EVALUATION OF THE STANISLAUS COUNCIL OF GOVERNMENTS' SB 375 2022 SUSTAINABLE COMMUNITIES STRATEGY

September 2024

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Overview

On August 17, 2022, the Stanislaus Council of Governments (StanCOG), which serves as the metropolitan planning organization (MPO) for the Stanislaus County region, adopted its 2022 Regional Transportation Plan/Sustainable Communities Strategy (2022 SCS). The 2022 SCS is available on StanCOG's *Transportation Planning Website*. StanCOG originally submitted its 2022 SCS to California Air Resources Board (CARB or Board) on December 1, 2022. CARB staff reviewed that submittal and found that StanCOG's inclusion of a new strategy to develop a vehicle miles traveled (VMT) mitigation program was not adequately supported to achieve the assumed greenhouse gas (GHG) emissions reduction levels, and caused StanCOG to inaccurately determine that the plan met its 2035 target, if implemented. StanCOG, in consultation with CARB, decided to revise its 2022 SCS submittal to meet the 2035 target.

StanCOG's Board reviewed the revisions to the 2022 SCS submittal on June 21, 2023, that removed credit for the VMT mitigation program and updated quantification of four off-model strategies as well as provided supportive evidence in the form of identified funding and other commitments to implement the SCS strategies, compared to the original SCS submittal. In addition, to address other identified discrepancies that resulted in an GHG emissions increase beyond what the original 2022 SCS forecasted and demonstrate how the region achieves the 2035 GHG emission reduction target, StanCOG corrected telework and commute-based trip lengths and forecasted participation rates, revised electric vehicle infrastructure charger station assumptions, and corrected electric vehicle incentive funding levels, vehicle fleet forecasts, and emission reduction calculations.

StanCOG provided a complete submittal of the revised 2022 SCS and all necessary supporting information for CARB staff's review on June 22, 2023. StanCOG's 2022 SCS estimates a 17.1% and a 19.3% decrease in GHG per capita emissions from light-duty passenger vehicles by 2020 and 2035, respectively, compared to 2005. The region's per capita GHG emission reduction targets are 12% in 2020 and 16% in 2035, compared to 2005 levels, as adopted by the Board in 2018. This report reflects CARB's evaluation of StanCOG's revisions to SCS strategies and quantification of GHG emission reductions for the 2022 SCS.

Based on a review of all available evidence in consideration of CARB staff's *Final Sustainable Communities Strategy Program and Evaluation Guidelines* (PDF download), referred to throughout this document as the SCS Evaluation Guidelines, CARB staff accepts StanCOG's determination that its 2022 SCS, as modified and presented with technical corrections and supplemental materials, reasonably demonstrate that the SCS would meet its 2035 target, when fully implemented. However, CARB staff identified significant concerns with achieving full implementation of the 2022 SCS, and this report offers recommendations to support the successful implementation of the SCS and achievement of SB 375's goals.

CARB's Evaluation

CARB's evaluation of the SCS consists of two components – the determination and reporting components – and is based on the general method described in CARB's SCS Evaluation Guidelines. The main body of this report summarizes CARB staff's findings from the determination component analyses in the following order: (1) Trend Analysis, (2) Plan Adjustment Analysis, (3) Policy Analysis, and (4) Investment Analysis. These analyses are supported by data and analysis contained in Appendices A-C. A summary of the reporting components for the 2022 StanCOG SCS is included in Appendix D.

Evaluation of SCS strategies, key supporting actions, and investments serves as the basis for CARB accepting or rejecting an MPO's SB 375 GHG determination. CARB staff's evaluation relied not only on a review of StanCOG's 2022 SCS but also on additional SCS submittal materials provided by StanCOG and information gathered in follow-up conversations with StanCOG staff. For a summary of strategies and quantification methods evaluated as part of StanCOG's 2022 SCS submittal see Appendix A: StanCOG's 2022 SCS Strategy Table.

I. Trend Analysis

Under the SCS evaluation process, an MPO should provide key performance metrics to demonstrate how the SCS will meet the GHG reduction target. CARB staff reviewed the metrics to see whether the changes indicated by the metrics are directionally supportive of GHG reduction. CARB staff also used the metrics to identify what changes from StanCOG's 2022 SCS were most critical to meeting the target and look to see whether those changes are consistent with the strategies and supportive actions included in the SCS (see Policy Analysis section). The metrics that CARB staff analyzed are shown in Appendix B: Trend Analysis Results.

A. Findings

CARB staff found that the trend analysis metrics reported from StanCOG's travel model somewhat support that StanCOG will reduce GHG emissions, but do not sufficiently explain how the region will reduce GHG emissions to meet the region's 2035 target. The metrics primarily indicate that StanCOG will reduce GHG emissions through changes in mode shift by 2035 with increases in carpooling and active transportation. CARB staff acknowledge the modeling and select 2022 SCS performance metrics only explain a small portion of the total per capita GHG emission reductions claimed. However, other 2022 SCS performance metrics for 2035 show changes between 2019 and 2035 that are inconsistent with GHG reduction.

The SCS submittal included modeled data showing mode share as the one metric with trends supportive of GHG emission reductions. Between 2019 and 2035, the SCS is expected to result in single-occupancy vehicle (SOV) mode share decreasing by 1.2

percent, high-occupancy vehicles (HOV) mode share increasing by 0.7 percent, and active transportation (walking and biking) mode share increasing by 0.6 percent.

The modeled results also showed many performance metrics going in the wrong direction or registering very minimal change to influence achievement of the 2035 GHG target. In Appendix B, CARB staff note significant concerns that the modeled results show increased average vehicle trip lengths, decreased transit mode share, and decreased average travel time by transit despite the SCS's emphasis on increasing the proportion of the region's growth (housing units and employment) that will be going into the region's established neighborhood areas, and areas with access to transit (located within one-half mile of a transit stop). Reported trends are strong indicators but dependent on multiple factors, such as robustness of the regional travel model and accuracy of outputs, that CARB must consider when reaching a conclusion. CARB staff note that for the 2022 SCS, StanCOG downscaled the prior 3-county MIP2 model that was previously used to quantify its SCS GHG impacts to a version of that model specific to Stanislaus County. Another significant factor contributing to the limited changes observed in the performance metric trends is the omission of potential effects resulting from off-model strategies quantified by StanCOG. These can result in performance metric trends showing little change. In StanCOG's case, the robustness of estimated GHG emission reductions from SCS strategies that were quantified off-model, comprising approximately 57% of total reductions claimed, are critical to the region's 2035 target demonstration (see Policy Analysis section). StanCOG should closely monitor the SCS strategies, especially for off-model strategies, to better track progress that the 2035 emissions reduction target is in fact met.

II. Plan Adjustment Analysis

Under the SCS evaluation process, an MPO should demonstrate what measures are being taken, as necessary, to correct course to meet an MPO's target if the region is not achieving the reductions anticipated through the prior SCS.

A. Findings

CARB's 2022 Progress Report found that StanCOG was not on track to achieve its previous 2018 SCS planned outcomes for 2020 and 2035. *Appendix B* of CARB's 2022 Progress Report provides more information about CARB's comparison with observed data. The travel disruption of the pandemic makes it difficult to assess the region's progress on changing travel patterns since the 2018 SCS. Although CARB staff cannot assess the progress made since the 2018 SCS, the 2022 SCS shows evidence of changes and adjustments since the 2018 SCS that are intended to help meet the region's GHG emission reduction targets. CARB staff's review of the 2022 SCS found that StanCOG builds upon and expands four transportation strategies established over several planning cycles (additional funding for Altamont Corridor Express (ACE) Forward, active transportation projects, San Joaquin Valley Air

Pollution Control District (SJVAPCD) Rule 9410 employer trip reduction program, and a vanpooling program).

StanCOG also included five new strategies in the 2022 SCS:

- Modesto bus rapid transit
- Telecommuting
- Electric vehicle incentives
- Electric vehicle infrastructure charging incentives
- Transportation system management/intelligent transportation systems

The 2022 SCS also includes changes to the land use assumptions compared to the 2018 SCS that are intended to prioritize future growth into the region's established neighborhoods and assumes more middle housing (e.g., duplex, triplexes, quadplexes, and even accessory dwelling units) on single-family lots to increase density.

Together these new strategies and updates are intended to help StanCOG meet its more ambitious GHG emission reduction target, if fully implemented, and help overcome challenges with implementation of assumptions about the amount of housing and jobs growth as well as growth in transit ridership rates in the 2018 SCS strategy. While StanCOG's revisions and adjustments in the 2022 SCS strategies help address these issues, it remains uncertain if all strategies will be fully implemented as assumed to meet the GHG emission reduction target.

III. Policy Analysis

Under the SCS evaluation process, CARB staff analyze whether SCS strategies for meeting the GHG emission reduction targets are supported by key policy, investment, and other commitments to advance their implementation. CARB staff's analysis is organized across four broad SCS strategy categories: (1) land use and housing, (2) transportation infrastructure and network, (3) local/regional pricing, and (4) electric vehicles and new mobility. In general, across all categories, CARB staff looked for:

- Whether the SCS provided policy actions that corresponded to each of its individual strategies.
- Whether the actions were clear with respect to scope, who will be involved, what will be done, and the anticipated implementation timeline.
- Whether the actions were measurable and included specific regional investment commitments in the RTP/SCS project list, policy and/or financial incentives; technical assistance; and if legislative or other entity action is needed, partnership activities to advance needed changes.

A. Findings

Overall, CARB staff's analysis found that StanCOG's 2022 SCS includes a set of strategies designed to achieve the GHG emission reduction targets and evidence of policy commitments for each of the strategies. However, CARB staff does have concerns about the implementation of some strategies, as noted below. The following sections summarize these strategies and CARB staff's findings regarding the commitments in the region to advance implementation, which are organized under the four broad SCS strategy categories, as applicable.

1. Land Use and Housing Strategy Commitments

StanCOG's 2022 SCS includes one strategy related to land use and housing that focuses growth in neighborhood infill areas. The strategy is designed to increase jobs/housing balance and infill development thereby increasing density near transit infrastructure. This strategy will contribute to 8.29 percent of its per capita GHG emission reductions that come from on-model strategies. StanCOG estimates VMT changes from its land use and housing strategy, along with long-term induced travel, in aggregate, using a combination of travel demand model outputs and off-model calculations. The percent reduction from implementing StanCOG's land use and housing strategy, along with transportation network strategies together, which often have synergistic effects when designed to support each other, is not verified. CARB is unable to isolate the emissions reductions associated with StanCOG's land use and housing strategy only. However, CARB staff note that the trend analysis indicates a small impact of the land use and housing strategy on trip length indicating a relatively negligible effect on GHG/VMT.

a) SCS Planned Outcomes

The SCS includes assumptions about the type and character of new land use and housing development that will take place in the region between 2019 and 2035. Specifically, the plan assumes the following outcomes, which is a subset of the information that can be found in Appendix C: Data Table:

- The addition of 31,843 new housing units and 38,530 new jobs.
- An 86.5 percent increase in the region's residential density compared to the business-as-usual scenario.
- The addition of 11,925 new single-family housing units and 13,277 multi-family housing units (37.4 and 41.7 percent of total new units, respectively).
- An estimated 84 percent of growth within center, corridor, and neighborhood infill areas and the addition of 15.8 percent of household growth for 2019 and 2035 and 16.1 percent of employment growth within one-half mile of transit stops in Figure 1 and Figure 2 as copied from StanCOG's 2022 SCS Submittal.

Figure 1. Forecasted Development Pattern Scenario D (Preferred Scenario)

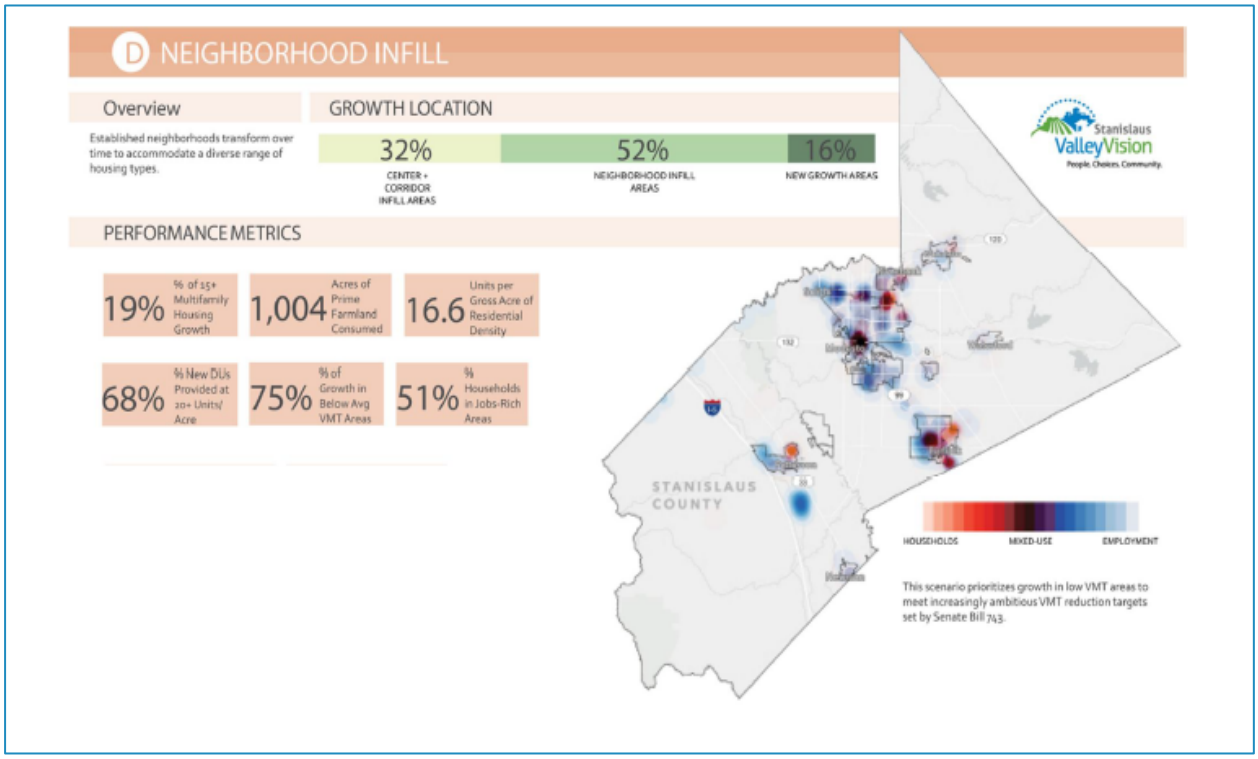
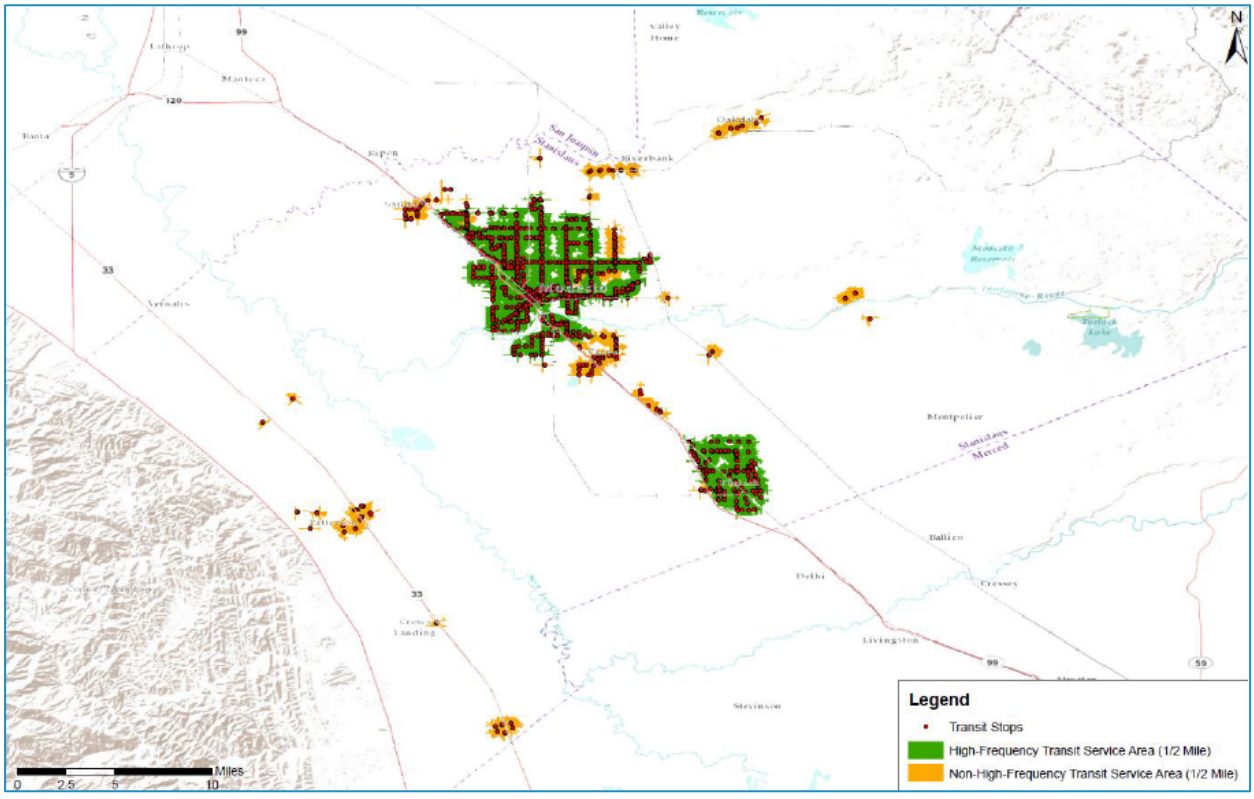


Figure 2. High-Frequency and Non-High-Frequency Transit Service Areas



b) Findings

CARB staff found that the 2022 SCS land use and housing planned outcomes are somewhat supported by region-specific funding and planning program actions. In particular, StanCOG's activities include research, analysis, and technical assistance for local jurisdictions, and the development of its regional housing needs allocation (RHNA). For the sixth cycle of RHNA, StanCOG revised its methodology for distributing the region's housing need to confront the region's jobs-housing imbalance more directly in alignment with its SCS land use and housing strategy. StanCOG also continues the facilitation of housing planning and production through grant programs, such as the 2019 Regional Early Action Planning ("REAP 1.0") grant program that provides one-time funding to regional governments and multiagency working groups. The REAP 1.0 grant program supports collaboration on accelerating housing production and facilitate compliance in implementing the sixth cycle of RHNA.

However, the 2022 SCS lacks detailed actions that would help overcome shortfalls in progress towards the total housing development assumed in the 2018 SCS as well as help translate the assumptions in the 2022 SCS about increases in housing types within neighborhood infill areas into reality. The observable housing data for the Stanislaus region indicate a shortfall in the region's assumed total production of housing units, with a particular gap between multifamily units produced and what was assumed. The 2022 SCS assumes a relative 86 percent increase in residential densities and 84 percent of growth within infill neighborhoods. The SCS submittal cited to materials that describe the land use and housing strategy broadly. But failed to identify which neighborhoods would, or may, accommodate growth and at what levels. The supporting detail is critical because VMT reductions from land use strategies rely on other critical factors such as proximity to destinations, land use diversity, and connectivity/accessibility with surrounding areas that influence travel choices between needed and desired destinations.

CARB staff was able to generally assess the reasonableness of infill growth assumptions from the reported modeling and trends analysis coupled with observable data. For example, the SCS submittal provides for an increase of 830 multifamily units between 2019 (the SCS baseline) and 2020, while the observable housing data indicate a net total of 141 units were built. Further, the observed data indicate substantial growth outside of infill neighborhood areas. While it is reasonable to assume that the implementation of various state housing laws designed to voluntarily allow individual residential property owners to construct accessory dwelling units or subdivide lots that would enable duplexes, triplexes, etc. (see, e.g., Assembly bills 68, 881, and 670 and Senate bill 1019) would partially support better outcomes, CARB staff remains concerned that the SCS land use and housing strategy will not realize the expected GHG emission reductions by 2035 because the SCS focuses on planning updates, offering technical assistance, and identifying research needs while lacking commitments from those responsible for

implementing the strategy, and the MPO does not have authority over land use decisions. Additional technical assistance and partnership work to support and encourage local jurisdictions and local developers to put new development in the areas envisioned in the 2022 SCS will be needed.

The 2022 SCS and SCS submittal describe StanCOG's commitments to develop a Vehicle Miles Traveled Mitigation Program ("program") and note designated funding from the Regional Early Action Planning Grant Program of 2021 ("REAP 2.0"). The program could be a method to support the SCS land use and housing strategy, if designed in a manner to meet the requirements of SB 375. CARB transmitted a letter to StanCOG's Executive Director on the Draft 2022 RTP/SCS, requesting additional information to substantiate the VMT mitigation bank strategy. Given that the program is still under development, CARB staff did not have adequate information to evaluate the strategy to verify that the emission reductions were appropriate for SB 375 purposes, calculated accurately, and avoided double counting. The 2022 SCS submittal did not include program details, administrative structures, local commitments, or timeframes to accomplish the program benefits among other necessary minimum program details.

In response to CARB staff's concerns that the program was not adequately supported to achieve the assumed emission reduction levels, StanCOG elected to postpone GHG emission reduction credit under the 2022 SCS and intends to further develop this strategy for the next SCS. As StanCOG prepares its next SCS, it should work with CARB to ensure that this strategy warrants GHG reduction credit for SB 375 purposes. As an initial step, CARB staff is available to help StanCOG develop the program's methodology to ensure GHG reductions are appropriate as an SCS strategy. A transparent process to review and calibrate calculations, as early in the process as possible, is necessary for CARB to verify the project types seeking VMT offsets and the development locations that generate revenues. The following list of considerations, while non-exhaustive, is included to help illustrate the level of detail CARB staff will need from StanCOG to evaluate program credit for the next SCS: the portfolio or specific types of mitigation projects, the geography of any off-site mitigation options for the purpose of reducing or minimizing VMT impacts at a project level (e.g., physically where the mitigation projects would be built); whether GHG reductions can be verified to come from light-duty vehicles; that the program would be administered to avoid double counting GHG/VMT reductions either attributed to mitigation projects required by CEQA or other kinds of double-counting that need to be avoided (e.g., reductions already counted in the region's transportation demand management (TDM) program, reductions from state/federal sources); that the program would not result in enabling growth adverse to the SCS land use scenario (e.g., would not simply facilitate growth in high-VMT areas by allowing projects to pay a fee, thereby potentially falling short of necessary emission reductions attributed to the land use and housing strategy envisioned in the SCS); the robustness of the program's estimated emissions reductions themselves; as well as

the commitment to actionable steps by StanCOG and member agencies to implement, monitor, and verify program benefits over time.

2. Transportation Infrastructure and Network Strategy Commitments

StanCOG included seven off-model transportation infrastructure and network strategies in the 2022 SCS. These strategies are new or expanded a multi-regional commute-trip reduction program, vanpooling, and the Stanislaus region's transportation demand management program (a regionally administrated commute program that coordinates carpool, vanpool, bus, and train services among other things), transportation system efficiencies, bike and pedestrian infrastructure projects, transit capital projects, and telecommuting/remote work. The strategies focus on reducing vehicle emissions by improving the transportation network, encouraging alternatives to driving, and reducing single-occupancy driving. Together, StanCOG estimates that these strategies will reduce per capita GHG emissions by approximately 9.51 percent of its total per capita GHG emission reductions.[1] StanCOG's estimates showed that VMT reduction resulting from transportation strategies toward increasing mode shift will be more significant than the contribution anticipated to come from the land use and housing strategy aimed at shortening vehicle trips.

a) SCS Planned Outcomes

These strategies are reflected in assumptions about changes to the transportation infrastructure and network that will serve the region between 2019 and 2035.[2] The 2022 SCS identified major regional transportation infrastructure projects including increased roadway lane miles, bicycle and pedestrian trails/lane miles, transit service hours, and local bus/shuttle operation miles. Specifically, the plan assumes the following outcomes:

- 178-mile increase of general-purpose freeway lane miles and 166 miles of arterial, collector, and local roadway lane miles.
- 148-mile increase in bicycle and pedestrian trail/lane miles.
- 21-hour increase in total daily transit service hours.

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[1] StanCOG estimated reductions individually for a total of nine off-model strategies. The seven off-model strategies specific to transportation infrastructure and networks include Tier One Bike Improvements, Modesto Bus Rapid Transit, ACE Forward (commuter rail), Vanpool, SJVAPCD Rule 9410 Commute Trip Reduction Program, telecommuting, and transportation system management/intelligent transportation system projects. StanCOG also claimed that some of the benefits of its bike and pedestrian infrastructure projects were captured through on-model reductions but were not apportioned out from the total.

[2] This subsection includes information based on StanCOG's 2022 RTP/SCS, Chapter 10: Action Plan and the submitted SCS data table and compares transportation indicators from the 2019 base year to 2035. It also includes information from Off-Model Calculations, and Off-Model Trip and Emissions Data documentation.

- 163-mile increase in local bus/shuttle operation miles.

b) Findings

CARB staff found that the 2022 SCS transportation planned outcomes are somewhat supported by region-specific funding and planning program actions, as well as through direct investments in the project list adopted with the 2022 SCS. This includes funding sources to expand existing and new transit services. CARB staff's analysis also found that the 2022 SCS includes other investments to support active transportation and transportation network strategies as well as commitments to expand commute-trip reduction programs. For example, StanCOG's expanding the region's travel demand management program, "*StanisCruise*", to promote greater levels of carpooling and support rates of telecommuting in the region. However, CARB staff remains concerned that key planned outcomes for anticipated rates of telecommuting/remote work, increasing mode share of HOV, and active transportation will not be fully realized without identification of further supporting policies, funding, and other changes.

For example, CARB staff found that while the off-model adjustments for the total amount of workers working from home in the region are reasonable, the SCS does not include commitments from those responsible for implementing the work-from-home strategy, and the MPO does not have such authority to mandate that employers require their employees to participate in commute-trip reduction programs. For the telework strategy, StanCOG conservatively assumes that approximately 8.5 percent of employees in the Stanislaus region will work from home in 2035 based on recent regional travel data. StanCOG's SCS submittal shows that the number of county residents working from home rose sharply between fall 2019 and fall 2022 based on data obtained from Replica, a big data service provider. Over the three-year period, teleworking residents increased 16.27 percent. StanCOG assumes a five percent increase above 2019 levels, accounting for extraneous variables like the COVID-19 pandemic, with commitments to support telecommuting as a major strategy in the StanisCruise program. CARB staff's review of available observed data from the 2021 American Community Survey (ACS) (see, *Table SO801, Commuting Characteristics for Stanislaus County*) reasonably supports that assumption, indicating that about 8.7 percent of employees in the Stanislaus region telecommuted in 2021.

CARB staff continues to monitor ongoing research on the effects of teleworking, and some research has begun to raise questions as it highlights the potential for VMT to increase and offset the reductions even with continued telework from this strategy due to other trips made by work-from-home workers.[3] As such, CARB staff would like to see strong actions from the region and its employers that would increase

[3] O'Brien, W., & Aliabadi, F. Y. (2020). Does telecommuting save energy? A critical review of quantitative studies and their research methods. *Energy and Buildings*, *225*, 110298.

participation rates in voluntary programs, as well as ongoing monitoring of telework participation in the region.

In the next SCS, StanCOG needs to provide evidence about the level of participation in commute-trip reduction programs and the region's actions to support this strategy. One opportunity for StanCOG to consider, for example, is strengthening the StanisCruise program so major regional employers monitor the number of employees that participate in programs with telecommute options. The monitoring data could be reported to StanCOG, so that SCS updates reflect actual mode changes in travel patterns (i.e., an observable shift from solo commute trips by employees who telecommute through participation in the StanisCruise program).

CARB staff also has concerns that the SCS does not include supporting implementation actions to sufficiently support the assumed increases in regional carpooling levels through either of the region's voluntary TDM strategies, and that the MPO does not have authority to mandate that employers require employees to participate in programs with carsharing, carpooling, or vanpooling options. The 2022 RTP/SCS assumes 58 percent of trips during the peak period would be HOV by 2046 (the planning horizon), which represents an increase in HOV commuting by over 500 percent from 2021 levels.[4] Available data indicates that about 11 percent of commute trips in Stanislaus carpooled in 2021. The data further shows that 76 percent of the working population in Stanislaus County drove to work alone.[5] To achieve the levels of carpooling assumed in the 2022 SCS, CARB would like to see stronger action from the region and its employers, as well as ongoing monitoring to ensure assumptions are realized. Similar to strengthening telecommute reporting, StanCOG could update the StanisCruise program or separately adopt a regional ordinance that, among other things, commits StanCOG to work with local employers to adopt policies that encourage commuting by means other than driving and to implement, monitor, and report reductions in their drive-alone rate.

In addition, CARB staff is concerned that while the SCS assumes funding for new active transportation projects that would increase bicycling and walking mode shift, StanCOG did not provide details to identify which active transportation projects from the RTP project list would be built by 2035 and the expected increase in trail/lane miles. CARB staff note that the region's adopted *2021 Non-Motorized Transportation Master Plan* includes recommendations for bicycle and pedestrian projects that could provide opportunities to identify and prioritize active transportation investments. StanCOG also did not provide documentation ensuring that GHG emission

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[4] ACS. 2021. *Table B0814, Means of Transportation to Work by Vehicle for Stanislaus County*. The 2022 SCS submittal does not distinguish the mode share splits between SOV and HOV2 or HOV3+ within the total home-work vehicle trips. However, the SCS submittal provides 2046 total commute trips and the SCS assumes 58 percent HOV during peak-period travel by 2046, or 200,749 HOV commute trips of a total 346,119 commute trips.

[5] ACS. 2021. *Table B08101, Means of Transportation to Work by Age for Stanislaus County*.

reductions are not double counted between its travel demand model and off-model quantification methods. While the SCS submittal lacked information for CARB to evaluate the impact of the bicycle strategy on GHG emissions, CARB staff found that StanCOG is still likely to achieve its 2035 GHG reduction target. In the next SCS, StanCOG should ensure these details are documented with clearly cited sources or CARB may be unable to verify GHG emission reductions as credible towards the region achieving the 2035 target.

The 2022 SCS also dedicates substantial investments in roadway capacity expansion projects that will include a new high-capacity expressway and add new passing lanes on highway segments in Stanislaus County. CARB staff identified over 85 roadway expansion projects in the 2022 SCS submittal. For these projects, StanCOG estimated an aggregated 2.33 percent increase in VMT by comparing its regional travel model results with research-based elasticity calculations. Road capital projects that increase capacity, especially those that are counter to the SCS's long-term vision for accommodating new growth, increase VMT and work against achieving the State's climate and air quality goals.[6] As part of its SCS submittal, StanCOG conducted an analysis of the anticipated long-term effects of projects, with operational dates by 2035, on VMT. Based on this analysis, StanCOG's estimated that these roadway projects would increase about 234,325 VMT per day, and per capita GHG emissions by over 2 percent in 2035 relative to 2005. CARB staff found that the forecasted VMT increases from these projects were included as part of StanCOG's overall 2022 SCS emissions estimate and that StanCOG appropriately determined that it will still be able to meet its SB 375 GHG reduction target, if fully implemented.

However, StanCOG will need to be vigilant about monitoring, implementing, and deploying projects through 2035 to ensure that planned VMT/GHG emission reductions and SB 375 goals are achieved. In particular, the 2022 SCS anticipates VMT/GHG emission reductions from a range of transportation strategies with supporting commitments in bus rapid transit and commuter-rail services, transportation system management/intelligent transportation systems (TSM/ITS), and active transportation that depend on timely investments in strategic locations (e.g., committing resources to relatively long-term projects within areas that the SCS land use scenario identifies as "low VMT"). Delays or removals of transit, TSM/ITS, or active transportation projects will prevent StanCOG from meeting its regional targets. StanCOG should work with its members to prioritize funding for transportation projects that align with the region's adopted SCS land use scenario and help to reduce VMT through the development of project-prioritization criteria as well as developing a regional implementation monitoring system.

3. Local and Regional Pricing Strategy Commitments

[6] CARB. *Highway Capacity and Induced Travel Brief.* (September 2014).

StanCOG did not include any pricing strategies in the 2022 SCS.

4. Electric Vehicles and New Mobility Strategy Commitments

StanCOG included two strategies related to electric vehicles (EV). These strategies seek to support EVs in the region by identifying funding for EV charging infrastructure improvements and providing financial incentives to help drivers shift to using EVs. StanCOG estimates the strategies will result in a total of 1.52 percent reduction in per capita GHG emissions in 2035.

a) SCS Planned Outcomes

The strategies and quantified GHG emission reductions apply critical assumptions about the availability of EV-supportive infrastructure and individual participation in subsidy/rebate programs that will serve the region between 2020 and 2035. This subsection includes information-based assumptions from StanCOG's Technical Methodology, Strategies Table 2, Off-Model Calculations, and Off-Model Trip and Emissions Data documentation. Specifically, the plan assumes the following regionwide outcomes:

- 1,684 new EV chargers supporting PHEV usage by 2035 for a total 153,218 miles shifted to electric VMT (eVMT).
- 6,400 new EVs by 2035 from subsidies and rebate programs for a total of average daily 239,478 miles shifted to EVs and eVMT.

b) Findings

CARB staff found that StanCOG's 2022 SCS EV assumptions are somewhat supported by region-specific funding and planning program actions. The 2022 SCS identifies work already underway to identify gaps and opportunities to encourage EV purchases and implement zero-emission vehicle infrastructure in the region. In particular, the StanCOG region is contributing funds towards an EV subsidy/rebate program and development of a regional plan to support EV infrastructure. StanCOG's March 2022 *EV Infrastructure Study* is intended for the purpose of developing a roadmap for increasing EV charging infrastructure, facilitating EV penetration, and improving air quality in the region. The study includes siting recommendations at workplaces, public facilities, medical centers, and commercial centers, as well as single-family and multi-family residences throughout the region. The study also identifies outreach strategies for marketing, training, and education for local government and for members of the public about EV technologies.

While CARB staff's analysis supports a conclusion that these strategies would help the StanCOG region meet the 2035 target, if fully implemented, CARB staff has concerns that StanCOG will need additional resources to secure and track investments in EV infrastructure and the number of EV chargers expected to be installed by 2035. The SCS submittal identified possible funding opportunities (federal grants, pilot programs, utility rebates, and other competitive funding sources) and discussed the

levels of financial resources necessary to support the total number of EVs in the county with StanCOG's commitment to pursue funding from all available sources. In support of gathering evidence of implementation, it is important that StanCOG find additional administrative resources to apply, secure, and allocate funding.

Looking across all four policy analysis categories, CARB staff found that StanCOG's 2022 SCS will achieve its GHG reduction target, if fully implemented, but has concerns that the land use and housing, telecommuting, commute-trip reduction, and EV strategies lack evidence of funding or other commitments from other agencies to realize the fully claimed GHG emission reductions.

IV. Investment Analysis

CARB staff evaluated whether the planned investments in the project list adopted with the 2022 SCS support the expected GHG emission reductions by 2035. CARB staff also qualitatively assessed the risk of delay to delivering projects that advance SCS goals based on assumed available revenue sources. CARB's analysis of the 2022 SCS planned investments is shown below in Figure 3 and Figure 4 and Table 1. StanCOG 2022 SCS Investment Breakdown by Expenditure Category and Fiscal Year. Figure 3 shows the total investment by mode in the 2022 SCS compared to the 2018 SCS. Figure 4 shows investment by mode as a percentage of total plan investment for both the 2022 SCS and the 2018 SCS. Table 1 shows the total investment by mode for the 2022 SCS for the time period before 2035 (2021 to 2025 and 2026 to 2035) and investments in projects with operational dates assumed or specified after 2035 (2035 to 2046).

Figure 3. Investments by Mode in StanCOG's 2022 SCS Compared to the 2018 SCS (dollars)

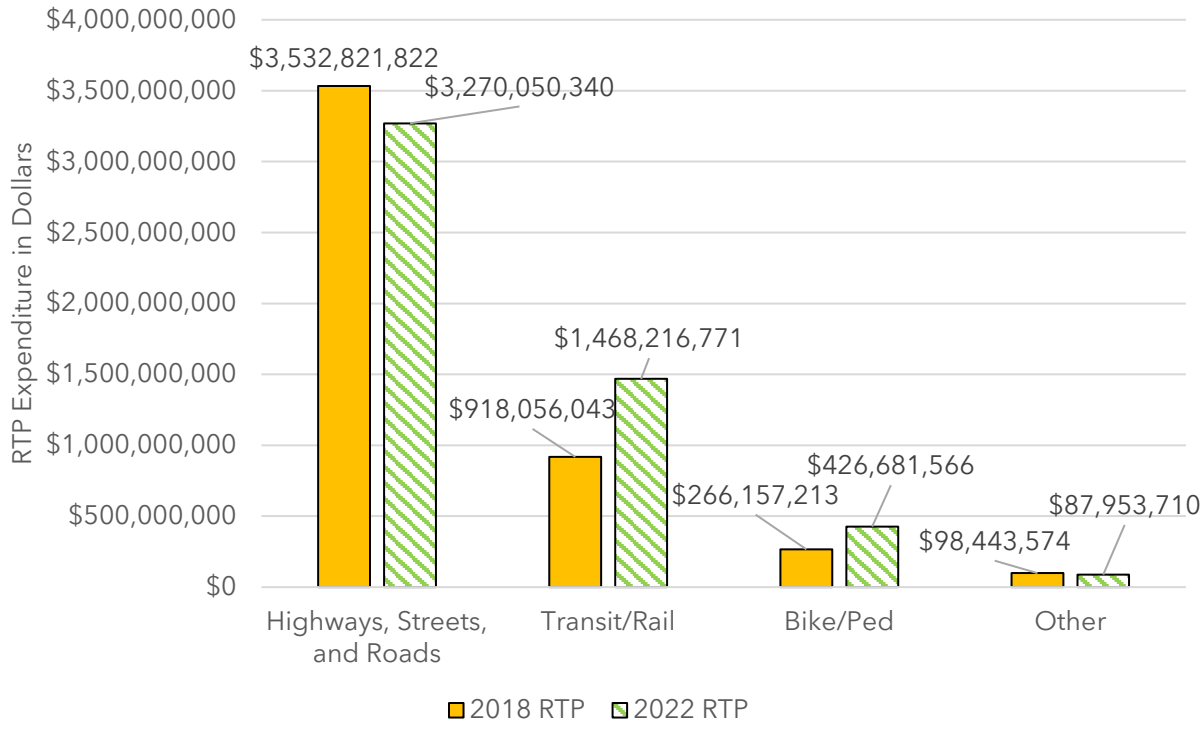
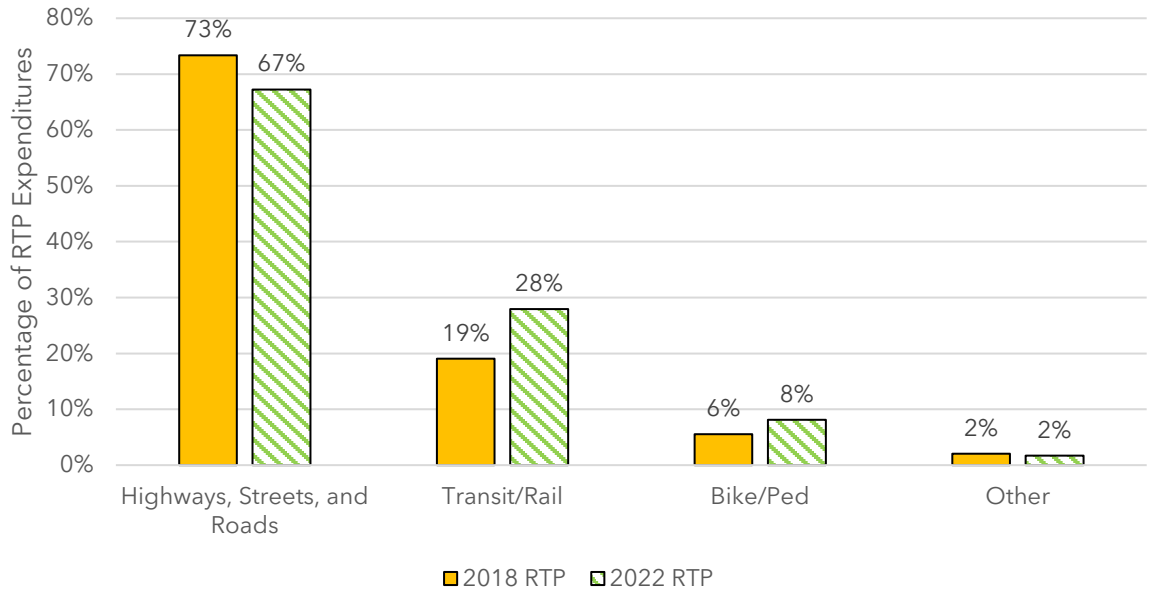


Figure 4. Investments by Mode in StanCOG's 2022 SCS Compared to the 2018 SCS (Percent of Total Investment)



Note: Other expenditures include regional investments in aviation and various planning studies.

Table 1. StanCOG 2022 SCS Investment Breakdown by Expenditure Category and Fiscal Year

Expenditure Category	Years 2022-2035	Years 2022-2035 (%)	Years 2036-2045	Years 2036-2045 (%)	Total 2022-2045
Highway, Streets, and Roads	$384,980	19%	$1,222,644	61%	$401,894
Transit	$147,290	7%	$479,449	23%	$1,447,319
Rail	$123,790	14%	$459,449	53%	$281,155
Bike/Ped	$62,703	10%	$81,248	13%	$499,505
TDM	$1,000	46%	$1,200	54%	$0
ITS	$7,153	5%	$56,042	41%	$72,786
Other	$17,377	6%	$179,045	64%	$82,450

Source: StanCOG SCS Submittal

Note: Table summarizes programmed and planned projects, including projects funded through 2046. Available expenditures for transit are limited to Tier 1 capital projects and operations, rail is a subset of transit and limited to ACE commuter rail, and TDM is limited to park and ride lots provided in the 2022 SCS submittal project list. Projects that had multiple modes (e.g., streets/roads and bike/ped) and other (e.g., planning studies) were included in Other category.

A. Findings

Based on CARB staff's review of StanCOG's project list, CARB staff found that the 2022 SCS includes funding that would somewhat advance implementation of the SCS by 2035 in terms of transit/rail and pedestrian/bikeway improvements and related enhancements with roadway projects (e.g., complete street projects). CARB staff compared the planned investments by mode between the 2018 and 2022 SCS and found that planned investments for highway, streets, and roads decreased approximately 7.43 percent to $3.27 billion in the 2022 SCS from $3.53 billion in the 2018 SCS. The budget for transit/rail increased 59.9 percent to $1.46 billion from $918 million between the 2022 and 2018 SCSs, respectively. The bicycle and pedestrian improvements budget also increased 60 percent to $426 million in the 2022 SCS from $266 million in the 2018 SCS. The relative decrease in highway,

streets, and roads, and the increase in planned investments for transit, bike and pedestrian improvements is aligned with StanCOG's assumptions around increases in non-SOV mode share and operational transit and rail miles, and relative decreases in VMT and GHG emissions.

CARB staff also looked at the distribution of planned investments by mode across the 2021 to 2035 period, as well as assumed available revenue sources to fund the planned investments. CARB staff found that the plan's investments for transit will generally support the 2035 target and are planned for an appropriate timeline to achieve the planned outcomes for these strategies, with upwards of 30 percent of transit investments planned to occur in the 2022-2035 period. CARB staff did not identify any significant concerns with risk of delay to related transit projects based on the plan's assumed revenue sources. However, CARB staff found that the plan's investments for active transportation that support the 2035 target are less certain.

The SCS submittal states that projects were included in the 2022 RTP/SCS with identified funding in order to build active transportation projects over the next 22 years. The quantified reduction from the SCS Strategy, tier 1 bicycle/pedestrian projects, is based on the SCS future land use scenario with substantial investment commitments in active transportation enhancements that would support mode shifts in regional travel patterns. The SCS submittal included a generalized list of bicycle/pedestrian projects, identifying over 220 investments in active transportation projects across the region. CARB staff's analysis of the project list identified 67 active transportation projects with an assumed operational date between 2022 and 2035, ranging from $6,200 to $15,000,000 for signage and street restriping and trail improvement to Class I/II/III bike paths and system improvements. Approximately 150 active transportation projects, totaling about 77 percent of the 2022 SCS active transportation investments, are either not planned for or uncertain to occur in the 2022-2035 period. CARB staff is concerned the investments and active transportation projects may not achieve the assumed levels of mode shift from light-duty automobiles to active transportation because assumed changes in the region's active transportation networks may not be fully operational and fail to realize the expected GHG emission reductions by 2035.

Overall, CARB staff find that the 2022 RTP/SCS project investments support the implementation of the 2022 SCS transportation strategies and achievement of the SCS's estimated GHG emission reduction benefits, if fully implemented.

CARB's Determination and Recommendations

Accept (with concerns regarding implementation and quantification methods)

Based on the policy evaluation of the 2022 SCS, CARB staff concludes that the plan includes some near-term supportive policy actions and active transportation, transit, and other SCS-supportive project investments that, if fully implemented, will lead the StanCOG region to achieve its 2035 GHG reduction target.

CARB staff, however, has significant concerns about whether key strategies in the 2022 SCS will be fully implemented and whether the anticipated GHG emission reductions by 2035 will be realized because the SCS does not include commitments from those responsible for implementing key strategies, especially for the jobs-housing balance / infill, telecommuting/remote work, carpooling, and EV charging infrastructure strategies. These strategies will require additional partnerships and funding commitments from local agencies and/or businesses to be implemented. Furthermore, there is no clear action to monitor implementation progress for these and other strategies in the SCS.

To support the full implementation of the SCS and achievement of SB 375's goals, and to continue fully supporting the GHG benefits claimed in the 2022 SCS, StanCOG and its local members will need to undertake additional actions to deliver and monitor its SCS strategies and to quickly adjust their strategies for any emission reductions that need to be replaced or mitigated. To address these and other concerns, CARB staff has the following recommendations and requests that StanCOG set up regular monitoring of the implementation actions associated with its SCS strategies in consultation with CARB and other relevant agencies.

Recommendations

I. Identify Further Actions to Accelerate Infill

StanCOG's SCS provides important growth assumptions regarding development, especially in its neighborhood infill areas and will require strong local jurisdiction support for implementation. CARB staff acknowledges the region's limited staffing availabilities and recommends that StanCOG identify opportunities to collaborate with other agencies, thereby leveraging administrative resources, to enhance its engagement with local jurisdictions and elevate needed actions.

For example, StanCOG could offer technical assistance to local planning agencies pursuing state planning grants and other funding sources intended to help implement an SCS. The impact on reducing VMT from awarded grants and resulting development projects could be further amplified, if coordinated with the planning efforts in neighboring regions.

StanCOG proposes to apply for funding under the Regional Early Action Planning Grant Program of 2021 that would support implementation of SCS strategies, among other things. StanCOG needs to focus these investments, if awarded, in the neighborhood infill areas that can maximize VMT reductions and further implement the 2022 SCS land use growth scenario. Specifically, StanCOG indicated some funding would be dedicated for supporting local land use planning updates and implement development projects, including housing production. To further implement the SCS, the region's funding decisions need to support other SCS strategies, such as increasing transit ridership by updating plans and implementing projects within one-half mile of the Modesto Bus Rapid Transit and ACE Forward systems. The funding targeted in these areas would help support how projects fit within identified transit priority areas, transit priority projects, and constrained areas as well as other SCS strategy land use assumptions, and thus, demonstrate GHG/VMT reduction. This would further allow regional, State, and local partners to identify which transit and land use projects are well-aligned with the region's adopted SCS preferred scenario and should be prioritized over projects that are not well-aligned to help reduce VMT.

StanCOG could also consider encouraging its members to pursue additional funding sources for infill development as well as providing additional technical assistance around State funding programs and incentives such as Affordable Housing and Sustainable Communities (AHSC) program,[7] the Transformative Climate Communities (TCC) program,[8] the Infill Infrastructure Grant Program (IIG),[9] and Permanent Local Housing Allocation (SB 2's PLHA).[10] Additionally, supporting local agencies to seek the Prohousing designation[11] will help their competitiveness in these programs and others.

In addition, StanCOG could develop and facilitate partnerships between local governments, employers, and affordable housing developers to encourage new development in areas that support the jobs/housing balances envisioned in the SCS and that are consistent with the RHNA allocation. StanCOG needs to focus initially in the areas of the Cities of Modesto and Turlock which are areas of existing development that received a large share of the RHNA allocation. Additionally, StanCOG could partner with local jurisdictions, economic development agencies, downtown associations, and private employers to promote job creation in existing

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[7] For more information about AHSS visit: *https://sgc.ca.gov/programs/ahsc/*.

[8] For more information about TCC visit: *https://www.sgc.ca.gov/programs/tcc/*.

[9] For more information about IIG visit: *https://www.hcd.ca.gov/infill-infrastructure-grant*.

[10] For more information about SB 2 Planning Grants visit: *https://www.hcd.ca.gov/community-development/planning-grants-ta.shtml*

[11] For more information about Prohousing visit: *https://hcd.ca.gov/prohousing-designation-program*.

communities where fewer jobs are situated, to promote a greater job-housing balance.

Furthermore, local jurisdictions need to align planning and local policies and actions that support development and growth constraints consistent with the SCS goals. To assist with this, StanCOG could provide guidance, webinars, resources, and analysis to support land use and housing planning with the SCS. For example, StanCOG could include assistance on updates to general and specific plans, development of an SCS transit priority growth and constraint areas site inventory/tool for local jurisdictions to use as part of their Housing Element updates, feasibility studies for infill potential, guidance on available CEQA streamlining, and review of development projects to determine whether SCS strategies would be implemented. StanCOG could also partner with the California Department of Housing and Community Development on providing technical assistance to its local members on Affirmatively Furthering Fair Housing (AFFH)[12] and Annual Progress Reports (APRs).[13] StanCOG could also encourage its local members to pursue Sustainable Agricultural Lands Conservation Program (SALC)[14] funding to protect agricultural lands.

For the next SCS, StanCOG could prepare a map that overlays the locations proposed for infill development aligned with the SCS land use and housing strategy, the locations where development is discouraged, and the location of regionally significant transportation projects.[15] This will help CARB, local jurisdictions, and the public better understand and track progress toward the assumptions being made in the SCS and help to focus strategy implementation efforts.

II. Update Estimates of GHG Benefits from Telecommuting and Commute Trip Reduction Strategies

The 2022 SCS includes assumptions about the GHG benefits that may come from increased teleworking and commute trip reduction strategies (carpooling) in the region. In the next SCS, CARB staff expect to see additional documentation, including assumptions, research, and/or any other information that supports relevant

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[12] For more information about AFFH visit: *https://www.hcd.ca.gov/community-development/affh/index.shtml*.

[13] For more information about APRs visit: *https://www.hcd.ca.gov/community-development/annual-progress-reports.shtml*.

[14] For more information about SALC visit: *https://www.conservation.ca.gov/dlrp/grant-programs/SALCP*.

[15] See, for example, mapping of priority development areas (PDAs) prepared by the Metropolitan Transportation Commission and Association of Bay Area Governments. PDAs are places near public transit with existing infrastructure where housing, transportation, and other types of land use planning work together as part of a regional growth framework. For more information, see, *MTC PDA website*.

assumptions associated with estimating the impacts of telework and commute trip reduction strategies as part of the SB 375 GHG emissions quantification.

CARB staff continue to monitor ongoing research on the effects of telework and anticipate updating our SCS Evaluation Guidelines on this topic. Some research has begun to raise questions, as it highlights the potential for VMT to increase and offset the reductions even with continued telework due to an increase in non-commute trips made by telecommuting workers. As such, CARB staff will look for more information about how the rebound effect is accounted for in the next SCS.

As part of the technical methodology prepared for the next SCS, please identify data sources, assumptions, variables, and other relevant factors considered for CARB staff to review. Please include documentation verifying that the rebound effect is accounted for. CARB staff will not be able to evaluate and/or accept an SCS GHG quantification without this information.

StanCOG also needs to consider ways to support the assumed future level of VMT reduction from these strategies. This could include things such as developing a strategic implementation plan, a regional TDM ordinance, and/or update its StanisCruise program that requires employers to implement, monitor, and report on telecommuting and carpooling within the region.

III. Update Estimates of GHG Benefits from Electric Vehicle Strategies

StanCOG's electric vehicle strategies are somewhat supported in the 2022 SCS. To maintain similar assumptions and strategies in the next SCS, CARB staff will look for documented evidence in the next SCS submittal that shows how the plan supports these strategies and demonstrates adequate progress is being made to help implement these strategies.

Also, CARB recently adopted the Advanced Clean Cars II Regulations, which require all new passenger cars, light-duty trucks, and SUVs sold in California to be zero emissions from 2035. SB 375 law excludes counting of emissions reductions from State programs that improve vehicle emissions standards, changes in fuel composition, and other State measures that reduce GHG emissions toward demonstration of regional target achievement. Therefore, as StanCOG prepares its next SCS, please work with CARB staff to appropriately account for any emission reductions associated with its electric vehicle strategies in the region. In the SB 375 program, it is important to appropriately identify GHG credits for zero-emission vehicle (ZEV) provisions that are above and beyond State and federal regulations and incentives to account for improved ZEV and PHEV technology and updated projections in ZEV incremental costs above conventional vehicles and to avoid double-counting between credits provided for infrastructure and vehicle incentives.

As part of the technical methodology prepared for the 4th cycle SCS, please fully reflect the policy, technological, and ZEV market changes that have occurred since

the prior SCSs were adopted in the quantification of electric vehicle strategies. For example, methodologies need to account for the ZEV regulation requirement of increasing sales up to 100 percent in 2035; other incentive credits, including the Federal Inflation Reduction Act (IRA) tax incentives for ZEV up to $7,500; and market observations, including CARB technology assessments in ACCII showing Battery Electric Vehicle (BEV) cost declines (staff ISOR Appendix G) and cost parity for some vehicle types beginning in 2031. As such, among other factors, please consider the following in updating the off-model ZEV quantification methods:

- Existing or currently planned incentives such as the federal IRA tax incentives, California's Clean Vehicle Rebate Project, and the California Clean Fuel Reward.
- Number of ZEVs and PHEVs required under state and federal regulations, also considering that under ACCII, for model years 2026–2035, PHEVs can only account for 20 percent of a manufacturer's ZEV requirement.
- The cost differential between ZEV and non-ZEV and impending cost parity in 2031.
- PHEVs must have an all-electric range of at least 50 miles under real-world driving conditions.

If these strategies are carried over for inclusion in the next SCS, this information must be provided as part of the technical methodology prepared for the next SCS for CARB to make its determination. If StanCOG needs technical assistance with the EV strategies, please get in touch with CARB staff.

IV. Prioritize Funding for Transportation Projects that Advance SCS Implementation and Goals

To support both the region and the State's ability to meet their respective climate and air quality goals, future regional investments need to explicitly limit or deemphasize roadway capacity expansion projects that are not well-aligned with the region's adopted SCS land use and housing strategy. Building on CARB's recommendation for StanCOG to identify further actions to accelerate infill through work with local agencies, it will also be important to analyze how proposed transportation projects align with the regional growth pattern with State and local partner agencies. The analysis could consider, among other factors, how the proposed transportation projects fit in with the SCS's identified transit priority areas, transit priority projects, and constrained areas, as well as SCS strategy deployment assumptions, and the impacts of road expansion projects on induced travel. This would allow regional, State, and local partners to identity which projects are well-aligned with the region's adopted SCS land use and housing strategies and could be prioritized over projects that are not well-aligned to help reduce VMT.

V. Develop and Monitor an SCS Implementation Plan of the Adopted SCS Strategies, Actions, and Transportation Project List

StanCOG will need to be vigilant about implementing the balance of strategies and transportation projects through 2035 to ensure SCS planned GHG reductions are achieved. Delays or removals of transit and active transportation projects or strategies will prevent StanCOG from meeting its GHG emission reduction target. CARB recommends amendments to the project list be accompanied by recalculation and discussion of whether and how SCS target achievement is maintained. Please inform CARB staff of these amendments.

StanCOG carries over some strategies from its previous 2014 and 2018 SCSs to the 2022 SCS. However, it is unclear how successful implementation of these strategies has been. To help with this, CARB recommends StanCOG develop an implementation plan for its 2022 SCS that identifies the actions, steps, and funding that StanCOG has and is pursuing in partnership with other public agencies, along with non-profit organizations and businesses to advance SCS implementation. This helps StanCOG and its local and State partners understand the concrete actions and shared commitments needed across the region to implement each SCS strategy.

As part of this work, CARB encourages StanCOG and its member agencies to develop a regional database with metrics and milestones to track, report, and assess implementation of its identified strategies. These points of information are fundamental for CARB to review as part of the next SCS. Per Board direction to CARB staff and the SCS Evaluation Guidelines, CARB staff will conduct a series of policy analyses of an MPO's SCS to evaluate whether the strategies, key actions, investments from the SCS, and the implementation progress to date support the stated GHG emission reductions and achieve the applicable GHG emission reduction targets.

The SCS Evaluation Guidelines outline how CARB staff will review whether a region is falling behind on implementation and, if so, what measures are being taken to correct course, such as a change to the RTP/SCS strategy and/or the addition of measures to accelerate implementation. Tracking strategy implementation will help inform StanCOG, its member agencies, and the public on what strategies are performing well, what strategies need to be adjusted, or if strategies need to be removed. This will also help inform what types of projects and investments the region could consider making to achieve the SB 375 GHG emission reduction targets. For example, if there are areas where the region is falling behind on implementation of a strategy, describe how the region is making the necessary adjustments in either the quantification of benefits, or policy commitments and investments in the RTP/SCS to maintain current assumptions. CARB staff will not be able to evaluate and/or accept the SCS GHG quantification without this information.

VI. Provide Emissions Calculation Methods and Assumptions for All Off-Model Strategies with Clearly Cited Sources

StanCOG relies on off-model strategies as part of its 2022 RTP/SCS to demonstrate the majority of GHG emission reductions. As detailed in the 2019 Evaluation Guidelines, an MPO must document the methodology, assumptions, and datasets in addition to demonstrating how each component of the off-model framework is addressed and supported.[16] The 2022 SCS submittal lacked information and details to support the tier 1 bicycle improvements strategy, questioning the levels of expected GHG emission reductions by 2035. In the next SCS, if the strategy is included, StanCOG needs to provide a detailed description of the quantification methodology, assumptions with supportive documentation, and trip and emissions data. For example, documenting the increase in trail/lane miles, existing and forecasted changes in bicycle commute trips and trip lengths, and the number of vehicle trips and lengths within the region from the travel modelling outputs will help StanCOG demonstrate how these changes help the region achieve the 2035 target. CARB's evaluation uses this information to evaluate the strategy's effect on providing or improving active transportation access and connectivity in the region as well as replacing vehicle trips (i.e., changes in mode shift and mode share).

VII. Developing SCS Strategies to Receive Credit for Emissions Reduction

StanCOG's original SCS submittal included strategies seeking credit for emissions reduction towards the 2035 target that lacked supportive documentation and evidence (e.g., VMT mitigation program). During the next SCS update process, StanCOG should work with CARB to ensure that its strategies warrant GHG reduction credit for SB 375 purposes. The technical methodology review and collaboration process outlined in SB 375 serves this purpose. CARB staff's evaluation is a strategy-based process designed to enhance transparency of the strategies within the SCS and verify emission reduction estimates. SB 375 calls on CARB to ensure that strategies help achieve GHG emission reductions from light-duty passenger travel within the MPO region and that reductions would not otherwise be a result of state regulations and other measures. CARB's 2019 Evaluation Guidelines lay out how CARB staff ensures that strategies are accompanied by supporting actions to advance implementation.

VIII. Provide All Trend Analysis Metrics

StanCOG's SCS submittal lacks data on transit daily ridership, transit seat utilization, and 2005 data on vehicle ownership, mode share, average vehicle trip length, average travel time by mode, and daily transit ridership, which are part of the performance indicators that CARB staff analyzed for the trend analysis. The SCS

[16] CARB. Sustainable Communities Strategy Program and Evaluation Guidelines Appendices. (2019). Appendix E: Off Model Strategies, at page 44.

submittal also lacked data on VMT per capita and GHG per capita for 2019, which are also part of CARB staff's analysis.

Providing more meaningful performance indicators like these may require StanCOG to back cast the 2005 performance indicators, prepare estimates for the modeling base year, and estimates for the missing indicators using its travel demand model. This information must be provided in StanCOG's next SCS.

IX. Improve Modeling and Data

CARB staff recommends that StanCOG improve the sensitivity of the model for biking and walking strategies. In addition, StanCOG should conduct the sensitivity analysis to potentially modeled strategies such as transit, telecommuting, and changes in auto operating costs. Transportation network companies and autonomous vehicles should also be part of the mode choice model of the Stanislaus travel model. These modeling improvements and analysis are important because they help to explain potential changes in how modeling outputs used to estimate GHG per capita and total VMT respond to land use and transportation strategies.

X. Estimating Induced Travel Impacts

CARB staff appreciates StanCOG's work to analyze and incorporate induced travel impacts into its quantification for this SCS. As part of the technical methodology for the 4th cycle SCS, please plan to continue quantifying the full impact on GHG emissions from induced travel for capacity-increasing projects that are roadway classes 1, 2, and 3 that are assumed to be built by 2035. Please also plan to provide a comprehensive mapping and tabulated list of all these projects 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 as part of the RTP/SCS for CARB staff to evaluate the final GHG emission reduction quantification. CARB staff will not be able to evaluate and/or accept an SCS GHG quantification without this information. Please consider also analyzing the full impact of induced travel demand from capacity-increasing projects that are assumed to be built by the horizon year of the next RTP/SCS to ensure GHG emission reductions are not backsliding after the 2035 GHG emission reduction target is achieved.

If StanCOG needs technical assistance with the induced travel analysis and estimating the VMT impacts of roadway expansion projects, please get in touch with CARB staff.

CARB also recommends that StanCOG coordinate with project sponsors and local agencies, including Caltrans, to fully analyze the transportation and land use impacts on the proposed roadway expansion projects in county and assist in identifying alternatives or appropriate mitigation measures.

XI. Update Auto Operating Cost Assumptions and Values

Auto operating cost (AOC) is crucial in forecasting travel behavior changes and influencing GHG emission reductions in the SCS. CARB staff recommends that StanCOG continue using the methodology in the SCS Evaluation Guidelines for the 4th cycle SCS with updated fuel price, efficiency, and non-fuel cost. Please ensure that alternative fuels are reflected appropriately in the AOC calculation. This information must be provided as part of the technical methodology prepared for the next SCS for CARB to make its determination. Please provide a complete technical methodology to CARB staff as early as possible to allow time for the necessary review and iteration needed for CARB to conclude that the technical methodology operates accurately before StanCOG starts the public participation process for the next SCS. If StanCOG needs technical assistance with the AOC calculation, please get in touch with CARB staff.

XII. Update Calculations and Emissions Factors for Off-Model Strategies

In the next SCS, CARB staff will expect to see updated calculations for off-model strategies to reflect current conditions. In accordance with CARB's SCS evaluation guidelines, MPOs must use the latest EMFAC model with updated emissions factors to estimate GHG emission reductions from off-model strategies. Using the latest EMFAC model improves emissions estimation accuracy by reflecting the latest vehicle fleet mix in the region.

As part of the technical methodology prepared for the next SCS, please clearly list each potential strategy along with the complete off-model quantification steps with identified data sources, assumptions, variables, and other relevant factors for CARB staff to review. In the listing of quantification steps, please include the GHG quantification step and indicate the emission factors from the EMFAC model that will be used when calculating GHG emission reductions from all off-model strategies for the next SCS. CARB staff will not be able to evaluate and/or accept the technical methodology without this information. Please provide a complete technical methodology to CARB staff as early as possible to allow time for the necessary review and iteration needed for CARB to conclude that the technical methodology operates accurately before StanCOG starts the public participation process for the next SCS.

XIII. Estimating Impacts of Autonomous Vehicles

In the next SCS, CARB staff expect to see accounting for the potential effects of autonomous vehicles. Autonomous vehicles are currently operating in California, and it is reasonable to expect that they will become common in the region during the next RTP/SCS planning period and will have transformative effects on transportation. CARB staff continue to monitor ongoing research on the effects of autonomous vehicles and anticipate updating our SCS Evaluation Guidelines on this topic. Regional transportation plans need to begin to anticipate the effects of autonomous vehicles on the transportation system, VMT, and GHG emissions. In the technical methodology for the next SCS please discuss what assumptions the region will make

about autonomous vehicles in the plan and provide any supporting data, evidence, or documentation for any assumptions made for CARB staff to review.

Appendix A: StanCOG's 2022 SCS Strategy Table

This is a summary table based on StanCOG's submittal that compares the key land use and transportation strategies between the 2018 and 2022 SCSs. This table also illustrates how GHG emissions were estimated for each strategy.

Category: 2022 SCS Strategy Name	New/Carryover Strategy from 2018 SCS	Analysis Type	Estimated GHG Emission Reduction in 2035
Land Use & Housing: Job/Housing Balance and Infill Development Around Transit	Carryover	On-Model[1]	-8.29%
Transportation: ACE Forward	Carryover	Off-Model	-0.3%
Transportation: Pedestrian and Tier 1 Bike Improvements	Carryover	On-Model/Off-Model	-0.89%
Transportation: Vanpool	Carryover	Off-Model	-0.05%
Transportation: Rule 9410 Employer Trip Reduction	Carryover	Off-Model	-3.0%
Transportation: Modesto Bus Rapid Transit	New	Off-Model	-0.3%
Transportation: Telecommuting	New	Off-Model	-4.28%
Transportation: Transportation System Management/Intelligent Transportation System	New	Off-Model	-0.69%

Category: 2022 SCS Strategy Name	New/Carryover Strategy from 2018 SCS	Analysis Type	Estimated GHG Emission Reduction in 2035
EV and New Mobility: Electric Vehicle Incentives	New	Off-Model	-0.64%
EV and New Mobility: Electric Vehicle Infrastructure Charging Incentives Program	New	Off-Model	-0.88%
Total Reduction	**N/A**	**N/A**	**-19.3%**

[1] StanCOG estimates VMT changes from its land use and housing strategy, along with long-term induced travel, in aggregate, using a combination of travel demand model outputs and off-model calculations. The percent reduction from implementing StanCOG's land use and housing strategy, along with transportation network strategies together, which often have synergistic effects when designed to support each other, cannot be isolated.

N/A - Not Available

Appendix B: Trend Analysis Results

This table summarizes CARB staff's analysis of key plan performance indicators provided by StanCOG to support the 2022 SCS's stated greenhouse gas (GHG) and vehicle miles traveled (VMT) reductions. CARB staff requested data on the following eight performance indicators: 1) household vehicle ownership, 2) mode share, 3) average travel time by mode, 4) daily transit ridership, 5) average trip length by mode, 6) seat utilization, 7) VMT per capita, and 8) GHG per capita. StanCOG provided data for 6 of the 8 requested performance indicators. StanCOG did not provide daily transit ridership or seat utilization data, so CARB staff could not review the trend for those data.

Performance Indicator	**Forecast Change[17] 2019[18] to 2035**	**Trend Analysis**
Average Trip Length by Mode	SOV (+1.9%) HOV2 (+1.8%) HOV3 (+0.9%) Transit (-2.8%) Bike/Walk (+0.0%)	StanCOG's 2022 SCS forecasts an average single-occupancy vehicle (SOV) trip length increase from 14.07 miles/day in 2019 to 14.34 miles/day in 2035. Over the same period, the average high-occupancy vehicle (HOV2) trip (vehicles with two riders) increased (13.11 miles to 13.34 miles) and HOV3+ (vehicles with three or more riders) also increased (11.83 miles to 11.94 miles). Average transit trip length decreases from 6.52 to 6.34 miles. Average bicycling and walking trip length remained constant at 3.55 miles in both 2019 and 2035. CARB staff finds these vehicle trip length trends are not directionally supportive and consistent with the relationship shown in the empirical literature that reducing light-duty vehicle trip length reduces VMT and GHG emissions. Please see Appendix C: Data Table for more details.

[17] Change shown as: (-) decreasing, (+) increasing.

[18] For its 2022 RTP/SCS, StanCOG used a 4-step travel demand model. The output from this modeling included the performance indicators used for the trend analysis. StanCOG was not able to provide modeled output for 2005 or 2019 for all metrics but did provide output for calendar year 2035.

Average Travel Time by Mode	SOV (-0.2%) HOV2 (0.0%) HOV3+ (+0.7%) Transit (-1.1%) Bike/Walk (+0.6%)	StanCOG's 2022 SCS forecasts a decrease in the average SOV trip travel time (13.16 minutes in 2019 and 13.13 minutes in 2035). Over the same period, average HOV2 time did not change (12.7 minutes to 12.7 minutes) while HOV3+ travel time increased (11.9 minutes to 11.98 minutes). Average transit time remained long but decreased slightly from 53.17 minutes in 2019 to 52.56 minutes in 2035. Average travel time for bicycling and walking increased (16.87 minutes to 16.97 minutes). CARB staff finds the variation in trip travel time is not directionally supportive and consistent with the relationship shown in the empirical literature that travel time and trip length change proportionally and are supportive of reducing VMT and GHG emissions. Please see Appendix C: Data Table for more details.
Mode Share	SOV (-1.2%) HOV2 (+0.29%) HOV3 (+0.42%) Transit (-0.1%) Walk (+0.13%) Bike (+0.48%)	StanCOG's 2022 SCS forecasts that mode share for SOV trips will decrease from 36.2% in 2019 to 35% in 2035. Mode share for trips in HOV2 (two riders per vehicle) will increase from 21.21% in 2019 to 21.5% in 2035. HOV3+ (three or more riders per vehicle) will increase from 29.45% to 29.87% during the same period. Mode share for trips by transit will decrease from 2.08% to 1.98%, walk trips will increase from 1.47% to 1.6%, and bicycle trips will increase from 9.58% to 10.06%, respectively, over the same period. CARB staff finds trends related to SOV, HOV2, HOV3+, and bicycling directionally supportive and consistent with the relationship shown in the empirical literature. The lack of change in the mode share of transit and walking also indicates they are not the main contributors to reducing GHG emissions. Please see Appendix C: Data Table for more details.
Daily Transit Ridership	StanCOG did not provide data	N/A

Household Vehicle Ownership	+3.3%	StanCOG's 2022 SCS forecasts that average vehicle ownership per household is 3.03 in 2019 and 3.13 in 2035, meaning that vehicles per household are increasing. At the same time, household size is decreasing from 3.13 persons per household in 2019 to 3.00 in 2035. CARB staff finds the 2019 to 2035 trend not directionally supportive of reducing GHG emissions and inconsistent with the relationship shown in the empirical literature that reducing vehicle ownership reduces GHG emissions. Please see Appendix C: Data Table for more details.
VMT per Capita[19]	0.0%	StanCOG's 2022 SCS forecasted no change in VMT per capita from 2020 to 2035 (13.8 VMT/capita). CARB staff finds this trend not supportive and inconsistent with the relationship shown in the empirical literature that reducing VMT per capita will reduce GHG emissions. Please see Appendix C: Data Table for more details.
GHG per Capita Reduction Between 2005 and 2035	-19.3%	The GHG per capita reduction forecasted by StanCOG meets the target of -16% established by CARB. Please see Appendix C: Data Table for more details.
Seat Utilization	StanCOG did not provide data.	N/A

N/A - Not Available.

[19] StanCOG's 2022 SCS did not provide VMT per capita or GHG per capita for 2019, the modeling base year. Available per capita VMT reductions do not account for reductions from off-model strategies.

Appendix C: Data Table

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Total population	503,191	556,624	560,582	625,213	670,411	University of the Pacific (b)
Total employment (employees)	172,800	238,205	238,362	276,735	294,754	University of the Pacific (b)
Average unemployment rate (%)	NA	6.20%	10.70%	5.90%	5.00%	Caltrans Economic Forecast (PDF), 2021
Total number of households	160,808	177,813	179,276	208,139	224,291	University of the Pacific (b)
Persons per household	3.13	3.13	3.13	3.00	2.99	CALCULATION
Auto ownership per household	2.86	3.03	3.06	3.13	3.06	Caltrans Economic Forecast (PDF), 2021
Median household income	NA	$60,704	$62,873	NA	NA	https://datausa.io/profile/geo/stanislaus-county-ca/
Land Use						
Total acres within MPO	957,450	957,450	957,450	957,450	957,450	https://www2.census.gov/geo/docs/maps-

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
						data/data/gazetteer/2018_Gazetteer/2018_gaz_counties_06.txt
Total developed acres (2016)	61,675	67,101	67,488	NA	NA	2016 Farmland Mapping and Monitoring Project
Total housing units	167,050	186,703	188,240	218,546	235,505	University of the Pacific (b)
Housing vacancy rate (Percentage)	3.74%	4.76%	4.76%	4.76%	4.76%	University of the Pacific (b)
Total single-family housing units	131,254	141,424	142,169	153,349	173,367	MODEL
Total multi-family housing units	26,696	40,813	41,643	54,090	67,369	MODEL
Total housing units within 1/2 mile of transit stops	NA	115,084	116,122	131,688	153,268	2022 RTP/SCS Environmental Justice Analysis
Total employment within 1/2 mile of transit stops	NA	127,104	128,313	146,442	154,351	2022 RTP/SCS Environmental Justice Analysis

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Total housing units within 1/2 mile of high-frequency transit stops	NA	87,937	88,806	101,848	119,279	2022 RTP/SCS Environmental Justice Analysis
Total employment within 1/2 mile of high-frequency transit stops	NA	107,682	108,763	124,969	132,016	2022 RTP/SCS Environmental Justice Analysis
Transportation System						
Freeway general purpose lanes – mixed flow lane miles	NA	4,739	4,761	5,086	5,112	MODEL
Expressway	NA	3,007	3,015	3,144	3,162	MODEL
Freeway-Freeway	NA	0	0	0	0	MODEL
Highway	NA	28	28	28	28	MODEL
Freeway	NA	260	263	300	300	MODEL
Arterial (lane miles)	NA	448	457	601	607	MODEL

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Collector (lane miles)	NA	979	980	993	993	MODEL
Local (lane miles)	NA	15	15	15	15	MODEL
Local, express bus, and neighborhood shuttle operation miles	NA	10,031	10,194	10,194	10,194	National Transit Database (Future Years are estimated based on proportional increase in transit headways)
Passenger rail operation miles	NA	0	0	42	42	2022 RTP/SCS Project List, Appendix K
Transit total daily vehicle service hours	NA	789	810	810	810	National Transit Database (Future Years are estimated based on proportional increase in transit headways)
Bicycle and pedestrian trail/lane miles	NA	206	206	354	456	2021 StanCOG Non-Motorized Transportation Plan (bike miles only; future miles based on mappable bike facilities)
Vehicle Mode Share (Whole Day)						
SOV (% of trips)	NA	36.20%	36.13%	35.00%	34.80%	MODEL

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
SharedRide 2(% Trips)	NA	21.21%	21.23%	21.50%	21.58%	MODEL
SharedRide 3+ (% Trips)	NA	29.45%	29.48%	29.87%	29.43%	MODEL
Transit (% of trips)	NA	2.08%	2.07%	1.98%	1.89%	MODEL
Walk (% Trips)	NA	1.47%	1.48%	1.60%	1.67%	MODEL
Bike (% Trips)	NA	9.58%	9.61%	10.06%	10.62%	MODEL
Average Weekday Trip Length by Mode (Miles)						
SOV	NA	14.07	14.09	14.34	14.02	MODEL
SharedRide 2	NA	13.11	13.12	13.34	13.11	MODEL
SharedRide 3+	NA	11.83	11.84	11.94	12.09	MODEL
Transit	NA	6.52	6.51	6.34	6.23	MODEL
Walk/Bike	NA	3.55	3.55	3.55	3.56	MODEL
Average Weekday Travel Time by Mode (Minutes)						

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
SOV	NA	13.16	13.16	13.13	13.24	MODEL
SharedRide 2	NA	12.71	12.71	12.68	12.78	MODEL
SharedRide 3+	NA	11.90	11.91	11.98	12.10	MODEL
Transit	NA	53.17	53.13	52.56	52.18	MODEL
Walk/Bike	NA	16.87	16.88	16.97	17.24	MODEL
Average Weekday Trip Length by Trip Purpose (Miles)						
Home-Work	NA	16.19	16.18	16.09	16.22	MODEL
Home-Shop	NA	7.88	7.88	7.7	7.72	MODEL
Home-Other	NA	15.9	15.95	16.55	15.58	MODEL
Work-Other	NA	16.54	16.12	9.79	9.88	MODEL
Other-Other	NA	16.06	15.66	9.59	9.64	MODEL
Average Weekday Travel Time by Trip Purpose (Minutes)						
Home-Work	NA	16.18	16.18	16.17	16.42	MODEL
Home-Shop	NA	19.54	19.54	19.54	19.58	MODEL

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Home-Other	NA	22.85	22.88	23.25	23.44	MODEL
Work-Other	NA	11.78	11.78	11.77	11.75	MODEL
Other-Other	NA	10.45	10.47	10.79	10.86	MODEL
Vehicle Trips by Trip Purpose						
Home-Work	NA	263,039	265,467	301,882	346,119	MODEL
Home-Shop	NA	385,673	388,525	431,311	498,192	MODEL
Home-Other	NA	493,490	496,409	540,193	673,270	MODEL
Work-Other	NA	254,320	256,023	281,571	297,344	MODEL
Other-Other	NA	479,715	485,570	573,392	596,996	MODEL
Travel Measures						
Total VMT per weekday for passenger vehicles (ARB vehicle classes of LDA, LDT1, LDT2 and MDV) (miles)	8,568,834	NA	9,497,260	10,827,451	12,147,114	MODEL/EMFAC

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Passenger Vehicle Induced VMT	0	NA	0	234,325	NA	NCST Calculator
Total VMT per weekday for passenger vehicles (ARB vehicle classes of LDA, LDT1, LDT2 and MDV) (miles) with Induced Demand	8,568,834	NA	9,497,260	11,061,776	NA	MODEL/EMFAC
Total II (Internal) VMT per weekday for passenger vehicles (miles)	5,436,242	NA	6,007,276	6,772,799	7,430,620	MODEL/EMFAC
Total IX/XI VMT per weekday for passenger vehicles (miles)	2,149,606	NA	1,724,919	1,865,053	2,229,810	MODEL/EMFAC
Total XX VMT per weekday for passenger vehicles (miles)	982,987	NA	1,765,065	2,189,598	2,486,683	MODEL/EMFAC

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
SB 375 VMT Per Capita	15.1	NA	13.8	13.8	14.4	MODEL/EMFAC
Carbon Dioxide Emissions						
Total CO2 emissions per weekday (all vehicle class) (tons/day)	NA	NA	NA	NA	NA	EMFAC
Total CO2 emissions per weekday for passenger vehicles (ARB vehicle classes LDA, LDT1, LDT2, and MDV) (tons)	3,989	NA	4,192	4,675	5,250	EMFAC; 2035 includes induced demand
Total II (Internal) CO2 emissions per weekday for passenger vehicles (tons)	2,531	NA	2,652	2,924	3,212	EMFAC
Total IX / XI trip CO2 emissions	1,001	NA	761	805	964	EMFAC

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
per weekday for passenger vehicles (tons)						
Total XX trip CO2 emissions per weekday for passenger vehicles (tons)	458	NA	779	945	1,075	EMFAC
SB 375 CO2 per capita (lbs./day)	14.0	NA	12.2	11.9	12.5	EMFAC
Off-Model Strategy Reductions						
EMFAC Adjustment Factor	NA	NA	-2.5%	-3.2%	-3.1%	EMFACT and CARB Guidance
Bicycle Projects	NA	NA	NA	-0.9%	NA	BRT Practitioners Guide Methodology (forecast additional transit trips and associated VMT reductions), see Appendix M
Modesto BRT	NA	NA	NA	-0.3%	NA	LEHD Data to forecast future commute ridership and associated VMT reductions, See Appendix M

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
ACE Forward (passenger rail service extension)	NA	NA	NA	-0.3%	NA	NCHRP 552 Methodology, Commute Trips Only, See Appendix M
Telecommuting	NA	NA	-4.31%	-4.31%	NA	CARB SB375 Guidelines, November 2019, Telecommuting in addition to Rule 9410, see Appendix M for Discussion
Rule 9410 (Transportation Demand Measures)	NA	NA	-3.03%	-3.0%	NA	SJVAPCD Rule9410; http://www.valleyair.org/Programs/Rule9410TripReduction/eTrip_main.htm
Electric Vehicle Incentives	NA	NA	NA	-0.64%	NA	Travel Demand Model to determine VMT to be mitigated for TAZs over the County's threshold (15% below County average); See Appendix M
Electric Vehicle Infrastructure Charging Incentives Program	NA	NA	NA	-0.88%	NA	CARB SB375 Guidelines, November 2019 (Assumes 0 benefits in 2020)
Transportation System Management/Intelligent	NA	NA	NA	-0.7%	NA	CARB SB375 Guidelines, November 2019 (Assumes 0 benefits in 2020)

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Transportation Systems						
Vanpooling	NA	NA	-0.1%	-0.1%	NA	CARB SB375 Guidelines, November 2019 (Assumes 0 benefits in 2020)
Total Off-Model CO2 Emissions Reduction (%)	NA	NA	-7.4%	-11.0%	NA	Sum of off-model strategy reductions only
GHG/Capita Change from 2005	NA	NA	-17.19%	-19.35%	NA	See Appendix M, incorporates EMFAC Adjustment Factor and Off-Model strategies

Notes:

NA – Not available either the dataset does not exist or is not easily developed. In either case, it is not a direct input into the methodologies which resulted in the air quality forecast.

Certain values for 2020 were interpolated between 2019 and 2035 or 2005 and 2019, if 2035 is not available.

Appendix D: MPO Reporting Components

This section summarizes the three reporting components called for in the SCS Evaluation Guidelines: tracking implementation, incremental progress, and equity. The three reporting components are included to identify the effectiveness of prior SCS implementation and increase overall transparency of the SCS for the public and other stakeholders.

I. Tracking Implementation

The purpose of this section is to report on the progress the StanCOG region made in implementing its previous SCS's planned outcomes. Specifically, CARB staff compared observed data for transportation, housing, and land use performance metrics to the outcomes modeled in the region's previous plan to determine whether the region is on track to meet its targets. CARB staff chose performance metrics based on the availability of observed data and plan performance indicators provided by StanCOG and represent a snapshot of the region's current standing. The tracking implementation analysis allows CARB staff to understand whether the region was on track to meet its previous SCS's expected plan outcomes and whether and how the latest adopted SCS needs to be adjusted to get the region on track with desired plan outcomes, which is then used to inform CARB staff's Plan Adjustment analysis.

CARB staff's analysis of observed data to outcomes provided in the region's 2018 previous plan is as follows:

- **Regional average household vehicle ownership** increased by 4.2 percent between 2010 and 2020. StanCOG's 2018 SCS estimated an approximate 3.1 percent increase between 2005 and 2020. The trend in observed data is heading in the wrong direction.
- **New homes built by type** shows multifamily housing increased by 141 units between 2018 and 2020, which is a small portion of the additional 7,935 multifamily housing units StanCOG's 2018 SCS estimated to be built in the region during that time period. Single-family units increased by 1,011 units during the same two-year period, which was also far short of the 7,306 single-family units the 2018 SCS forecasted to be built in the region. Overall total housing production was far below what was estimated in the 2018 SCS and multifamily housing represented a smaller share of new housing units built between 2018 and 2020, at 12.3 percent of total housing units built in the region and is heading in the wrong direction.
- **Commute trip travel time** increased by approximately 10 percent in StanCOG from 2010 to 2019. No data were provided for commute trip travel time in the 2018 SCS.
- **Daily transit ridership** decreased by approximately 51 percent in StanCOG from 2010 to 2020. No data were provided for daily transit ridership in the 2018 SCS.

Household vehicle ownership and new homes built by type are not headed in the right direction toward expected plan outcomes; other observed data metrics are not able to be

directly compared to expected plan outcomes reported by StanCOG. To view CARB's 2022 Progress Report and observed data trends, please visit CARB's *Tracking Progress Webpage*.

II. Incremental Progress

Table 2 provides a summary of the CARB staff's assessment. CARB staff note that the forecast for the 2022 SCS modeled for 2035 included a decreased population and number of households and an increase in employment compared to the 2018 SCS. In addition, the modeled forecasts apply an increased auto operating costs and average household vehicle ownership.

Table 2. Incremental Progress Analysis of exogenous factors and forecasted performance metrics for StanCOG's 2018 SCS and 2022 SCS

Type	Metric	2018 SCS	2022 SCS	Change	Directionality
Exogenous Factor [1]	Population	674,019	625,213	-48,806	(-)
Exogenous Factor	Households	221,414	208,139	-13,275	(-)
Exogenous Factor	Employment	222,414	276,735	+54,321	(+)
Exogenous Factor	Auto operating cost (AOC) [2]	0.21	0.25	+0.04	(+)
Exogenous Factor	Average auto ownership per household	3.0	3.1	+0.1	(-)
Exogenous Factor	Average household size	3.0	3.0	0.0	(-)
SCS Strategy	Percent of housing units within 0.5 miles of transit [3]	52%	60%	+8%	(+)

Type	Metric	2018 SCS	2022 SCS	Change	Directionality
SCS Strategy	Percentage of multifamily housing units in overall housing-type stock [3]	28%	25%	-3%	(-)
SCS Strategy	Total acres of farmland consumed [4]	2,988	1,004	1,984	(+)
SCS Strategy	Overall housing density for new development [4]	42%	68%	+26%	(+)
SCS Strategy	Tier 1 Bike Improvements [5]	NA	18,507 new cyclists	18,507	(+)
SCS Strategy	ACE Forward Ridership [5]	NA	1,176 new passengers	1,176	(+)
SCS Strategy	Vanpool	NA	132 total vanpool members	132	(+)
SCS Strategy	Employer-Trip Reduction Program (Rule 9410)	NA	324 total participating employers	324	(+)
SCS Strategy	Modesto BRT Ridership [5, 6]	NA	2,203 new passenger trips per day	2,203	(+)
SCS Strategy	Telecommute [6]	NA	12,225 participating employees	12,225	(+)
SCS Strategy	Electric Vehicle Incentives (eVMT) [6]	NA	239,478 eVMT	239,478	(+)

Type	Metric	2018 SCS	2022 SCS	Change	Directionality
SCS Strategy	Transportation System Management / Intelligent Transportation Systems [6]	NA	16 new systems	16	(+)

* NA - not available

[1] Exogenous factors reported by StanCOG in the 2018 and 2022 SCS submittals. CARB staff note inconsistencies with reported values for households, population, and employment in StanCOG's 2022 SCS submittal data table and supplemental documentation with the 2022 RTP/SCS Appendix L: Goals, Performance Measures, and Results; Appendix M: Technical Methodology; Appendix N: Scenario Development; and Appendix U: TDM Validation Report.

[2] AOC reported in 2018 SCS adjusted to 2010-dollar values for comparison with 2022 SCS.

[3] Reported strategy performance metrics obtained from data tables in StanCOG's 2018 and 2022 SCS submittals. CARB staff note consistencies with values reported in 2022 RTP/SCS Appendix L: Goals, Performance Measures, and Results.

[4] Farmland acres and housing densities are not provided in StanCOG data tables and forecasts are unavailable for 2035. Reported strategy performance metrics obtained from 2022 RTP/SCS Appendix L: Goals, Performance Measures, and Results that reflect the region's 2046 regional growth forecast. CARB staff note inconsistencies with values reported in StanCOG's 2018 and 2022 SCS submittal data tables.

[5] Reported strategy performance metrics obtained from 2022 RTP/SCS Appendix M: Senate Bill 375 Technical Methodology.

[6] New SCS strategy, reported strategy performance metrics obtained from StanCOG's 2022 SCS submittal for off-model strategy quantification methodologies and data.

StanCOG provided land use and transportation strategy-related metrics for plan-over-plan analysis for 2035. StanCOG included 1 carry-over and no new land use strategies in the 2022 SCS. StanCOG enhanced the land use strategy through the provisions of new actions such as facilitating housing planning and production through a state grant program and encouraging local jurisdictions to implement various state housing laws that voluntarily allow residential property owners to increase housing densities. StanCOG provided 2 land use strategies-related metrics for 2035. One metric is headed in an expected direction, suggesting that the region is making some progress in reducing VMT and GHG emissions by 2035. The forecasted percent of housing units within 0.5 miles of transit increases from 52% to 60% compared to the prior RTP/SCS. However, the percentage of multifamily housing units in the overall housing-type stock decreased from 28% to 25%, respectively, but may be attributed to lower growth forecasts between the 2018 and 2022 RTP/SCS. CARB staff note changes in land use assumptions compared to the 2018 SCS that prioritized growth in established neighborhoods and other available land use metrics that StanCOG forecasted, but beyond 2035. For example, the total farmland consumed in acres decreased from 2,988 to 1,004 acres and housing densities increased from 42% to 68% in the 2022 RTP/SCS by 2046. While the locations where StanCOG allocated infill growth as the share of

housing in TOD remains unclear, the overall contribution of the land use strategy towards reducing VMT and GHG emissions seems reasonable.

StanCOG included 7 transportation strategies in the 2022 SCS. These include bike and pedestrian improvement projects, transit capital improvements, vanpool, employer-based trip reduction program (Rule 9410), bus rapid transit improvements, telecommute, and operational improvements (transportation system management, or "TSM") and intelligent transportation system ("ITS"). Four of the 7 strategies were carried over and three strategies were added. StanCOG made enhancements to the carry-over strategies, such as expanding a multi-regional commute-trip region program (Rule 9410) that increased participating employers and enhancing administrative coordination of carpooling, vanpooling, bus, and train services through a region-specific program (StanisCruise). These actions collectively reduce GHG emissions and VMT beyond what the 2018 SCS would achieve by shifting travel behavior from single-occupancy vehicles to greater rates of high-occupancy vehicles and other modes of travel. StanCOG also enhanced the bike infrastructure and operational improvements of TSM and ITS strategy through funding for new systems. Modesto BRT and telecommuting are new transportation strategies included in the 2022 SCS. Considering that these strategies were not part of the previous SCS, these strategies contribute additional reductions towards achieving the GHG target. Overall, the additional contribution of transportation strategies toward reducing VMT and GHG emissions seems reasonable.

In the 2022 SCS, StanCOG included one new EV related strategy. The forecasted eVMT due to charging infrastructure results in 239,478 eVMT by 2035. Since the 2018 SCS, StanCOG has developed the region's EV Infrastructure Study, indicating that the Stanislaus region is making incremental progress on this strategy.

Overall, it appears that StanCOG is making some incremental progress in its 2022 SCS compared to its 2018 SCS. Due to a lack of data, CARB staff cannot estimate the magnitude of the impact of the additional strategies.

III. Equity

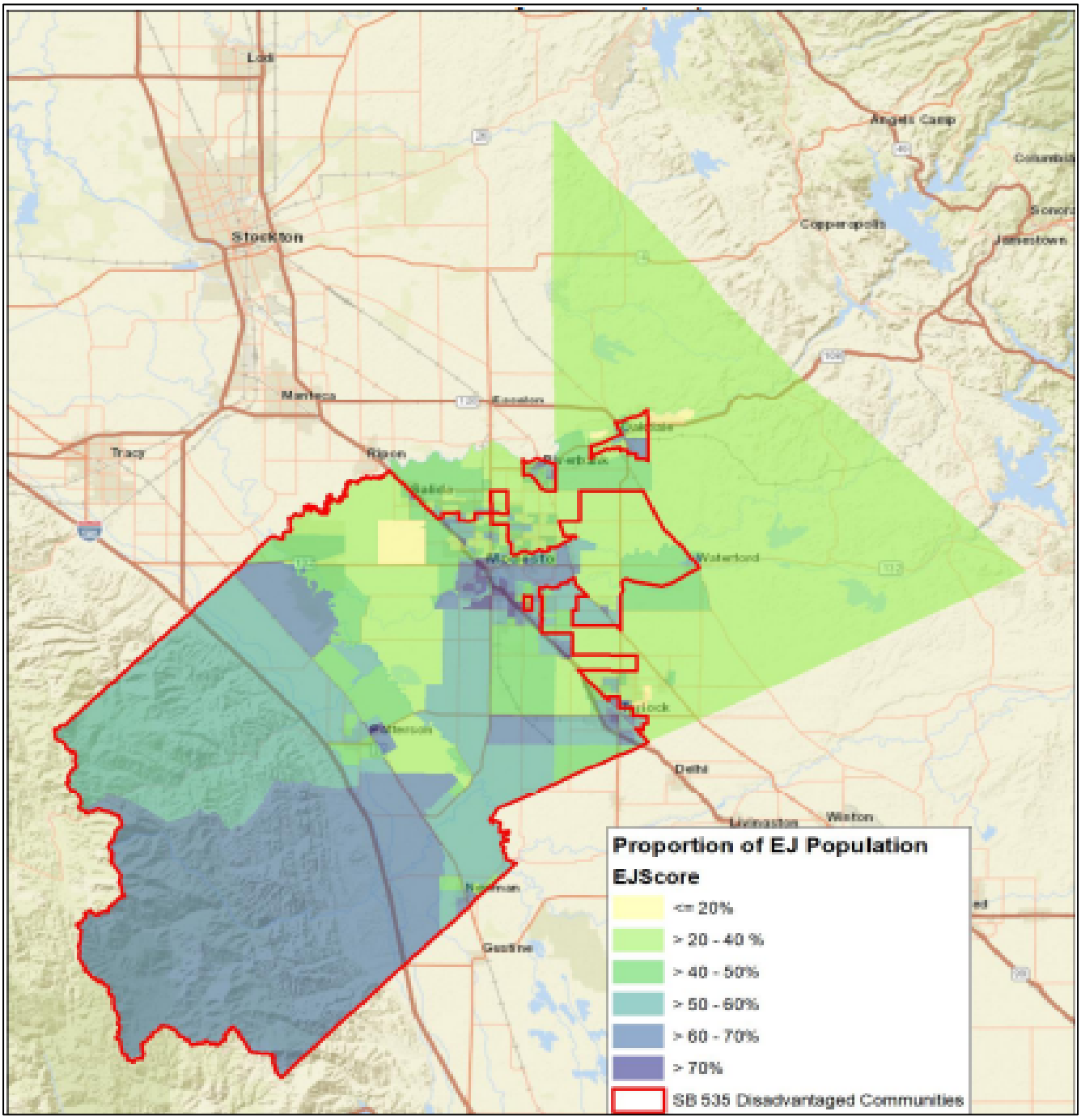
MPOs may report to CARB a summary of how they conducted equity analyses as part of the development of their SCSs in accordance with the CTC's *2017 Regional Transportation Plan Guidelines for Metropolitan Planning Organizations*.[20] StanCOG included information on its equity efforts with the SCS submission materials. CARB staff reviewed this information and prepared this section to summarize StanCOG's 2022 SCS equity work, including identified communities of concern, equity performance measures, equity analysis, and public participation efforts.

[20] The RTP Guidelines for MPOs were updated in January 2024, however, the 2022 SCS was developed under the 2017 version.

A. Identifying Vulnerable Communities

For the environmental justice and social equity analysis, StanCOG defined and identified EJ areas within the county based on estimates of income, race, and ethnicity utilizing Census/2016-2020 American Community Survey (ACS) data sets at the block/TAZ level. Figure 5, below, maps the ratio of EJ TAZs in Stanislaus County.

Figure 5. Environmental Justice Proportion of Population



Source: StanCOG, 2022 RTP/SCS Appendix R

B. Public Outreach and Engagement

StanCOG's Public Participation Plan (PPP) outlines the process for communicating with the public throughout the RTP/SCS development and documents the specific outreach activities taken to support its development. For this plan, StanCOG incorporated technological

changes to its outreach and engagement through an increase in online access and improved online tools for participation, since the previous public involvement process.

For the 2022 RTP/SCS StanCOG's outreach and engagement activities integrated the following elements:

- Outreach efforts to encourage the active participation of a broad range of stakeholder groups in the planning process.
- Informational meetings with elected officials.
- Consultation with local, state, and federal officials and other planning partners.
- At least three rounds of three community workshops throughout the region to provide the public with the information and tools necessary to provide a clear understanding of the issues and policy choices.
- Outreach presentations to stakeholder groups relevant to this planning process.
- Preparation and circulation of a Draft SCS not less than 55 days before adoption of a Final RTP.
- At least two public hearings, each in different locations around Stanislaus County, on the Draft RTP/SCS.
- A process for enabling members of the public to provide a single request to receive notices, information, and updates.

C. Equity Performance Measures

To determine the impacts of the proposed plan under the preferred scenario, StanCOG developed six performance measures to compare the social equity impacts expected by 2046 for its regionally identified EJ populations. StanCOG used Census Bureau definitions to identify "minority persons" and data to determine the distribution patterns of minority populations within Stanislaus County.[21] StanCOG then evaluated each performance measure between the 2022 RTP/SCS's preferred scenario (Scenario D) relative to the "Stay the Course" scenario (Scenario A). Additionally, for each scenario, StanCOG compared results for each performance measure for the environmental justice population area with those of the overall county average. Some outcomes from StanCOG's analyses are

[21] StanCOG. 2022 RTP/SCS, Chapter 7: Environmental Justice. Assessing Equity and Burdens, at page 7-112.

summarized below and further details can be found in *Appendix R of StanCOG's 2022 RTP/SCS*.

1. Percentage of Low-Income Housing / Minority Population within One Half-Mile of Transit Stops

The results of this analysis are summarized in StanCOG's EJ analysis Table 3. Minority Population and Low-Income Households within One-Half Mile of Transit Stops and indicate that the preferred scenario improves transit accessibility for the EJ population compared to the business-as-usual scenario and overall would improve more for EJ populations compared to the overall county average.

Table 3. Minority Population and Low-Income Households within One-Half Mile of Transit Stops

Analysis Zone		Total	Minority	Low-Income	EJ Score	EJ vs County
Scenario A	Population	403,853	252,425	NA	50.5	+3.9
	Households	135,068	NA	52,061		
	Percentage	NA	62.5%	38.5%		
Scenario D	Population	460,064	286,574	NA	50.7	+2.7
	Households	153,868	NA	60,281		
	Percentage	NA	62.3%	39.2%		

Source: StanCOG, 2022 RTP/SCS Appendix R

2. Percentage of Low-Income Housing / Minority Population within One-Half Mile of Frequent Transit Stops

The results of this analysis are summarized in StanCOG's EJ analysis Table 4and indicate that the preferred scenario will not have a significant impact on minority populations however, transit service accessibility for low-income households would improve, and overall would improve more for EJ populations compared to the overall county average.

Table 4. Percent of Low-Income Housing / Minority Population within One-Half Mile of Frequent Transit Stops.

Analysis Zone		Total	Minority	Low-Income	EJ Score	EJ vs County
Scenario A	Population	311,389	191,229	NA	50.6	+3.9
	Households	104,143	NA	41,467		
	Percentage	NA	61.4%	39.8%		
Scenario D	Population	358,059	218,488	NA	50.7	+2.7
	Households	119,752	NA	48,434		
	Percentage	NA	61%	40.4%		

Source: StanCOG, 2022 RTP/SCS Appendix R

3. Percentage of low-income/minority population within 500 feet of major roadways

The results of this analysis are shown in Table 5 and indicate that approximately 63.5 percent of racial or ethnic minorities, and 45.1 percent of low-income households would be located within 500 feet of major roadways with the preferred scenario, which is an increase compared to the business-as-usual scenario. StanCOG explains that the preferred scenario would locate more people in proximity to high-volume transportation corridors, however, it would also facilitate mode shift with denser populations making more viable transit and active transportation rather than vehicle travel.

Table 5. Percentage of Low-Income and Minority Population within 500 Feet of Major Roadways

Analysis Zone		Total	Minority	Low-Income	EJ Score	EJ vs County
Scenario A	Population	13,096	7,618	NA	47.8	+1.2
	Households	4,380	NA	1,643		
	Percentage	NA	58.17%	37.51%		
Scenario D	Population	41,650	26,464	NA	54.3	+6.3
	Households	13,930	NA	6,280		
	Percentage	NA	63.5%	45.1%		

Source: StanCOG, 2022 RTP/SCS Appendix R

In addition to analysis of these performance metrics, StanCOG used a regional financial analysis comparing the allocation of the preferred scenario expenditures between low-income households and all other households in Stanislaus County to determine if low-income populations are disproportionately impacted by transportation investments. The total expenditures for each mode that would benefit the low-income and non-low-income populations were identified and the per capita project expenditures by mode and income status was determined and are summarized in Table 6. StanCOG concluded from this analysis that low-income populations will disproportionately benefit more from overall transportation expenditures compared to the non-low-income population of the County due to the significant focus of dollars being spent on transit and bicycle/pedestrian projects.

Table 6. Per Capita Project Expenditures by Mode and Income Status

Commute Mode	Low-Income Population	Non-Low-Income Population
Roadway	$19,017	$19,849
Transit	$14,872	$9,061
Bicycle/Pedestrian	$8,261	$2,711
Total	$42,150	$31,621

Source: StanCOG, 2022 RTP/SCS Appendix R