CALIFORNIA
AIR RESOURCES BOARD

Gavin Newsom, Governor
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July 15, 2025

Stacie Guzman
Executive Director
Merced County Association of Governments
369 W. 18th Street
Merced, California 95340
Stacie.Guzman@mcagov.org

Dear Executive Director Guzman:

In accordance with the Sustainable Communities and Climate Protection Act of 2008, please find enclosed the California Air Resources Board's (CARB) Executive Order G-24-047 and CARB staff's evaluation of the Merced County Association of Governments' (MCAG) 2022 SB 375 Regional Transportation Plan/Sustainable Communities Strategy (2022 SCS). The Executive Order accepts MCAG's determination that its 2022 SCS would, when fully implemented, meet the applicable 2035 GHG emissions reduction target for automobiles and light trucks as established by CARB in 2018, specifically, a 14 percent per capita reduction by 2035 relative to 2005 levels. CARB staff's evaluation report summarizes its assessment, findings, and recommendations for determining the 2035 target.

CARB staff would like to acknowledge some of the particularly positive aspects of the plan. CARB staff appreciates that MCAG continues to highlight the changes needed to the current land use pattern to achieve the plan's climate goals. The 2022 SCS showcases several housing and mixed-use projects that are illustrative of the types of projects that will help the region reduce vehicle miles traveled. This is a good example for other regions.

Though the Executive Order accepts the 2035 target determination for the 2022 SCS based on a sufficient presentation of information that would support achievement if every strategy and measure were implemented, CARB staff is concerned that this plan will not be fully implemented as MCAG envisions. More support will be needed to realize the land use and housing strategies at the assumed levels. Nevertheless, the actions identified in the plan establish an important blueprint to guide future efforts.

Reducing vehicle miles traveled (VMT) is more important than ever. As the 2022 Progress Report assessing progress toward the goals of Senate Bill 375 found, per capita VMT continues to increase statewide. The 2022 Scoping Plan Update, adopted by the CARB Board in December 2022, shows that new vehicle sales being zero-emission by 2035 will not be enough to achieve carbon neutrality by 2045. In addition to technology-based solutions, California needs to reduce VMT by 25% by 2030 relative to 2019 levels, and 30% by 2045. Implementation of MCAG's adopted 2022 SCS is an important element of achieving these ambitious goals. To support successful implementation, and the GHG benefits claimed, CARB staff includes specific recommendations in the SCS Evaluation Report and requests

that MCAG regularly monitor the implementation of the plan in consultation with CARB and other relevant agencies.

Looking at MCAG's fourth cycle SCS, please work closely with CARB staff as you prepare for the submittal of the next technical methodology prior to the start of your public participation process, as SB 375 requires. Doing so will ensure that the plan the MCAG Board adopts appropriately demonstrates it meets the target. CARB staff also encourage MCAG's participation in CARB's process to update the SCS Evaluation Guidelines as we discuss potential changes to CARB's evaluation of quantification methodologies for subsequent cycles.

CARB staff appreciates MCAG's continued work to advance environmental sustainability in a way that increases transportation choice and housing opportunities and looks forward to an ongoing partnership to implement this plan and develop the fourth-cycle plan. If you have any questions or need further information, please contact *Carey Knecht*, Chief, Transportation and Land Use Planning Branch, Sustainable Transportation and Communities Division.

Sincerely,

/s/

Annalisa Schilla, Ph.D., Acting Division Chief, Sustainable Transportation and Communities Division Enclosures (2)

cc: Elizabeth Forte
Director of Planning and Programming
Merced County Association of Governments
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State of California
Air Resources Board

Executive Order G-24-047

Merced County Association of Governments' 2022 Sustainable Communities Strategy

CARB Acceptance of GHG Quantification Determination

Whereas, SB 375 (Steinberg, Chapter 728, Statutes of 2008), also known as the Sustainable Communities and Climate Protection Act, aims to reduce greenhouse gas (GHG) emissions from passenger vehicle travel through improved transportation and land use planning at the regional scale;

Whereas, SB 375 requires each of the State's 18 federally designated Metropolitan Planning Organizations (MPOs), including the Merced County Association of Governments (MCAG), to develop a Sustainable Communities Strategy (SCS) or an Alternative Planning Strategy that meets the regional GHG emissions reduction targets for automobiles and light trucks set by the California Air Resources Board (CARB or Board);

Whereas, on September 23, 2010, the Board set targets for the MCAG region of a 5 percent per capita decrease by 2020, and a 10 percent per capita decrease by 2035 relative to 2005 levels;

Whereas, on September 4, 2018, CARB accepted MCAG's quantification of GHG emissions for automobiles and light trucks as meeting the applicable targets in its first SCS, adopted by the MCAG Board of Directors on September 25, 2014, and SCS amendment adopted on May 19, 2016.

Whereas, on February 22, 2022, CARB accepted MCAG's quantification of GHG emissions reductions for automobiles and light trucks as meeting the applicable targets in its second SCS, adopted by the MCAG Board of Directors on August 16, 2018;

Whereas, on March 22, 2018, the Board set updated targets for the MCAG region of a 10 percent per capita reduction by 2020 and a 14 percent per capita reduction by 2035 relative to 2005 levels;

Whereas, in preparation for its 2022 SCS, MCAG staff engaged the public via advisory committee meetings, stakeholder working group meetings, public workshops, and public hearings between March 2022 and August 2022;

Whereas, in June 2022, MCAG published its draft 2022 SCS, which was available for public review through August 2022;

Whereas, on August 18, 2022, MCAG's Board of Directors adopted the final 2022 SCS, known as the 2022 Regional Transportation Plan / Sustainable

Communities Strategy, with a determination that the SCS would achieve the region's GHG targets, with a 10 percent per capita reduction by 2020 and a 14 percent per capita reduction by 2035 relative to 2005 levels;

Whereas, MCAG submitted the final 2022 SCS to CARB on April 23, 2023, as required by California Government Code section 65080, subdivision (b)(2)(J)(ii), and completed its submittal of supporting information on September 19, 2023;

Whereas, CARB staff performed an evaluation of the 2022 SCS's quantification of the GHG emissions reductions the strategy would achieve and the technical methodology used to obtain that result based on CARB's November 2019 document entitled *Final Sustainable Communities Strategy Program and Evaluation Guidelines*;

Whereas, CARB staff's evaluation found that MCAG made a determination that its 2020 GHG emissions reduction target was met in 2020 but the 2022 SCS did not include a determination whether it continues to achieve the 2020 GHG emission reduction target;

Whereas, CARB staff's evaluation indicated that MCAG used technical methodologies that would reasonably quantify GHG emissions reductions from the 2022 SCS for 2035;

Whereas, CARB staff's evaluation indicated that MCAG's 2022 SCS included strategies, key actions, and investments to support its stated GHG emissions reductions for 2035;

Whereas, CARB staff's evaluation showed MCAG's 2022 SCS, when implemented, would meet the applicable GHG emissions reduction target that the Board established for the region for 2035;

Whereas, CARB staff's technical evaluation of MCAG's GHG emissions reduction determination is included in Attachment A, Evaluation of the Merced County Association of Governments' SB 375 2022 Sustainable Communities Strategy, July 2025;

Whereas, California Government Code section 65080, subdivision (b)(2)(J)(ii), calls for CARB to accept or reject an MPO's determination that the Sustainable Communities Strategy submitted would, if implemented, achieve the GHG emissions reduction targets established by the Board;

Whereas, California Health and Safety Code sections 39515 and 39516 delegate to the Board's Executive Officer the authority to act on behalf of the Board in this manner;

Now, therefore, be it resolved that under California Government Code section 65080, subsection (b)(2)(J)(ii), the Executive Officer hereby accepts MCAG's determination that the SCS adopted by the MCAG Board of Directors on August 18, 2022, would, when implemented, achieve the applicable GHG emissions reduction target for automobiles and light trucks of 14 percent per capita reduction by 2035, relative to

2005 levels, as established by CARB for the region.

Now, therefore, CARB staff is directed to forward this executive order to the MCAG Executive Director.

Executed at Sacramento, California, this 15th day of July 2025.

_____/s/_____

Annalisa Schilla, Ph.D., Acting Division Chief,
Sustainable Transportation and Communities Division

Attachment A: Evaluation of the Merced County Association of Governments' SB 375 2022 Sustainable Communities Strategy

EVALUATION OF THE MERCED COUNTY ASSOCIATION OF GOVERNMENTS' SB 375 2022 SUSTAINABLE COMMUNITIES STRATEGY

July 2025

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Overview

On August 18, 2022, the Merced County Association of Governments (MCAG), which serves as the metropolitan planning organization (MPO) for the Merced region, adopted its 2022 Regional Transportation Plan/Sustainable Communities Strategy (2022 SCS). The 2022 Regional Transportation Plan/Sustainable Communities Strategy is available on MCAG's *regional planning website.* MCAG provided a complete submittal of the 2022 SCS and all necessary supporting information for CARB staff's review on September 19, 2023. MCAG's 2022 SCS estimates a 19% decrease in per capita greenhouse gas (GHG) emissions from light-duty passenger vehicles by 2035, compared to 2005. The region's per capita GHG emission reduction target is 14% in 2035, compared to 2005 levels, as adopted by the California Air Resources Board (CARB or Board) in Resolution 18-12 in 2018. This report reflects CARB's evaluation of the 2022 SCS and MCAG's determination that it would meet the targets when fully implemented.

Based on a review of all available evidence in consideration of CARB staff's 2019 *Final Sustainable Communities Strategy Program and Evaluation Guidelines,* referred to here as SCS Evaluation Guidelines, CARB staff accepts that MCAG's 2022 SCS and supplemental materials reasonably demonstrate that its SCS would meet its 2035 target, when fully implemented. However, CARB staff identified concerns with the 2022 SCS. This report offers recommendations to strengthen implementation of the land use and housing strategies, prioritize transportation projects that help to reduce vehicle miles traveled, improve quantification methods and modeling, and better track implementation of actions to support 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 generally on the method described in the 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. Appendix D summarizes the three additional reporting components called for in the SCS Evaluation Guidelines: tracking implementation, incremental progress, and equity.

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 on a review of MCAG's 2022 SCS and additional SCS submittal materials provided by MCAG. For a summary of strategies and quantification methods evaluated as part of MCAG's 2022 SCS submittal, see Appendix A: MCAG's 2022 SCS Strategy Table.

I. Trend Analysis

Under the SCS evaluation process, CARB staff evaluate key performance metrics to demonstrate how the SCS will meet the GHG reduction target. CARB staff look at the metrics to see whether the changes indicated by the metrics are directionally supportive of GHG reduction. CARB staff also use the metrics to identify what changes from MCAG's 2022 SCS are most critical to meet 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 MCAG's travel model minimally support the idea that the 2022 SCS will reduce GHG emissions and vehicle miles traveled (VMT) in 2035 compared to 2005, on a per capita basis. Other factors that contributed to the GHG reduction that are not reported as part of the trend analysis indicate that the SCS will reduce GHG emissions primarily through land use changes that help facilitate some increase in transit boardings, walking and biking trips as well as shorter travel times when traveling by car.

The modeled data show travel times decreasing for all modes of travel between 2019 and 2035. The percentage of trips made by driving alone is about 34% in 2019 and 2035. Average travel distance remains constant at about 7 miles per trip per day in 2019 and 2035. However, the population is increasing by 18% and the travel time for driving alone is decreasing by about 1% during this time. Walking and biking as a transportation mode are also reported to have shorter average travel times and trip lengths. These metrics together suggest that the development pattern assumes new homes and jobs are close to existing homes and jobs, which contributes to maintaining short travel distances within the county. This is supportive of the plan's strategy to prioritize infill and growth in existing communities.

The SCS submittal included modeled data that shows transit trips increasing by about 23% from 2019 to 2035, which is an increase in transit trips per capita, while transit as a mode of travel stays stagnant at around 3.5% of all trips happening in both 2019 and 2035. This suggests that transit service is expanding commensurate with increases in the region's population to maintain a similar share of travel. Travel time by transit in 2035 improves slightly by about 1% for trip lengths that stay about the same as in 2019. This is consistent with the plan's strategies for prioritizing infill and enhancing existing transit services.

The modeled results also showed most performance metrics registering very minimal change to influence achievement of the 2035 GHG target. In Appendix B: Trend Analysis Results, CARB staff note concerns that the modeled results generally show little to no change in most metrics except for decreases in travel time across all modes and that the transit trip increase is higher than observed data. Reported trends are useful indicators but dependent on multiple factors that CARB must consider when reaching a conclusion, such as robustness of the regional travel model and accuracy of outputs. Other factors that

contributed to the GHG reduction that are not reported as part of this trend analysis include land use changes, population and household projections, and off-model strategies.

II. Plan Adjustment Analysis

Under the SCS evaluation process, CARB staff evaluate 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 staff utilize data from the 2022 Progress Report to assess progress on the 2018 SCS. The travel disruption of the pandemic makes it difficult to assess the region's progress on changing travel patterns since the 2018 SCS. CARB staff found that much of the data needed to evaluate progress is missing and generally the data that does exist is trending in the wrong direction. The one exception is that housing production data, although limited, suggests that housing is being built at a pace that could yield the total housing units forecasted in the 2018 SCS. Additional analysis can be found in the Tracking Implementation section of this report.

However, CARB staff found that the 2022 SCS shows evidence of changes and adjustments since the 2018 SCS that are intended to help meet the region's more ambitious targets. CARB staff's analysis found that MCAG has enhanced the land use and housing strategies compared to the 2018 SCS.

- In 2046, the 2018 SCS assumes a net residential density of 10.3 units per acre, with 14% of all homes being multi-family. In the 2022 SCS, the net residential density in 2046 is assumed to be 10.9 units per acre with 30% of the units being multi-family.
- In the 2018 SCS scenario, 6,169 acres are assumed to be consumed for new development by 2046. Of that, 4,394 acres are agricultural land lost. In the 2022 SCS, 5,837 acres are assumed to be consumed for new development by 2046, with 4,474 of the acres being agricultural land lost.

Since the 2018 SCS, MCAG completed an infrastructure capacity assessment for local jurisdictions to support infill development. The local jurisdictions have also completed significant updates to their housing elements to accommodate the sixth cycle Regional Housing Needs Allocation. These updates are anticipated to help facilitate infill development through rezoning, infrastructure planning, and streamlining review and permit processes. Additionally, the Joint Powers Authority for Merced County (administered by MCAG) expanded access to bus transit across the county by launching microtransit services in rural service areas of the county.

The enhancements to the land use and housing strategies are intended to help the region meet its GHG emission reduction goals if fully implemented. However, while there is some evidence of implementation progress, it is uncertain if these strategies will be fully implemented as assumed to meet the 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 policies, investments, 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 includes policy actions that correspond to each of its strategies.
- Whether the actions are clear with respect to scope, who will be involved, what will be done, and the anticipated implementation timeline.
- Whether the actions are measurable and include 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 MCAG's 2022 SCS includes a set of strategies designed to achieve the GHG emission reduction targets and evidence of policy commitments for these strategies. However, CARB staff are concerned about the ability to implement some strategies, as noted below. The following sections summarize these strategies and CARB staff's findings regarding commitments in the region to advance implementation, organized under the four broad SCS strategy categories.

1. Land Use and Housing Strategy Commitments

MCAG's 2022 SCS includes a strategy to prioritize infill and growth in existing communities. This strategy aims to reduce GHG emissions per capita through a more compact growth pattern that provides housing choices, improves jobs-housing balance, protects and enhances the natural environment, and supports a sustainable economy. MCAG estimates this strategy will contribute to the 18% per capita GHG emission reductions that come from on-model strategies.[2] Although CARB staff cannot isolate how much of the GHG per capita reduction is coming from the land use strategy, the policy evidence discussed in detail below suggests that this is a significant factor.

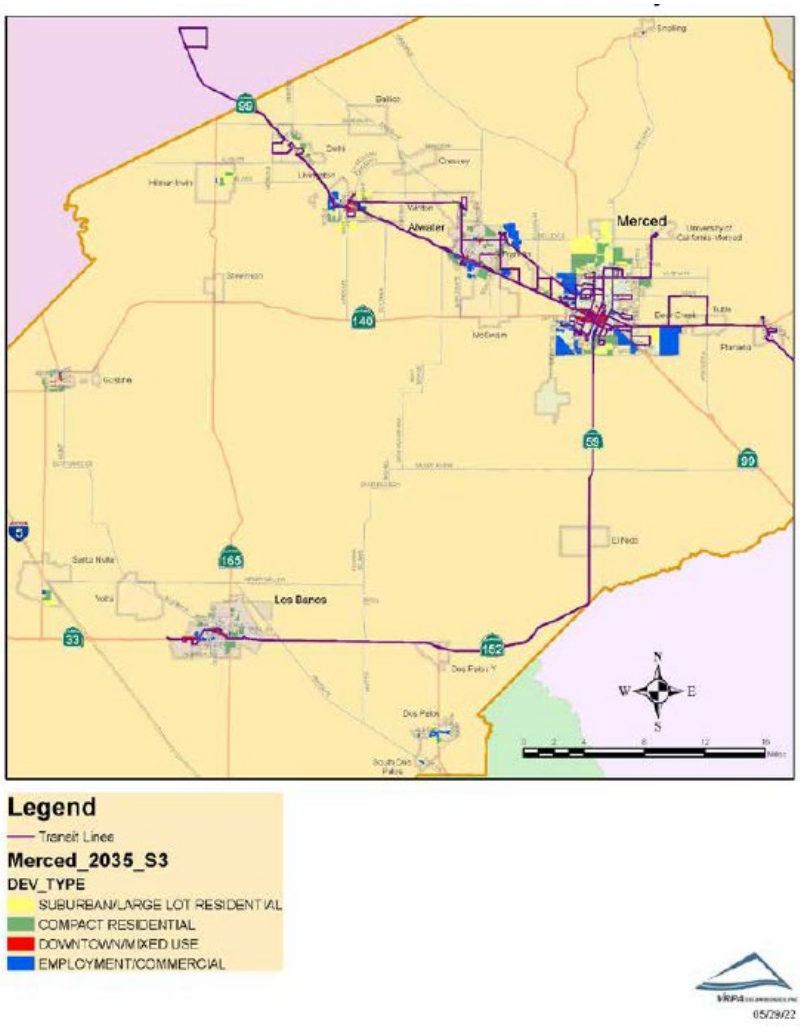
[2] MCAG's travel model estimates VMT changes from the land use strategies, transportation strategies, and network changes in aggregate. MCAG uses the VMT estimate to calculate the change in per capita GHG emissions. Therefore, the GHG emissions reduction estimate reflects MCAG's estimated reduction when implementing its land use and transportation changes together, which often have synergistic effects when designed to support each other. CARB is unable to isolate the emission reductions associated with MCAG's land use strategy by itself.

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:

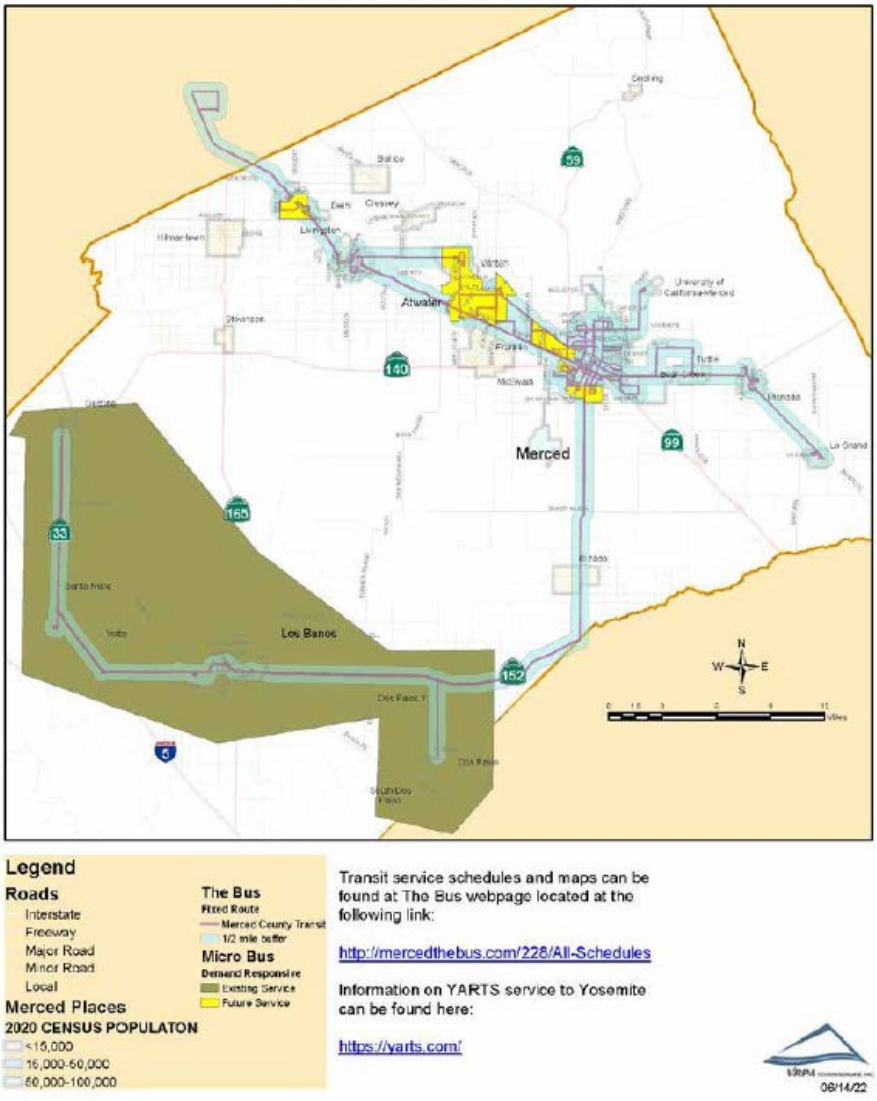
- The addition of 23,166 new housing units and 12,947 new jobs.
- A 49% increase in the region's residential density. This is an increase from 7.3 housing units per acre in 2019 to 10.9 housing units per acre in 2035.
- Half of all new homes between 2019 and 2035 is assumed to be "compact residential" or "downtown/mixed use" place types, compared to about 16% of existing homes characterized by these two place types. The forecasted place types for Scenario 3, the final SCS preferred scenario, are shown in Figure 1. Development Types.
- An increase of approximately 5,800 new homes and 5,400 new jobs within a half-mile of transit (a 63% and 36% increase, respectively) between 2019 and 2035. Merced County transit is shown in Figure 2. Merced County Transit.

Figure 1. Development Types



Source: MCAG 2022 RTP/SCS Figure 7.3 – Scenario 3: Conserve & Connect Merced County (Preferred Scenario)

Figure 2. Merced County Transit



Source: MCAG 2022 RTP/SCS Appendix T – Transit Service Area Map

b) Findings

CARB staff found that MCAG includes several actions for how it will support local agencies to prioritize infill and new growth in existing communities in the 2022 SCS. These actions include assisting member agencies in evaluating land use strategies, reviewing transportation impacts of land use and development proposals, supporting more multi-family and mixed-use developments, and exploring a sustainable planning and infrastructure grant program to help jurisdictions implement the region's SCS. The plan notes that this grant program will use existing and new revenue sources. Notably, MCAG's

2022 SCS showcases a number of recently approved development projects throughout the region that help reduce vehicle miles traveled and support the goals of the SCS.[3]

CARB staff found the 2022 SCS land use and housing planned outcomes are supported by inclusion of policies and actions. However, many of the actions outlined in the plan do not identify specific funding or timelines. CARB staff are concerned that the SCS land use and housing strategies will not be fully implemented. Because MCAG has no authority over land use decisions, these strategies will require strong local jurisdiction support for implementation. Additional technical assistance, partnership work, and tracking tools will likely be needed to implement the land use changes necessary to support the plan's assumptions.

2. Transportation Infrastructure and Network Strategy Commitments

MCAG's 2022 SCS includes four transportation strategies. One of the strategies is to enhance existing transit service, which is complementary to the land use strategy and quantified in the travel demand model. As noted above, the land use and transportation strategies employed in the travel demand model together account for an 18% reduction in GHG emissions per capita from 2005 to 2035.

The other three transportation strategies are quantified outside of the travel demand model, or "off-model," and are additional GHG emission reductions to what is accounted for using the travel demand model. These include the planned extension of the Altamont Corridor Express train, supporting vanpools, and implementing Rule 9410, which requires larger employers in the region to establish a plan to encourage employees to carpool or use transit services to reduce single-occupancy vehicle use. Together, these three off-model strategies contribute to a 1% reduction in per capita GHG emissions by 2035.

a) SCS Planned Outcomes

These transportation strategies translate into assumptions about changes to the transportation infrastructure and network that will serve the region between 2019 and 2035. Figure 3, Figure 4, and Figure 5 show the existing regional transportation network, existing bikeway network, and the countywide project map for 2046.[4] Specifically, the plan assumes the following outcomes:

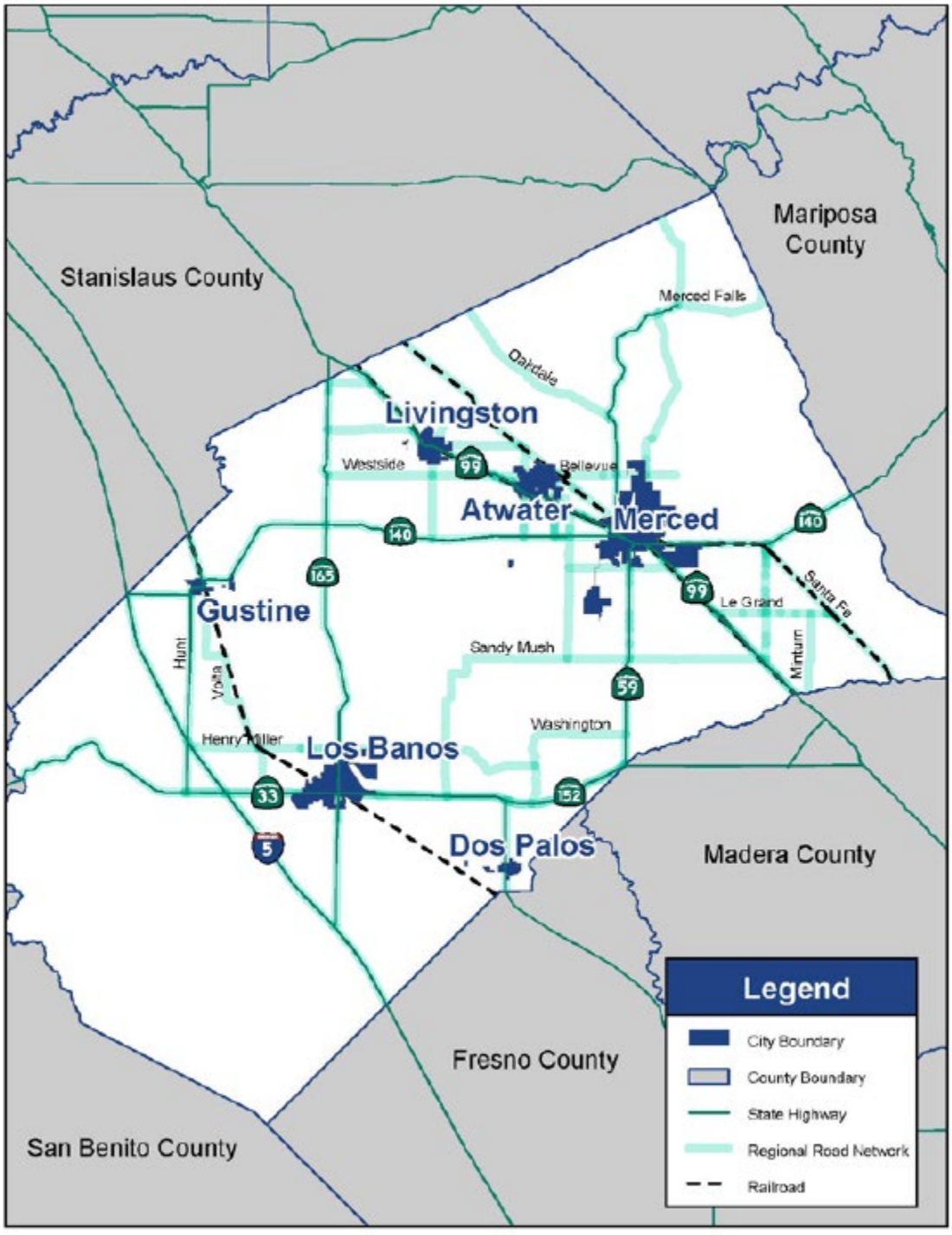
- A 5% (143 miles) increase in the region's total lane miles, including the addition of 36 highway general purpose lane miles, 9 arterial/expressway lane miles, and 98 collector lane miles by 2035.
- A 23% (about 2,200 trips) increase in transit trips between 2019 and 2035.

[3] MCAG 2022 SCS Chapter 3, pages 43-46.

[4] The countywide project map includes only Tier I projects that have a spatial location that can be mapped. Tier I projects are defined in the 2022 RTP/SCS as projects that are fiscally constrained.

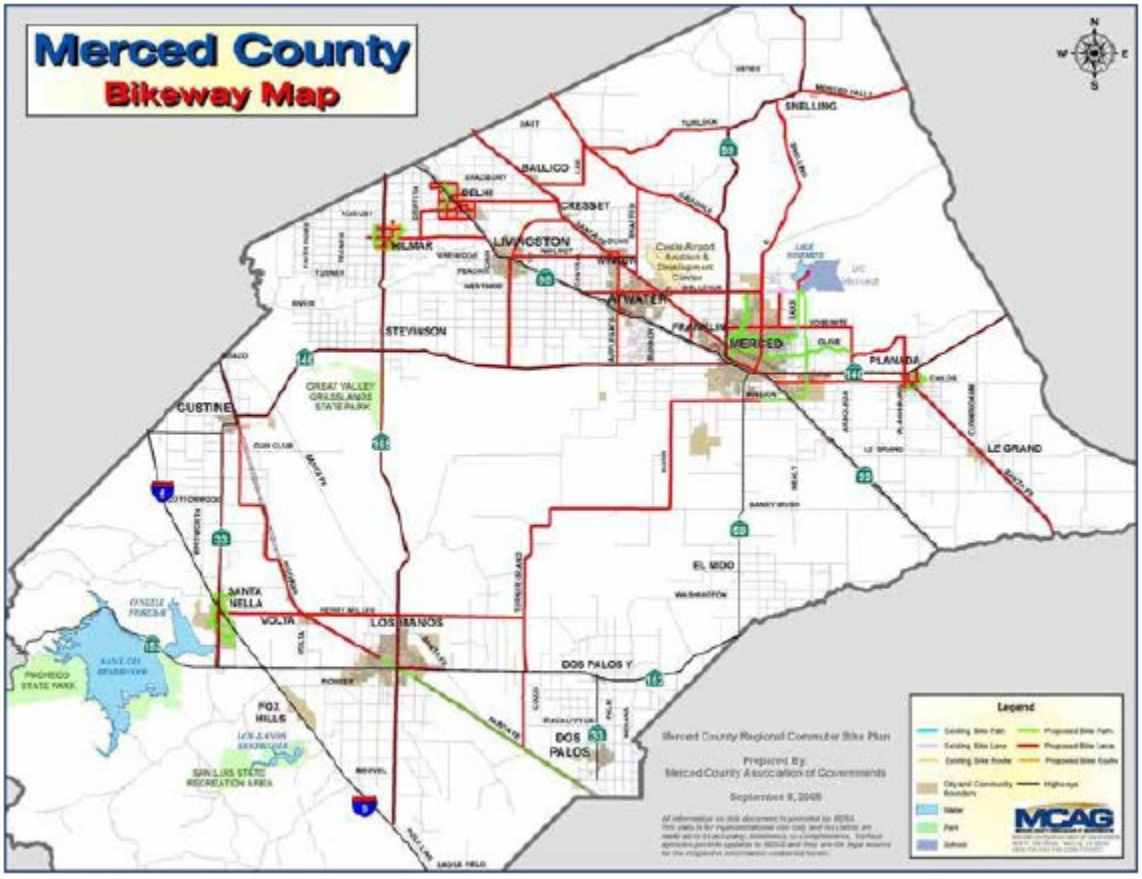
- New commuter rail service provided by the Altamont Corridor Express to Sacramento and San Jose.
- An increase in the number of vanpool vans with 71 vans carrying 10 passengers each and reducing VMT by 3,465 miles per day.

Figure 3. Regional Transportation Network



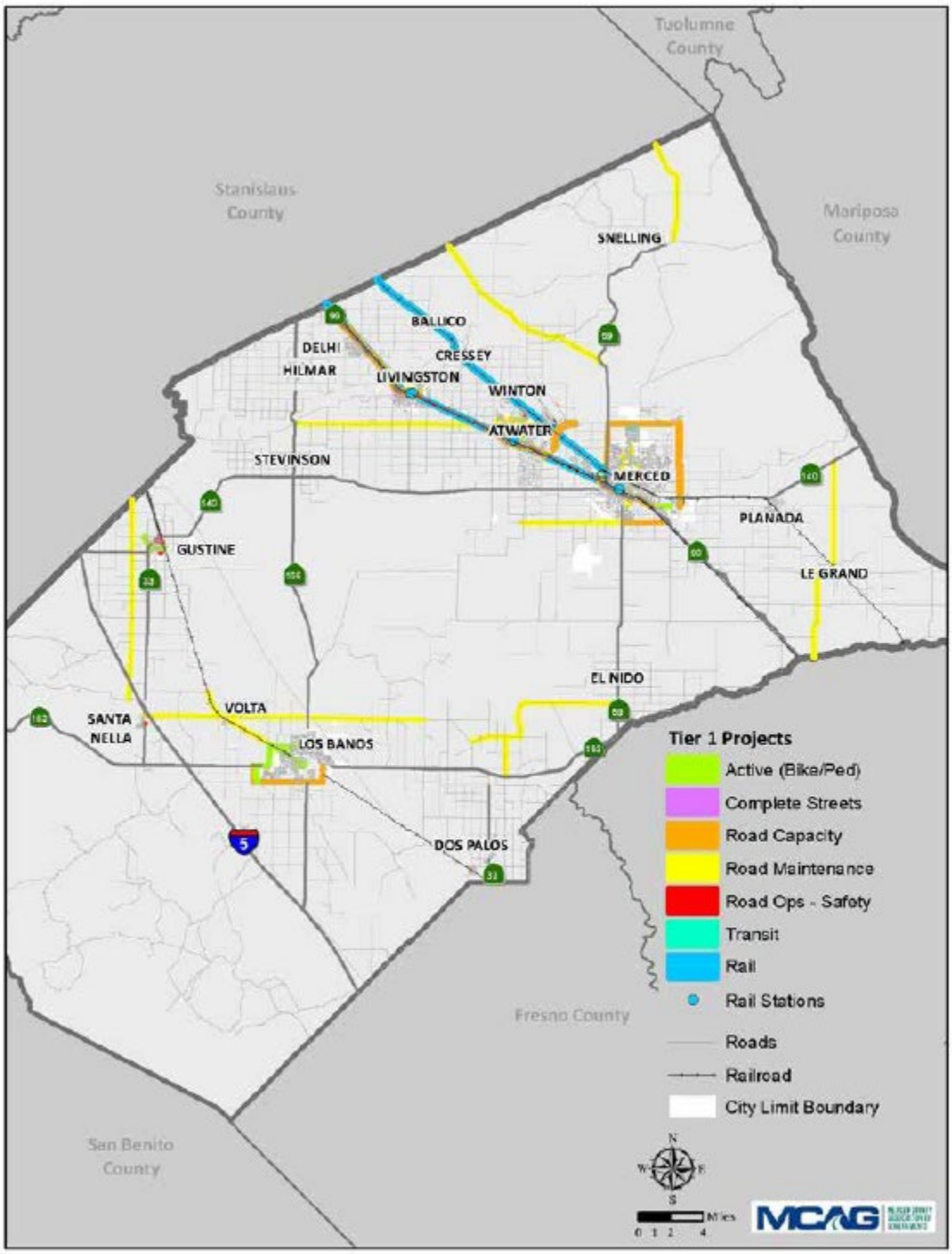
Source: MCAG 2022 SCS Figure 1.1 Merced County Regional Transportation System

Figure 4. Regional Bicycle Network



Source: MCAG 2022 SCS Figure 3.4 Merced County Bikeway Map

Figure 5. Countywide Project Map



Source: MCAG 2022 SCS Figure 1.5a Countywide Project Map

b) Findings

MCAG's 2022 SCS transportation project list includes Tier I and Tier II projects. The Tier I project list provides a list of fiscally constrained projects consistent with the financial revenue forecast through 2046. However, the Tier I projects account for only about 42% of the total revenues projected by 2046, and all projects are planned for completion by 2035. The Tier II projects are described in the plan as, "potential projects that, following further development, may be included in a future RTP/SCS." Most of the Tier II projects also have a projected timeline by 2035, indicating these are projects desired in the near term.

CARB staff found that the 2022 SCS transportation planned outcomes are somewhat supported by policies and actions, and through direct investments in the Tier I project list adopted with the 2022 SCS. The 2022 SCS includes positive project commitments that align with MCAG's on-model strategies to prioritize infill and enhance existing transit service. For example, the plan shows investment in public transit and increased frequency planned on key core routes to support the higher density development pattern assumed in 2035. Additionally, existing Amtrak rail service will be increased with double track improvements connecting to California High-Speed Rail and the new Altamont Corridor Express at a unified station in Merced. The 2022 SCS includes several important goals, including, prioritizing funding for complete streets on existing corridors, supporting projects that reduce vehicle use and GHG emissions, and updating project selection criteria to emphasize positive health outcomes, reducing environmental impacts, improving air quality, and reducing GHG emissions.

CARB staff found that the off-model GHG emission reductions for the planned extension of the Altamont Corridor Express train, vanpools, and Rule 9410 are reasonable and supported with dedicated funding in the Tier I project list.

However, CARB staff also found significant investments in Tier I and Tier II projects that are not supportive of the plan's VMT and GHG emission reduction goals. These include multiple expansions of State Route 99 and State Route 59 as well as new or expanded collector, arterial, and local roads. The State Route 99 widenings together have an estimated cost of $4.89 million and account for almost one-third of the Tier I project's total budget. Capacity expansion projects increase VMT and work against achieving the State's climate and air quality goals.[5]

As part of its SCS submittal, MCAG provided an analysis of induced vehicle travel. However, MCAG did not include the quantitative analysis of long-term induced travel and associated VMT and GHG estimates in the 2035 GHG quantification. To ensure that the VMT associated with induced travel from road capacity projects is accounted for in the GHG reduction calculation for purposes of achieving the SB 375 GHG reduction target, CARB staff analyzed the induced travel effects for the 44 miles of additional class 2 and 3 roadways planned in

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

the region on the Tier I project list using a hybrid approach similar to other MPOs.[6] This analysis resulted in an additional VMT of approximately 136,600 miles (1.6% change) to MCAG's 2035 VMT. In other words, this would increase the per capita total VMT from 26.2 to 26.6 miles/day/person. CARB staff found that this VMT increase would not likely affect MCAG's determination that the 2022 SCS achieves the 2035 GHG emission reduction target.

It is important to note that CARB's and MCAG's analysis is limited to road capacity-increasing projects in the Tier I project list only. MCAG's SCS has a Tier II project list that includes capacity projects, as well as assumed revenues that are unallocated to specific projects. It is possible that road projects from the Tier II project list and/or future unidentified road capacity projects could be developed prior to 2035. CARB staff are concerned by the fact that only the road capacity increasing projects listed in the Tier I project list were analyzed as part of the SB 375 GHG reduction target achievement. Any capacity-increasing road projects not on the Tier I list that are amended into the plan later will need to be analyzed for GHG emissions impact. MCAG will need to reassess whether the plan achieves the GHG emission reduction target with any proposed amendments.

3. Local and Regional Pricing Strategy Commitments

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

4. Electric Vehicles and New Mobility Strategy Commitments

MCAG did not include any electric vehicles or new mobility strategies in the 2022 SCS.

Looking across all four policy analysis categories, CARB staff found that MCAG's 2022 SCS will achieve its GHG reduction target, if fully implemented, but has concerns that key SCS strategies for land use and housing lack evidence of funding or other key actions to support the level of assumed implementation.

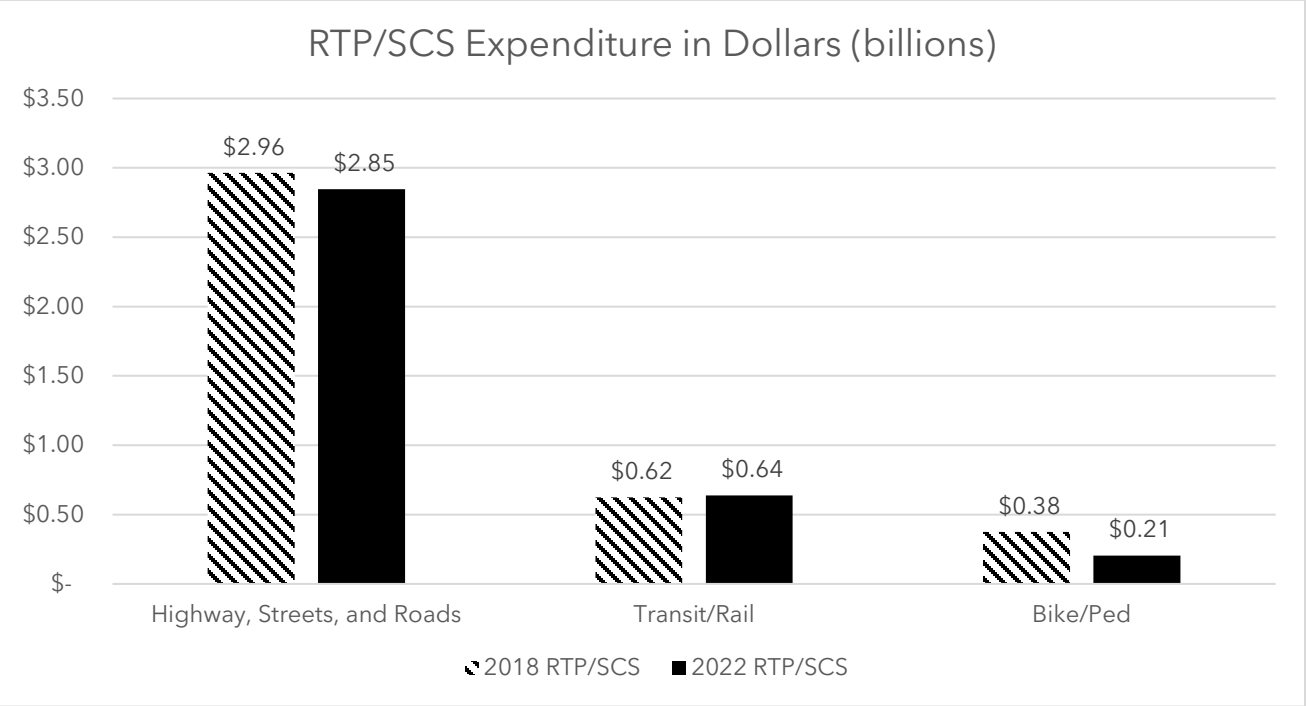
IV. Investment Analysis

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 in 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 6 and Figure 7, and Table 1. Figure 6 shows the total investment (Tier I and Tier II projects) by mode in the 2022 SCS compared to the 2018 SCS. Figure 7 shows investment (Tier I and Tier II projects) by mode as a percentage of total plan investment for both the 2022 SCS and the 2018 SCS. Table 1 shows the total revenues assumed and the investment by mode for the 2022 SCS for Tier I projects (committed funds

[6] Through induced travel or increases in travel due to changes in the number of trips and trip distances (destination changes); shifts in travel modes, the time-of-day travel occurs, and routes; as well as changes in residences and workplace locations.

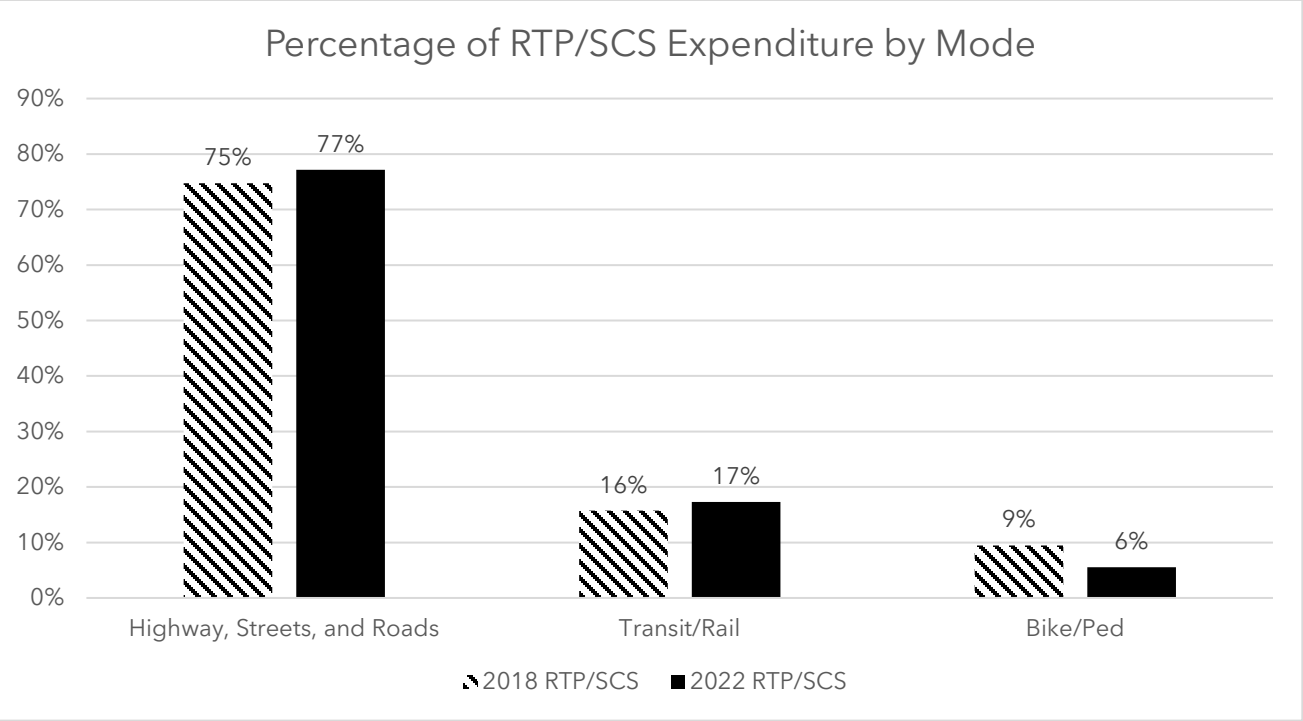
by 2035), Tier II projects (uncommitted funds), and the remaining funds forecasted but unaccounted for in the project lists.

Figure 6. Investments by Mode in MCAG's 2022 SCS Compared to the 2018 SCS (dollars)



Source: MCAG 2022 SCS Submittal and 2018 SCS

Figure 7. Investment by Mode in MCAG's 2022 SCS Compared to the 2018 SCS (% of Total Investment)



Source: MCAG 2022 SCS Submittal and 2018 SCS

Table 1. MCAG 2022 SCS Revenue and Investment Breakdown by Expenditure Category and Year

Expenditure Category	**Total Revenue Forecast 2022-2046**	**Tier 1 Projects Committed Funds (Years 2022-2035)**	**Tier I (%)**	**Tier II Projects Uncommitted Funds (Years 2022-2046)**	**Tier II (%)**	**Unallocated Revenue** **Balance =** **Total Revenue minus (-)** **Tier I + Tier II**
Road Capacity: Highway, Local Streets and Roads	$892,500,000	$886,000,000	99%	$104,051,000	11%	-$97,551,000

Road Maintenance, Complete Streets, and Safety	$1,953,500,000	$391,855,000	20%	$149,035,000	8%	$1,412,610,000
Active Transportation	$205,000,000	$40,882,000	20%	$33,650,000	16%	$130,468,000
Transit	$637,500,000	$221,141,000	35%	$990,808,000	155%	-$574,449,000
Total	*$3,688,500,000*	*$1,539,878,000*	*42%*	*$1,277,544,000*	*35%*	*$871,078,000*

Source: MCAG 2022 SCS Submittal

A. Findings

Based on CARB staff's review of the 2022 SCS project list, CARB staff found that it includes some funding that would advance the implementation of the SCS by 2035, specifically the off-model transportation strategies. However, CARB staff are strongly concerned that the road capacity projects included on the Tier II project list indicate a serious future risk to the achievement of the 2022 SCS planned GHG emissions reductions.

CARB staff compared the planned Tier I and Tier II investments by mode between the 2018 and 2022 SCS both in actual dollar amounts (Figure 6) and as a percentage of the total revenues assumed (Figure 7) and found that the revenue forecast and the planned investments for all modes except transit are decreasing in this plan (as shown in Figure 6). Specifically, the budget for transit/rail increased 2% to almost $638 million from $624 million between the 2022 and 2018 SCSs, respectively. The transit budget and project list include continued investments in supporting the three off-model strategies of vanpools, Rule 9410, and the extension of the Altamont Corridor Express train. The budgets for bicycle and pedestrian improvements decreased significantly from $376 million in the last SCS to $205 million in the 2022 SCS. However, MCAG's 2022 SCS does not claim to reduce GHG emissions per capita through bicycle or pedestrian improvements. In the 2022 SCS, total forecasted revenues are almost $3.69 billion, compared to about $3.96 billion in total revenues in the 2018 SCS.

CARB staff also compared the distribution of planned investments by mode across the 2022 to 2035 period for Tier I projects (projects with committed funds by 2035), across the 2022 to 2046 period for Tier II projects (projects where funds are uncommitted but could be considered for future funding/inclusion in the RTP/SCS), and the assumed available revenue through 2046 (Figure 8). CARB staff are concerned that the road capacity projects in the Tier I project list consume most of the revenues identified as available for road capacity projects whereas road maintenance, complete streets, active transportation, and transit consume

only a fraction of the available revenues for these project types. Further, the road capacity projects identified in the Tier II project list exceed the available revenues for that category, indicating a large pipeline of projects that are not VMT decreasing. CARB staff are concerned that MCAG will consider using revenues currently projected for non-capacity-increasing road projects to fund road capacity projects that increase VMT. The differences between the Tier I and Tier II lists for road maintenance, complete streets, active transportation, and transit also suggest that further work is needed to support the development and/or acceleration of VMT-decreasing projects to utilize available revenues.

Overall, CARB staff found that the 2022 SCS project investments somewhat support the 2022 SCS transportation strategies and achievement of the SCS's estimated GHG reduction benefits, if implemented. CARB staff are concerned about the potential for Tier II road capacity projects to impact the plan's anticipated GHG emissions reduction and whether further work is needed to meet the revenue available for development and/or acceleration of VMT-decreasing projects onto the Tier I project list.

CARB's Determination and Recommendations

Accept (with concerns regarding implementation and quantification)

CARB staff's policy evaluation of the 2022 SCS concludes that the plan includes a land use growth forecast, transit expansion, and other SCS-supportive project investments that, if fully implemented, will lead the Merced 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 as described and realize the anticipated emission reductions. The SCS does not include commitments from those responsible for implementing the infill land use strategy, which is critical to the emission reductions reported. CARB is also concerned about the risk from unanalyzed emissions by roadway capacity-increasing projects. Because there are significant additional revenues forecasted in the 2022 RTP/SCS beyond the Tier I project list that was analyzed, and because there is a Tier II list of projects desired for completion by 2035, CARB staff is concerned that additional roadway capacity-increasing projects could be amended into the plan without proper analysis of the impact to the GHG reduction target. MCAG also did not include VMT from induced travel demand from its Tier I project list in the final GHG emission reduction quantification. CARB staff's estimates do show that even with induced travel, the region could meet the 2035 target, but this does not nullify the need for MCAG to analyze the effects of induced travel in the next SCS. Neither MCAG nor CARB staff analyzed the VMT or GHG impact of the Tier II project list at this time, which will be important to do if any Tier II projects are amended into the plan.

To support the successful implementation of the SCS and achievement of SB 375's goals, and to continue fully supporting the GHG benefits claimed in the 2022 SCS, MCAG and its local members will need to undertake additional actions to deliver and monitor its SCS strategies, carefully assess the implications of any plan amendments, and adjust its strategies to offset any additional emissions or shortfall in emissions reductions. To address these concerns, CARB staff has the following recommendations and requests MCAG set up regular monitoring of the implementation actions associated with its SCS in consultation with CARB and other relevant agencies.

Recommendations

I. Identify Further Actions to Support the Implementation of the Land Use and Housing Strategies

MCAG's SCS provides important growth assumptions regarding jobs/housing balance, infill development, and growth around transit stops in the SCS. This land use and housing SCS strategy requires strong local jurisdiction support for implementation. CARB recommends that MCAG consider additional actions to support the implementation of these strategies by its local member agencies. This could include encouraging and securing commitments from local agencies to support SCS implementation through their land use decisions. For example, the next SCS presents an opportunity to highlight and incorporate local

jurisdictions' commitment to SCS implementation through the Regional Early Action Planning Program 2.0 and recent updates to local housing elements.

CARB encourages the region to take further steps to strengthen the land use and housing strategy within the SCS. One of MCAG's supporting land use actions in the SCS is to work with local agencies to evaluate their land use strategies. Another is to assist local jurisdictions in their review of the transportation impacts of land use and development proposals. CARB staff strongly support this work and recommend MCAG use this type of local technical assistance opportunity to further explore where additional development is projected, by when, and if there are other strategies such as phasing development or pursuing infill development opportunities that can minimize the GHG impact. In the next SCS, documenting these efforts in greater detail, including local agency participation and support for these efforts, will help demonstrate progress on implementing this strategy.

Tracking the implementation of the SCS strategy to prioritize infill and growth in existing communities is also critical to carrying this strategy forward into the next SCS. To help with this, CARB staff recommends that MCAG develop an implementation plan that identifies the actions, steps, and funding that MCAG has and is pursuing in partnership with other public agencies, along with non-profit organizations and businesses to advance this strategy. Detailing the steps necessary, and the staffing and funding needed to accomplish it, such as in MCAG's Overall Work Program for example, helps MCAG and its local and state partners understand the concrete actions and shared commitments needed to implement each SCS strategy.

To maintain similar infill strategy assumptions that are being credited in this SCS, CARB staff will look for documented evidence in the next SCS that demonstrates adequate progress is being made to help implement the strategy through things like:

- Specific investments by the MPO or other agencies in the region towards this strategy.
- Data on VMT reduction or other measurable data that relates to the specific strategy. This data could be regional or through specific projects, programs, or pilots within the region.
- Specific actions or legislation that will enable or help advance the strategy within the region.
- Significant actions, beyond planning or studies, that implement or advance the strategy. This could include things such as built projects.

If there is inadequate measurable progress on implementation, CARB staff will look for clear, actionable next steps and a timeline for implementation of actions in the SCS that are commensurate to what is needed for the region to get back on track for implementing the strategy by 2035.

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

The 2022 SCS includes several important goals, including prioritizing funding for complete streets on existing corridors, supporting projects that reduce vehicle use and GHG, and updating project selection criteria to emphasize positive health outcomes, reduce environmental impacts, improve air quality, and reduce GHG. 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 strategies. Also, MCAG should work with member agencies, partners, and community members to build a greater pipeline of active transportation projects and prioritize funding for these projects. These projects can help advance climate, equity, and safety goals. MCAG should provide more detail and an action plan around achieving these important goals, including increasing active transportation project development. As an example, MCAG could consider highlighting projects on the RTP project list that are most critical to VMT reduction. This would allow regional, State, and local partners to identify 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.

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

MCAG will need to be vigilant about implementing the balance of strategies and transportation projects through 2035 to ensure SCS-planned GHG reductions are achieved. MCAG will need to carefully monitor transportation projects through 2035, inclusive of any plan amendments, to ensure that the SCS is still able to achieve the GHG emission reduction target. An increase in road capacity projects could prevent MCAG from meeting its GHG emission reduction target. Amendments to the project list need to be accompanied by recalculation and discussion of whether and how SCS target achievement is maintained. Please inform CARB staff of these amendments.

MCAG carries over some strategies from its previous 2014 and 2018 SCSs. However, as CARB staff noted previously on the land use strategy, it is unclear how successful implementation of each of the SCS strategies has been. To help with this, CARB recommends that MCAG and its member agencies develop metrics and milestones to track, report, and assess the implementation of each of its identified strategies. These points of information are fundamental for CARB to review as part of the next SCS. Tracking strategy implementation will help inform MCAG, 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. As an example, MCAG could consider highlighting projects on the RTP project list that are most critical to VMT reduction. This would allow regional, State, and local partners to identify

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. Tracking implementation also allows MCAG to understand whether the region is falling behind on implementation of a strategy and 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. 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. CARB staff will not be able to evaluate and/or accept the SCS GHG quantification without this information.

IV. Improve Estimate of Long-Term Induced Travel Impacts

CARB staff is concerned that the region's RTP/SCS continues to include road expansion projects, which can lead to short- and long-term induced travel in the region, and that MCAG did not provide quantitative results from its induced travel analysis. In the next SCS, CARB staff expect to see a more robust quantitative analysis of induced travel as part of the SB 375 GHG emissions quantification.

As part of the technical methodology for the 4th cycle SCS, please work with CARB staff to develop an approach and the steps to quantify induced VMT, how the proposed method will be validated, and how the induced VMT will be factored into the ultimate GHG quantification. Please plan to quantify 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 also analyze 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 MCAG needs technical assistance with the induced travel analysis and estimating the VMT impacts of roadway expansion projects, please get in touch with CARB staff. The inclusion of quantitative induced travel demand analysis as part of the per capita GHG emissions will be required with MCAG's next SCS submittal for CARB to make its determination.

V. Improve Data and Modeling

The data and modeling used in the next SCS need to be updated to reflect the most recent on-the-ground conditions and be able to provide the greater level of detailed data that CARB needs to make its determination. For example, the current model underestimates

commute travel time and overestimates transit boardings, which need to be validated using the latest observed data. MCAG needs to improve the accuracy of the input data and calibrate the submodel to the observed travel patterns and mode choices to improve confidence in the model's outputs. In addition, MCAG should improve the model validation for VMT estimation by expanding the number of screenlines and cordon line locations before developing the next RTP/SCS. As part of the technical methodology for the next SCS, CARB staff expect to see this information updated and documented with sensitivity tests completed as suggested in the SCS Evaluation Guidelines and the 2024 RTP Guidelines. 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 MCAG starts the public participation process for the 2026 SCS.

Additionally, MCAG's SCS submittal is missing important data on seat utilization that will be needed in the next SCS evaluation. In the next SCS submittal and the accompanying technical methodology, is critical that MCAG provide all the data and analysis that CARB has outlined in the SCS Evaluation Guidelines or subsequent guideline updates. Without this information, CARB may not be able to evaluate the next SCS.

VI. 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 MCAG 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 MCAG starts the public participation process for the 2026 SCS. If MCAG needs technical assistance with the AOC calculation, please get in touch with CARB staff.

VII. 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. Following 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 MCAG starts the public participation process for the 2026 SCS.

VIII. 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 could 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: MCAG's 2022 SCS Strategy Table

This is a summary table based on MCAG'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: • Prioritize infill and growth in existing communities *Transportation:* • Enhance existing transit services	All strategies are carryover	On-Model[7]	-17.7%
Transportation: Rule 9410	Carryover	Off-Model	-0.68%
Transportation: Transportation Demand Management (Agricultural Worker Vanpools)	Carryover	Off-Model	-0.07%
Transportation: ACE Rail	Carryover	Off-Model	-0.26%
Total Reduction	**All strategies**	**On and off-model**	**-18.7%**

[7] Modeled estimates include a 4.3% EMFAC adjustment. EMFAC adjustment is required by CARB to accurately compare SCS changes as a result of updated emission factors.

Appendix B: Trend Analysis Results

This table summarizes CARB staff's analysis of key plan performance indicators provided by MCAG 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. MCAG provided data for 7 of the 8 requested performance indicators.[8],[9] MCAG did not provide seat utilization data or household vehicle ownership, so CARB staff could not review the trend for those data.

Performance Indicator	**Forecast Change 2019 to 2035**	**Trend Analysis**
Average Trip Length by Mode	Single-occupancy Vehicle Drive Alone (-0.71%) Shared Ride (-0.9%) Transit (-0.88%) Bike + Walk (-1.18%)	MCAG's 2022 SCS forecasts almost no change in average light-duty vehicle trip length from 7.05 miles/day in 2019 to 7 miles/day in 2035. Similarly, the average trip length for shared rides forecasts a minor decrease from 6.65 miles/day in 2019 to 6.59 miles/day in 2035. Transit trip length decreases from an average of 6.81 miles/day in 2019 to 6.75 miles/day in 2035. Walking and biking trip lengths also decreased from 0.85 miles/day in 2019 to 0.84 miles/day in 2035. CARB staff found the trends are consistent with the plan's forecasted VMT and GHG emission reductions, as compared to 2005. However, trip lengths across all modes show only very minor changes, so it is unlikely that this will contribute significantly to the VMT and GHG emission reductions reported by MCAG. This data is from the travel demand model and does not reflect the impact of MCAG's off-model strategies. Please see Appendix C: Data Table for more details.
Average Travel Time by Mode	Commute (-2.0%)	MCAG's 2022 SCS forecasts a decrease in travel time by all modes and for commute trips between

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

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

Performance Indicator	Forecast Change 2019 to 2035	Trend Analysis
	Non-Commute (-2.2%) Transit (-1.1%) Walk (-1.5%) Bike (-2.1%)	2019 and 2035. Commute trips decreased from 13.2 minutes in 2019 to 13.0 minutes in 2035. CARB staff note that the commute time estimates being used in the model for 2019 are lower than the observed data (see Recommendations section for more details). However, the relative change modeled from 2019 to 2035 is reasonable. Shorter commute trip travel time is shown in empirical literature to support the reduction of VMT and GHG emissions. Transit, walk, and bike travel times also decrease. However, because trip lengths across these modes show only very minor changes, it is unlikely that this will contribute significantly to the VMT and GHG emission reductions reported by MCAG. This data is from the travel demand model and does not reflect the impact of MCAG's off-model strategies. Please see Appendix C: Data Table for more details.
Mode Share[10]	Single-occupancy vehicle (SOV) (+0.6%) Shared Ride (-0.7%) Transit (~0%) Bike + Walk (+0.14%)	MCAG's 2022 SCS forecasts very little change in mode share for trips by any mode. The mode share for light-duty vehicles is increasing from 34% in 2019 to 34.6% in 2035. This increase is not directionally consistent with the VMT reduction strategies in the plan. However, trip lengths across all modes show only very minor changes, so it is unlikely that this will contribute significantly to the VMT and GHG emission reductions reported by MCAG. Please see Appendix C: Data Table for more details.

[10] Mode share reductions do not account for VMT and GHG reductions from off-model strategies, including carpooling and vanpooling.

Performance Indicator	Forecast Change 2019 to 2035	Trend Analysis
Average Daily Transit Trips	+23.1%	MCAG's 2022 SCS forecasts that daily transit trips will increase from 9,549 in 2019 to 11,752 in 2035. CARB staff found this trend directionally supportive and consistent with the relationship shown in the empirical literature that increasing transit ridership will reduce GHG emissions. However, because transit as a mode share is not increasing, it is unlikely that this will contribute significantly to the VMT and GHG reductions reported by MCAG. This data is from the regional travel demand model and does not reflect the impact of MCAG's off-model strategies. Please see Appendix C: Data Table for more details.
Household Vehicle Ownership	Not reported	
VMT per Capita Reduction[11]	-16% Between 2005 and 2035	MCAG's 2022 SCS forecasts VMT to decrease from 14 VMT per capita in 2005 to 11.7 VMT per capita in 2035. CARB staff found this trend supportive and consistent with the relationship shown in the empirical literature that reducing VMT per capita will reduce GHG emissions. While CARB staff is concerned that the VMT estimates generated by MCAG's travel model are low compared to the observed data in the base year, the relative change between 2005 and 2035 is reasonable (see Recommendations section for more details). Please see Appendix C: Data Table for more details.

[11] Per capita VMT reductions do not account for reductions from off-model strategies, including carpooling and vanpooling.

Performance Indicator	Forecast Change 2019 to 2035	Trend Analysis
GHG per Capita Reduction	-18.7%[12] Between 2005 and 2035	The GHG per capita reduction forecasted by MCAG meets the target of -14% established by CARB. Please see Appendix C: Data Table for more details.
Seat Utilization	Not reported	

[12] Modeled estimates include a 4.3% EMFAC adjustment. EMFAC adjustment is required by CARB to accurately compare SCS changes as a result of updated emission factors.

Appendix C: Data Table

Modeling Parameters	**2005**	**2019 Base Year**	**2020**	**2035**	**Plan Horizon Year (2046)**	**Data Sources**
Modeled Population	239,836	280,411	284,761	330,805	362,542	MCAG Single County Model
Vehicle Operating Costs (cents/mile)	19.56	20.57	19.05	25.50	30.72	MCAG Single County Model
Average Toll Price ($/mile)	Not reported	Not reported	Not reported	Not reported	Not reported	
Average Median Household Income ($/year)	$40,281	$45,319	Not reported	Not reported	Not reported	ACS
Total Number of Households	Not reported	80,412	82,529	103,800	114,012	MCAG Single County Model
Total Number of Jobs	Not reported	89,532	86,716	102,479	111,344	MCAG Single County Model
Total Developed Acres	Not reported	Not reported	Not reported	Not reported	5,387	MCAG Single County Model
Total Housing Units	Not reported	80,454	82,553	103,620	114,022	MCAG Single County Model
Total Single-Family Housing Units (du)	Not reported	70,704	72,052	82,996	88,518	MCAG Single County Model
Share of Single-Family Housing Units (%)	Not reported	Not reported	Not reported	Not reported	Not reported	

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Total Multi-Family Housing Units (du)	Not reported	9,750	10,501	20,624	25,504	MCAG Single County Model
Share of Multi-Family Housing Units (%)	Not reported	Not reported	Not reported	Not reported	Not reported	
Total Housing Units Within ½ Mile of a High-Quality Transit Station	Not reported	9,211	9,507	14,989	17,349	MCAG Single County Model
Total Jobs Within ½ Mile of a High-Quality Transit Station	Not reported	15,075	14,545	20,496	22,427	MCAG Single County Model
Freeway and General-Purpose Lanes - Mixed Flow, auxiliary, etc. - net new (lane miles)	Not reported	2,834	2,834	2,978	2,982	MCAG Single County Model
Freeway - net new (lane miles)	Not reported	145	145	145	145	MCAG Single County Model
Highway and Expressway - net new (lane miles)	Not reported	406	406	442	442	MCAG Single County Model
Arterial - net new (lane miles)	Not reported	258	258	267	267	MCAG Single County Model

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Collector and Local - net new (lane miles)	Not reported	31	31	31	31	MCAG Single County Model
Average Transit Headway (minutes)	Not reported	Not reported	Not reported	Not reported	Not reported	
Total Transit Operation Miles	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported
Transit Total Daily Vehicle Service Hours	Not reported	12,000	Not reported	Not reported	Not reported	Merced "The Bus" Approximation
Bike and Pedestrian Lane (class I, II, & IV) Miles – net new miles	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported
Household Vehicle Ownership	Not reported	Not reported	Not reported	Not reported	Not reported	
Average Trip Length (miles/day)						
Drive Alone	Not reported	7.05	7.09	7.00	6.96	MCAG Single County Model
Shared Ride	Not reported	6.65	6.68	6.60	6.57	MCAG Single County Model
Public Transit	Not reported	6.81	6.90	6.75	6.63	MCAG Single County Model

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Bike / Walk	Not reported	0.85	0.86	0.84	0.84	MCAG Single County Model
Average Travel Time by Mode (minutes)						
Commute Trip	Not reported	13.24	13.27	12.98	12.98	MCAG Single County Model
Non-Commute Trip	Not reported	13.82	13.79	13.51	13.49	MCAG Single County Model
Drive Alone	Not reported	16.95	16.91	16.65	16.60	MCAG Single County Model
Drive Alone (TNC)	Not reported	16.50	16.47	16.31	16.30	MCAG Single County Model
Shared Ride	Not reported	16.00	15.98	15.81	15.79	MCAG Single County Model
Shared Ride (pooled TNC)	Not reported	Not reported	Not reported	Not reported	Not reported	
Public Transit	Not reported	12.06	12.16	11.93	11.81	MCAG Single County Model
Bike	Not reported	13.19	13.19	12.91	12.86	MCAG Single County Model
Walk	N/A	12.67	12.71	12.48	12.43	MCAG Single County Model
Average Travel Time for Low-Income	Not reported	Not reported	Not reported	Not reported	Not reported	

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Populations (minutes)						
Mode Share						
Drive Alone	Not reported	34.00%	34.11%	34.57%	34.73%	MCAG Single County Model
Drive Alone (TNC)	Not reported	Not reported	Not reported	Not reported	Not reported	
Shared Ride	N/A	51.33%	51.12%	50.67%	50.54%	MCAG Single County Model
Shared Ride (pooled TNC)	Not reported	Not reported	Not reported	Not reported	Not reported	
Public Transit	Not reported	2.96%	2.97%	2.91%	2.88%	MCAG Single County Model
Bike / Walk	Not reported	11.71%	11.8%	11.85%	11.86%	MCAG Single County Model
Seat Utilization	Not reported	Not reported	Not reported	Not reported	Not reported	
Transit Ridership (Average daily trips)	Not reported	9,549	9,648	11,752	12,929	MCAG Single County Model
Total VMT per weekday (all vehicle class) (miles)	Not reported	7,475,157	7,713,001	8,661,253	9,332,225	MCAG Single County Model

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Total VMT per weekday for passenger vehicles (CARB vehicle classes LDA, LDT1, LDT2, and MDV)	5,551,770	Not reported	6,106,477	7,028,202	7,651,355	MCAG Single County Model ; EMFAC 2014
Total II VMT per weekday for passenger vehicles (miles)	2,852,983	Not reported	2,337,977	2,796,329	3,070,551	MCAG Single County Model; EMFAC 2014
Total IX/XI VMT per weekday for passenger vehicles (miles)	768,978	Not reported	903,335	1,086,234	1,194,291	MCAG Single County Model; EMFAC 2014
Total XX VMT per weekday for passenger vehicles (miles)	2,199,808	Not reported	2,865,165	3,145,639	3,386,512	MCAG Single County Model; EMFAC 2014
SB 375 VMT per capita	14.0	Not reported	11.4	11.7	11.8	Calculated: (II + IX/XI passenger VMT) / population
Total CO_2 emissions per weekday (all vehicle class) (tons/day)	Not reported	Not reported	Not reported	Not reported	Not reported	

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
Total SB 375 CO_2 emissions per weekday for passenger vehicles (CARB vehicle classes LDA, LDT1, LDT2, and MDV) (tons/day)	2,660	Not reported	2,814	3,129	3,405	EMFAC 2014
Total II CO_2 emissions per weekday for passenger vehicles (tons/day)	1,238	Not reported	1,077	1,245	1,366	EMFAC 2014
Total IX/XI CO_2 emissions per weekday for passenger vehicles (tons/day)	369	Not reported	416	484	531	EMFAC 2014
Total XX CO_2 emissions per weekday for passenger vehicles (tons/day)	1,054	Not reported	1,320	1,400	1,507	EMFAC 2014
SB 375 CO_2 per capita (lbs./day)	13.4	Not reported	10.5	10.4	10.5	Calculated: (II + IX/XI CO_2) / population / 2000 lbs./ton

Modeling Parameters	2005	2019 Base Year	2020	2035	Plan Horizon Year (2046)	Data Sources
EMFAC Adjustment Factor (if applicable)			-1.0%	-4.3%	-3.7%	CARB Methodology for Estimating CO2 Adjustment
RTP/SCS Strategy 1 – Rule 9410				-0.68%		SJV Offmodel Spreadsheet
RTP/SCS Strategy 2 – Off Model 2: Vanpools/Calvan				-0.07%		SJV Offmodel Spreadsheet
RTP/SCS Strategy 3 – ACE Rail				-0.26%		SJV Offmodel Spreadsheet

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 MCAG 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 compared performance metrics from the 2022 Progress Report and plan performance indicators provided by MCAG that 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 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 modeled in the region's previous 2018 SCS is as follows:

- **Regional average household vehicle ownership** increased by almost 8%, from 1.9 to 2 vehicles per household, in the MCAG region from 2010 to 2019, respectively. The 2018 SCS reported a household vehicle ownership of 1.73 in 2035. The trend in household vehicle ownership is heading in the wrong direction and the 2018 SCS projection is not on track.
- **Daily transit ridership** has not seen consistent increases or decreases in ridership historically. The average transit ridership between 2005 and 2019 is about 3,680 boardings per day. No data was provided for transit ridership in the 2018 SCS.
- **Commute trip travel time** was about 26 minutes in 2019 which has increased steadily from 2015. No data was provided for commute travel time in the 2018 SCS. In the 2018 SCS, MCAG did report the average trip length for home-based work trips, which decreased from 21.25 miles per trip in 2015 to 18.82 miles per trip estimated in 2035. Trip time and trip length are not the same; however, there is a relationship, and it is reasonable to assume, based on the trip length data provided in the 2018 SCS that the trip travel time was also likely assumed to decrease. However, the recent trend data shows an increase in trip travel time over the last five years and is therefore generally heading in the wrong direction to support VMT reduction.
- **New homes built by type** show that single-family housing has represented a large share of the new housing units built between 2005 and 2019. Over the last ten years, the average percent of new homes built that are single-family is 66%. This is consistent with MCAG's 2018 SCS as it forecasted about 67% of the new homes from

2015 to 2035 as single-family housing units. The average number of total homes built in this time period is 920, with a high of 3,100 new homes in 2007 and a low of 58 new homes in 2010. MCAG's 2018 SCS assumed 28,763 new homes between 2015 and 2035. This is an average of 1,438 homes per year. Although higher than the historic average, this is in the range of historic housing production.

Most of the observed trend metrics seem to be heading in the wrong direction to support the region in achieving GHG emissions reduction by 2035. Some of the observed data is not able to be compared to the expected plan outcomes of MCAG's 2018 SCS because the data was not provided.

II. Incremental Progress

Based on the SCS Evaluation Guidelines, CARB staff evaluated the incremental progress reporting component for MCAG using the alternative Incremental Progress assessment.[13] CARB staff compared the data from the year 2035 land use and transportation system characteristics submitted by MCAG for the 2022 SCS with those obtained from the 2018 SCS to determine the incremental progress in those strategies.

The per-capita GHG emission reduction targets for 2035 for MCAG's 2018 SCS and 2022 SCS are 10% and 14%, respectively. To stay on course and achieve the more aggressive target adopted by the Board in 2018, MCAG would need to make up the respective gaps through a combination of innovation, additional strategies, and/or enhancements to existing strategies that reduce GHG emissions. While incremental progress is not used for CARB's SCS determination, CARB expects MPOs to achieve incremental progress from its land use and transportation strategy commitments in its third SCS compared to its second SCS.

The 2022 SCS model forecasts decreased population and households, but increased jobs from the previous RTP/SCS. The model also forecasts increased auto operating costs. The 2022 SCS appears to strengthen land use and transportation strategies compared to the 2018 SCS. See Table 2. Incremental Progress Analysis below.

[13] Where a direct model-to-model comparison between the proposed RTP/ SCS and the previously submitted RTP/SCS is not possible, or if the MPO does not report its incremental progress for any reason, CARB staff will conduct an alternative Incremental Progress assessment. The alternative analysis compares the year 2035 land use and transportation system characteristics data submitted by the MPOs with those obtained from previously submitted RTPs/SCSs (including data submittals) to determine the incremental progress in those strategies. This process is further described in the SCS Evaluation Guidelines. Data for this analysis was obtained from MCAG during the 2018 and 2022 SCS submittal processes and considers available information in MCAG's adopted 2018 and 2022 SCS with associated technical appendices.

Table 2. Incremental Progress Analysis

Type	Metric	2018 SCS	2022 SCS	Change	Directionality
Exogenous factor	Population	357,496	330,805	-7.5%	(-)
Exogenous factor	Households	107,984	103,800	-4%	(-)
Exogenous factor	Employment	101,313	102,479	+1.2%	(+)
Exogenous factor	Auto operating cost	22.54	25.50	+13%	(+)
SCS Strategy: Prioritize Infill	Housing density for new growth	1.0% increase in residential density annually	1.8% increase in residential density annually	+.8	(+)
SCS Strategy: Prioritize Infill	Share of multifamily housing	14% of all homes	30% of all homes	+16	(+)
SCS Strategy: Prioritize Infill	Total land consumed	6,422 acres	5,837 acres	-585 acres	(+)
SCS Strategy: Enhance existing transit services	Share of investment in transit projects	16%	17%	+1	(+)

SCS Strategy: Agricultural Worker Vanpools	Number of vans and riders	Not available	71 vans and 10 riders per van	71 vans and 10 riders per van	Unable to calculate
SCS Strategy: Rule 9410	Number of employees and worksites (Tier 1 and 2)	Not available	116 worksites and 666 employees per worksite	116 worksites and 666 employees per worksite	Unable to calculate
SCS Strategy: ACE Rail	Riders per year	Not available	285,350	285,350	Unable to calculate

While incremental progress is not used for CARB's SCS determination, CARB expects MPOs to achieve incremental progress due to its SCS land use and transportation strategy commitments from its second SCS to its third SCS. The information presented shows that MCAG's 2022 SCS has further enhanced the strategies to prioritize infill and growth in existing communities and enhance transit services, compared to the 2018 SCS.

III. Equity

MPOs may report to CARB a summary of how they conducted equity analyses as part of the development of their SCSs following the CTC's *2017 Regional Transportation Plan Guidelines for Metropolitan Planning Organizations*.[14] Below is a summary of the environmental justice (EJ) considerations from MCAG's 2022 RTP/SCS, including Appendices N, O, and P. CARB staff did not evaluate or analyze this information.

A. Public Outreach and Engagement

One of MCAG's requirements in developing the RTP/SCS is to provide equal opportunity for all segments of the population to provide input into the plan. MCAG held two community workshops, several meetings of a formal Advisory Committee throughout the process, and online surveys. A full description of MCAG's public engagement can be found in the 2022 RTP/SCS, Appendix N: Public Participation Plans, Appendix O: Public Engagement, and Appendix P: Environmental Justice Analysis.

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

B. Identifying Communities for Environmental Justice Analysis

MCAG's EJ analysis aims to consider whether there is equity in the distribution of potential benefits and burdens resulting from the proposed transportation investments in the 2022 SCS. MCAG's analysis consisted of identifying "low-income and minority populations" and then quantitatively assessing the benefits and burdens of the plan concerning these communities. In the 2022 SCS, these communities are defined as Census block groups where 50% or more of households have an income less than $50,000 (i.e., "low income") or block groups where 50% or more of the population identify as Hispanic or Latino of any race, Black or African American, American Indian or Alaskan Native, Asian, Native Hawaiian or Pacific Islander, or a combination of these or other races (i.e., "high minority").

C. Environmental Justice or Equity Performance Measures

MCAG's 2022 SCS includes a discussion of EJ and plan impacts, as analyzed by MCAG on populations defined by MCAG as "high minority or low income" and referred to here as "EJ communities." The 2022 SCS and Appendix P include an environmental justice analysis of transit operations, 2 near-term pedestrian/bicycle projects, 11 regionally significant roadway projects, and 5 regionally significant transit projects. The analysis looks at project locations and/or buffered project areas compared to locations of EJ communities to estimate the population most likely to benefit from transportation facilities. If a project is located in an EJ community it is assumed to be a benefit. Below is a summary of some of the conclusions the plan makes based on this analysis:

- The analysis indicates that the plan will not have a disproportionate impact on the identified EJ communities because the benefit within EJ communities is proportional to non-EJ communities, if not higher.
- The plan reduces congested lane miles and vehicle hours of delay for all users of the transportation system.
- EJ communities have equitable walking access to fixed-route transit and paratransit.
- EJ communities have equitable benefits from the locations of near-term pedestrian/bicycle projects.
- A notable pedestrian/bicycle improvement project is the Childs Avenue Multiuse Path. In this area, which is categorized as a Senate Bill 535 Disadvantaged Community that ranks among the top 25% and scores in the top 5% of the pollution burden indicator, school children currently walk or bike on dirt shoulders of the busy street. Because of the significance of this project, the MCAG Board authorized the programming of funds to cover almost 89% of the project cost.