TECHNICAL EVALUATION OF THE GREENHOUSE GAS EMISSIONS REDUCTION QUANTIFICATION FOR SANTA BARBARA COUNTY ASSOCIATION OF GOVERNMENTS' SB 375 2017 SUSTAINABLE COMMUNITIES STRATEGY

January 2018

CALIFORNIA AIR RESOURCES BOARD

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BACKGROUND

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) is intended to support the State's broader climate goals by encouraging integrated regional transportation and land use planning that reduces greenhouse gas (GHG) emissions from passenger vehicle use. California's metropolitan planning organizations (MPOs) develop regional Sustainable Communities Strategies (SCSs) containing land use, housing, and transportation strategies that, if implemented, can meet the per capita passenger vehicle-related GHG emissions targets (targets) for 2020 and 2035 set by the California Air Resources Board (CARB or Board). Once an MPO adopts an SCS, SB 375 directs CARB to accept or reject an MPO's determination that its SCS, if implemented, would meet the targets.

On August 30, 2017, Santa Barbara County Association of Governments (SBCAG) submitted its 2017 SCS for CARB staff to review with estimates of over 13 percent and 17 percent decreases in GHG per capita emissions by 2020 and 2035 respectively, as compared to 2005. The region's GHG per capita emissions targets are zero percent for both 2020 and 2035, compared to 2005. This report reflects CARB staff's technical evaluation of SBCAG's 2017 SCS GHG quantification.

CARB DETERMINATION

ACCEPT

Based on a review of all available evidence, including model inputs, outputs, the SCS strategies, performance indicators, and implementation efforts so far, CARB accepts SBCAG's determination that its 2017 SCS would, if implemented, meet the targets of zero percent for both 2020 and 2035, respectively.

SBCAG's 2017 SCS contains nearly the same strategies as their first SCS, which CARB staff reviewed and accepted as meeting the targets in November 2013.[1] For the 2017 SCS, SBCAG improved the transportation network data and updated the base-year land use information that show an increase in quantified GHG emissions reductions for the same set of strategies. The improved modeling inputs coupled with lower inter-regional trip data from its neighboring MPOs, led to an increase in GHG emissions reductions quantified.

[1] https://www.arb.ca.gov/cc/sb375/sbcagrtp.pdf

SCOPE AND METHODOLOGY

CARB staff examined SBCAG's modeling inputs and assumptions, model responsiveness to variable changes, model calibration and validation results, and performance indicators using the general method described in CARB's July 2011 document entitled Description of Methodology for ARB Staff Review of Greenhouse Gas Reductions from Sustainable Communities Strategies (SCS) Pursuant to SB 375.[2]

In addition, as SBCAG's 2017 SCS is an update to their adopted 2013 SCS, CARB staff also considered SBCAG's implementation actions over the past four years. CARB staff identified ways in which SBCAG and its member agencies have coordinated project investments, programs, incentives, or guidance to help implement the region's first SCS and establish a foundation for continued implementation of policies and programs in both their 2013 and 2017 plans.

CHANGES FROM THE REGION'S PREVIOUS SCS GHG QUANTIFICATION

CARB staff focused its review on identifying and evaluating changes that SBCAG made between their current 2017 SCS and their previous 2013 SCS that have the potential to affect SCS GHG emissions quantification.[3] This included a review of changes made to the demographic growth projections, land use forecast and transportation investments included in the plan, model or off-model methods used to calculate passenger travel-related GHG emissions, and any changes in expected regional land use and transportation performance indicators.

In 2013, SBCAG forecast that the SCS, if implemented, would reduce GHG per capita emissions by 10.5 and 15.4 percent by 2020 and 2035 respectively, compared to 2005. SBCAG forecasts that the 2017 SCS would achieve greater GHG per capita reductions than their last plan, estimating that the 2017 plan would achieve over 13 and 17 percent reductions for 2020 and 2035 respectively, compared to 2005.

This shift is largely due to updated land use and transportation model inputs for the baseline year, and to lower inter-regional trip data from its neighboring MPOs, as outlined in the sections that follow. Table 1 summarizes the minor changes in plan assumptions for future demographics, land use, and transportation. Table 2

[2] https://www.arb.ca.gov/cc/sb375/scs_review_methodology.pdf

[3] CARB's acceptance and technical evaluation of SBCAG's first SCS was completed in November 2013, and contains detailed information about the methods SBCAG used to quantify GHG emissions. That information is still relevant for this technical evaluation and can be accessed at https://www.arb.ca.gov/cc/sb375/sbcagrtp.pdf.

summarizes the changes in SBCAG's model and off-model GHG emissions assumptions and calculations.

LAND USE AND TRANSPORTATION STRATEGIES

SBCAG's 2017 SCS maintains largely the same set of land use and transportation strategies adopted in their previous 2013 SCS. It uses the same Regional Growth Forecast, adopted in December 2012, and essentially the same land use assumptions and growth allocation.

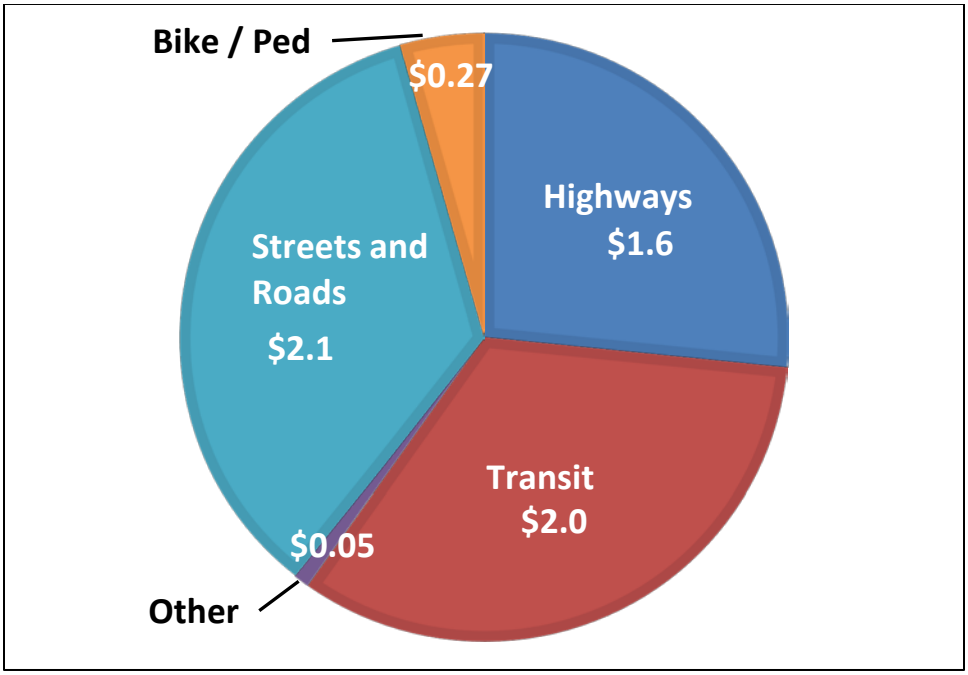
The region's preferred scenario is the Transit Oriented Development (TOD)/Infill with Enhanced Transit Strategy. It has three core land use approaches for reducing emissions: (1) to identify infill areas near transit to intensify growth, (2) to better balance jobs with housing by planning for job growth in the county's northern subregional area and compact housing in the jobs-rich southern subregional area, (3) to protect the natural and agricultural resource lands identified in their regional greenprint.

The 2017 SCS also includes a multi-modal transportation network, with updates to both the expected revenues and expenditures. The updated revenue estimates reflect the end of some funding programs (e.g., Proposition 1B) and expansion of competitive State grant programs[4], including the cap-and-trade funding programs and the Caltrans Active Transportation Program. The SCS estimates that $204 million from competitive grant funds will be available to enhance transit services and plans to identify the specific transit enhancements as the need arises while protecting funding for competing local demands such as road maintenance.

The 2017 SCS also makes minor changes to the package of planned infrastructure investments. The 2017 plan prioritizes expenditures for streets and roads (35 percent), transit (33 percent), and highways (26 percent), as illustrated in Figure 1 below.[5]

[4] A detailed update of revenue or expenditure estimates following the passage of Senate Bill 1, the "Road Repair and Accountability Act of 2017", was not conducted due to timing between SCS preparation and bill passage.
[5] Source: SBCAG 2017, p. 203

Figure 1. Transportation Expenditures in SBCAG's 2017 RTP (billions)



Source: SBCAG 2017a SCS, p. 203. "Other" includes Intelligent Transportation Systems, Transportation Demand Management, and Rail. Dollars are escalated to year of expenditure.

Compared to the 2013 SCS, the 2017 SCS allocates a greater portion of its budget for public transit (33 percent in 2017 versus 26 percent in 2013) and active transportation (4.4 percent in 2017 versus 2.7 percent in 2013).[6] (See Appendix A for more detail.) The 2017 SCS covers a shorter time horizon (2016-2040) but maintains the same horizon date as the 2013 plan (2010-2040). SBCAG updated the project list by removing completed transportation projects and adding new projects made possible by additional funding, including projects from the recently-completed Regional Active Transportation Plan. No projects were added that would impact agricultural land or add new lanes in a way that would be considered growth inducing, according to the plan's environmental review.

Table 1 summarizes the changes made to land use and transportation strategies between the 2013 and 2017 SCS, and where appropriate, CARB staff's assessment and findings based on consistency with best available information and practice.

[6] Source: SBCAG 2013, Figure 86

Table 1. Summary of Demographic, Land Use, and Transportation Changes in SBCAG's 2017 SCS Compared to the 2013 SCS

Assumptions	CARB Assessment	Finding
Maintained Demographic Growth Projections from 2013 Sustainable Communities Strategy	Somewhat Reasonable	Overall, the region's growth forecast remains unchanged from the 2013 SCS. The total population forecasted is within 0.5 percent of the Department of Finance's (DOF) population projections for 2035. For 2020, however, the population projection is now 3.5 percent lower than the latest DOF projections, greater than the target maximum variance of 3 percent per §65584.01. See Appendix A for more detail. The employment forecast did not change from the 2013 SCS. Employment projections for 2020 remain consistent with the California Employment Development Department (EDD)'s estimates for 2014-2024. Between 2020 and 2035, SBCAG forecasts that job growth will slow significantly, such that its 2035 estimate is very close to EDD's estimate for 2024. CARB staff also compared SBCAG's forecast to that of Caltrans, as well as to recent employment data, which suggest that the forecast for 2040 is reasonable. CARB staff recommends that it be reviewed and updated if necessary in SBCAG's next SCS.
Minor Changes to Land Use Reflecting Updates to Local Plans and Project Revisions	Reasonable	The region's land use growth pattern remains largely unchanged from the 2013 SCS. Where completed projects or project proposals resulted in less growth than expected, additional growth was added within the community to retain a similar baseline between the 2013 and 2017 SCSs. Household and employment allocations did not change by more than 0.4 percent by jurisdiction. See Appendix A for more detail.

Updates Revenue Projections and Transportation Project List	Reasonable	The 2017 SCS includes updated revenue assumptions that address changes in transportation funding programs, including the conclusion of Proposition 1B funding and expansion of competitive State funds. It updates the project list to reflect the completion of projects and new projects added in the interim, including projects from the active transportation plans that were newly completed by SBCAG and several jurisdictions. No new projects would impact agricultural land or add lanes in a growth-inducing way beyond those in the 2013 SCS.
Interregional Travel	Reasonable	For the 2017 SCS, SBCAG worked with neighboring MPOs to update its inter-regional travel assumptions. Consistent with the "50/50 method" recommended by the Regional Targets Advisory Committee, SBCAG included 50 percent of this travel in its GHG emissions calculations. Based on MPO conversations with its neighboring Southern California Association of Governments (SCAG) to SBCAG's south and San Luis Obispo Council of Governments (SLOCOG) to SBCAG's north, SBCAG calculated lower emissions values for interregional travel as a result of these neighboring MPOs' most recently adopted SCSs. CARB staff reviewed this information and found the reductions to be reasonable. (See Appendix A for more detail.)

MODEL AND OFF-MODEL CALCULATIONS

For the 2017 plan, SBCAG staff used the same land use and travel modeling tools as they did for their previous plan. They used the Urban Growth Land Use model (UPlan) and input from local jurisdictions to allocate regional growth in various alternative land use scenarios for testing. SBCAG then used a TransCAD platform-based traditional travel demand model that considers the "the four Ds" variables (Density, Diversity, Design, and Destination) in estimating trip generation. However, the 2017 SCS also included minor changes to model inputs and assumptions that changed its regional GHG emissions quantification. Table 2 summarizes these changes along with CARB staff's assessment and findings based on consistency with best available information and modeling practices.

Table 2. Key Changes in Modeling Processes of SBCAG's 2017 SCS Compared to the 2013 SCS

Modeling Component	CARB Assessment	Finding
Land Use Allocation Model	Reasonable	SBCAG made changes to better reflect the region's current land use that were consistent with the latest information from local jurisdictions, local general plan updates, and planned projects as described above (e.g., less growth estimates in completed projects). These were appropriately translated into their land use model. Other updated information includes regional commercial and residential developed acres.
Travel Demand Model	Reasonable	SBCAG updated its modeled roadway network. U.S. 101's functional classification was changed from a Principal Arterial to a Freeway between unincorporated Santa Maria and the Gaviota Coast. The public transit network was also updated to include more bus lines.
EMFAC Model	Somewhat Reasonable	SBCAG applied EMFAC2014 to calculate per capita GHG emissions. SBCAG did not apply the CARB Methodology to Calculate CO2 Adjustments to EMFAC Output for SB 375 Target Demonstrations. CARB staff applied the adjustment to values provided by SBCAG and determined that SBCAG would still meet the targets.
Sensitivity Analysis	Reasonable	SBCAG conducted additional tests to demonstrate their model's sensitivity to variables associated with their SCS strategies: • Auto Operating Cost (AOC) • Proximity to Transit • Jobs-Housing Diversity The estimates and impacts are consistent with existing studies. See Appendix B for more detail.

MODELED REGIONAL LAND USE AND TRANSPORTATION PERFORMANCE INDICATORS

CARB staff also reanalyzed several land use and transportation modeled indicators against relationships expressed in the empirical literature between each metric and vehicle miles traveled (VMT) and/or GHG emissions to understand whether changes were consistent with forecasted GHG emissions reduction trends. Unless otherwise noted, the data for this analysis came from SBCAG's modeling data table, see Appendix C. Supporting data and charts for performance indicators are provided in Appendix D.

Table 3. Modeled Performance Indicators for the SCS

Performance Indicator	CARB Assessment	Finding
Land Use Indicators		
Residential Density	Consistent with reducing VMT and GHG	Average residential density is projected to increase by 15 percent between 2010 and 2035. (See Figure 3 in Appendix D.)
Distribution of Housing Type	Consistent with reducing VMT and GHG	The proportion of the region's homes that are multi-family will increase, growing from 28 percent in 2010 to 40 percent in 2040. (See Figure 4 in Appendix D.)
Infill Housing	Consistent with reducing VMT and GHG	Infill housing is forecasted to account for a growing percentage of total new housing units through 2040. Infill is forecasted to account for nearly three-quarters of total new housing units by 2040. (See Figure 5 in Appendix D.)
Jobs-Housing Balance	Consistent with reducing VMT and GHG	Jobs-housing balance in every subregion is forecasted to shift closer to SBCAG's target balance of 1.5. (See Appendix D, Table 11, for the Jobs-Housing Balance table that SBCAG provided CARB staff.)
Transportation Indicators		
Average Auto Trip Length	Consistent with reducing VMT and GHG	Modeled average auto trip length is forecasted to decrease by 7.5 percent between 2010 and 2035. (See Figure 6 in Appendix D.)
Per Capita Passenger Vehicle Miles Travelled	Consistent with reducing VMT and GHG	Per capita VMT is forecasted to decline by 16 percent from 2005 to 2040 under this plan. (See Figure 7 in Appendix D.)

IMPLEMENTATION OF SBCAG'S FIRST SCS

SBCAG's actions over the past four years demonstrate the region's commitment to implementing their first SCS. They establish a foundation for continued implementation of policies and programs included in both the 2013 and 2017 SCSs.

Encouraging Sustainable Land Use

The future land use pattern adopted in both the 2013 and 2017 SCS includes an increase in infill development near transit and reflects efforts to balance jobs and housing. To implement this, SBCAG and its member agencies are adopting plans that would foster mixed-use development near transit. Between 2013 and 2017, local jurisdictions updated or adopted land use plans that helped to implement the SCS, including:

- In 2015 and 2016, the City of Goleta updated several sections of their General Plan, including the Land Use, Open Space, and Housing elements.
- The City of Santa Maria updated its Downtown Specific Plan in 2015. The plan builds upon their 2008 plan and gives more flexibility for building re-use and focuses on cross-departmental collaboration to achieve a vibrant, pedestrian-friendly, and diverse downtown.[7]
- The Eastern Goleta Valley Community plan update was adopted by the Santa Barbara County Board of Supervisors in October 2015 to address key issues of "economic vitality, high-quality residential neighborhoods, environmental protection, and sustainable transportation networks."[8]
- Between 2013 and 2016, the City of Lompoc adopted elements of its 2030 General Plan in two phases, then updated its Zoning Code to match. This General Plan update seeks to achieve its community vision of an "economically prosperous, compact urban place nestled among natural hillsides with undisturbed ridgelines, adjacent to wide expanses of fertile agricultural land, and straddling the biologically-rich Santa Ynez River," making the city "a safe, healthy, attractive, socially-inviting, and affordable place" with a "vibrant downtown."[9]

[7] Source: Hamblin, Abby. November 16, 2015. "City Council to Make Santa Maria Downtown Plans Official." Santa Maria Times. http://santamariatimes.com/news/local/city-council-to-make-santa-maria-downtown-plans-official/article_cde4b459-8f31-5176-9553-b43c04c6c583.html. Accessed 11/1/17.
[8] Source: County of Santa Barbara Planning and Development, Long Range Planning Division. "Eastern Goleta Valley Community Plan (EGVCP) Adopted by the Board of Supervisors on October 20, 2015." http://longrange.sbcountyplanning.org/planareas/goleta/gcp.php. Accessed 10/2/17.
[9] Source: City of Lompoc. *2030 General Plan*. http://www1.cityoflompoc.com/departments/comdev/pdf/GeneralPlan2030/Introduction.pdf. Accessed 10/2/17. p. 8.

- The City of Santa Barbara has produced annual reports on the implementation of its General Plan since 2013. In 2017, the report focused on issues of sustainability, jobs-housing balance, an updated climate emissions inventory, transportation, and the implementation of the 2012 Climate Action Plan. The City of Santa Barbara updated its Housing Element in 2015 to help the city meet its affordable housing need.[10]

A key strategy for the SCS is to balance jobs and housing to slow the growth in long-distance commuting from North County to South County. The 2017 SCS included information about the geographic distribution of new homes that were approved or under construction as of December 2015. CARB staff compared the split between the North County and the South Coast for the new construction with that in the SCS as a whole, using the Jobs-Housing Ratio Table, Table 11. This comparison showed that the housing development underway as of 2015 tracked well, at this sub-regional level, with the geographic distribution necessary to improve jobs-housing balance in the region.[11]

Enhancing Transportation Options

SBCAG and its member agencies have completed a number of transportation plans and projects to implement their 2013 SCS.[12] These include a number of road projects, as well as a number of public transportation and active transportation projects that will help SBCAG reduce GHG emissions. For example:

- Greyhound service in Santa Maria relocated to the multimodal Santa Maria Transit Center from its previous location one mile away, giving riders a more seamless connection between Greyhound and Santa Maria Transit routes.
- A number of transit districts have expanded their service offerings, particularly on weekends:
    - Santa Barbara MTD began offering Route 38 for the University of California Santa Barbara campus.
    - Guadalupe Transit expanded its Saturday service to the entire day and now offers new service on Sundays.
    - Saturday service was launched by the Wine Country Express, Breeze Route 100, and Breeze Route 200.
    - To travel between Santa Barbara and the Santa Ynez Valley, the Clean Air Express launched twice-a-day service on Saturdays.

[10] Source: City of Santa Barbara. "General Plan Implementation and Active Management Program (AMP) Reports." https://www.santabarbaraca.gov/services/planning/mpe/gpi.asp. Accessed 11/1/17.
[11] A valid comparison for non-residential space was not possible because the December 2015 data used commercial square footage, which could not be directly compared to the number of jobs created.
[12] The sources for these examples are the 2017 SCS, the Environmental Impact Report, SBCAG's Regional Active Transportation Plan, and the bikestation.com website.

- In 2015, Santa Barbara's second Bike Station opened at the Metropolitan Transit District (MTD) Transit Center, providing cyclists with a secure place adjacent to the MTD bus hub to safely park their bike for the first or last mile of the trip. Members of this publicly-funded and commercially-operated facility also have access to the original Santa Barbara Bike Station in the downtown Granada Garage, which also offers lockers, showers, and a Valet Bike Repair Program in partnership with local Open Air Bicycles. Santa Barbara also expanded parking for bicycles by converting an automobile parking space on East Canon Perdido Street into a stall that accommodates fourteen cycles.

Santa Barbara MTD bikestation hub. Source: bikestation.com

- In Isla Vista, a Class 1 bikeway along El Colegio Road was rebuilt. To improve safety for cyclists, pedestrians, and drivers, its new design sets the bike lane back further from the road at the points where driveways intersect the lane, allowing drivers space to pull off of El Colegio Road but to yield to bicycles before crossing the bikeway.


The photo highlights the design of the El Colegio Road bikeway

[10]http://www.noozhawk.com/article/lompocs_creative_crosswalks_proposal_wins_santa_barbara_foundation_grant


One former automobile parking space now accommodates parking for 14 bicycles along Canon Perdido Street in Santa Barbara

Source: SBCAG Active Transportation Plan

Policy Guidance and Strategic Planning Documents

SBCAG and its member jurisdictions have also prepared several regional and local policy documents that will support implementation of the 2013 and 2017 SCS. For example, in addition to the land use plans listed above, a number of active transportation and climate action planning efforts were completed or have been ongoing since 2013, including:[13]

- In 2015, SBCAG adopted a Regional Active Transportation Plan that includes top-priority active transportation projects from each of its member jurisdictions.
- In February 2014, the City of Guadalupe adopted a Bicycle and Pedestrian Master Plan to connect key destinations within Guadalupe and with neighboring jurisdictions.
- Carpinteria's Bicycle Master Plan was adopted in 2013.
- The City of Goleta intends to adopt a new Bicycle/Pedestrian Master Plan by May 2018.
- The County of Santa Barbara Energy and Climate Action Plan (ECAP), adopted in May 2015, aims for a 15 percent reduction in baseline emissions by 2020.
- The City of Santa Barbara adopted a Climate Action Plan in September 2012 and began preparing implementation reports in 2013.
- Goleta's Climate Action Plan, adopted in July 2014, identifies specific measures to reduce GHG emissions by a target of 11 percent below 2007 emissions by 2020 and 26 percent below 2020 levels for 2030.

[13] The sources for these examples are the 2017 SCS, the Environmental Impact Report, SBCAG's Regional Active Transportation Plan, and the City of Goleta's "Final Climate Action Plan," July 2014, http://www.cityofgoleta.org/home/showdocument?id=9735, accessed 12/1/17.

OTHER FINDINGS AND RECOMMENDATIONS

Update growth forecasts before next SCS and coordinate with the Department of Finance.

This SCS uses the same demographic projections as the 2013 plan. The population projections for 2020 differ from the projections of the California Department of Finance (DOF) by 3.5 percent, which is outside of the 3 percent threshold specified by §65584.01, beyond which an agency and DOF must meet to discuss the differences.

Use a non-flat auto operating cost value that better reflects future costs for fuel, maintenance, and tire replacement.

In this SCS, SBCAG applied a flat auto operating cost (AOC) value in its travel demand model. While SBCAG provided CARB staff with a sensitivity analysis for AOC showing reasonable responsiveness to the variable, to further improve model simulation results, CARB staff recommends that SBCAG use an AOC value that better reflects costs for fuel, maintenance, and tire replacement in their next SCS.

Validate automobile ownership model with DMV data.

SBCAG currently uses an automobile ownership model to determine the number of motor vehicles available for use by household members. CARB staff recommends SBCAG should validate its auto ownership model with the latest DMV data. The auto ownership model should be sensitive to land use and transit accessibility variables.

Develop an economic-based land use model.

As SBCAG works to transition to an activity-based model for its next SCS, CARB staff recommend that SBCAG develop an economic-based land use model to better estimate land use changes. The model may also directly track and analyze job-housing changes, especially at the city and sub-regional levels, to better support future SCS evaluation.

Update interregional travel VMT and GHG emissions estimation method.

In the current SCS, SBCAG used the “50/50” method to estimate its interregional VMT and GHG emissions, incorporating both its model outputs and its neighboring MPOs’ model outputs. While this is consistent with the method originally recommended by the Regional Targets Advisory Committee, current best practice amongst the MPOs is to instead use SBCAG’s travel demand model to include VMT that occurs within the MPO regional boundaries. CARB staff also recommend SBCAG validate the traffic volumes in major freeways with its neighboring MPOs.

More fully capture the benefits of all strategies used in GHG emissions calculations for future SCSs.

In the current SCS, SBCAG did not include any off-model GHG emissions reduction calculations, perhaps because SBCAG is able to meet its target without them. However, analyzing and quantifying the GHG emissions reductions from strategies whose GHG emissions reductions cannot be calculated using SBCAG's travel-demand model, such as ride sharing or active transportation projects, could help SBCAG better understand the total GHG emissions reduction potential of regional and local efforts, pursue strategies that reduce GHGs whose benefits are not well-reflected in travel-demand models, and better support climate change mitigation goals. Off-model calculations to estimate the benefits of strategies whose benefits are not adequately reflected in travel-demand models have increasingly become a standard part of California MPOs' SCSs. Therefore, CARB staff recommends SBCAG include off-model calculations in its future SCS.

Increase attention to housing affordability, displacement, and climate adaption.

In the current SCS, SBCAG described the ways that housing affordability is lengthening commutes and outlined a growth pattern that would better balance jobs and housing. However, the SCS could go further, for example by specifically describing how regional policies and funding will foster that jobs-housing balance and improve housing affordability, and by identifying strategies to monitor for displacement or signs that affordability is worsening rather than improving. Similarly, the SCS describes the possible impacts that climate change could have and some strategies for beginning to adapt to its impacts but could go further. For example, SBCAG could take the lead on an assessment of the region's vulnerabilities and an associated action plan.

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APPENDIX A: FURTHER DISCUSSION OF 2017 SCS CHANGES

POPULATION, EMPLOYMENT, AND HOUSING GROWTH FORECAST

SBCAG's 2017 SCS utilizes the same Regional Growth Forecast (RGF) as the 2013 SCS. CARB staff's review of the 2013 SCS outlines the methodology to prepare the RGF.

To judge whether this growth forecast remains realistic, CARB staff compared SBCAG's population forecasts for the horizon years of 2020, 2035, and 2040 to the most recent California Department of Finance (DOF) population forecast for those years, generated in March 2017. Table 4 below compares the estimates of population growth used in the 2013 and 2017 SCS against the most current DOF projections.

The DOF and SBCAG estimates for 2020 differ by approximately 3.5 percent, which exceeds the difference threshold of 3 percent per §65584.01. Because population projections are a key component of the DOF's method for setting Regional Housing Needs Allocations, California law sets forth a method for resolving discrepancies between population projections of an MPO and the DOF. Where the difference exceeds 3 percent, an agency and the DOF must meet, and then the DOF uses its projection, as modified following this meeting. In making a determination regarding whether the plan met the targets, CARB staff decided that this was not of serious concern, because this difference only slightly exceeds the threshold and because the variation resolved by 2035.

Table 4. Comparison of Population Estimates in SBCAG 2017 SCS and Department of Finance

	SBCAG	DOF	Difference
2010	423,800	423,552	0.1%
2020	445,900	461,916	-3.5%
2035	507,500	505,338	0.4%
2040	520,000	516,163	0.7%

Sources: SBCAG Data Table provided to CARB, September 2017; Department of Finance Demographic Projections: http://www.dof.ca.gov/Forecasting/Demographics/ Projections/ documents/P1_County.xlsx. Accessed 9/28/17.

SBCAG generated its employment estimates via a top-down method explained in CARB's 2013 review. To ensure that they remained reasonable, CARB staff compared them to those generated for the California Department of Transportation (Caltrans) by the California Economic Forecast Project in 2015 for all three horizon years and to those generated by the California Employment Development Department for the 2014-2024 time period available, in Table 5 below. It is important to note that the

Caltrans forecast only includes wage and salary jobs and does not include self-employment. SBCAG is projecting that economic growth will slow between 2020 and 2040, to the point that their estimate for 2035 is very close to EDD's projection for 2024. However, their estimates for growth in later years appear similar to or higher than the projections developed for Caltrans. CARB staff also compared the employment estimates to current employment and growth trends. SBCAG's estimate is reasonable, because the EDD projected employment increase rate (1.7 percent annually) is higher than the actual situation according to the most recent data. CARB staff recommends that SBCAG review and consider updating its employment projections to account for changing economic conditions in SBCAG's next SCS.

Table 5. Comparison of Employment Estimates

	SBCAG	Caltrans*	EDD
2010	197,400	181,500	
2014			212,900
2020	229,900	211,200	
2024			249,500
2035	250,000	228,900	
2040	257,600	234,300	

*It is important to note that the Caltrans estimates do not include self-employment, which is included in SBCAG and EDD's estimates.

Sources: SBCAG Data Table (Appendix C).

EDD "2014-2024 Occupational Employment Projections," May 2017. http://www.labormarketinfo.edd.ca.gov/file/occproj/satb$occproj.xlsx Accessed 9/28/17. Occupational employment projections include self-employed, private household workers, farm, and nonfarm employment.

Caltrans: "California County-level Economic forecast 2015-2040," prepared by the California Economic Forecast for the Economic Analysis Branch of California Department of Transportation. September 2015. Includes farm and non-farm wage and salary jobs.

LAND USE SCENARIO

The 2017 SCS utilizes the same baseline and preferred scenario as the 2013 SCS, with only minor changes reflecting slight decreases in growth.

The preferred scenario is Scenario 3, "the TOD/Infill with Enhanced Transit Strategy." It includes three components: (1) a land use plan that accommodates the projected growth; (2) a multi-modal transportation network; and (3) a greenprint that uses key farmland and natural resource areas as constraints to development. To develop the land use plan, SBCAG began with adopted General Plans, then worked closely with member jurisdictions to identify areas near transit where land use might intensify based upon draft updates to current plans. As SBCAG writes:

The intent of these changes is ultimately to shorten trip distances and reduce vehicle miles traveled by (1) directly addressing regional jobs/housing imbalance by providing more housing on the jobs-rich South Coast and more jobs in bedroom communities in the North County, and (2) promoting more trips, both local and inter-city, by alternative transportation modes, especially public transit.

The 2017 SCS notes that it reflects "essentially the same land use assumptions and growth allocation as the prior plan." CARB staff compared the household and employment growth between the 2013 and 2017 SCSs to confirm this statement and found that the largest shift at a jurisdiction level was 0.4 percent, reinforcing the statement that the growth pattern remains almost exactly the same.

EXPECTED TRANSPORTATION REVENUES AND EXPENDITURES

SBCAG's 2017 SCS updates both the expected revenues and transportation expenditures of the 2013 plan. The financial element of SBCAG's previous SCS planned for expenditures of $7.4 billion for the 31 years from 2010-2040.[14] The 2017 plan includes just over $6 billion over a shorter time period, 2016-2040.[15] On an annualized basis, projected spending grew just slightly.

The 2017 plan includes a variety of federal, State, and local funding sources. Many sources of funds remained the same between the 2013 and 2017 SCS. This includes the local self-help sales tax Measure A, which makes up approximately one-fifth of the region's budget in both plans. SBCAG updated the revenues to reflect changes between 2013 and 2017, including new funding sources associated with the cap-and-trade program and expansion of the Caltrans Active Transportation Program and that Proposition 1B funds are no longer available. The plan notes that much of the funding for active transportation and enhancing transit is anticipated to come from competitive grant funds.

For the 2017 SCS, the allocation of transportation funds to different travel modes is shown in Figure 1. The plan devotes approximately $5.7 billion to the three largest categories: streets and roads, transit, and highways. Table 6 compares the spending of the 2013 and 2017 plans. The share of the plan dedicated to highways and to local streets and roads declined, and the share dedicated to transit and active transportation increased. Most of this shift is likely due to the completion of significant roadway projects between 2010 and 2016, as completed projects were removed from the

[14] Source: SBCAG 2013 SCS.
[15] Source: SBCAG 2017 SCS.

expenditure plan. Some portion of this shift may also result from increases in state funding for transit and active transportation projects.

Table 6. Comparison of Transportation Spending in SBCAG's 2013 and 2017 SCS

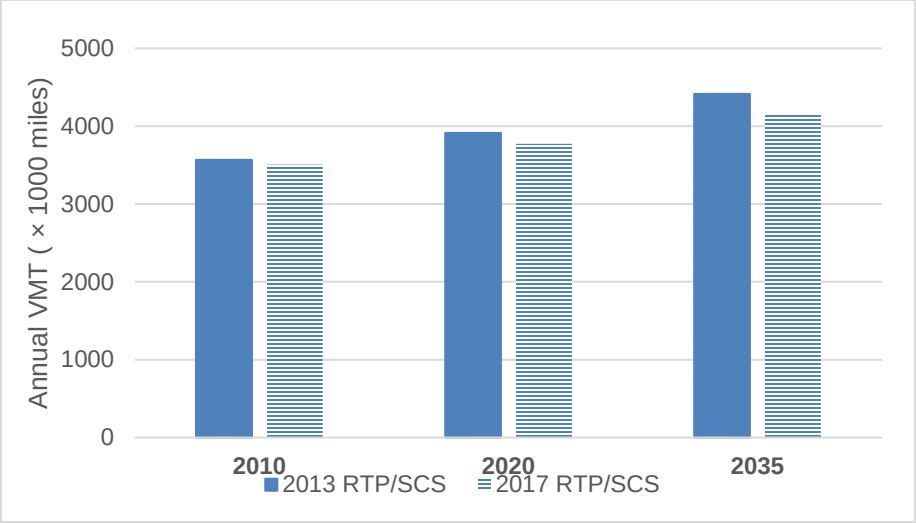
	2013 SCS	2017 SCS
Streets & roads	39%	35%
Highways	31%	26%
Transit	26%	33%
Bike / Pedestrian	2.7%	4.4%
Other	1.5%	0.8%

Sources: SBCAG 2013 SCS Figure 86, SBCAG 2017 SCS p. 203. "Other" includes Intelligent Transportation Systems, Transportation Demand Management, and Rail.

REDUCTION IN INTERREGIONAL TRIPS AND VMT

In the current SCS, interregional trip and VMT numbers in 2020 and 2035 are both lower than SBCAG's previous SCS. SBCAG applied the RTAC's recommended "50/50 method" to project future interregional trips. According to SBCAG, it obtained lower interregional trip and VMT numbers from its neighboring MPOs' (i.e., SCAG and SLOCOG) regional transportation models for the current 2017 SCS compared to the previous 2013 SCS (Figure 2). CARB staff reviewed data for these trips that were provided by SBCAG. Therefore, the interregional trip and VMT reduction in SBCAG's SCS is due to the lower trip and VMT numbers it obtained from its neighboring MPOs. This update partially explains the higher per capita GHG and VMT reductions associated with the same SCS strategies for the 2013 and 2017 SCS.

Figure 2. Inter-Regional VMT: 2013 SCS vs. 2017 SCS



APPENDIX B: SENSITIVITY ANALYSES

AUTO OPERATING COST

Auto operating cost in an important factor influencing travelers' auto use. SBCAG uses a fixed auto operating cost value over time (19.93 cents/mile). SBCAG conducted fourteen test scenarios to examine the responsiveness of the model to changes in auto operating cost. These scenarios included a 90 percent increase and decrease, 60 percent increase and decrease, and 30 percent increase and decrease from the base case.

CARB staff compared these modeled VMT values to what would be expected based on the elasticity[16] of VMT with respect to the change in auto operating cost from the empirical literature. The modeled VMT from each of SBCAG's sensitivity tests changed in the expected direction and fell within the expected range (Table 7). The calculated elasticity of VMT with respect to auto operating cost for SBCAG's travel demand model is -0.04, which falls in the range found within the empirical literature.

Table 7. Auto Operating Sensitivity Model Performance

Test	Modeled VMT	Expected VMT Range
90% Decrease from Base Case	1,0373,300	8,378,825 – 10,373,300
60% Decrease from Base Case	1,0424,050	9,109,625 – 10,439,275
30% Decrease from Base Case	1,0484,950	9,835,350 – 10,505,250
Base (2035)	**1,0566,150**	
30% Increase from Base Case	1,0667,650	10,627,050 – 11,296,950
60% Increase from Base Case	1,0789,450	10,687,950 – 12,159,700
90% Decrease from Base Case	1,0921,400	10,753,925 – 12,753,475

* Expected VMT Ranges are calculated based on Burt and Hoover (2006) and Small and Van Dender (2010)

PROXIMITY TO TRANSIT

SBCAG tested the responsiveness of the travel demand model to proximity to transit by placing or removing housing units in transportation analysis zones (TAZs) within a quarter-mile of transit stops or stations. Using the 2010 totals for each housing type as a base case, TAZs within a quarter-mile of a transit line either lost or gained units to represent density change. The total household counts for each TAZ were adjusted proportionally to maintain their respective countywide totals. When more households

[16] Elasticity is defined as the percent change in one variable divided by the percent change in another variable.

are located near transit, it is expected that ridership will increase, which leads to a decrease in VMT, and vice versa.

SBCAG conducted four scenario tests using the travel demand model, including a 50 percent increase and decrease, and 25 percent increase and decrease in households within transit corridor TAZs for the base year (2010). In this sensitivity analysis, SBCAG defined transit corridor TAZs as TAZs that are immediately adjacent to and completely within a quarter-mile of the region's primary transit corridors within the cities of Santa Barbara, Santa Maria, and Lompoc. Table 8 summarizes the population and household inputs in this sensitivity analysis. In the five scenarios, SBCAG modified household and population distributions in transit corridors and non-transit corridor TAZs, while keeping the total household and population numbers constant.

Table 8. Scenarios Used for Proximity to Transit Sensitivity Test

Test	Population (TC TAZs)	Population (non-TC TAZs)	Household (TC TAZs)	Household (non-TC TAZs)	Population (Total)	Household (Total)
50% Decrease from Base	109,908	313,976	35,161	106,907	423,884	142,068
25% Decrease from Base	164,723	259,164	52,617	89,484	423,887	142,101
Base (2010)	219,550	204,335	70,069	72,028	423,885	142,097
25% Increase from Base	274,506	149,383	87,645	54,462	423,889	142,107
50% Increase from Base	329,458	94,410	105,230	36,886	423,868	142,116

The sensitivity test results are summarized in Table 9, and show that the total VMT decreases as the number of households within transit corridor TAZs increases, and vice versa. This trend is consistent with the empirical literature, and the percentage of VMT changes (less than 2 percent) from SBCAG model is also reasonable. The calculated elasticity of VMT with respect to transit proximity for SBCAG's travel demand model is -0.03, which is consistent with the empirical literature.

Table 9. Proximity to Transit Sensitivity Test VMT Output

Test	Modeled VMT	Change of VMT
50% Decrease from Base[1]	9,539,616	1.86%
25% Decrease from Base[1]	9,447,327	0.88%
Base (2010)	**9,365,328**	--
25% Increase from Base[2]	9,293,590	-0.77%
50% Increase from Base[2]	9,244,361	-1.29%

1. Decreases means the number of household in TC TAZs decreases
2. Increases means the number of household in TC TAZs increases

JOBS-HOUSING BALANCE

SBCAG performed a sensitivity test for job-housing balance (J/H) to examine the impacts on modeled VMT, as SBCAG's SCS indicates that balancing the job housing ratio is an important strategy for the region. SBCAG conducted this sensitivity test by changing the "Job Housing Diversity (J/H diversity)" variable in its travel demand model. This variable can range from 0 to 1; J/H diversity close to 1 means a more balanced J/H ratio, while close to 0 means a less balanced J/H ratio.

Five hypothetical scenarios for 2040 were tested by the SBCAG model, including J/H diversity values of 1, 0.75, 0.5, 0.25, and 0. These scenarios cover a wide range of possible J/H diversity, from extremely balanced (i.e., 1) to extremely imbalanced (i.e., 0). Table 10 summarizes the modeled trip numbers and VMT. As shown in the table, both trip number and VMT are lower when J/H ratio is more balanced, and vice versa. This trend is consistent with empirical literature showing that improving the J/H balance in urban areas can reduce VMT. CARB staff calculated that in the SBCAG model, the VMT elasticity to J/H diversity is 0.005.

It should be noted that these sensitivity tests are conducted at the transportation analysis zone (TAZ) level, and therefore may not perfectly reflect the model's sensitivity to J/H balance at the city or regional level. A key strategy in the SCS is to add housing in the jobs-rich southern portion of the region, and vice versa, and these scenarios did not test the model's responsiveness to improving J/H balance at that subregional scale to reduce long-distance commuting. Alternatively, SBCAG used this J/H diversity variable, which is an indirect indicator to the regional job-housing balance level.

Table 10. Job-Housing Balance Diversity Sensitivity Test Outputs

	VMT		Vehicle Trips	
Extreme Balance JHD[1] = 1.0	10,596,124	--	1,621,685	--
Moderate Balance JHD = 0.75	10,608,817	+0.12%[2]	1,624,891	+0.20%[2]
Average JHD = 0.50	10,625,907	+0.28%	1,628,675	+0.43%
Moderate Imbalance JHD = 0.25	10,637,227	+0.39%	1,631,928	+0.63%
Extreme Imbalance JHD = 0	10,651,236	+0.52%	1,635,083	+0.83%

1. JHD is Job Household Diversity, the formula of which according to SBCAG is *1-[ABS(b*HH-EMP)/(b*HH + EMP)]*, where b = regional employment/regional households. HH and Emp are the households and employment within a half mile buffer from the block centroid.
2. The percentages refer to VMT and trip number differences compared to the JHD = 1.0 case

	Extreme Balance	Moderate Balance	Average	Moderate Imbalance	Extreme Imbalance
	JHD*= 1.0	JHD = 0.75	JHD = 0.5	JHD = 0.25	JHD = 0.0
VMT	10,596,124 --	10,608,817 (+0.12%)	10,625,907 (+0.28%)	10,637,227 (+0.39%)	10,651,236 (+0.52%)
Vehicle Trips	1,621,685 --	1,624,891 (+0.20%)	1,628,675 (+0.43%)	1,631,928 (+0.63%)	1,635,083 (+0.83%)

*JHD is Job Household Diversity, the formula of which according to SBCAG is *1-[ABS(b*HH-EMP)/(b*HH + EMP)]*, where b = regional employment/regional households. HH and Emp are the households and employment within a half mile buffer from the block centroid.

APPENDIX C: DATA TABLE

Modeling Parameters	2005	2010 Base Year	2020		2035		2040		Data Source(s)
			w/ projects[1]	w/o projects[2]	w/ projects	w/o projects	w/ projects	w/o projects	
DEMOGRAPHIC									
Total Population	417,500	423,800	445,900	445,900	507,500	507,500	520,000	520,000	2005-Prior RGF P.4; RGF, P. 19
Group Quarters Population	17,381	17,782	20,800	20,800	24,100	24,100	24,440	24,440	2005-DOF E-8 Report; RGF Model input (constant %)
Total Number of Households	139,293	142,100	149,900	149,900	177,400	177,400	183,600	183,600	2005-DOF E-8 Report; RGF, P. 20
Persons Per Household	2.83	2.85	2.83	2.83	2.72	2.72	2.69	2.69	2005-DOF E-8 Report Calculated
Auto Ownership Per Household	n/a	1.91	1.77	1.77	1.75	1.77	1.75	1.77	SBCAG Travel Model; HHFile_Sbcag.bin
Total Number of Jobs	188,100	197,400	229,900	229,900	250,000	250,000	257,600	257,600	2005-Prior RGF, P. 39; RGF, P. 13
Average Unemployment Rate (%)	4.4	9.4	5.5	5.5	5.5	5.5	5.5	5.5	2005, EDD; RGF, P. 18
Median Household Income	57,059	61,896	no change	no change	no change	no change	no change	no change	2005-ACS 2005-2007; ACS 2007-2011, Table, DP03
LAND USE									
Total Developed Acres[3]	n/a	51,892	53,375	55,186	58,500	65,401	69,128	77,020	
Commercial Developed Acres	n/a	3,633	4,756	4,999	5,357	5,754	5,616	6,042	
Residential Developed Acres	n/a	15,189	15,549	15,634	16,780	19,969	16,933	20,672	
Total Acreage Developed (new)	n/a	n/a	1,483	1,811	3,315	6,901	3,727	7,892	
Housing Vacancy Rate	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total Housing Units	n/a	142,097	145,796	145,797	167,326	167,325	171,722	171,721	
Total Single-Family Detached Housing Units[4]	n/a	101,927	102,095	102,105	102,514	106,423	102,516	107,138	
Total Single-Family Attached Housing Units	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Modeling Parameters	2005	2010 Base Year	2020		2035		2040		Data Source(s)
			w/ projects[1]	w/o projects[2]	w/ projects	w/o projects	w/ projects	w/o projects	
Total Multi-Family Housing Units[5]	n/a	40,170	43,701	43,691	64,812	60,901	69,206	64,582	UPlan Land Use Model; Dwelling Units per Acre Calculation.xlsx
Total infill Housing Units[6]	n/a	n/a	2,482	1,457	18,118	5,046	21,742	6,824	UPlan Land Use Model; Percent New Housing.xlsx
Total small-lot single family detached households (XX sqft lots and smaller)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Total conventional-lot single family detached households (between XX and XX sqft lots)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Total large-lot single-family detached households (XX sqft lots and larger)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Average Density (dwelling units/acre)	n/a	1.76	1.80	1.80	2.03	1.96	2.08	1.99	UPlan Land Use Model; Dwelling Units per Acre Calculation.xlsx
PROXIMITY TO TRANSIT									
Total housing units within 1/4 mile of transit stations and stops	n/a	98,389	102,901	101,651	120,759	114,222	124,629	117,462	
Total housing units within 1/2 mile of transit stations and stops	n/a	126,205	129,341	128,906	150,080	146,925	154,366	150,832	
Total employment within 1/4 mile of transit stations and stops	n/a	145,964	165,985	162,026	179,149	171,055	183,614	172,756	
Total employment within 1/2 mile of transit stations and stops	n/a	168,908	192,592	189,999	210,108	204,915	215,811	208,111	
Transit Stations and Stops in TOD[7]									
Total housing units within 1/4 mile of transit stations and stops[8]	n/a	17,079	31,233	17,592	39,279	19,013	40,939	19,155	

Modeling Parameters	2005	2010 Base Year	2020		2035		2040		Data Source(s)
			w/ projects[1]	w/o projects[2]	w/ projects	w/o projects	w/ projects	w/o projects	
Total housing units within 1/2 mile of transit stations and stops	n/a	28,398	48,085	30,538	58,967	33,153	61,177	33,726	Measures from Travel Model.xlsx
Total employment within 1/4 mile of transit stations and stops	n/a	48,035	77,429	52,311	77,564	53,232	77,611	53,232	
Total employment within 1/2 mile of transit stations and stops	n/a	59,412	100,292	70,124	100,502	71,428	100,562	71,441	
Percent New Housing[9]	n/a	n/a	15.61	1.06	37.77	8.53	40.43	8.56	UPlan Land Use Model; Percent New Housing.xlsx
Average Headway (minutes)[10]	n/a	26.54	25.87	28.70	25.87	28.70	25.87	28.70	SBCAG Travel Model;Transit Route System
Average Density (dwelling units/acre)	n/a	2.21	2.35	2.22	4.38	2.72	4.86	2.81	UPlan Land Use Model; Dwelling Units per Acre Calculation.xlsx
TRANSPORTATION SYSTEM									
Freeway and General Purpose Lanes -Mixed Flow, auxiliary, etc. (lane miles)	n/a	431.81	431.81	431.81	433.38	431.81	433.38	431.81	
Freeway Managed Lanes - HOV, HOT, Tolled, etc. (lane miles)	n/a	0.00	5.25	5.25	23.60	23.60	23.60	23.60	
Arterial/Expressway (lane miles)	n/a	996.49	1,006.91	1,006.43	1,023.27	1,012.39	1,023.27	1,012.39	
Collector and Local (lane miles)	n/a	2,500.39	2,505.28	2,505.28	2,508.14	2,505.78	2,508.54	2,505.78	
Regular Transit Bus Operation Miles	n/a	998.77	1,286.72	1,182.93	1,300.46	1,182.93	1,327.96	1,182.93	
Bus Rapid Transit Bus Operation Miles[11]	n/a	2,216.07	2,697.07	2,595.92	2,868.81	2,767.66	2,868.81	2,767.66	
Transit Rail Operation Miles	n/a	207.96	379.70	379.70	379.70	379.70	379.70	379.70	
Transit Total Daily Vehicle Service Hours	n/a	84.06	104.29	98.67	108.87	102.67	110.78	103.61	
Bike Lane (class I & II) miles	n/a	183.51	205.76	189.10	228.11	189.23	228.30	189.23	SBCAG Travel Model; Master Highway Network

Modeling Parameters	2005	2010 Base Year	2020		2035		2040		Data Source(s)
			w/ projects[1]	w/o projects[2]	w/ projects	w/o projects	w/ projects	w/o projects	
TRIP DATA									
Number of Trips by Purpose									
Home-Based Work	n/a	310,482	317,676	317,824	368,570	367,250	377,116	377,066	
Home-Based Shopping	n/a	120,694	125,112	125,335	143,410	144,465	147,099	148,385	
Home-Based School (Elementary)	n/a	51,953	52,250	52,250	52,547	52,547	52,847	52,847	
Home-Based School (Middle)	n/a	13,653	13,731	13,731	13,809	13,809	13,888	13,888	
Home-Based School (High)	n/a	20,594	20,711	20,711	20,830	20,830	20,948	20,948	
Home-Based School (College)	n/a	75,163	106,672	106,672	126,122	126,122	135,878	135,878	
Home-Based School (Private Elementary)	n/a	6,454	6,491	6,491	6,528	6,528	6,565	6,565	
Home-Based School (Private High)	n/a	1,606	1,615	1,615	1,624	1,624	1,633	1,633	
Home-Based School (Total)	n/a	169,423	201,469	201,469	221,460	221,460	231,759	231,759	
Home-Based Other	n/a	613,719	628,877	630,557	723,723	728,170	741,876	748,231	
Non-Home-Based Work	n/a	207,541	214,337	214,186	248,874	248,561	254,395	255,461	
Non-Home-Based Other	n/a	254,669	261,406	262,187	302,157	303,265	309,253	311,644	
IXXI	n/a	187,423	214,973	214,973	240,228	240,228	251,707	251,707	
Visitor	n/a	63,059	69,181	68,369	76,026	75,130	77,956	76,794	
By Travel Mode									
Average Auto Trip Length (miles)	n/a	8.00	7.81	8.70	7.42	9.00	7.40	9.06	
Average Peak Transit Trip Length (miles)	n/a	6.94	6.56	6.90	6.22	7.69	6.17	7.83	
Average Off-Peak Transit Trip Length (miles)	n/a	6.58	6.27	6.93	5.82	7.62	5.81	7.77	
Average Walk Trip Length (miles)	n/a	1.60	1.59	1.59	1.57	1.61	1.57	1.61	
Average Bike Trip Length (miles)	n/a	3.23	3.24	3.24	3.22	3.24	3.22	3.24	
Average Auto Travel Time (minutes)	n/a	14.18	14.19	15.05	13.84	15.48	13.89	15.63	
Average Off-Peak Transit Travel Time (min)	n/a	105.04	98.66	100.01	97.46	102.04	96.91	102.19	

Modeling Parameters	2005	2010 Base Year	2020		2035		2040		Data Source(s)
			w/ projects[1]	w/o projects[2]	w/ projects	w/o projects	w/ projects	w/o projects	
Average Peak Transit Travel Time (minutes)	n/a	107.78	102.13	100.85	102.28	103.46	101.70	103.47	
Average Walk Travel Time (minutes)	n/a	31.91	31.74	31.80	31.35	32.14	31.32	32.16	
Average Bike Travel Time (minutes)	n/a	14.43	14.58	14.48	14.50	14.45	14.50	14.45	
PERCENT PASSENGER TRAVEL MODE SHARE (Daily)									
Auto	n/a	92.69	92.23	92.32	92.01	92.48	91.97	92.45	
Transit	n/a	1.34	1.55	1.48	1.72	1.42	1.72	1.42	
Non-Motorized (bike/walk)	n/a	4.83	4.91	4.89	5.00	4.82	5.02	4.82	
Other (School Bus)	n/a	1.14	1.31	1.31	1.26	1.29	1.29	1.31	
PERCENT PASSENGER TRAVEL MODE SHARE (Peak Period)									
Drive Alone	n/a	47.00	46.20	46.14	46.40	46.47	46.27	46.38	
Share Ride	n/a	45.62	45.82	45.99	45.46	45.84	45.52	45.88	
Public Transit (all)	n/a	1.37	1.63	1.51	1.80	1.42	1.80	1.42	
Public Transit (Express Bus)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Public Transit (BRT)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Public Transit (Rail)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Non-Motorized (Bike)	n/a	0.91	0.92	0.93	0.93	0.93	0.94	0.93	
Non-Motorized (Walk)	n/a	3.38	3.45	3.46	3.50	3.38	3.53	3.39	
Other (School Bus)	n/a	1.72	1.98	1.97	1.90	1.96	1.94	2.00	
VEHICLE MILES TRAVELED									
Total VMT/weekday (all vehicle class) (mi.)	9,622,929	9,276,947	8,943,917	10,218,560	9,600,392	12,073,954	9,746,623	12,362,749	
Total VMT per weekday for passenger vehicles (ARB vehicle classes LDA, LDT1, LDT2, and MDV)	8,629,235	8,284,963	8,187,956	9,369,234	8,914,621	11,233,826	9,058,156	11,512,238	

Modeling Parameters	2005	2010 Base Year	2020		2035		2040		Data Source(s)
			w/ projects[1]	w/o projects[2]	w/ projects	w/o projects	w/ projects	w/o projects	
Total II VMT per weekday for passenger vehicles (miles)[12]	n/a	4,916,487	4,378,306	5,374,814	4,612,959	6,711,930	4,573,079	6,791,346	n/a
Total IX/XI VMT per weekday for passenger vehicles (miles)[12]	n/a	3,046,062	3,262,980	3,325,901	3,584,254	3,670,217	3,703,399	3,798,953	
Total XX VMT per weekday for passenger vehicles (miles)[12]	n/a	322,414	546,670	550,899	717,408	729,006	781,678	795,717	
CONGESTED TRAVEL MEASURES									
Congested weekday VMT on freeways (miles, V/C ratios > 0.75)	n/a	1,770,574	2,073,433	2,626,880	2,377,246	4,546,463	2,460,029	4,741,834	
Congested weekday VMT on all other roadways (miles, V/C ratios > 0.75)	n/a	676,921	1,106,730	1,239,282	1,254,298	1,724,771	1,279,012	1,831,879	
CO2 EMISSIONS									
Total CO2 emissions per weekday (all vehicle class) (tons)[13]	5,109	4,948	3,968	4,540	2,974	3,732	2,912	3,684	
Total SB375 CO2 emissions per weekday for passenger vehicles (ARB vehicle classes LDA, LDT1, LDT2, and MDV) (tons)[14]	3,918	3,783	3,630	4,134	3,918	4,908	3,987	5,038	
Total II CO2 emissions per weekday for passenger vehicles (tons)[15]	n/a	2,245	1,941	2,402	2,027	2,965	2,013	3,005	
Total IX/XI CO2 emissions per weekday for passenger vehicles (tons)[15]	n/a	1,391	1,447	1,486	1,575	1,621	1,630	1,681	
Total XX CO2 emissions per weekday for passenger vehicles (tons)[15]	n/a	147	242	246	315	322	344	352	
Total SB 375 CO2 (w/ EMFAC adjustment)[16]	n/a	n/a	30	n/a	52	n/a	n/a	n/a	
INVESTMENT (millions) (YEAR of Expenditure in $)[17]									
Total Plan Period Investment	n/a	n/a	1,307	1,191	4,893	1,680	6,043	1,680	

Modeling Parameters	2005	2010 Base Year	2020		2035		2040		Data Source(s)
			w/ projects[1]	w/o projects[2]	w/ projects	w/o projects	w/ projects	w/o projects	
Highway Capacity Expansion	n/a	n/a	25	25	483	115	483	115	Draft Fast Forward 2040, Appendix 2, Project Lists
Other Road Capacity Expansion	n/a	n/a	119	103	257	117	257	117	
Rail Transit Capacity Expansion	n/a	n/a	24	24	24	24	24	24	
BusTransit Capacity Expansion	n/a	n/a	95	49	260	49	334	49	
Bus Transit Operations	n/a	n/a	207	153	1,049	153	1,423	153	
Rail Transit Operation	n/a	n/a	6	6	31	6	42	6	
Bike and Pedestrian Projects	n/a	n/a	64	64	275	170	299	170	
Other[18]	n/a	n/a	767	767	2,515	1,046	3,181	1,046	
TRANSPORTATION USER COSTS AND PRICING (YEAR of Expenditure in $)[19]									
Vehicle Operating Costs (cents/mile)[20]	n/a	19.93	no change	no change	no change	no change	no change	no change	SBCAG Land Use and Travel Model Users Guide.pdf
Gasoline Price ($ per gallon)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Parking Price ($ per day)	n/a	7-20	no change	no change	no change	no change	no change	no change	SBCAG Travel Model; TAZData.bin
Toll Price ($)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Congestion Price ($ per mile)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Average Transit Fare Per Passenger Mile ($/mile)	n/a	0.239	0.286	0.288	0.287	0.290	0.287	0.290	SBCAG Travel Model; Average Transit Fare Per Passenger Mile.xlsx

Footnotes

[1] This scenario includes modeling of all planned and programmed projects in FF2040 RTP/SCS for respective calendar year, and a more compact growth scenario.
[2] This scenario excludes planned projects in FF2040 RTP/SCS for respective calendar year, i.e., it includes programmed projects only per CARB's prior SCS deliberation instructions, and includes a more business-as-usual growth scenario.
[3] Includes all developed land, including airports, institutional, schools, transportation corridors, urban reserves, utility services.
[4] Derived from UPlan low and very low density residential land use categories.
[5] Derived from UPlan high and medium density residential land use categories.
[6] Infill defined as non redevelopment new housing within 1,000 feet of existing housing.
[7] "TOD" defined to include all preferred scenario land use changes and existing high density mixed uses. Refer to existing high density mixed use and hatched/bolded changes in preferred scenario land use maps.
[8] Within a high-quality transit corridor (fixed route bus service with service intervals no longer than 15 minutes during peak commute hours).

[9] Percent new high density housing located within TOD land uses as defined above.
[10] Based on main transit routes serving TOD areas: COLT Routes 1, 3, & 5; MTD Downtown Shuttle; SMAT Route 1,2 & 5, MTD Routes 1, 2, 6, 11, 12X, 15X, & 24X.
[11] Express bus service substituted in place of BRT.
[12] I-I, IX-XI, and X-X trips are calculated for total trips only. VMT is calculated using SBCAG model estimates for average trip length for each trip type. We default to EMFAC to calculate emissions for passenger vehicles.
[13] The EMFAC runs for the entire vehicle inventory include state control measures excluded from the SB 375 analysis (such as the advanced clean cars and low carbon fuel standard).
[14] The SB 375 runs in EMFAC exclude state control measures to reduce GHG emissions (such as advanced clean cars and the low carbon fuel standard).
[15] SBCAG relies on EMFAC to calculate total passenger vehicle CO_2 emissions, and do not quantify I-I, IX-XI, and X-X passenger vehicle CO_2 emissions (see footnote 12).
[16] The EMFAC adjustment is applied to the CO2 per capita metric, per the CARB methodology guidance in Methodology to Calculate CO2 Adjustment to EMFAC Output for SB375 Target Demonstrations.
[17] For years 2035 and 2040, the values shown are cumulative of prior periods.
[18] Primarily roadway maintenance and intersection improvements.
[19] Year of expenditure for currency is 2010.
[20] For the base year 2010 model, value of time is set to $7.05/hr and auto operating cost is set to 19.93 cents/mile, defined as an out-of-pocket expense consisting of fuel cost and “other” costs (repairs, maintenance, tires, and accessories). These are the parameters used in the SCAG model.

Figure 3. Change in Regional Residential Density (2010-2035)

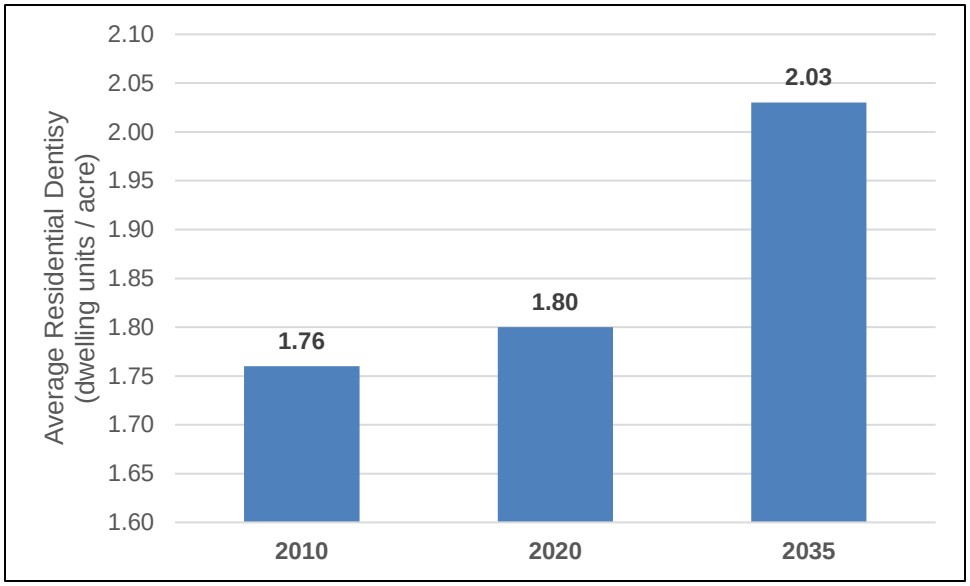


Figure 3 shows the shift in residential density that will occur if the plan is implemented. The residential density in the region will increase from 1.76 dwelling units per acre in 2010 to 2.03 units per acre in 2035 according to SBCAG's SCS.

HOUSING TYPES

Figure 4. Distribution of Housing Types (2010-2040)

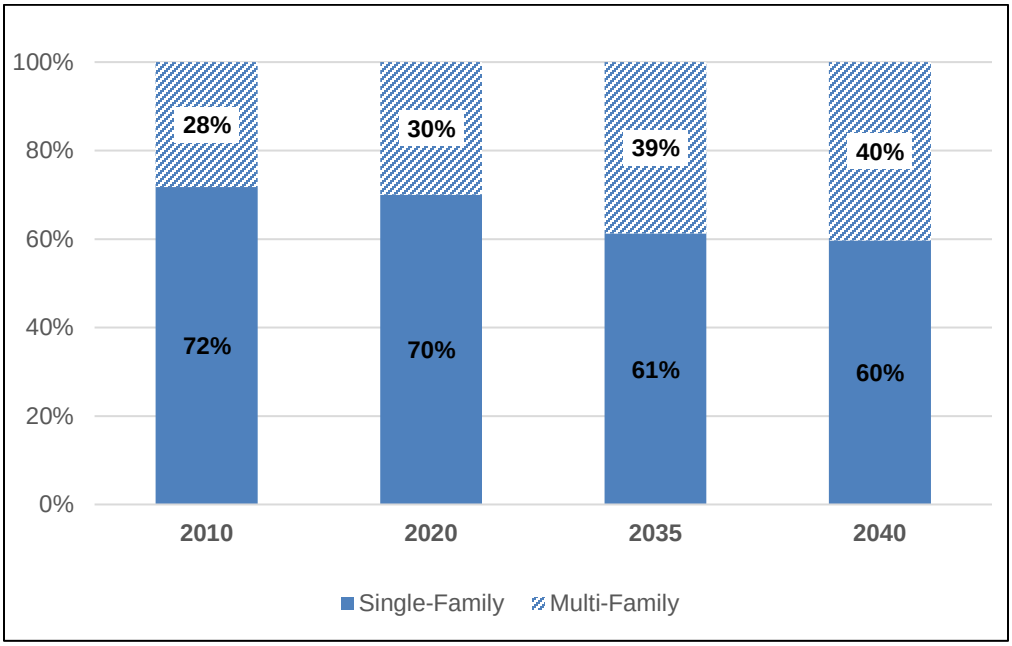
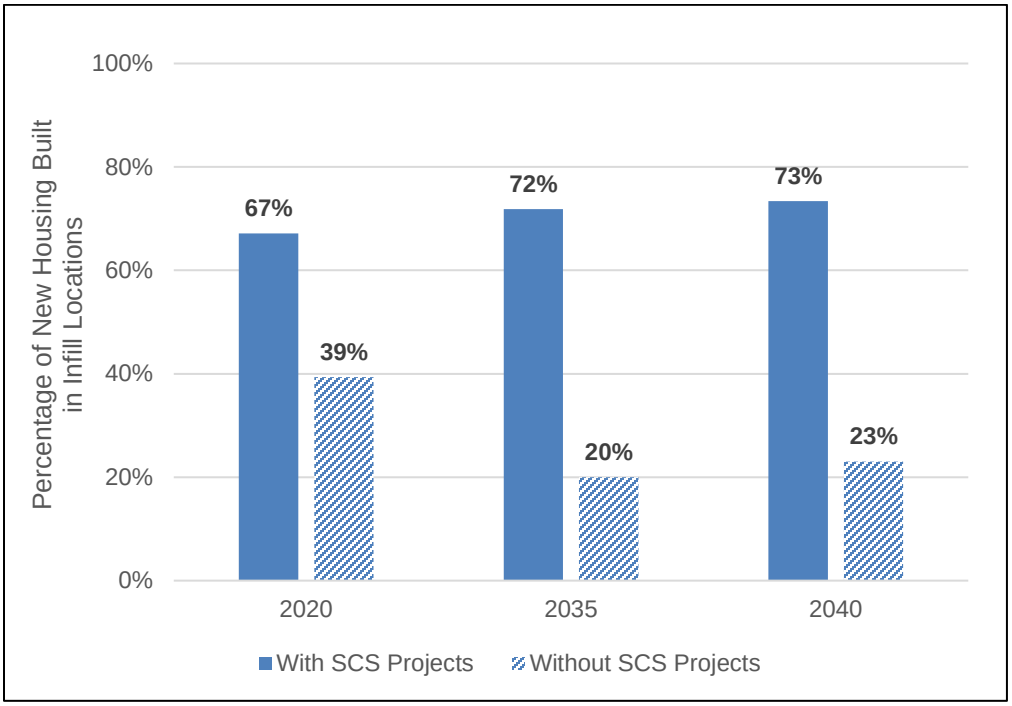


Figure 4 illustrates the proportion of the region's homes that are or will be single-family and multi-family for the base year of 2010 and plan horizon years. According to SBCAG's SCS, the single-family housing percentage is forecasted to decrease from 71.7 percent of total housing units in 2010 to 59.7 percent in 2040.

Figure 5. Percentage of New Housing Built in Infill Locations (2020-2040)



As shown in Figure 5, if implemented, the SCS will focus more housing growth as infill development. The percentage of new homes built in infill locations is forecasted to continue to grow through 2040 under the SCS. Infill is forecasted to account for 67 percent of total new housing units in 2020, 72 percent in 2035, and 73 percent in 2040. Under the more conventional growth pattern from the "no project" scenario, the percentage will be less than 40 percent.

Table 11. Jobs-Housing Balance by SBCAG Sub-Region

With Project									
Jurisdiction	2010			2035			2040		
	Jobs	Households	Ratio	Jobs	Households	Ratio	Jobs	Households	Ratio
Santa Maria City	34,333	27,079	1.27	62,996	33,833	1.86	67,694	35,377	1.91
Guadalupe City	686	1,810	0.38	1,695	1,911	0.89	1,695	1,911	0.89
Santa Maria Unincorporated	6,345	11,642	0.55	9,077	12,680	0.72	10,888	12,711	0.86
Guadalupe Unincorporated	283	93	3.04	283	93	3.04	283	93	3.04
Cuyama Unincorporated	366	447	0.82	366	447	0.82	366	447	0.82
North County Area	**42,013**	**41,071**	**1.02**	**74,417**	**48,964**	**1.52**	**80,926**	**50,539**	**1.60**
Solvang City	3,364	2,167	1.55	3,407	2,452	1.39	3,407	2,452	1.39
Buellton City	1,884	1,755	1.07	3,258	2,161	1.51	3,258	2,274	1.43
Solvang-Santa Ynez Unincorporated	7,558	4,761	1.59	7,794	4,869	1.60	7,794	4,901	1.59
Santa Ynez Area	**12,806**	**8,683**	**1.47**	**14,459**	**9,483**	**1.52**	**14,459**	**9,627**	**1.50**
Lompoc City	10,686	13,242	0.81	18,113	14,230	1.27	18,594	14,436	1.29
Lompoc Unincorporated	9,449	5,407	1.75	9,695	5,601	1.73	9,695	5,632	1.72
Lompoc Area	**20,135**	**18,649**	**1.08**	**27,808**	**19,831**	**1.40**	**28,289**	**20,068**	**1.41**
Santa Barbara City	62,912	34,966	1.80	63,700	43,093	1.48	63,760	44,106	1.45
Goleta City	21,120	10,880	1.94	22,128	16,465	1.34	22,128	17,326	1.28
Carpinteria City	6,075	4,756	1.28	6,879	4,949	1.39	6,879	4,949	1.39
Santa Barbara Unincorporated	24,754	21,185	1.17	27,233	22,590	1.21	27,233	23,156	1.18
Carpinteria Unincorporated	2,292	1,907	1.20	2,413	1,951	1.24	2,413	1,951	1.24
South Coast Area	**117,153**	**73,694**	**1.59**	**122,353**	**89,048**	**1.37**	**122,413**	**91,488**	**1.34**
Total Unincorporated	**51,047**	**45,442**	1.12	56,860	48,232	1.18	58,671	48,891	1.20
Total	**192,107**	**142,097**	**1.35**	**239,037**	**167,326**	**1.43**	**246,087**	**171,722**	**1.43**

Research suggests that the ideal jobs-to-housing unit ratio is 1.5 to 1. More specifically, the ideal theoretical job–to-employed resident ratio is 1 to 1. Jobs-Housing Balance; Planning Advisory Service Report Number 516, Weitz, Jerry. Accessed 18 March 2013.
http://www.planning.org/pas/reports/subscribers/pdf/PAS516.pdf

Source: SBCAG-CARB Data Submittal provided on 11/6/2017

Table 11 was provided to CARB staff by SBCAG to illustrate the improved jobs-housing balance in SBCAG's subregions. If the SCS is implemented, every subregion jobs-housing balance approaches SBCAG's target balance of 1.5 jobs per household, as follows: the North County Area shifts from 1.02 (2010) to 1.52 (2035); the Santa Ynez Area shifts from 1.47 (2010) to 1.52 (2035); the Lompoc Area shifts from 1.08 (2010) to 1.40 (2035); and the South Coast Area shifts from 1.59 (2010) to 1.37 (2035).

Auto Trip Length

Figure 6: Average Auto Trip Length (2010-2040)

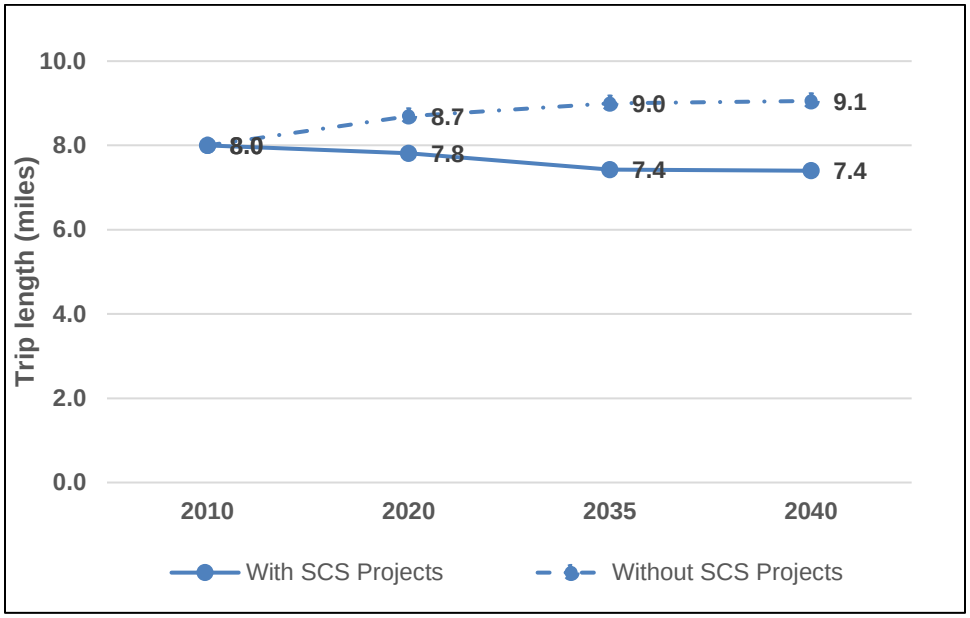


Figure 6 illustrates the shift in average modeled auto trip length under the SCS, in comparison to a scenario that only includes transportation projects that are already committed and a more business-as-usual growth pattern. SBCAG estimates that if the SCS is implemented, average auto trip length will decline from 8.0 miles in 2010 to 7.4 miles in 2035.

Per Capita VMT

Figure 7. Per Capita Weekday Passenger Vehicle Miles Traveled (VMT)

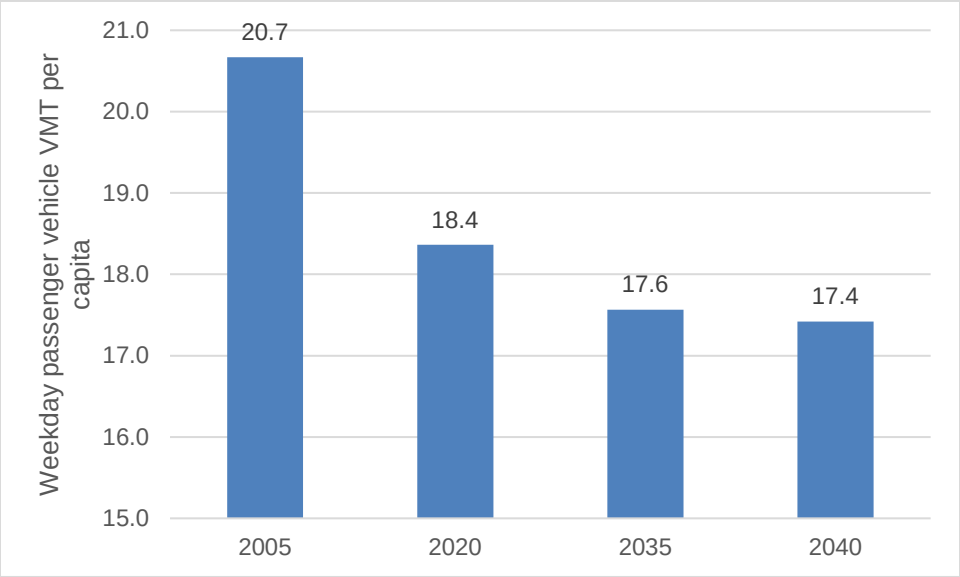


Figure 7 illustrates the shift in per capita VMT that the current SCS predicts. Per capita VMT is forecasted to decrease from 19.6 miles per day in 2014 to 18.4 miles per day by 2020, 17.6 miles per day by 2035, and 17.4 miles per day by 2040.