

**CALIFORNIA AIR RESOURCES BOARD  
2017 SCOPING PLAN-IDENTIFIED VMT REDUCTIONS  
AND RELATIONSHIP TO STATE CLIMATE GOALS**

**January 2019**



## **CARB 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals**

### **Purpose**

The California Air Resources Board (CARB) is responsible for developing a plan to detail how the State will achieve its greenhouse gas (GHG) emissions reduction targets mandated by law. In the transportation sector, GHG emissions reducing measures include low carbon fuels, cleaner vehicles, and strategies to promote sustainable transportation choices that result in reduced Vehicle Miles Traveled (VMT). This document includes information on what level of statewide VMT reduction, in the judgment of CARB staff, would promote achievement of statewide GHG emissions reduction targets. The data underlying the technical information in this document are the most recent available as of the time of this publication, and may be superseded when subsequent analysis is completed, resulting in updates to this paper.

The analysis in this document may serve multiple uses, including providing non-binding technical information that acts as an optional aide to local governments and lead agencies when evaluating an individual project's transportation-related GHG impacts to determine whether they are consistent with statewide 2030 and 2050 GHG emissions reduction goals. Pursuant to Senate Bill (SB) 743 (Chapter 386, Stats. 2013), the Governor's Office of Planning and Research (OPR) proposed updates to the California Environmental Quality Act (CEQA) Guidelines on how to analyze transportation impacts under CEQA. OPR selected VMT as the appropriate measure to analyze transportation impacts because it meets the statutory criteria of promoting the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses. The Natural Resources Agency has now certified and adopted the CEQA Guidelines update. Although lead agencies may utilize the VMT metric immediately, lead agencies statewide must utilize the metric by July 1, 2020.<sup>1</sup>

This document first provides background on how VMT and associated GHG emissions relate to state climate goals and why additional GHG emissions reductions through land use decisions are important beyond the GHG emissions reduction targets adopted under SB 375 (Chapter 728, Stats. 2008). Following that background, this paper describes two separate modeling scenarios developed by CARB staff showing possible pathways to quantify the project-level per capita VMT reduction that would be consistent with state climate goals.

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<sup>1</sup> See CEQA Guidelines § 15064.3(c).

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### Background

#### *Curbing Growth in VMT Helps Meet State Climate Goals*

CARB adopted the 2017 Update to the Scoping Plan (2017 Scoping Plan Update)<sup>2</sup>, as required by statute, as the State's plan to achieve the 40 percent reduction in GHG emissions from 1990 levels by 2030 mandated by SB 32 (Chapter 249, Stats. 2016). Implementing this plan puts California on a trajectory to achieve an 80 percent reduction from 1990 levels by 2050 reflected in Executive Order S-3-05, which is consistent with the Under2 Memorandum of Understanding.<sup>3</sup> The 2017 Scoping Plan Update includes a discussion of the relationship between local government actions and achievement of the State's long-term GHG emissions reduction goals, and non-binding recommendations to support local governments in their efforts to reduce GHG emissions.<sup>4</sup> Those non-binding recommendations include guidance for jurisdictions considering discretionary approvals and entitlements for individual projects under CEQA.

The 2017 Scoping Plan Update states: in many instances, "achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development," and also recognizes that achieving a net zero increase in GHG emissions may not be appropriate or feasible for every project.<sup>5</sup> Indeed, there are circumstances when certain types of development projects, by virtue of their location and land use context, are likely consistent with state climate goals, when considered on a per capita VMT basis. To illustrate as much, this paper describes situations in which focusing on VMT metrics may provide for consistency with State climate goals. In other words, VMT metrics and GHG metrics can support each other.

Such developments would be consistent with the State's climate goals because they minimize growth in VMT consistent with those overall goals. VMT is a proxy for transportation-related GHG emissions and the associated effect on the climate (see modeling information below). The 2017 Scoping Plan Update identifies that slower growth in VMT from more efficient land use development patterns would promote achievement of the State's climate goals.<sup>6</sup> This paper provides non-binding information intended to be helpful to local governments as they adopt thresholds of significance

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<sup>2</sup> Health & Saf. Code § 385561, subd. (a); CARB, 2017 Scoping Plan Update, available at [https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf).

<sup>3</sup> <https://www.under2coalition.org/under2-mou>.

<sup>4</sup> 2017 Scoping Plan Update, pages 97-102.

<sup>5</sup> 2017 Scoping Plan Update, page 101.

<sup>6</sup> Ibid.

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used to review individual projects and determine whether the VMT associated with the project is consistent with State climate goals.

### *Relationship of SB 375 Targets to State Climate Goals*

The Sustainable Communities and Climate Protection Act of 2008, SB 375, encourages regional planning that integrates land use and transportation policy in a way that reduces GHG emissions from driving, and ultimately results in healthier, more efficient, and equitable communities. The VMT metrics discussed below may be used in combination with a consideration of consistency with a Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) adopted pursuant to SB 375. This section describes the relationship between the GHG emissions and VMT reductions used to derive those plans, and the documented gap between those plans and achievement of state climate goals.

Under SB 375, the development and implementation of SCSs, which link transportation, land use, housing, and climate policy, are designed to reduce per capita GHG emissions. This is partially accomplished through reductions in per capita light-duty VMT. Under SB 375, CARB is required to establish regional GHG emissions reduction targets (targets) that apply to RTPs prepared by the State's MPOs. CARB initially established targets in 2010, and recently updated those in 2018.<sup>7</sup>

Currently adopted SCSs would achieve, in aggregate, a nearly 18 percent reduction in statewide per capita on-road light-duty transportation-related GHG emissions relative to 2005 by 2035, if those SCSs were successfully implemented.<sup>8</sup> However, the full reduction needed to meet our climate goals is an approximately 25 percent reduction in statewide per capita on-road light-duty transportation-related GHG emissions by 2035 relative to 2005.<sup>9</sup> CARB explored setting the updated 2018 SB 375 targets at the level necessary to attain state climate goals, and determined that those targets would be infeasible for MPOs to achieve with currently available resources.<sup>10</sup>

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<sup>7</sup> CARB, Updated final Staff Report, Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets (Feb. 2018), available at,

[https://www.arb.ca.gov/cc/sb375/sb375\\_target\\_update\\_final\\_staff\\_report\\_feb2018.pdf](https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf).

<sup>8</sup> *Ibid.*

<sup>9</sup> *Ibid.*

<sup>10</sup> CARB, Appendix F, Final Environmental Analysis, Prepared for the Proposed Updated to the SB 375 GHG Emissions Reduction Targets (Mar. 2018), available at,

[https://www.arb.ca.gov/cc/sb375/sb375\\_target\\_update\\_final\\_ea.pdf](https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_ea.pdf).

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CARB modeled a scenario (i.e., the *Baseline* scenario shown in Figures 1, 2 and 3, below and discussed in more detail in the following section) that reflects the VMT activity through year 2035 assumed in the SCSs adopted as of 2016. The updated 2018 SB 375 targets call for higher per capita GHG emissions reductions than were assumed in the *Baseline* scenario but additional per capita GHG emissions reductions will be needed to meet the State's climate goals above and beyond what it would take to meet the SB 375 targets.

An RTP/SCS that meets the applicable SB 375 targets alone will not produce the GHG emissions reductions necessary to meet state climate goals in 2030 nor in 2050. This means that SB 375 targets are not stand-alone CEQA thresholds for GHG or transportation impact analysis (though SCS compliance may nonetheless entitle projects to certain CEQA exemptions or streamlining procedures pursuant to statute). In other words, a project that is consistent with an SCS may be eligible for certain exemptions, but compliance does not necessarily more broadly imply consistency with state climate goals nor with science-based GHG reduction targets, in CARB staff's non-binding view. Some land use development projects contemplated in an SCS that will be operational in 2030 and 2050 will be consistent with state climate goals, and SB 375 defines project circumstances under which CEQA streamlining is available to qualified projects consistent with an SCS. Other projects may need to consider additional mitigation measures to further reduce per capita light-duty transportation-related GHG emissions to levels that would not conflict with state climate goals. Likewise, certain transportation infrastructure projects that will be operational in 2030 and 2050 that substantially increase VMT may conflict with state climate goals, even if they are included in an SCS that meets the applicable SB 375 targets.

Ultimately, project evaluation continues to be in the purview of local planners. This paper's function is to provide a crosswalk amongst potential metrics, as they relate to modeling and scientific analysis offered by the State. As shown below, VMT metrics may serve as an important adjunct or complement to GHG metrics.

*Additional per capita GHG emissions reductions will be needed to meet the State's climate goals above and beyond what it would take to meet the SB 375 targets.*

...

*SB 375 targets are not stand-alone CEQA thresholds for GHG or transportation impact analysis.*

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### Pathways to Reduce GHG Emissions from Transportation and Land Use

This section describes the scenario modeling completed by CARB staff in support of achieving statewide GHG emissions reduction goals. It also documents the results of that modeling most relevant to the analysis of VMT and transportation-related GHG emissions from land use development projects.

Mobile sources, and the fossil fuels that power them, are the largest contributors to the formation of ozone, fine particulate matter, and GHG emissions in California, thus significant cuts in pollution from transportation sources are needed to mitigate climate change and to reduce local and community level pollution exposures.

In May 2016, CARB released the updated Mobile Source Strategy<sup>11</sup> that demonstrates how the State can simultaneously meet air quality standards, achieve 2030 and 2050 GHG emission reduction targets, decrease health risk, and reduce petroleum consumption from the transportation sector. CARB developed a scenario-based modeling system (Vision<sup>12</sup>) that was used to identify foreseeable emission reductions associated with existing mobile-source regulations, and to explore different combinations of further advancements in technologies, fuels, and transportation system efficiencies. This modeling usefully relates VMT and GHG metrics to each other, and can be a useful source of information for planners considering projects using one or the other of these metrics. Specifically, in support of the Mobile Source Strategy, CARB developed two scenarios using the Vision model that are particularly relevant with respect to GHG emissions from the transportation sector:

- The *Baseline* scenario represents the mobile-source GHG emissions reductions associated with existing mobile-source controls, regulations, foreseeable deployment of technology, and current projections of VMT included in the existing Regional Transportation Plans/Sustainable Communities Strategies (RTP/SCSs) adopted by the State's 18 Metropolitan Planning Organizations (MPOs) pursuant to SB 375 as of 2015.<sup>13</sup>
- The *Cleaner Technologies and Fuels (CTF)* scenario evaluates what level of additional deployment of cleaner vehicle technologies and fuels combined with

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<sup>11</sup> CARB, 2016 Mobile Source Strategy, available at, <https://www.arb.ca.gov/planning/sip/2016sip/2016mobsr.htm>.

<sup>12</sup> CARB, vision Scenario Planning, available at, <https://www.arb.ca.gov/planning/vision/vision.htm>.

<sup>13</sup> VMT included in the *Baseline* scenario is based on 2015 Federal Statewide Transportation Improvement Program (FSTIP) for 17 Metropolitan Planning Organizations (MPOs), and for the Southern California Association of Governments (SCAG), it was based on SCAG's draft 2016 RTP/SCS. For non-MPO regions, VMT was based on CARB's default EMFAC2014 model.

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slower growth in VMT would be necessary to achieve state air quality targets and climate goals of 40 percent reduction in GHG emissions from 1990 levels by 2030 and 80 percent by 2050.

While the *CTF* scenario is not intended to be a specific forecast of the future, it is based on technology and fuels assessments that evaluate the current state and projected development of mobile-source technologies and fuels, their suitability in different applications, current and anticipated costs at widespread deployment (where available), and emissions levels. The *CTF* scenario does quantify the importance of GHG emissions reductions from vehicle technology, fuels, and slower growth in VMT, and the interaction of those three factors.

Note that this modeling does not fully quantify the benefits of VMT reduction: Neither scenario quantifies complementary GHG emissions reduction benefits in other sectors that can accompany VMT-reducing strategies. For example, VMT reduction provides policy resiliency and support for GHG emission reductions overall by supporting reduced vehicle use, reduced energy consumption in buildings, preservation of natural and working lands, and reduced water consumption and conveyance from more compact land use planning. Further, lower VMT is associated with additional co-benefits such as placemaking (creation of quality public spaces) that leads to local economic development, overall economic growth, reduction in other air pollutant emissions and water pollution, reduction in traffic congestion, and improvements in safety and public health, among others.

While the majority of the mobile-source GHG emissions reductions in the modeling are assumed to come from new vehicle technologies and low carbon fuels, reductions from curbing growth in VMT are also necessary to meet climate targets. Indeed, VMT reductions from the baseline are likely more important to meet climate targets than the modeling alone suggests, as increasing demand on vehicle use puts pressure on other aspects of California's climate policies.<sup>14</sup>

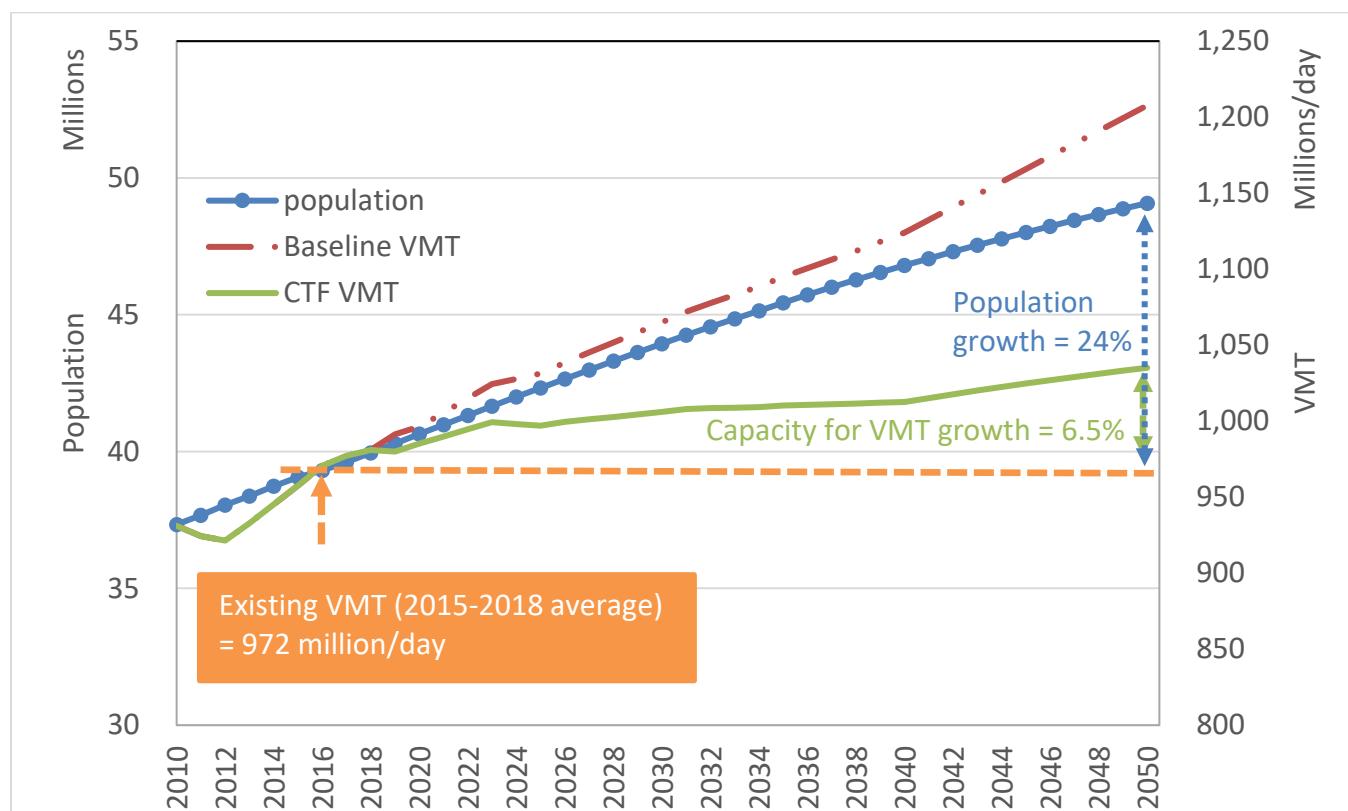
It is important to note that both of CARB's planning scenarios assume that total VMT in California still continues to grow, though at a slower rate of growth. There is no expectation or endorsement of any policy that would require the total statewide VMT to decrease such as to limit population growth, limit new housing growth, support out-migration, or slow economic growth in the State.

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<sup>14</sup> See generally, CARB, 2018 Progress Report, California's Sustainable Communities and Climate Protection Act, available at, [https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report\\_SB150\\_112618\\_02\\_Report.pdf](https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf)

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Figure 1 below plots the projected daily VMT that would occur under the *Baseline* scenario and under the *CTF* scenario, along with projected population growth. When compared to existing conditions, defined here as the average VMT from 2015-2018, the *CTF* scenario can accommodate a cumulative increase in total statewide daily VMT of about 6.5 percent in 2050 (about 63 million daily VMT), and still achieve the 2050 climate goal. According to the California Department of Finance, the State's population is projected to grow by nearly 10 million people, or 24 percent over that same time period.<sup>15</sup> If California is to meet its climate goals, average statewide per capita VMT must be reduced well beyond the trajectory in which the State is currently headed.



**Figure 1: California Total Projected Population Growth and VMT Growth**

<sup>15</sup> Department of Finance, Total Estimated and Projected Population for California Counties: July 1, 2010 to July 1, 2060 in 1-year Increments, available at [http://www.dof.ca.gov/Forecasting/Demographics/Projections/documents/P1\\_County\\_1yr\\_interim.xlsx](http://www.dof.ca.gov/Forecasting/Demographics/Projections/documents/P1_County_1yr_interim.xlsx).

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As noted above, the 2017 Scoping Plan Update identifies that per capita VMT reductions from land use and transportation projects are necessary to achieve the Statewide GHG emissions reduction goals, but will not alone achieve the goals.<sup>16</sup> It is reasonable for new development to achieve a fair share of per capita VMT and GHG emissions reductions necessary to achieve statewide climate goals and to continue to work towards additional VMT and GHG emissions reductions through other measures. The remainder of this document presents quantitative information about the rate of per capita VMT reduction needed on a statewide average basis compared to existing conditions to achieve the State's long-term climate goals. This rate of per capita VMT reduction is scalable to a fair share reduction at the project level.

### **Technical Guidance: Linking Transportation and GHG Emissions Impact Analyses from Land Use Projects**

The results from CARB's GHG emissions and air quality modeling exercise show what slower growth in VMT consistent with the *CTF* scenario would deliver on the State's GHG emissions reduction goals under the model's conditions. Accordingly, these data may provide planners a method to determine when an individual project may be consistent with state GHG emissions reduction goals. Although use of these data are, of course, optional, it may aid in project evaluation.

Climate change is inherently driven by cumulative impacts, and no single project alone will cause a detectable change in the global climate. However, when taken together, many land use development projects, large or small, that deviate from the needed trajectory to hit California's GHG targets would result in a substantial conflict with California's GHG emission reduction goals, which would amount to a cumulatively substantial contribution of GHG emissions and the resulting global significant environmental impact of catastrophic climate change. On the other hand, projects that accommodate population and/or employment growth with lower VMT will help the State slow growth in transportation-related GHG emissions, and will support achievement of state climate goals.

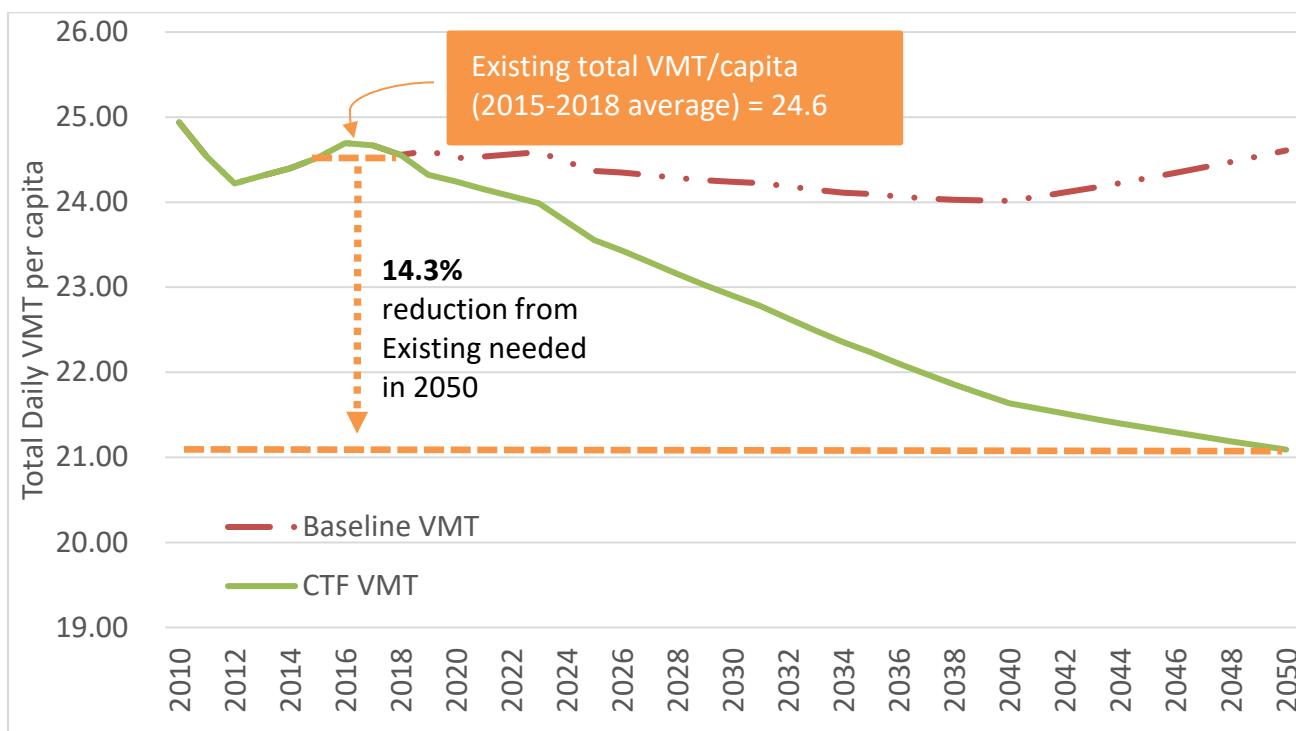
The following paragraphs provide parameters for when a project, at the discretion of local planners, could be considered low-VMT and consistent with state climate goals by linking the project to the VMT assumptions in the *CTF* scenario.

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<sup>16</sup> 2017 Scoping Plan Update, page 101.

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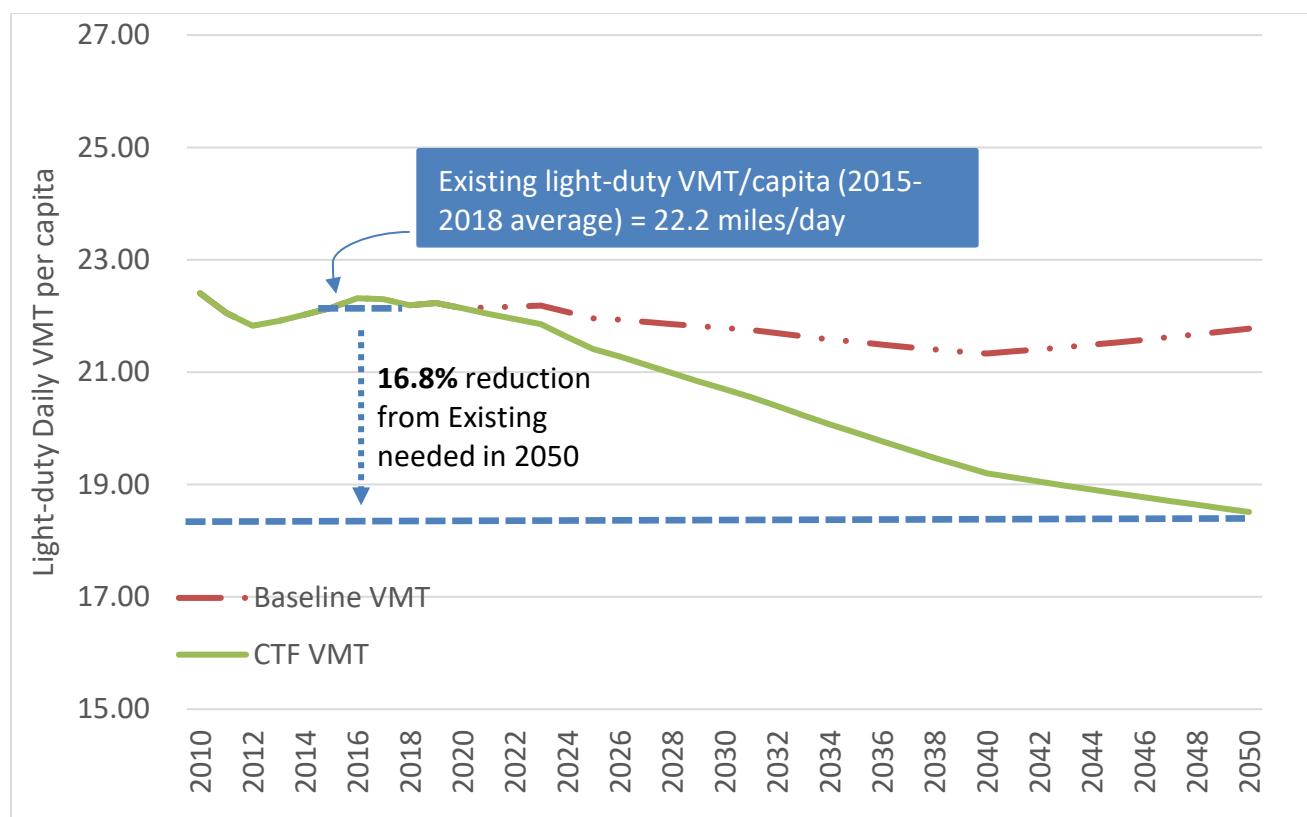
Figure 2 below shows the extent of the reduction in **total** daily VMT per capita assumed in the *CTF* scenario compared to the *Baseline* scenario relative to existing conditions (defined as 2015-2018 average total VMT per capita). Total VMT per capita is calculated as a ratio of total statewide VMT to forecast population from the California Department of Finance. This is not household-generated VMT, and the values are not directly comparable to output from a local or regional travel demand model. This estimate is merely meant to show the extent of per capita VMT reduction needed relative to existing conditions in order to show consistency with the State's climate goals.



**Figure 2: California Total Daily VMT Per Capita**

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Figure 3 below shows the extent of the reduction in **light-duty** daily VMT per capita assumed in the *CTF* scenario compared to the *Baseline* scenario relative to existing conditions (defined as 2015-2018 average light-duty VMT per capita). Light-duty VMT per capita is calculated in the same way as in Figure 2 above: as a ratio of total statewide light-duty VMT to forecast population from the California Department of Finance. This is not household-generated VMT, and the values are not directly comparable to output from a local or regional travel demand model. This estimate is merely meant to show the extent of per capita light-duty VMT reduction needed relative to existing conditions in order to show consistency with the State's climate goals.



**Figure 3: California Light-Duty VMT Per Capita**

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These curves show the per capita VMT levels that are consistent with the modeling completed in support of the 2017 Scoping Plan Update and the 2016 Mobile Source Strategy, and can serve as an alternate assessment tool for jurisdictions that choose to use them to complete analyses directed by the CEQA Guidelines. Certain land use development projects located in areas that would produce rates of **total** VMT per capita that are approximately 14.3 percent lower than existing conditions, or rates of **light-duty** VMT per capita that are approximately 16.8 percent lower than existing conditions (either lower than the regional average or other appropriate planning context) could be, by virtue of their location and land use context, interpreted to be consistent with the transportation assumptions embedded in the 2017 Scoping Plan and with 2050 State climate goals.

### Conclusion

This paper summarizes modeling completed by CARB staff that includes information about the extent to which VMT reductions are necessary to achieve the State's 2030 and 2050 climate goals. These data are the most recent available as of the time of this publication, and may be superseded when subsequent analysis is completed in support of future updates to the Scoping Plan or other relevant statewide planning or modeling documents for the reduction of GHG emissions. The results and recommendations presented herein are non-binding, and intended as supportive documentation that can be used at a lead agency's discretion to help substantiate significance thresholds used for purposes of compliance with SB 743, and to help minimize occurrence of duplicate or redundant analysis across transportation and climate resource impact areas under CEQA.