Attachment 1 - Detailed List of CARB Questions, Issues, Suggested Remedies, and Comments

SACOG 2025 MTP/SCS SB 375 GHG Emissions
June 2023 Draft Final Technical Methodology
and March & July 2024 follow-up information

This document details CARB's response to new information sent by SACOG staff in March and July 2024. The document is organized into different sections according to the type of issue. For example, the first section outlines specific concerns about SACOG's technical methodology used to quantify greenhouse gas reductions, and subsequent sections highlight areas where we simply have clarifying questions.

Significant issues

1. Travel modeling and data

1.1 Exogenous variables

CARB staff appreciate that SACOG staff provided additional detail, including specific values and assumptions on the exogenous variables that will be used for its plan analysis. Please see comments on auto operating costs (1.1.1), telework assumptions (1.4.1), and interregional travel (1.2) below.

1.1.1 Auto operating cost assumptions and values

CARB staff reviewed this TM's proposed methodology for calculating auto operating costs (AOC) and determined that it would yield results that CARB cannot confirm are accurate. Specifically, the method provided uses some elements of the method in CARB's 2019 Final Sustainable Communities Strategy Program and Evaluation Guidelines (2019 SCS Evaluation Guidelines) (e.g., the fleet mix from the Advanced Clean Cars [ACC] I regulation) and adds fuel efficiency rebound effects as a new variable, which increases the AOC values in the future years (e.g., 2035). Applying a fuel efficiency adjustment as an update to the model while not applying other updates, such as the updated fleet mix in ACCII, will overestimate AOC values and underestimate the GHG emissions. Other specific concerns are described as follows:

- This TM's AOC methodology assumes the same vehicle miles traveled (VMT) elasticity to fuel price by fuel types (gasoline, diesel, EV, and hydrogen). In contrast, the literature shows higher price elasticity for gasoline and diesel than for electric and hydrogen vehicles.

- The fuel efficiency adjustment methodology is not possible for CARB staff to validate, particularly in adjusting for long-term fuel efficiency changes. Even small changes in inputs produce large differences in outcomes.
- The fuel efficiency adjustment equates the elasticities of fuel efficiency and fuel price by assuming that a change in fuel efficiency will cause driving behavior to vary in the same ways as a change in fuel price. These elasticities are driven by different causes (price vs. technological change), and different behavioral responses are measured, even if the outcome is the same (i.e., VMT). Equating fuel price and efficiency elasticities to calculate the adjusted fuel efficiency oversimplifies the complex interplay between these factors and their distinct impacts on VMT.
- The fuel efficiency adjustment methodology does not distinguish between vehicles (e.g., gasoline, diesel, electric), which may underemphasize future travel behavior for electric and hybrid vehicles, especially as their adoption increases.
- The AOC methodology assumes that the non-fuel costs for hybrid and EV vehicles will be the same as the non-fuel costs for gasoline vehicles. However, the literature shows that EVs' non-fuel costs are 40 percent less than gasoline vehicles.[1]

CARB staff have identified updating the AOC methodology as a priority for the next cycle of SCSs and intend to continue working with MPOs to update the methodology as part of CARB's 2019 SCS Evaluation Guidelines update process. This process will require extensive research to accurately reflect new data and regulations, public input, and continued collaboration between the MPOs and CARB staff.

Remedy: Please revise the TM to use the AOC methodology in CARB's 2019 SCS Evaluation Guidelines. This should include unadjusted fuel efficiency and the latest fuel price. In addition, please revise the non-fuel cost appropriately for EVs and hybrid vehicles. As part of the revised TM, please provide a spreadsheet that documents the calculation and actual values used for CARB staff verification.

1.2. Interregional travel assumptions and validating data sources

CARB staff appreciate that SACOG staff has provided a detailed discussion of the proposed methodology to forecast interregional travel (Attachment 1.2 submitted on July 26, 2024). For the 2025 MTP, this TM uses a predictive curve methodology to estimate the region's interregional travel at the gateway locations. However, from the

[1] Burnham, Andrew, Gohlke, David, Rush, Luke, Stephens, Thomas, Zhou, Yan, Delucchi, Mark A., Birky, Alicia, Hunter, Chad, Lin, Zhenhong, Ou, Shiqi, Xie, Fei, Proctor, Camron, Wiryadinata, Steven, Liu, Nawei, and Boloor, Madhur, 2021. Comprehensive Total Cost of Ownership Quantification for Vehicles with Different Size Classes and Powertrains

documentation, it is not clear how this sub-model was calibrated and validated. Further, the implications of this update on the overall GHG emission estimation are unclear as the volumes and how those compare to the prior SCS and to the estimates generated by neighboring regions are not provided.

Remedy: Please revise the TM as follows:

(1) Provide the calibration and validation results of the interregional travel sub-model.
(2) Update Table 2 (Interregional Volume Assumptions for Major Highway Gateways) to include the traffic volume assumptions for all 30 gateways. Table 2 currently only includes data for 11 gateways.

1.3 Induced travel demand calculations and assumptions

This TM proposes using a hybrid approach to quantify the induced VMT and GHG emissions from transportation projects that increase road capacity. For long-term induced travel demand, the TM proposes to quantify GHG emissions from only the roadway capacity-increasing projects that are assumed to be built by 2027. The TM notes that this is because the long-term induced travel takes effect between 5 to 10 years, and the midpoint is 8 years from 2035. However, this approach is likely to result in overestimating the value of GHG emission reductions assumed by 2035 today by undercounting the full impact on GHG emissions from induced travel for capacity-increasing projects assumed to be built by 2035.

The second issue is that this TM subtracts truck VMT based on general adjustment factors from the literature. However, the adjustment estimate for the proportion of truck traffic in the base and future years will need to be based on local traffic conditions, supported by truck traffic model calibration and validation results, to ensure the region's adjustments are reasonable.

The third issue is that this TM proposes adjusting the long-term induced travel elasticity for transportation investments paired with land use growth. From the technical methodology, it is unclear how the qualitative case studies will be used to adjust the quantitative elasticity of the hybrid approach. Further, this approach is not supported by any existing research that CARB staff are aware of. Finally, in section 6 below, CARB staff identifies questions that remain about the land use development plans. CARB will not be able to accept this TM's current approach as described.

Remedy: Please revise the approach to quantify the full impact on GHG emissions from induced travel for roadway capacity-increasing projects that are roadway classes 1, 2, and 3 that are assumed to be built by 2035. Consider also analyzing the full impact of induced travel demand from capacity-increasing projects that are assumed to be built by 2050 to ensure GHG emission reductions are not backsliding after the 2035 GHG emission reduction target is achieved.

Please revise the hybrid approach steps to either calculate the region's specific truck traffic on classes 1, 2, and 3 roadways in the SACOG region and adjust the elasticity appropriately or exclude truck adjustments while calculating the long-term induced travel.

Please remove the proposed adjustment to the elasticity for land use growth or provide additional justification and clarification for CARB staff's consideration.

Information request for the draft 2025 MTP/SCS: As part of the draft 2025 MTP/SCS, please provide a comprehensive mapping and tabulated list of all projects that will add lane miles by functional classification with the number of lanes added, specifying lane types such as general purpose, HOV, HOT/Express, tolled, and auxiliary lanes. This information will be needed for CARB to evaluate SACOG's final GHG emission reduction determination.

1.4 2023 travel model documentation and sensitivity analyses

CARB staff appreciate that SACOG staff provided the complete sensitivity analysis for the Draft SACSIM23 travel demand model (attachment 1.4 submitted on March 21, 2024). However, CARB staff's feedback on some of the model assumptions and sub-models (e.g., AOC, telework) is likely to affect these draft results; hence, the sensitivity test results should be revisited once modeling changes have concluded.

CARB has also not yet received model documentation for SACSIM23.

Remedy: Please coordinate with CARB staff and revise the draft TM to include updated sensitivity analyses for any new or revised sub-models and for any new or revised on-model strategies, along with details on assumptions (as applicable) before the draft 2025 MTP/SCS is released for public review. Also, please provide documentation for SACSIM23 as soon as it becomes available.

1.4.1. Estimating telework impacts

This TM estimates that the percentage of workers teleworking ("no work-related travel") was 35% in 2021 and 34% in 2022 using multiple datasets, including the American Community Survey (ACS), a National Bureau of Economic Research Working Paper, and a Sacramento Region Employer Survey. Teleworking share in each dataset varies significantly, and the definition of teleworking also differs from one dataset to another. For example, this TM cites the 2022-2023 Sacramento Region Employer Survey data to forecast part-time telework rates that are three times that of the ACS (65% vs. 19.5%), which seems to influence the final telework estimates. The comparatively high telework estimates in the Sacramento Region Employer Survey might be due to the survey underrepresenting industries that have lower telework rates (e.g., 9% of the region's employees work in retail sales, but only 2.6% of

employers surveyed were from the retail industry, 17% of the region's employees work in health services, but only 5% of the employers surveyed were from the healthcare industry), or because the TM assumes that *all* of an employer's workers will telework part-time if the employer indicated that their future workforce will be a "mix of in-person and remote."

In addition, the TM uses "Euler's method," essentially an annual reduction rate, to forecast telework rates for 2024 through 2050 but does not provide literature or empirical evidence to support the methodology and assumptions. Recent ACS data shows SACOG region telework rates trending downward at a rate of 15% per year between 2021 and 2022 (declining from 22.8% in 2020 to 19.3% in 2022), which is a much steeper decline than what the TM is proposing.

Remedy: Please revise the telework assumptions for 2021 to 2023 to be consistent with observed telework activity, as reported in ACS, the Bureau of Labor Statistics' American Time Use Survey (ATUS), or the Survey or Working Arrangements and Attitudes (SWAA). Please provide additional detail and justification for the methodology and assumptions used to forecast 2024 through 2050 telework rates.

2. Calculations and emissions factors for off-model strategies

A significant mismatch exists between the off-model strategies listed in Attachment A2 (submitted July 26, 2024) and the GHG reduction strategies listed in Attachment A3 (also submitted July 26, 2024). For example, some of the off-model strategies listed in Attachment A2 are not listed in Attachment A3. CARB staff understand that the strategies to be undertaken and quantified may still change as part of the region's public planning dialogue, but because of this mismatch, CARB staff cannot be certain that the comments in Section 2 regarding off-model strategies are complete.

Remedy: Please remedy the mismatch between Attachments A2 and A3 by providing a list of GHG reduction strategies that are consistent with the off-model calculation methodologies provided in A2. If off-model strategies in Attachment A3 are considered for the 2025 MTP/SCS, please provide the quantification methodologies for those strategies.

2.1 Local programs to increase electric vehicle market penetration

Attachment A2, submitted by SACOG staff on July 26, 2024, notes three electric vehicle (EV)-related strategies: (1) local EV purchase rebates, (2) local EV recharging cost rebates, and (3) local incentives for EV supply equipment (EVSE). CARB staff reviewed all three strategy quantification methods and found them unlikely to result in acceptable estimates for the SB 375 program.

Local EV Incentives

This TM quantifies GHG benefits from local EV incentives (EV purchase rebates and EV recharging cost rebates) by estimating increased EV marginal sales by assuming a 3-7% increase in EV sales per $1,000 local incentive. This methodology significantly deviates from the recommended method in the SCS Evaluation Guidelines under the SB 375 program. Further, SACOG's proposed methodology uses the 3-7% range by citing: (1) a U.S. study found that every $1,000 offered as a rebate or tax credit increased average EV sales by 2.6%; (2) a European study found that financial incentives yield about 5–7% relative sales share increase per €1,000. The issue with this assumption is that the European study may not be applicable to the Sacramento region, and the U.S. study evaluated data from 2010-2015 when market conditions and vehicle technology were significantly different than today. Numerous recent studies (e.g., Lee and Nillson, 2025[2]) have explored the relationship between incentives and EV sales, which should be considered in developing this methodology. CARB staff is willing to work with SACOG to revise the EV marginal sales rate based on the latest research and data; however, this may require additional back and forth, which may not work within SACOG's SCS adoption timeline.

Furthermore, the proposed approach ignores federal and State incentives and claims all GHG reductions are from local incentives. In addition, the description claims the benefits are not accounted for beyond 2030, but the formulas on pages 32 and 33 of Attachment 2 refer to 2035 as the final year of the calculations. Given all these issues, CARB staff recommends revising the methodology to be consistent with the SCS Evaluation Guidelines.

This TM also claims an increase in EV sales due to EV recharging cost rebates. To validate the benefits, additional research and statistical data are needed to support the idea that recharging cost rebates increases EV sales. Further, this TM did not provide details on who is providing these incentives and how many are utilizing them. This may overestimate the GHG benefits attributable to the local incentives. At this time, only the two electric vehicle strategies outlined in the 2019 SCS Evaluation Guidelines are recommended for quantifying the SB 375 GHG emission reductions from electric vehicles. Assessing the impact of other EV strategies that are not addressed in the existing guidelines would require additional data and technical work that is likely beyond the available timeframe for SCSs in the fourth cycle.

Remedy: Please update the quantification method for local EV incentives similar to the method provided in the SCS Evaluation Guidelines. In addition, include the latest EV regulations, market conditions, and currently planned incentives. Further, the cost differential between ZEV and non-ZEV and impending cost parity in 2031 should be accounted for in the final GHG emissions quantification. The inclusion of ZEV

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[2] Lee and Nillson (2025), An examination of the effect of external factors on zero-emission vehicle adoption in the United States. https://doi.org/10.1016/j.tbs.2024.100904

incentives after 2031 may overestimate GHG emission reductions. In addition, the TM should exclude the benefits claimed due to EV recharging cost rebates. Without this information, CARB staff cannot evaluate and/or accept the proposed methods outlined in the TM.

Local incentives for charging infrastructure or electric vehicle supply equipment (EVSE)

This TM quantifies the GHG benefits of charging infrastructure incentives by estimating additional EV sales due to the availability of EV charging infrastructure. Under the SB 375 program, GHG benefits are provided for converting cVMT to eVMT through workplace charging infrastructure for PHEVs, not for the EV sales increases (see CARB's 2019 SCS Evaluation Guidelines Appendices). To assess the impact of charging infrastructure on EV sales would require additional data and technical work that is likely beyond the available timeframe for SCSs in the fourth cycle.

Remedy: Please revise the methodology for EV charging infrastructure to reflect credit for PHEVs alone for the appropriate portion of the commute and take into account the average increase in the eVMT range per PHEV due to the increased battery capacity.

Information request for the draft 2025 MTP/SCS: Please identify the policies, programs, and/or investment actions that support the local EV incentives and any applicable PHEV charging infrastructure strategies. At a minimum, please identify the funding sources, and number of EV incentives and charging infrastructure.

2.2. Transportation system management (TSM)/intelligent transportation systems (ITS) projects

In Attachment A2, SACOG staff states that the 2025 SCS assumes "aggressive deployment" of a broad set of TSM/ITS strategies. The methodology for calculating the GHG benefits of these strategies relies on non-empirical literature (the Moving Cooler report prepared by Cambridge Systematics for FTA) to support an aggregate GHG reduction based on a qualitative description of policies and programs related to TSM/ITS. It does not give step-by-step calculations to estimate GHG emission reductions from each of those strategies. Further, it is unclear how aggregated reductions from the Moving Cooler report are applied to the individual TSM/ITS strategies. In addition, the reduction estimated in the Moving Cooler report may not be valid anymore, given that the research was conducted about two decades ago.

Remedy: Please revise the TM to use the TSM/ITS off-model quantification methodology provided in CARB's 2019 SCS Evaluation Guidelines Appendices (p. 98-99).

Information request for the draft 2025 MTP/SCS: Please identify the policies, programs, and/or investment actions that support the TSM/ITS strategy. At a minimum, please identify the following

- Anticipated deliverables for each component of the TSM/ITS strategy
- Cost estimate
- Funding sources and commitments to implement the TSM/ITS strategy

2.3 Employer-based trip reduction strategies

To estimate the GHG emission reductions from the employer-based trip reduction program, this TM cites elasticities from multiple sources ("Boarnet/Hsu/Handy," "CAPCOA," and "GHG Handbook"). Still, it is not clear which elasticity was used to quantify the GHG emissions. This TM also provides several assumptions for the input variables and the resulting VMT/GHG reduction estimates but does not provide step-by-step calculations to show how the input variables and assumptions resulted in those VMT/GHG reduction percentages.

This TM indicates that it plans to use the following assumptions in its calculations but does not provide any justification or literature evidence to support the assumptions:

- Commute VMT share: +/- 50%
- Worker coverage rate (defined by the TM as "the number of employees offered incentives or other programs"): 50-60% (2020), 50-80% (2035)

This methodology applies the magnitude of effect for metropolitan areas (4-6% reduction) to the entire SACOG region's commute population (including rural regions), which may overestimate the benefits. Further, it is unclear if SACOG's program will include the type of financial incentives that would justify such a high magnitude of effect.

Remedy: Please include a clear description of the preferred/chosen methodology, including the step-by-step calculations to show how the inputs and assumptions will be used to estimate GHG reductions from the employer-based trip reduction strategy. Please provide justification and/or evidence from the literature to support the assumptions used in the calculations.

Information request for the draft 2025 MTP/SCS: Please identify the policies, programs, and/or investment actions that support the employer-based trip reduction strategy. At a minimum, please provide the following:

- Cost estimate for this strategy (e.g., direct subsidy/incentive amounts, administration costs)

- Funding sources and commitments to implement the employer-based trip reduction strategy, including plans to support the administration of the program and the proposed direct incentives. This TM indicates that "TMAs [transportation management associations] would be the 'likely' administrators" of such a program, but CARB staff's understanding is that SACOG discontinued regular/ongoing funding for TMAs some years ago, and very few of the current TMAs have adequate funding to support direct incentive programs.

2.4 Bikeshare programs

The estimate of the GHG benefits of bikeshare, as described in Attachment A2, is likely to overestimate GHG emission reductions by assuming significantly increased bikeshare usage. For example, it estimates 120,000-280,000 daily trips in CY 2035, compared to the current share of 1,000-2000 daily trips (nearly all of which are on e-scooters).[3] Further, it assumes that 40% of bikeshare trips will replace car trips, which is higher than the mode shift rate from car to bikeshare that CARB has found in recent research.[4, 5]

Remedy: Please revise the TM to include more realistic estimates of bikeshare usage rates, given the current usage data for the Sacramento region peer bikeshare systems. Also, please revise the mode shift rate from car to bikeshare. For example, consider the research cited above, or other research.

Information request for the draft 2025 MTP/SCS: Please identify the policies, programs, and/or investment actions that support the bikeshare strategy. At a minimum, please provide the following:

- Cost estimate for the bikeshare program (e.g., capital, operating, administration costs)
- Funding sources and commitments to implement the bikeshare strategy
- Plans and commitments for the program's administration, ownership, and oversight (e.g., public-private partnership, publicly owned/operated).

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[3] SACOG's micromobility dashboard

[4] Fukushige, T., Fitch, D. T., & Handy, S. (2023). Estimating Vehicle-miles traveled reduced from Dock-less E-bike-share: Evidence from Sacramento, California. Transportation research part D: transport and environment, 117, 103671.

[5] Krauss, K., Doll, C., & Thigpen, C. (2022). The Net Sustainability Impact of Shared Micromobility in Six Global Cities.

2.5 Mobility hubs

This TM calculates the GHG benefits of its mobility hubs strategy by summing the benefits of a car sharing strategy with the benefits of a microtransit strategy. This TM also quantifies the benefits of the car sharing strategy as part of the employer-based trip reduction strategy (see Table 1 in Attachment 2) and the TSM/ITS program (see Table 6 in Attachment 2), which may be triple counted. The TM is not clear how the quantifications distinguish between each of these car sharing programs to avoid overcounting. In addition, the TM provides the GHG emission estimates of car sharing and microtransit (on page 37 of Attachment 2), but it does not provide the inputs or assumptions used in the analysis. Although CARB staff realize that the policy aspects may still be under development, without more information about the equations and quantification methods to be used, CARB staff cannot assess the validity of the methodology.

Remedy: Please ensure the car sharing strategy is not triple-counted in the 2025 MTP/SCS. Also, please provide key inputs and assumptions to evaluate the GHG emission results.

Information request for the draft 2025 MTP/SCS: For both the car sharing (at mobility hubs) strategy and the microtransit (at mobility hubs) strategy, please identify the policies, programs, and/or investment actions that support the strategies. At a minimum, please provide funding sources and commitments for both the car sharing and microtransit strategies.

3. Implementation assumptions and qualifying reductions for SCS strategies

The document "SACOG Response to CARB comments on SCS4 TM July2024" provided useful information about adjustments in implementation for various strategies. Please see follow-up requests and comments below.

3.1. Regional express lane pricing strategy

Thank you for providing information about the regional express lane pricing strategy in the document "SACOG Response to CARB comments on SCS4 TM July2024." Please include this and any appropriate updates in the final 2025 MTP/SCS.

3.2. Regional mileage-based user fee strategy

SACOG staff's response in the document "SACOG Response to CARB comments on SCS4 TM July2024" noted that the regional strategy would build on an assumed State transition from the fuel tax to a road usage charge, discussed some details of an assumed system, and mentioned an ongoing project that will lead to a regional pilot.

The response mentioned an assumed "state changeover by 2030" to a road charge system. CARB staff understand the unpredictable timeline and speculative nature of a potential road charge transition but are concerned that the assumed timeline may not be realistic given the current rate of progress. For example, in September 2024, the SACOG transportation committee heard a Caltrans presentation on road charges that noted the 2025 completion of a State pilot, following necessary enabling legislation in an unknown year, and an assumed 10- to 12-year transition period for the full implementation of a mileage-based user fee.

Information request for the draft 2025 MTP/SCS: Please provide detail on how the timelines for the regional and state efforts align to support the regional strategy's assumed start date, the responsibilities and authority needed to implement this fee strategy, as well as action commitments to support coordination with local, region, state, and national partners on implementation of this pricing mechanism. This may include, but is not limited to, the date(s) that the fee would take effect, locations where the fee would apply, the assumed fee rate, and types of roadways considered applicable. Please also include documentation of what public agencies are responsible for, what actions would be implemented, and how progress will be monitored. The information should note how the claimed quantified credit would be adjusted if the strategy would not yield the prior anticipated level of GHG emission reduction.

3.3. Electric vehicle strategies

Please see CARB staff comments above on calculations and emissions factors for off-model strategies (topic 2).

Potential issues (need further clarifications)

4. On- and off-model strategies that assume revenues from pricing as a funding source

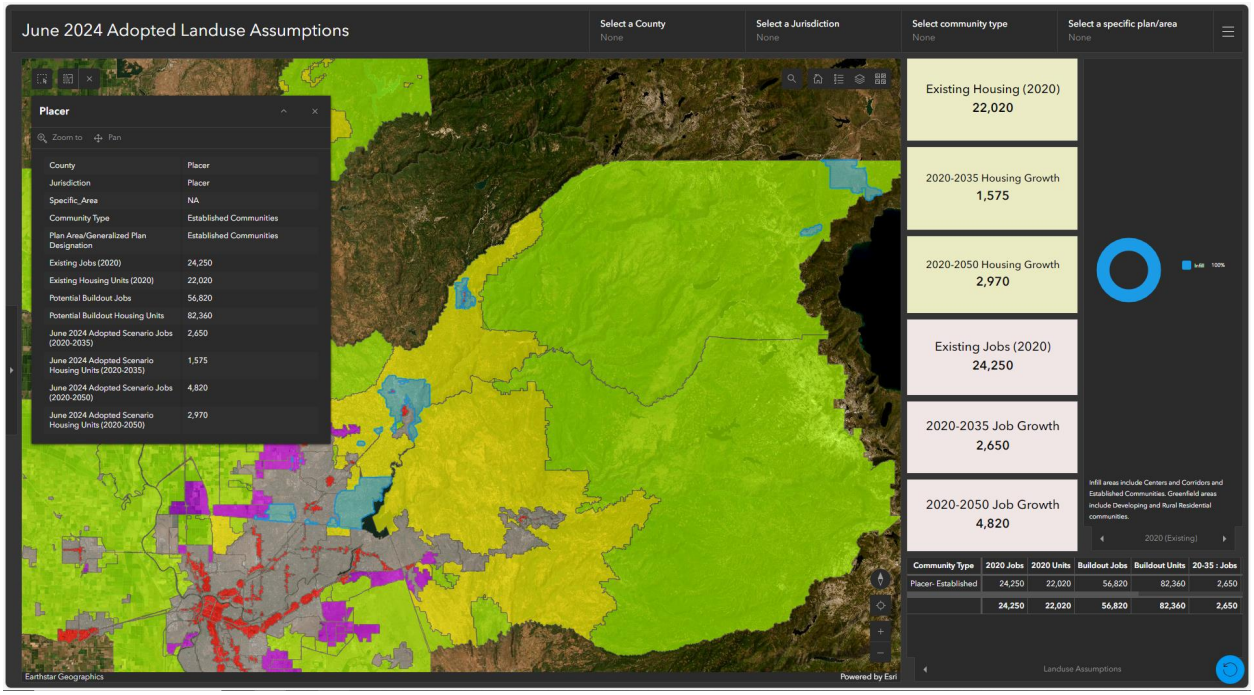
TM information in the document "SACOG Response to CARB comments on SCS4 TM July2024" notes that "GHG reduction strategies do not include new revenue assumptions from pricing as a primary funding source." We understand that SACOG staff does not anticipate strategies would be funded by revenue from pricing strategies before 2036. If assumptions about pricing revenue and their relationship to SCS strategies change, CARB staff may need additional information in the TM and draft 2025 MTP/SCS. For example, for strategies that would rely on pricing revenues, please include in the SCS (as appropriate) how much pricing revenue is assumed, by what date, what agencies are to be responsible, and how progress will be monitored, and reference where evidence of progress being made on pricing strategies is discussed. We would also ask you about adjustments to the timeline for strategy

implementation and quantified credit based on availability of pricing revenue, or whether alternative revenue sources can be identified for implementing impacted strategies should funding availability be delayed.

5. Growth geography and timing

In the October 2023 comment letter, CARB staff asked for supporting information about growth and on any changed assumptions relative to the 2020 SCS. The document "SACOG Response to CARB comments on SCS4 TM July2024" provided useful information about implementation actions at multiple government levels and about housing trends.

However, while a useful tool, some aspects of the online map cited for SCS land use limit its usefulness for understanding the VMT impacts of expected growth patterns. As an example, development areas in the online map are aggregated and discontinuous, leaving the effects of any given amount of new development unclear. In one instance, at least 14 separate areas across Placer County, from near Lake Tahoe to the Sacramento County line, are in a single growth geography (see the blue highlighted areas in the screen shot below). The location of new housing units or employment within the geography, assuming some of the 14 areas receive more development than others, could have greatly different consequences for future VMT/GHG since areas within this aggregated boundary appear within categories on SACOG's VMT map ranging from 50-85% of the regional average VMT to greater than 150% of the regional average.



Information request for the draft 2025 MTP/SCS: CARB staff appreciate the ongoing efforts to track and document the implementation progress of a core land use strategy in the 2020 SCS. We also understand that the locations of future development may change as part of the SCS planning process and associated public dialogue. In SACOG's draft 2025 MTP/SCS and final SCS submittal, please include documentation on growth geography and timing as mentioned in the October 2023 comment letter, updated and elaborated as appropriate from information provided in SACOG staff's July 2024 response document. Please include a description and the proposed changes to baseline conditions in growth geographies that will be amended in the 2025 MTP/SCS as compared to the 2020 SCS, disaggregated such that the relative effects on VMT/GHG can be discerned (as mentioned above), for instance by separating projected growth into disaggregated locations based on current average VMT. Relevant data include, but are not limited to, the types of land uses, densities and intensities, and other variables used to estimate GHG emissions and VMT reductions. The information and detail are needed during CARB's final SCS review to assess the magnitude of proposed changes and whether assumed levels of growth support the claimed GHG and VMT reduction estimates underpinning multiple strategies.

6. Estimating impacts of autonomous vehicles

In response to this issue, SACOG staff included the document "A7_Impacts_Autonomous_Vehicle_SACOG_SCS4." This document notes (underline added):

> AVs are unlikely to reach a significantly high level of penetration by the planning horizon year. As such, SACOG has decided not to incorporate AV assumptions into its 2025 Blueprint. Instead, SACOG staff have opted to investigate the potential impacts of AVs in the future by reviewing reports and academic studies on the topic and propose strategies in response to the potential high penetration of AVs.

We agree this is appropriate for the 2025 SCS. Nonetheless, SACOG staff's analysis for the 2020 MTP/SCS showed potential VMT impacts of 0-13% in different adoption and use scenarios. Likewise, as the "A7…" document notes, as a new and rapidly developing technology, autonomous vehicles have the potential to cause a great variety of effects that may increase or decrease VMT, trip-making, vehicle ownership, and emissions. Since the MTP/SCS's horizon year is 2050 and autonomous vehicles are already in operation in multiple California cities, it seems likely that these effects will become significant in the SACOG region during the plan period. We have identified this as a topic for the ongoing SCS Guidelines update and would like to collaborate with SACOG staff as you collect more information about impacts and develop your approach for incorporation in the next SCS.

Potential future issues (need further clarification in the future)

7. RAISE grant and furthering equity and inclusion

Thank you for providing information about the RAISE grant and furthering equity and inclusion in the document "SACOG Response to CARB comments on SCS4 TM July2024." Please include similar documentation and any appropriate updates in the final 2025 MTP/SCS.

8. Project selection and evaluation process

Thank you for providing information about the project selection and evaluation process in the document "SACOG Response to CARB comments on SCS4 TM July2024." Please include similar documentation and any appropriate updates in the final 2025 MTP/SCS.