*

16. What efforts are underway to quantify travel impacts related to AVs:

- A. AVs are incorporated within the transportation demand model
- B. AVs are quantified as an off-model strategy
- C. Quantification methodology currently under development
- D. Not currently quantifying AV impacts**
- E. Other: \_\_\_\_\_

If you selected “A” or “B” above, please provide a link to your Technical Methodology or other supporting material. If you selected “D,” please note why not (e.g., lack of staff time, lack of data).

*As part of the 4MPO Future Mobility Research Program, SCAG staff have and will continue to explore how assumptions can be varied within an activity based model to simulate adoption of automated and connected vehicle technologies. However at this time, real-world deployments remain limited in scope and meaningful data is very difficult to assess. Therefore any assumptions about changes in travel behavior remain entirely theoretical. For these reason it is unlikely that modeling or off-model methodologies of AV impacts will make their way into the SCAG 2020 RTP/SCS.*

17. What MPO efforts have been taken to integrate shared-use mobility (e.g., car-sharing and bike-sharing services) within the transportation system?

*SCAG’s efforts include working with partners to deploy shared mobility hubs & low-income EV car sharing, and also working with local jurisdictions to deploy and track bike-sharing programs. As indicated before, SCAG will be developing a Regional TDM Strategic Plan to address these topics, as part of the 2020 RTP/SCS.*

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18. What efforts are underway to quantify travel impacts related to shared-use mobility in your region:

- A. Shared use is incorporated within the transportation demand model
- B. Shared use is quantified as an off-model strategy**
- C. Quantification methodology currently under development
- D. Not currently quantifying shared use impacts
- E. Other: \_\_\_\_\_

If you selected “A” or “B” above, please provide a link to your Technical Methodology or other supporting material. If you selected “D,” please note why not (e.g., lack of staff time, lack of data).

SCAG’s *Technical Methodology for the 2016 RTP/SCS* can be viewed at:

[https://www.arb.ca.gov/cc/sb375/scag\\_technical\\_methodolgy\\_submittal\\_11\\_11\\_15.pdf](https://www.arb.ca.gov/cc/sb375/scag_technical_methodolgy_submittal_11_11_15.pdf)

Also SCAG will be developing a *Regional TDM Strategic Plan* to address these topics, as part of the 2020 RTP/SCS.

**Pricing**

19. Has your region incorporated congestion pricing into the regional road or bridge network?

- A. No, and we are not considering it
- B. We have begun to discuss whether or not this might be right for our region
- C. We have begun to take action to adopt congestion pricing
- D. We have already adopted congestion pricing**
- E. Other: \_\_\_\_\_

20. Is the region providing technical assistance, incentives or grants, or other active support to help local jurisdictions adopt other pricing policies (e.g., cordon pricing)?

- A. No, and we are not considering it
- B. We have begun to discuss whether or not this might be right for our region
- C. We have begun to take action to support local work on pricing
- D. We have already taken action to support local work on pricing**
- E. Other: \_\_\_\_\_

21. If you answered “C” or “D” to either of the two questions above, what measures are you taking to ensure that the pricing policies benefit and do not negatively impact low-income populations?

*SCAG has been conducting technical analysis and development of low-income “mitigation” program as part of pricing programs. Recognize that pricing can be fairer than current approaches to funding and providing transportation resources.*

**State Policies and Funding**

22. What thoughts do you have about the impact of state policies and funding? In particular, do you have thoughts about the following recent state policy or funding efforts and how they will contribute to or hinder your efforts?

a. SB1 (formula and competitive funds)

*SB 1 funding which is more targeted to system preservation will have a positive impact on transportation infrastructure as it stabilizes STIP revenues, provides additional funding opportunities through the discretionary programs, and its formula funds will ensure a consistent revenue source for local streets and roads and local partnership programs.*

*Federal MAP-21/FAST Act requires SCAG to include a series of performance measures as part of the upcoming 2020 RTP/SCS and 2019 FTIP to demonstrate how the region is making progress towards achieving its targets for safety, system preservation, and system performance. Performance measure 2 (PM2), includes metrics related to pavement and bridge conditions on the National Highway System (NHS). Some SB 1 funds will be used to improve pavement and bridge conditions, which in turn will help SCAG as well as the state overall reach its PM2 targets.*

b. The package of housing bills passed in 2017

*The fifteen bills signed by Governor Brown in 2017 are a step in the right direction into increasing the supply of housing of all types throughout the State. Some of these bills are focused on the RHNA process while others target housing elements or funding for building housing. SCAG encourages more funding sources, such as those set forth by SB 2 and SB 3 that can help local jurisdictions build more housing after they have planned for it in their housing elements.*

c. Relatively new CARB programs, such as the Low-Income Barriers Study under SB 350, and the Community Air Protection Program under AB 617

*Overall, the Low-Income Barriers Study is aligned with SCAG's RTP/SCS goals including to ensure EJ communities sharing the benefits from public policies, e.g., clean energy policies under SB 350 and not be disproportionately adversely impacted. The Low-Income Barriers Study can also be a resource to enhance our EJ analysis for the RTP/SCS including its recommendations to overcome barriers to low-income households.*

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*With substantial funding and extensive targeted outreach, ARB's Community Air Protection Program (CAPP) focuses on reducing exposure in communities most impacted by air pollution, many of which are EJ communities. Therefore, the CAPP is likely to be very effective in improving public health where it is needed the most and also in achieving greater environmental justice where it matters the most at the same time.*

d. Other

*SCAG would support incorporating additional funding into the Active Transportation Program from SB1 and other funding sources. SCAG also looks forward to continuing to work with California Transportation Commission to ensure their guidelines provide the flexibility for MPOs to direct resources to regional and local priorities, including set-asides for planning and capacity building projects and technical assistance.*

*SCAG sits on the Office of Health Equity (OHE) Advisory Committee and would like to see the OHE more engaged with county and regional agencies to integrate health equity into state and regional planning and funding programs.*

*SCAG would like to see more engagement from the Health in All Policies task force with regional and county agencies. While its work with state level policies is extremely important and has been very impactful, we think it could benefit from expanded engagement with implementing agencies.*

*Finally, AB 2363, a bill to fix long-standing issues with speed limits in California, did not advance in the 2018 legislative session, however, a legislative strategy to address unsafe speeds is essential to creating a safe and welcoming environment to increase the numbers of people walking, biking and taking transit since pedestrian and bicycle fatalities continue to rise in the SCAG region.*

23. What are the most helpful State policies and funding? What would you most like to see preserved or enhanced?

*One of the most helpful State policies is to ensure steady and adequate funding for transportation and housing needs. Though not comprehensive in scope, SB 1 is a recent good example for transportation funding while SB 2 & SB 3 (pending voter approval in November 2018) are good examples for housing funding.*

*In addition, the RTP/SCS is required to fulfil the federal transportation conformity requirements and to meet the state's regional GHG targets. Given that the*

## Attachment B: CARB SB 150 Data Request – SCAG Responses

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*SCAG region has among the worst air quality in the nation and the transportation sector is the largest source of emissions, the ARB's Mobile Source Strategy and Low Carbon Transportation Investments and Air Quality Improvement Program are very helpful state policies and funding. These state policies and funding represent an integrated and effective effort to address criteria pollutants, GHG emissions, and air toxics concurrently.*

*Finally, the focus on integrated planning should be preserved and enhanced. There should also be expanded funding from Cap-and-Trade and other sources to fund AHSC and ensure fair and adequate funding allocation and award to the SCAG region to implement its RTP/SCS.*

24. What change(s) to State policies or funding would most bolster the success of your RTP/SCS? Do you have any advice as to how the SB 150 process could be used to help advance these shifts?

*Greater and steady funding to support implementation of all major initiatives in the RTP/SCS would most bolster the success of SCAG's RTP/SCS. It is imperative for a successful transitioning starting in 2025 from an excise tax on gasoline to a mileage based user fee (for which the state has been conducting a pilot study per SB 1077) to serve as one of the primary sources of funding our transportation investment identified in the RTP/SCS. In addition, State policies that promote and enable more regional and local options for funding and managing the system would be very helpful.*

*In addition, to bolster the success of SCAG's RTP/SCS, there needs to be funding incentives for jurisdictions that build housing near transit so that jurisdictions both provide enough housing and increase the effectiveness of transit investment. Moreover, there should be funding that can help build and preserve affordable housing, particularly in areas at-risk of gentrification and displacement. Some forms of the past Redevelopment agencies (RDA) with dedicated funding to affordable housing should be considered. In addition, more dedicated special district funding with incentives, such as EIFDs and CRIAs, will help implement the goals and policies of our RTP/SCS.*

*Finally, State policies that help streamline project approvals and permits from Caltrans and resource agencies need be adopted to ensure timely delivery of projects. For example, projects already in an adopted RTP/SCS should be streamlined to allow for timely reviews and approvals for environmental documents, including project-level air quality analyses, and permitting.*



**Attachment C: Proposed Data Metrics**

CARB staff have identified the following seven indicator areas for its SB 150 work. The final report will present information statewide, by MPO, and possibly by subregional geographies (e.g., counties) where available. The chart below outlines the (draft) monitoring time period and data sources. Grayed sections represent metrics for which we are still researching their availability for the September 2018 report timeframe.

CARB has identified external data sources for most items but is requesting MPO assistance in the six items highlighted in yellow below, for which we are intending to use MPO reporting. CARB is also asking that MPOs confirm the scenario assumptions to which the report will compare monitoring data in those areas where the right most column titled “Compare to RTP?” is marked “yes” below.

| Indicator 1: Progress Toward SB 375 GHG Emissions Reduction Targets | Monitoring Year        | Source            | Compare to RTP? |
|---|------------------------|-------------------|-----------------|
| A GHG/capita  | up to 2016             | Derived from HPMS | Yes             |
| Indicator 2: Shifting Travel Patterns                               |                        |                   |                 |
| A VMT/capita  | up to 2016             | HPMS              | Yes             |
| B Drive to work alone   | 2005-2016              | ACS               | -               |
| C Transit boardings   | 2005-2016              | NTD               | Yes             |
| D Carpooling  | 2005-2016              | ACS               | -               |
| E Vehicle ownership   | 2005-2016              | DMV/ACS           | Yes             |
| F Vehicle hours of delay (<55 mph)                                  | 2005-2017              | PeMS              | -               |
| Indicator 3: Funding and Delivering Travel Choices                  |                        |                   |                 |
| A Transportation spending   |                        |                   |                 |
| - Total spending planned in RTP, by mode                            | RTP period             | MPO               | -               |
| - Planned use of local & state funds, by mode                       | RTP period             | MPO               | -               |
| - Programmed spending   | TIP period             | MPO               | Yes             |
| - State Transportation Improvement Program                          | 2006-2018              | Caltrans          | -               |
| - Transit operations spending                                       | 2005, 2010, 2012, 2016 | NTD               | Yes             |
| - Under-served communities spending (GGRF)                          | [TBD]                  | CARB / GGRF       | -               |
| B Lane miles built  | 2012-2014, 2016        | Caltrans          | -               |
| C Transit service hours per capita                                  | 2005-2016              | NTD               | -               |
| D Transit and all-mode commute time for low-income communities      | 2010, 2016             | ACS               | -               |
| E Transit and all-mode commute time for unincorporated communities  | 2010, 2016             | ACS               | -               |

Attachment C: CARB SB 150 Data Request  
Page 2

| Indicator 4: Efficient and Sustainable Regional Growth |  |                      |                 |     |
|--|--|----------------------|-----------------|-----|
| A  | <b>Acres conserved</b><br>Permanently conserved, fee title   | 2009, 2017           | www.calands.org | -   |
| B  | <b>Farmland and rangeland lost</b> Agriculture & grazing lands: acreage decline  | 2004-2014            | FMMP            | -   |
| C  | <b>Acres urbanized</b><br>Residential / commercial, normalized by homes / jobs built   | 2004-2014            | FMMP / EDD, DOF | Yes |
| D  | <b>MF / SF split</b>   | 2005-2016            | DOF             | Yes |
| E  | <b>Jobs-housing balance</b><br>Ratio of jobs to housing by county  | 2005-2016            | EDD, DOF        | Yes |
| F  | <b>Jobs/housing growth near transit</b>  | 2005, current year   | MPO             | Yes |
| Indicator 5: Walkable, Healthy Communities             |  |                      |                 |     |
| A  | <b>Walk / bike to work</b>   | 2005-2016            | ACS             | -   |
| B  | <b>Injuries / fatalities by mode</b>   | [TBD]                | Caltrans        | -   |
| C  | <b>Grocery store access</b>  | 2010, 2015           | USDA            | -   |
| D  | <b>Air quality (PM 2.5)</b><br>Average annual ambient concentration, county  | 2005-2017            | US EPA          | -   |
| E  | <b>Air quality (Ozone)</b><br>Average annual ambient concentration, county   | 2005-2017            | US EPA          | -   |
| Indicator 6: A Fair and Vibrant Economy                |  |                      |                 |     |
| A  | <b>Jobs and unemployment rate</b>  | 2005-2018            | EDD             | -   |
| B  | <b>Jobs by wage level</b> high / med / low   |                      |                 | -   |
| C  | <b>Local housing plans &amp; permitting</b><br><br>- Percent of jurisdictions with certified Housing Elements<br>- Housing units permitted / RHNA allocation<br>- Number of jurisdictions with equity policies |                      | HCD             | -   |
|  |  | RHNA cycle           | HCD             | -   |
|  |  |                      | OPR             | -   |
| D  | <b>Households overburdened by rent</b>   | 2008-2016            | ACS             | -   |
| E  | <b>Vacancy rate</b>  | 2005-2017            | DOF             | -   |
| F  | <b>Displacement risk</b> (method under development)  |                      |                 | -   |
| Indicator 7: An Inclusive Planning Process             |  |                      |                 |     |
| A  | <b>Proactive efforts to engage underrepresented communities</b><br><br>- RTP/SCS meetings with translation and food<br>- Amount of subgrants for community partners to perform outreach, if any                | RTP plan development | MPO             | -   |
|  |  | RTP plan development | MPO             | -   |



## **Technical Working Group**

# **Agenda Item 3**

# TECHNICAL ADVISORY

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## ON EVALUATING TRANSPORTATION IMPACTS IN CEQA



April 2018

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## A. Introduction

This technical advisory is one in a series of advisories provided by the Governor’s Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subs. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

[Senate Bill 743](#) (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: “During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . .” (*Covina Residents for Responsible Development v. City of Covina* (Feb. 28, 2018, B279590) \_\_Cal.App.5th\_\_, ordered pub. Mar. 22, 2018.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” (*Id.*, subd. (b)(1).) To that end, OPR has proposed changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project’s transportation impacts. Once the California Natural Resources Agency adopts these changes to the CEQA Guidelines, automobile delay, as measured by “level of service” and other similar metrics, generally will no longer constitute a significant environmental effect under CEQA.

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 [“It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs.”].)

This April 2018 technical advisory is an update to the advisory it published in November 2017. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

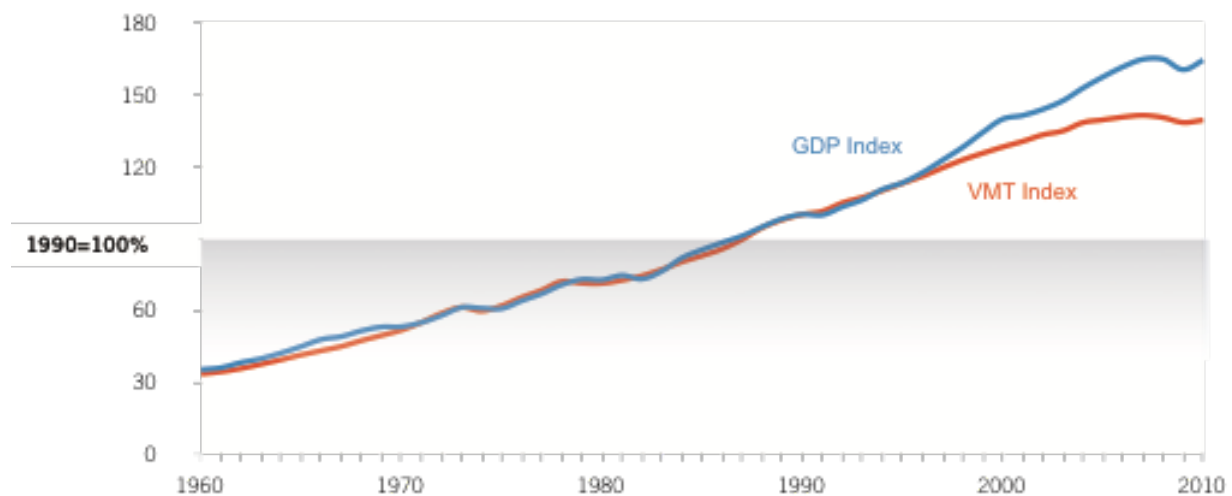
## B. Background

*VMT and Greenhouse Gas Emissions Reduction.* Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12

provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing greenhouse gas emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State’s 2030 and post-2030 emissions goals without reducing VMT growth.

*VMT and Other Impacts to Health and Environment.* Beyond greenhouse gas emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel leads to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affects other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development which leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways. ([Fang et al., 2017.](#))

*VMT and Economic Growth.* While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.<sup>1,2</sup>



**Figure 1.** VMT and Gross Domestic Product (GDP), 1960-2010 ([Kooshian and Winkelman, 2011](#))

<sup>1</sup> Haynes et al., [Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles](#), Sept. 2015.

<sup>2</sup> Osman et al., [Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area](#), March 2016.

## C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project's greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

### 1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a "lead agency may use models to estimate a project's vehicle miles traveled . . ." CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 ["the issue is not whether the studies are irrefutable or whether they could have been better" ... rather, the "relevant issue is only whether the studies are sufficiently credible to be considered" as part of the lead agency's overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

**Vehicle Types.** Proposed Section 15064.3, subdivision (a), states, "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

**Residential and Office Projects.** Tour- and trip-based approaches<sup>3</sup> offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

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<sup>3</sup> See Appendix 1, *Considerations About Which VMT to Count*, for a description of these approaches.



- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

**Retail Projects.** Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT<sup>4</sup> because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

**Considerations for All Projects.** Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries. CEQA requires environmental analyses to reflect a “good faith effort at full disclosure.” (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Analyses should also consider a project’s both short- and long-term effects on VMT.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subs. (a)(7), (b)(1).)

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<sup>4</sup> See Appendix 1, *Considerations About Which VMT to Count*, “Assessing Change in Total VMT” section, for a description of this approach.

## D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific “criteria for determining the significance of transportation impacts of projects[.]” (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on “thresholds of significance.” The CEQA Guidelines define a “threshold of significance” to mean “an identifiable **quantitative, qualitative<sup>5</sup> or performance level** of a particular environmental effect, non-compliance with which means the effect will **normally** be determined to be significant by the agency and compliance with which means the effect **normally** will be determined to be less than significant.” (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, “provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.” (*Id.* at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means “enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached.” (*Id.* at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to **make a decision which intelligently takes account of environmental consequences**. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is **reasonably feasible**. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The **courts have looked not for perfection** but for **adequacy, completeness**, and a **good faith effort** at full disclosure.

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR’s recommendations regarding thresholds of significance for VMT set forth below.

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<sup>5</sup> Because the amount of a project’s VMT is needed (and is currently being used in practice) to assess the environmental impacts on a variety of resources (such as air quality, greenhouse gases, energy, and noise), qualitative analysis should only be applied when models or methods do not exist for undertaking a quantitative analysis.

## E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own thresholds.

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- [Assembly Bill 32](#) (2006) requires statewide greenhouse gas reductions to 1990 levels by 2020 and continued reductions beyond 2020.
- [Senate Bill 32](#) (2016) requires at least a 40 percent reduction in greenhouse gas emissions by 2030.
- Pursuant to [Senate Bill 375](#) (2008), the California Air Resources Board establishes greenhouse gas reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies. Current targets for the largest metropolitan planning organizations range from 13% to 16% reductions by 2035.
- [Executive Order B-30-15](#) (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.
- [Executive Order S-3-05](#) (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.
- [Executive Order B-16-12](#) (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.
- [Senate Bill 391](#) requires the [California Transportation Plan](#) to support 80 percent reduction in GHGs below 1990 levels by 2050.
- The [California Air Resources Board Mobile Source Strategy](#) (2016) describes California's strategy for containing air pollutant emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.
- The California Air Resources Board's [2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target](#) describes California's strategy for containing

greenhouse gas emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

Considering these various targets, the California Supreme Court observed:

Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan ... assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(*Center for Biological Diversity v. California Dept. of Fish & Wildlife, supra*, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project's effect on meeting long-term reduction goals. (*Ibid.*) And more recently, the Supreme Court stated that "CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." (*Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504.)

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb greenhouse gases and other pollutants. But those targets do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB's *First Update to the Climate Change Scoping Plan* explains: "Achieving California's long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**" (CARB, *First Update to the Climate Change Scoping Plan*, May 2014, p. 46 (emphasis added).) In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the greenhouse gas emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.
- New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.
- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.
- Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.

- When assessing climate impacts of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity, supra.*)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR's Technical Advisory is not binding on public agencies, CEQA allows lead agencies to "consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence." (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR's extensive review of the applicable research and literature on this topic, **OPR finds that in most instances a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold.**

First, as described above, Section 21099 states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions." SB 743 also states the Legislature's intent that the analysis of transportation in CEQA better promotes the State's goals of reducing greenhouse gas emissions. It cites in particular the reduction goals in the Global Warming Solutions Act (AB 32) and the Sustainable Communities and Climate Protection Act (SB 375), both of which call for substantial reductions. As indicated above, CARB established long-term [reduction targets](#) for the largest regions in the state that ranged from 13 to 16 percent.

Second, Caltrans has developed a statewide VMT reduction target in its [Strategic Management Plan](#). Specifically, it calls for a 15 percent reduction in per capita VMT, compared to 2010 levels, by 2020.

Third, fifteen percent reductions in VMT are achievable at the project level in a variety of place types. ([Quantifying Greenhouse Gas Measures](#), p. 55 CAPCOA, 2010).

Fourth, in CARB's most recent update to the Climate Change Scoping Plan, a 15 percent reduction in light-duty VMT beyond what existing plan and policies achieve is recommended to achieve the State's 2030 and 2050 targets. (CARB, [The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target](#), October 2017, pp. 116, 150; see generally, CARB, [Climate Change Scoping Plan: A Framework for Change](#), December 2008, p. 27; CARB, [First Update to the Climate Change Scoping Plan](#), May 2014, p. 113; CARB, [The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target](#), October 2017, p. 149.)

The Final 2017 Scoping Plan Update states,

VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals." (CARB, [California's 2017 Climate Change Scoping Plan](#), November 2017, p. 75.)

Furthermore,

At the State level, a number of important policies are being developed. Governor Brown signed Senate Bill 743 (Steinberg, 2013), which called for an update to the metric of transportation impact in CEQA. That update to the CEQA Guidelines is currently underway. Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. (*Id.* at p. 76.)

....

Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375. The State can provide guidance and tools to assist local governments in achieving those objectives. (*Id.* at p. 76.)

....

California’s future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches. Further, the State’s understanding of transportation impacts continues to evolve. The CEQA Guidelines are being updated to focus the analysis of transportation impacts on VMT. OPR’s Technical Advisory includes methods of analysis of transportation impacts, approaches to setting significance thresholds, and includes examples of VMT mitigation under CEQA. (*Id.* at p. 102.)

Also, the Scoping Plan includes the following item as a “Recommended Action”: “forthcoming statewide implementation of SB 743[.]” (*Id.* at p. 103.)

Achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State’s emissions goals. The following pages describe a series of screening thresholds below which a detailed analysis may not be required. Next, this advisory describes numeric thresholds recommended for various project types. Finally, this advisory describes the analysis for certain unique circumstances.

## 1. Screening Thresholds for Land Use Projects

Many agencies use “screening thresholds” to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, and transit availability.

### *Screening Threshold for Small Projects*

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day<sup>6</sup> generally may be assumed to cause a less-than-significant transportation impact.

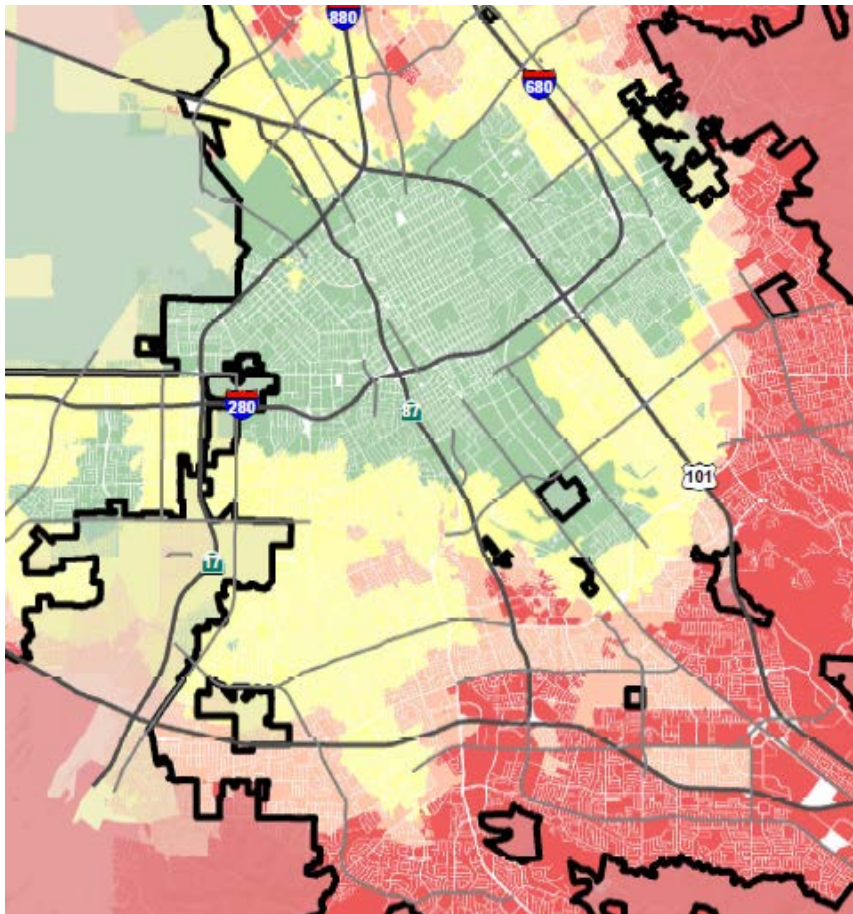
### *Map-Based Screening for Residential and Office Projects*

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with data from a travel survey or travel demand model can illustrate areas that are currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

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<sup>6</sup> CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.





**Figure 2.** Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

*Presumption of Less Than Significant Impact Near Transit Stations*

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop<sup>7</sup> or an existing stop along a high quality transit corridor<sup>8</sup> will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project

<sup>7</sup> Pub. Resources Code, § 21064.3 (“‘Major transit stop’ means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.”).

<sup>8</sup> Pub. Resources Code, § 21155 (“For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.”).



will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

## 2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

**Recommended threshold for residential projects:** A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing city VMT per capita should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.<sup>9</sup> It is critical, however, that the agency be consistent in its VMT measurement

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<sup>9</sup> See Appendix 1 for a description of these approaches.

approach throughout the analysis to maintain an “apples-to-apples” comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

**Recommended threshold for office projects:** A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an “apples-to-apples” comparison.

**Recommended threshold for retail projects:** A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,<sup>10</sup> estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project’s transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-specific information, such as market studies or economic impacts analyses that might bear on customers’ travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a

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<sup>10</sup> Lovejoy, et al., *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California*, *The Journal of Transport and Land Use*, 2013.

project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

### ***Mixed-Use Projects***

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

### ***Other Project Types***

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

### ***Redevelopment Projects***

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

### ***RTP-SCS Consistency (All Land Use Projects)***

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation.

#### 3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans over the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if it is not consistent with the relevant RTP-SCS.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

#### 4. Other Considerations

##### ***Rural Projects Outside of MPOs***

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

##### ***Impacts to Transit***

Because criteria for determining the significance of transportation impacts must promote "the development of multimodal transportation networks" pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds

destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

## F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as “induced vehicle travel,” would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining “project” under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining “project-specific effect” to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project’s environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported. (See, e.g., California Department of Transportation, [Guidance for Preparers of Growth-related, Indirect Impact Analyses](#) (2006).)

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects’ effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project’s transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

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

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

- Rehabilitation, maintenance, replacement and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Traffic metering systems
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage

- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes in rural areas that do not increase overall vehicle capacity along the corridor

## 1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)<sup>11</sup>
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)

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<sup>11</sup> The Air Resources Board has ascertained, in [The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target](#) (p. 116) and [Mobile Source Strategy](#) (p. 37), the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. The [Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets](#) (Figure 1, p. 10, and Figure 2, p. 23), illustrates that Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving GHG reductions research says is needed to achieve climate stabilization, so OPR recommends not basing transportation project thresholds on those documents.

- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The recommendations in this technical advisory may be updated over time.

## 2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project’s potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the “change in total VMT” method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

### ***Transit and Active Transportation Projects***

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

### ***Roadway Projects***

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.



Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., “elasticity”). (See U.C. Davis, Institute for Transportation Studies, [Increasing Highway Capacity Unlikely to Relieve Traffic Congestion](#), (October 2015); Boarnet and Handy, [Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions](#), California Air Resources Board Policy Brief, September 30, 2014.) Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study ([Duranton and Turner, 2011](#)), estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.

**To estimate VMT impacts from roadway expansion projects:**

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

$$[\% \text{ increase in lane miles}] \times [\text{existing VMT}] \times [\text{elasticity}] = [\text{VMT resulting from the project}]$$

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand

from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

### ***Mitigation and Alternatives***

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.<sup>12</sup> If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

## G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change “does not relieve a public agency of the requirement to analyze a project’s potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation.” OPR expects that lead agencies will continue to address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA’s requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments,

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<sup>12</sup> See *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, National Center for Sustainable Transportation, October 2015, available at [http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST\\_Brief\\_InducedTravel\\_CS6\\_v3.pdf](http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf); see Duranton and Turner, *The Fundamental Law of Road Congestion: Evidence from US cities*, 2011, available at <http://www.nber.org/papers/w15376>.

metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of the [General Plan Guidelines](#) summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

## H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation, supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid.*)

Several examples of potential mitigation measures and alternatives to reduce vehicle miles traveled are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.

- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking or roadway pricing or cash-out programs.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a “project’s incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact”].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- Locate the project in an area of the region that already exhibits low VMT.
- Locate the project near transit.
- Increase project density.
- Increase the mix of uses within the project or within the project’s surroundings.

- Increase connectivity and/or intersection density on the project site.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

## Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.<sup>13</sup> A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

### Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

*Trip-based* assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

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<sup>13</sup> The California Supreme Court has explained that when an agency has prepared an environmental impact report:

[T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

#### *Trip- and Tour-based Assessment of VMT*

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

#### *Assessing Change in Total VMT*

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

#### *Using Models to Estimate VMT*

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the [preliminary discussion draft](#)). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, agencies should use comparable data and methods, in order to set up an "apples-to-apples" comparison between thresholds, VMT estimates, and VMT mitigation estimates.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an “apples-to-apples” comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission’s [“2010 Regional Transportation Plan Guidelines,”](#) beginning at page 35.



## Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

*Evidence of Induced Vehicle Travel.* A large number of peer reviewed studies<sup>14</sup> have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

Most of these studies express the amount of induced vehicle travel as an “elasticity,” which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish “short run elasticity” (increase in vehicle travel in the first few years) from “long run elasticity” (increase in vehicle travel

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<sup>14</sup> See, for example, [Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief](#) (CARB, Sept. 30, 2014) and [Increasing Highway Capacity Unlikely to Relieve Traffic Congestion](#) (National Center for Sustainable Transportation, Oct. 2015).

beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0 (See [Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief](#), p. 2.), meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study (Duranton and Turner, [The Fundamental Law of Road Congestion: Evidence from US Cities](#), 2011) finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel. (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

*Quantifying Induced Vehicle Travel Using Models.* Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

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

However, estimating long-run induced VMT also requires an estimate of the project's effects on land use. This component of the analysis is important because it has the potential to be a large component of the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the

assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.

3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In some cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.