

Appendix B

Comparison of Observed Data with SCS Forecasts for Selected Metrics

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INTRODUCTION

Appendix B compares the observed data for eight metrics with the future forecasts provided in the most recent sustainable communities strategies (SCS) for each metropolitan planning organization (MPO) region. These seven metrics include per capita greenhouse gas (GHG) emissions, household vehicle ownership, daily transit ridership, total new housing units, total new single-family housing units, total new multi-family housing units, and urbanized land. Performance metrics used in this analysis were chosen based on the availability of observed data and representation of SCS strategies provided by MPOs in their regional transportation plan (RTP)/SCS. This provides a snapshot of where MPO regions are currently and how they perform relative to their SCS goals.

This appendix describes the definition of each metric, as well as the data sources, calculation methods, rationale for selection, and key findings associated with each metric. Then it presents charts for these metrics by MPO region. The empirical data in this appendix are the same as those in Appendix A. However, in Appendix B, they are presented in a different format to compare observed data in each region with the MPO's forecasts from its SCS. This analysis shows whether the regions are on track to meet the GHG targets and key regional metrics as expected in their SCSs. In other words, does the observed data show that the SCS implementation is moving in the direction consistent with the planned outcomes. However, it is worth noting that the empirical data June not match the forecasts for several reasons discussed in the main report, including the general difficulty of long-range forecasting and unexpected changes to exogenous variables such as fuel prices, demographic change, and economic conditions.

CARB staff collected the forecasts included in the SCSs by sending a request to each MPO to provide information regarding these seven metrics, except the per capita GHG target¹. In cases where a MPO forecast was not available for either 2020 or 2035, that is noted below. When neither the 2020 nor 2035 forecast was available, no chart was included since Appendix A provided the observed data. A chart is presented for each metric based on data availability. Each chart compares the forecasts provided in the most recent SCS for each MPO region (plan performance), which are represented in the **blue**-colored dots for years 2020 and 2035, versus the observed data, which are represented by the **gray**-colored dots, to determine whether the region is on track to meet its goal. The covered years for observed data (**gray**-colored dots) vary based on the data availability.

Per Capita Greenhouse Gas (GHG) Emissions

Definition: GHG emissions per capita within an MPO's boundary represents the daily GHG emissions generated through passenger vehicles by people traveling in those

¹ [Link to SCS Regional Plan Targets](#)

MPO areas for various travel purposes (e.g., going to work, school, shopping, and personal business) divided by the population. The population figure excludes residents of group quarters such as college dormitories, prisons, and nursing facilities. Per capita GHG emission is the primary metric used to measure, evaluate, and monitor the SB 375 program.

Calculation of observed data: CARB staff calculated regional GHG emissions and vehicle miles traveled (VMT) from passenger vehicles based on three publicly available data sources for regional VMT, including highway performance monitoring system (HPMS) data, vehicle registration data from the Department of Motor Vehicles (DMV), Smog Check Program data from the Bureau of Automotive Repair (BAR), and California Energy Commission (CEC) retail fuel outlet annual reporting data. The VMT input file for individual MPO regions from 2005 to 2019 is developed for EMFAC 2021 to estimate GHG emissions. The GHG emission output excludes emission benefits from CARB's clean cars regulations adopted since the passage of SB 375. A full explanation of VMT calculation and data sources and methods related to observed data is available in Appendix A's Personal Vehicle VMT and GHG Emissions Per Capita section.

Key findings: California is still not reducing GHG emissions from passenger vehicles as needed under SB 375. Per capita GHG emissions continued to increase, though more slowly than in the 2018 Progress Report. The largest per capita GHG reductions achieved relative to 2005 are seen in the TMPO, SBCAG, and SACOG regions, and the largest per capita GHG increases are in the KCAG and TCAG regions. Comparing observed data with SCS projections show that most MPO regions are not on track to meet GHG targets.

Household Vehicle Ownership

Definition: Household vehicle ownership is the average number of light-duty vehicles (i.e., passenger cars, light-duty trucks, and medium-duty trucks) registered per household. Vehicle ownership is a critical metric to reflect people's preferences for using personal vehicles and travel choices.

Calculation of observed data: CARB staff analyzed the trend in household vehicle ownership by MPO region from 2010 to 2019. For this metric, CARB reports the average number of privately owned vehicles by each household in each MPO region, which is the total number of private owned vehicles divided by the number of households in a given MPO region. This analysis uses the tract-level privately owned vehicle data, and household data from the American Community Survey (ACS) 1-year reports from 2010 to 2019. A full explanation of sources and methods related to observed data is available in Appendix A's Transportation Choices and Travel Patterns section.

Key findings: Observed data show an increasing trend of household vehicle ownership for all MPO regions. Comparing observed data with SCS projections shows that the vehicle ownership rate is higher than the SCS forecast in most regions, except for the MCTC, SRTA, and StanCOG regions.

Daily Transit Ridership

Definition: Daily transit ridership is the total number of one-way linked or unlinked average daily transit passenger trips boarding on public transportation in a given period. Transit ridership is a critical metric that can reflect people's mode choice and travel behavior in a region. The temporal trend of this metric can also reflect whether a region is improving its public transit system and supporting the SB 375 targets.

Calculation of observed data: The national transit database (NTD)² publishes monthly transit boarding numbers (unlinked trips) reported by local transit agencies. CARB staff calculated the annual boarding numbers in every MPO region from 2005 to 2020. A full explanation of sources and methods related to observed data is available in Appendix A's Transportation Choices and Travel Patterns section.

Key findings: Observed data shows that daily transit ridership numbers in most MPO regions decreased from 2005 to 2020, especially since 2014, and it is not on track as predicted in the SCSs, except in the BCAG region.

Total New Housing Units/Total New Single-Family Housing Units/Total New Multi-Family Housing Units³

Definition: The total number of new housing units includes new single-family homes and new multi-family housing units. Land use and housing are the key strategies of SCSs that emphasize job-housing balance, funding affordable housing, and building houses near existing transit infrastructure. For example, policies that will result in higher residential densities reduce the need for vehicle travel. In addition, the housing product mix shows the extent to which a region promotes more compact development, which supports less driving and lower GHG emissions.

Calculation of observed data: CARB staff analyzed the growth rate in housing units by structure type in California from 2005 to 2020 using the California Department of Finance (DOF) datasets⁴. A full explanation of sources and methods related to observed data is available in Appendix A's Housing Choices section.

Key findings: Housing production is not meeting regional housing needs in terms of the total number of units relative to the SCS forecasts. In addition, the structure type of new housing units varies by region. The annual housing unit growth has increased

² National Transit Database, <https://www.transit.dot.gov/ntd/ntd-data>

³ They are three different metrics, so for each MPO region, three charts are presented for these metrics.

⁴ DOF Population Estimates, E-8 for years 2001 to 2010, and E-5 for years 2011 to 2020:
<http://www.dof.ca.gov/Forecasting/Demographics/Estimates/>

from the 2008 level, and the number of more compact housing types is increasing in MTC, SCAG, and SANDAG regions. However, there is a trend toward less compact housing with higher single-family detached units than multi family units in SACOG and the San Joaquin Valley MPO regions.

Urbanized Land

Definition: This metric calculates acreage of newly developed urban and built-up land and accounts for various types of lands which are converted to urban land bi-annually. Land use density has a well-established relationship with VMT and GHG emissions. Therefore, urbanized land is an indicator of how effectively each MPO uses its developed land to accommodate regional growth and meet its SB 375 goals.

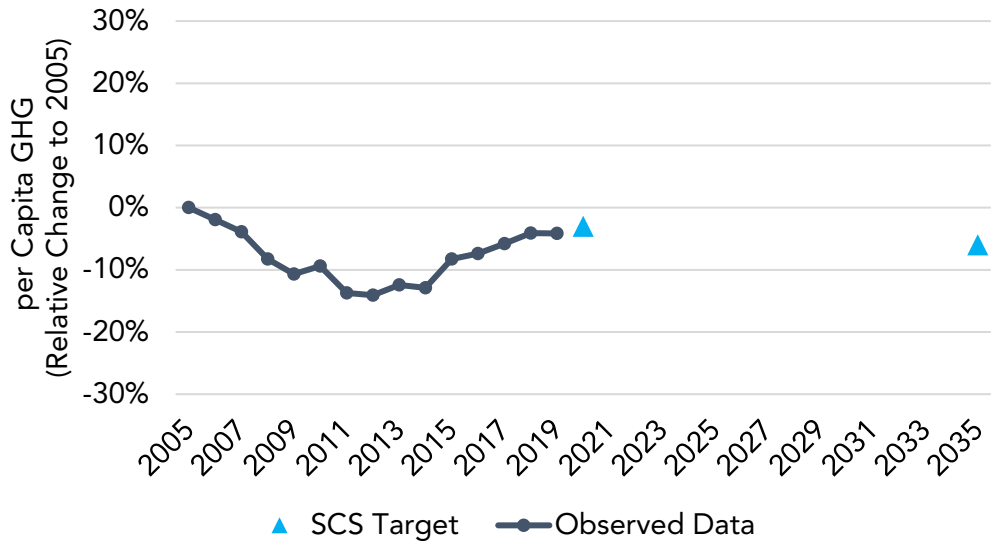
Calculation of observed data: CARB staff analyzed land acres developed based on the Farmland Mapping and Monitoring Program (FMMP) data⁵ from 2002 to 2016, depending on data availability. A full explanation of sources and methods related to observed data is available in Appendix A's Regional Growth section.

Key findings: Comparing the observed data with SCS forecasts for urbanized land indicates higher urbanized land in FCOG, KCAG, KCOG, MCAG, and MCTC regions which is not in support of SB375 goal of reducing GHG.

⁵ Farmland Mapping and Monitoring Program (FMMP) data:
https://www.conservation.ca.gov/dlrp/fmmp/Pages/county_info.aspx

ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS (AMBAG)

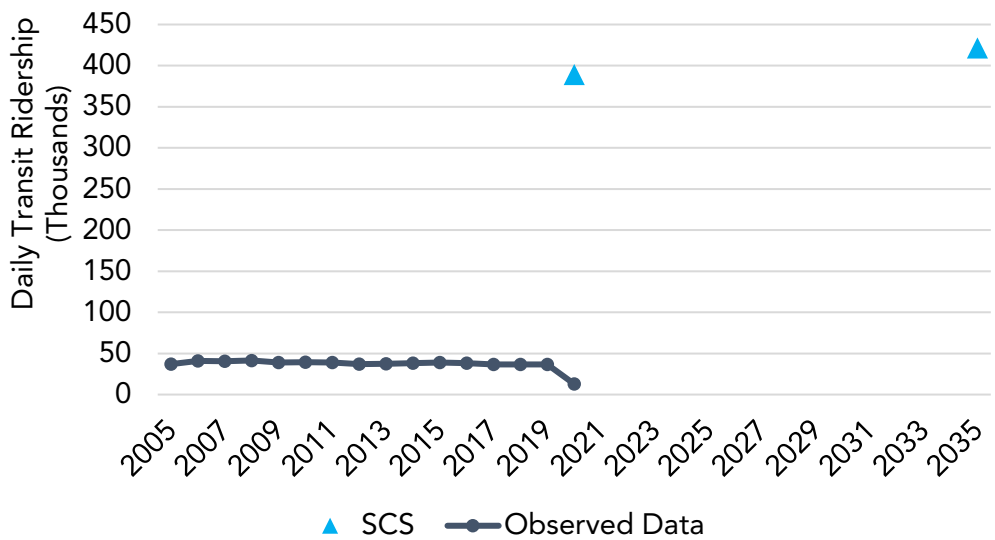
Per Capita GHG



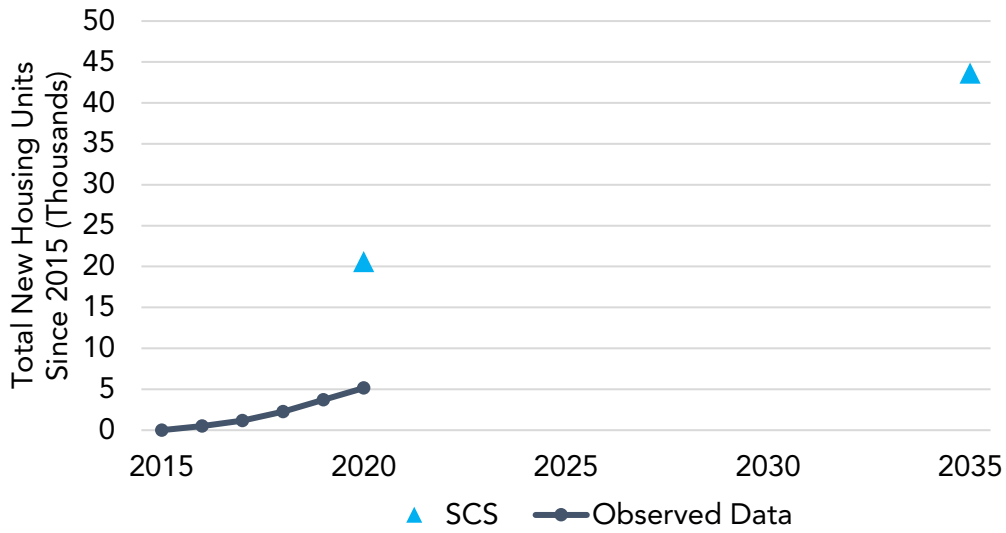
Household Vehicle Ownership

Not available SCS data.

Daily Transit Ridership



Total New Housing Units



Total New Single-Family Housing Units

Not available SCS data.

Total New Multi-Family Housing Units

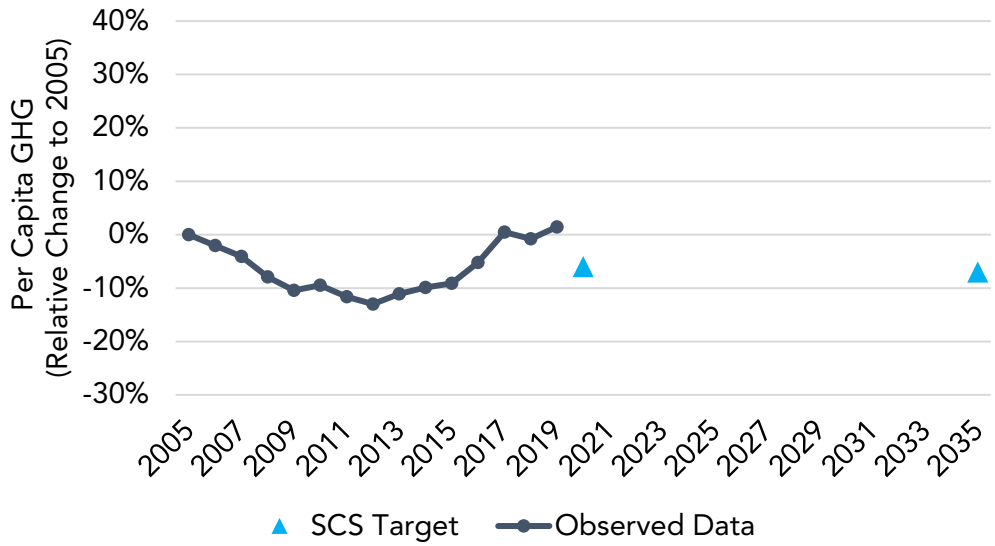
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Urbanized Land

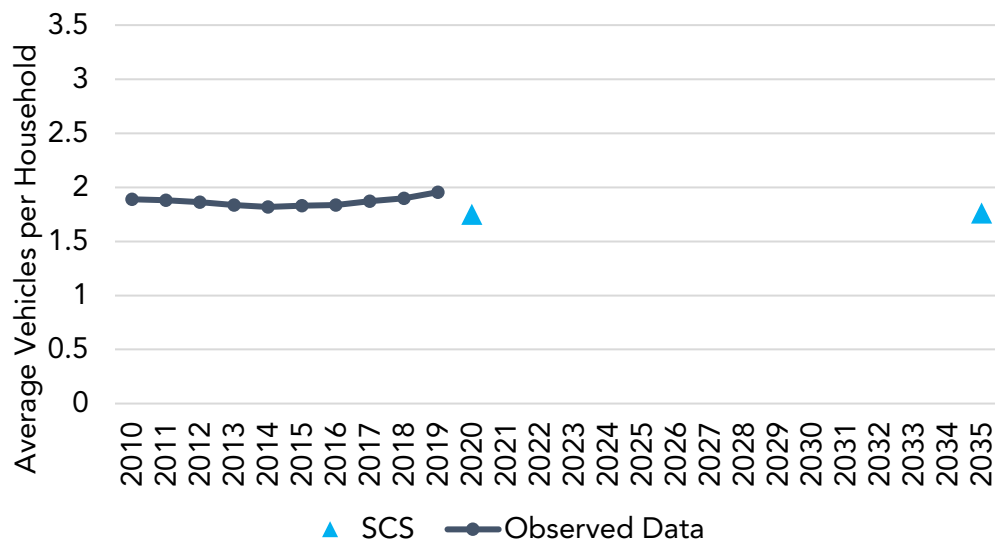
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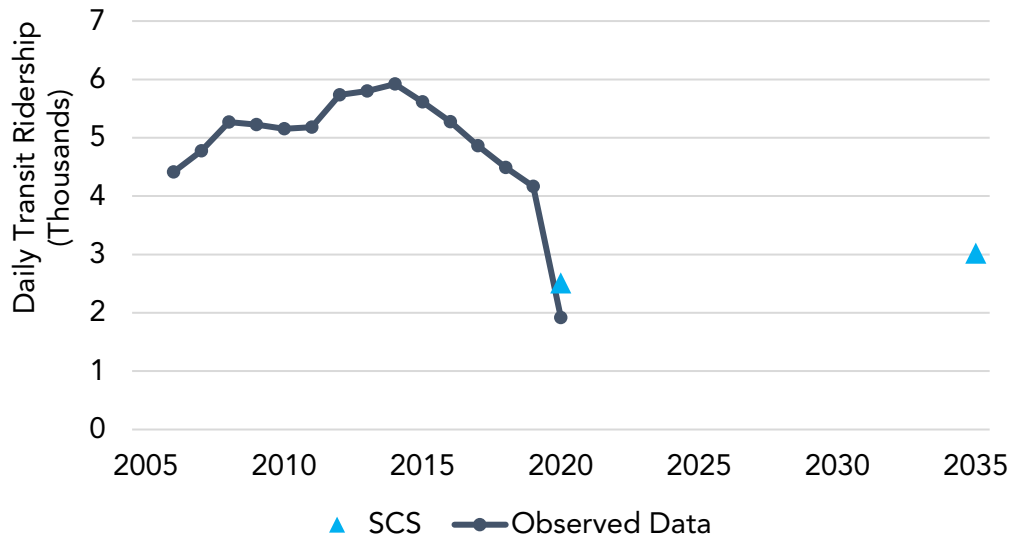
Per Capita GHG



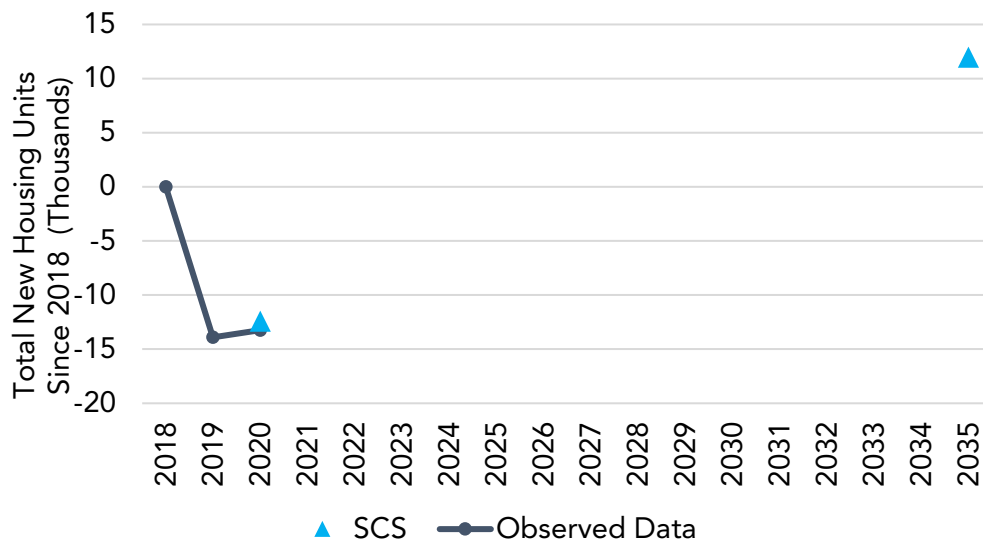
Household Vehicle Ownership



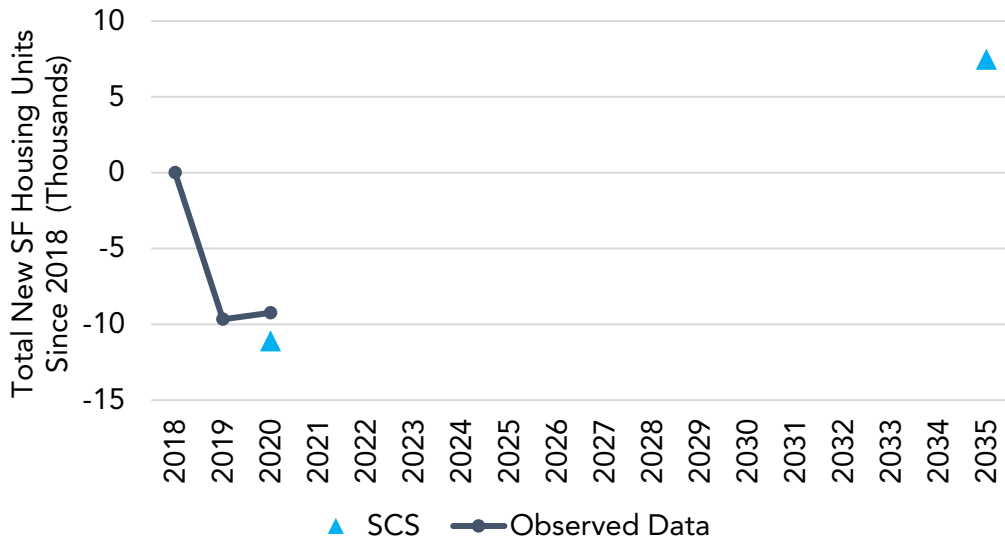
Daily Transit Ridership



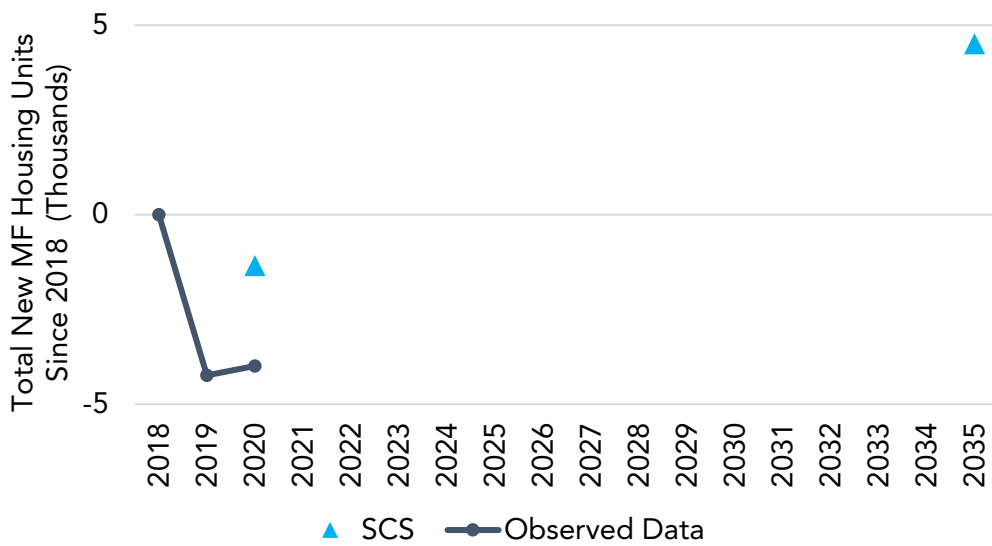
Total New Housing Units



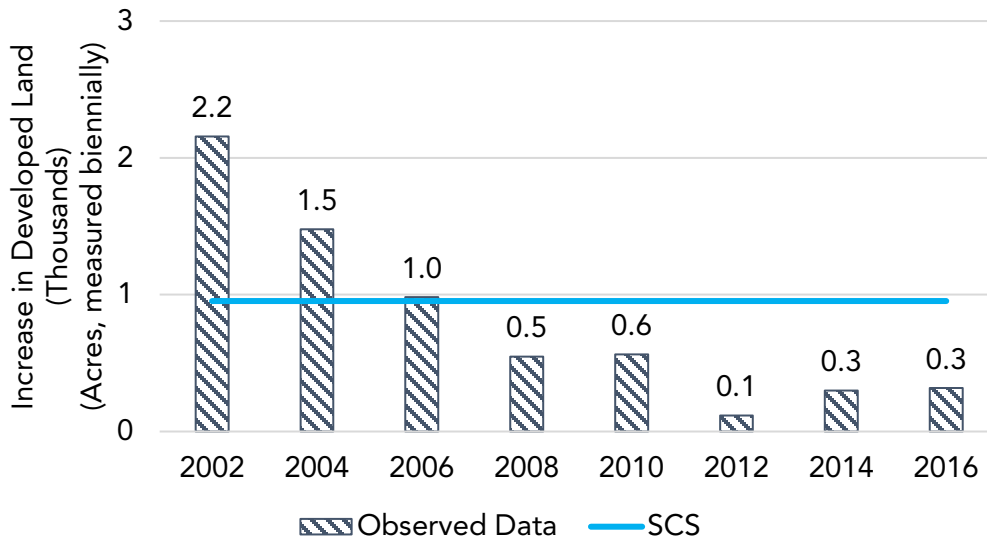
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

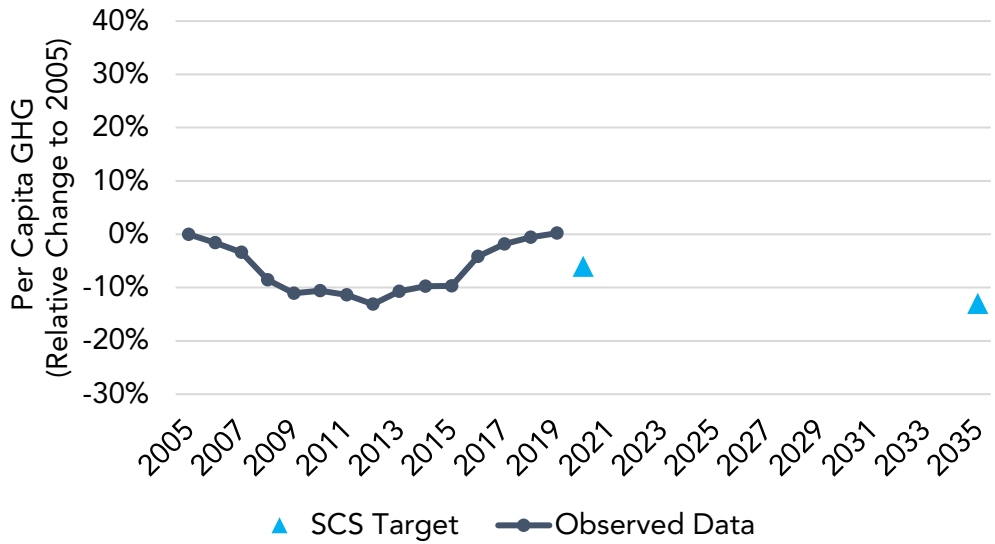


Urbanized Land

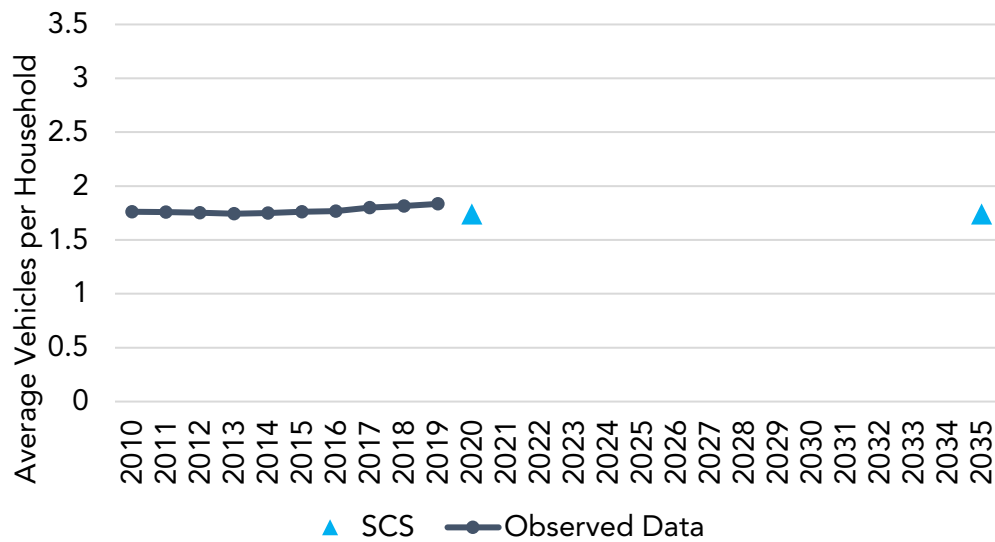


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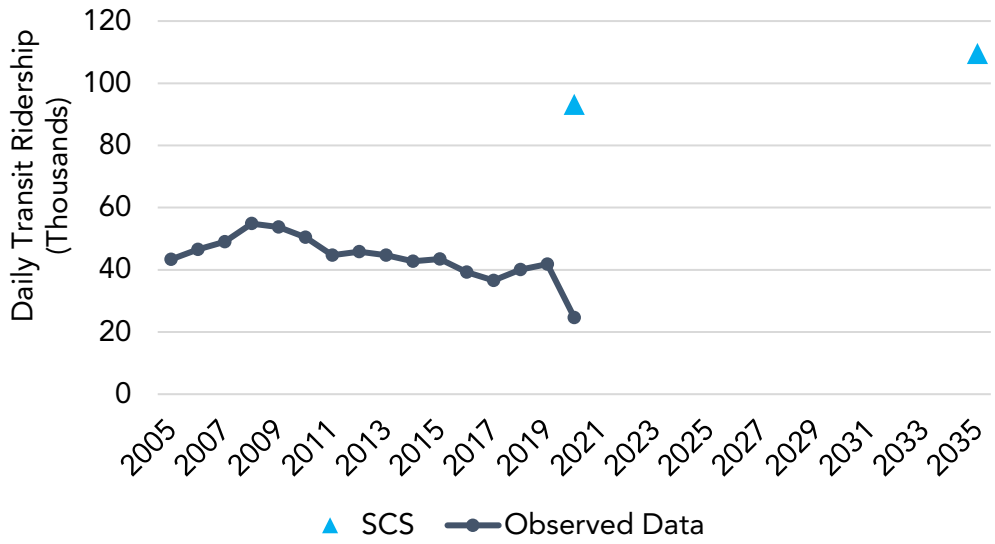
Per Capita GHG



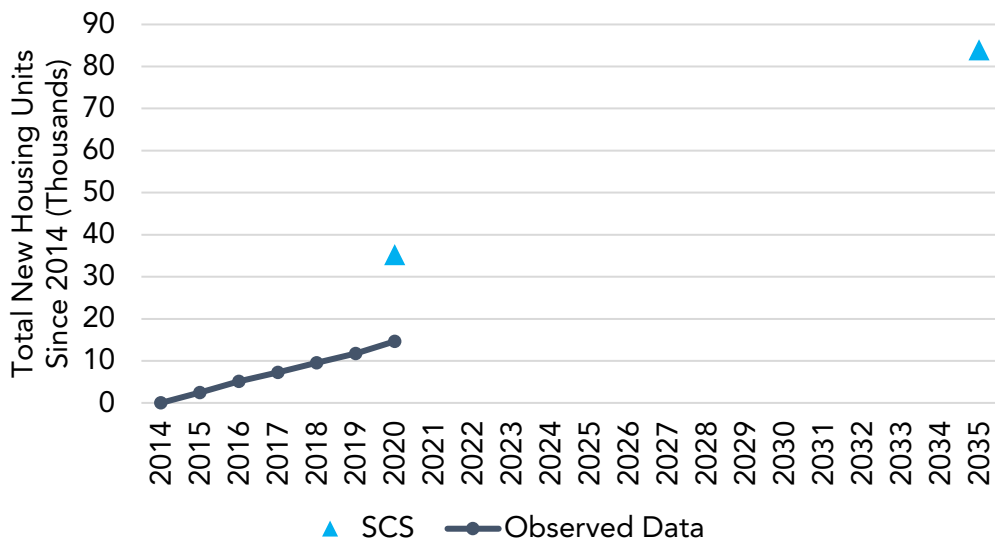
Household Vehicle Ownership



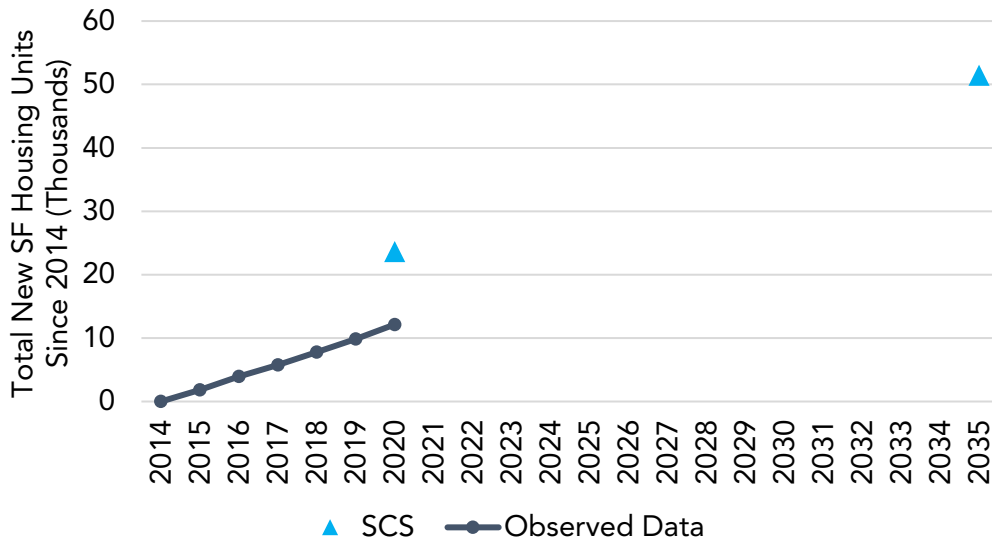
Daily Transit Ridership



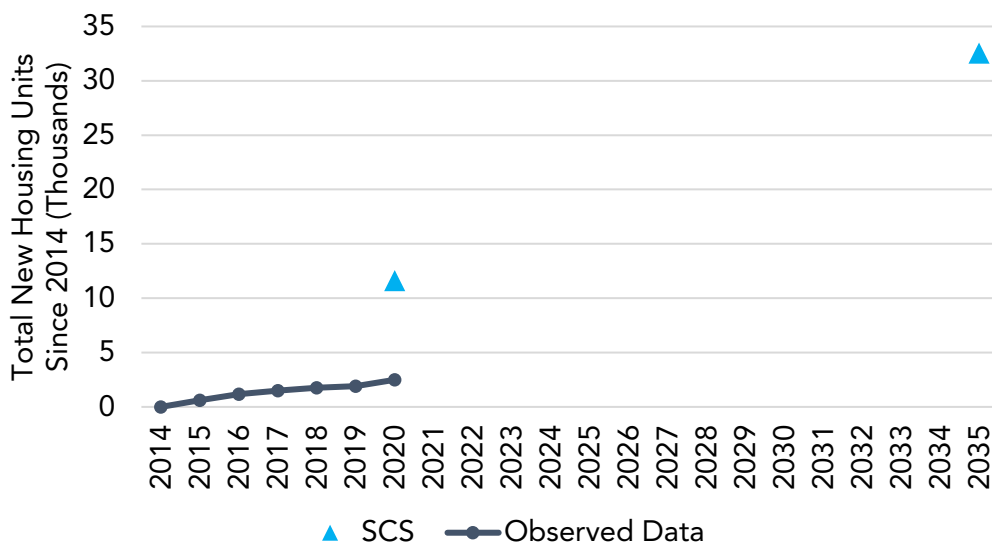
Total New Housing Units



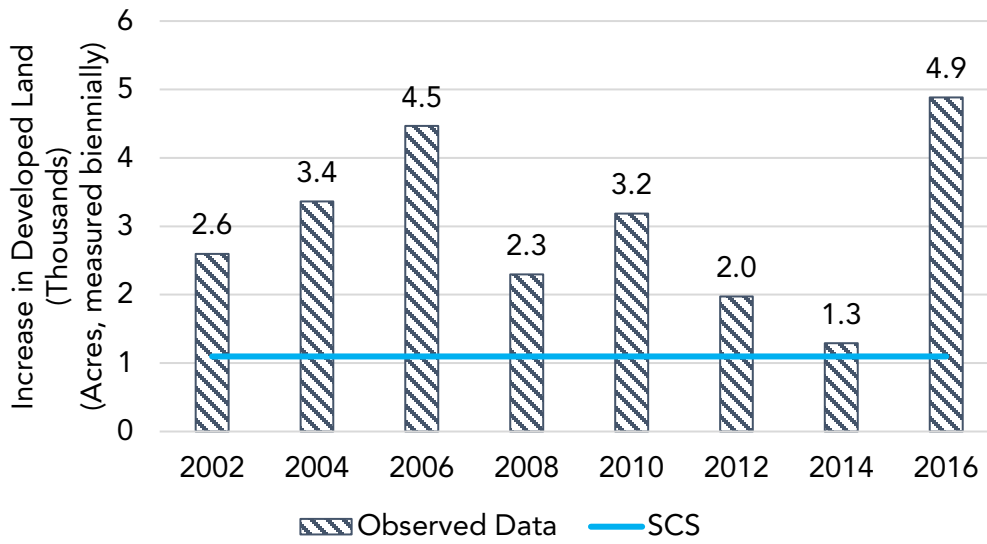
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

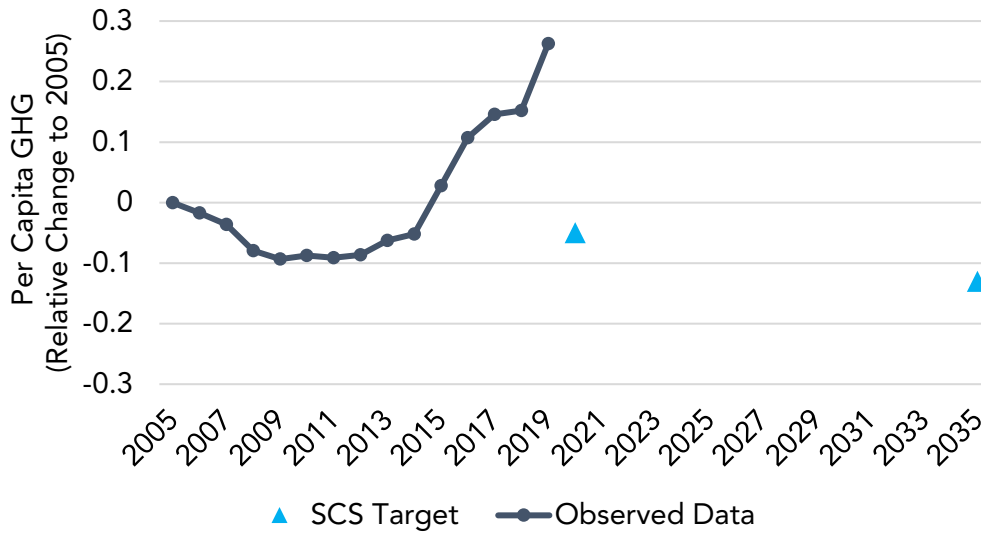


Urbanized Land

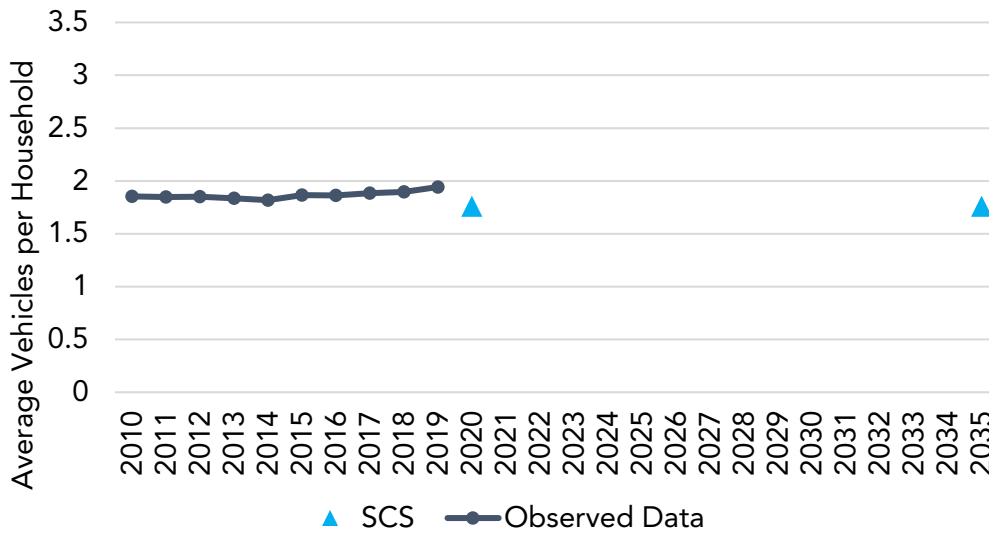


KINGS COUNTY ASSOCIATION OF GOVERNMENTS (KCAG)

Per Capita GHG



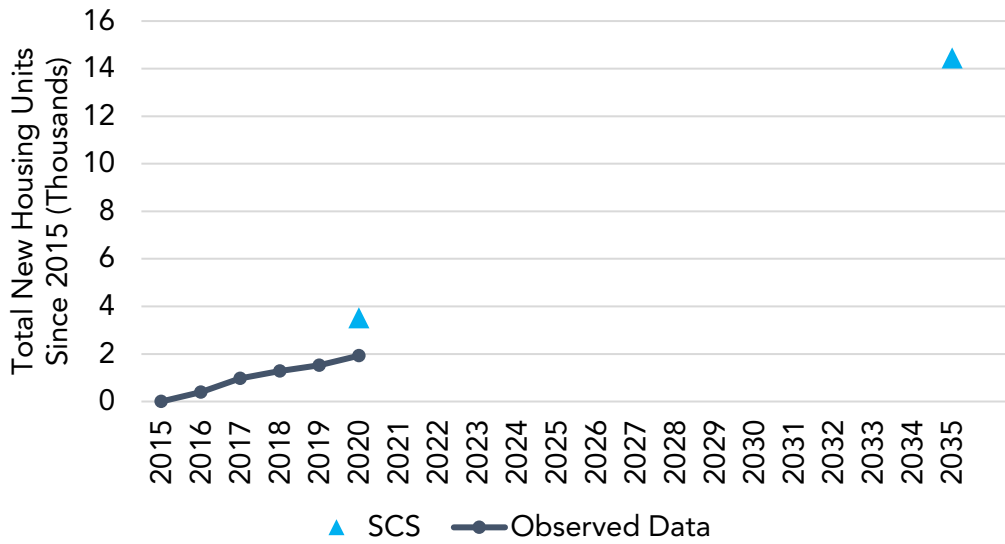
Household Vehicle Ownership



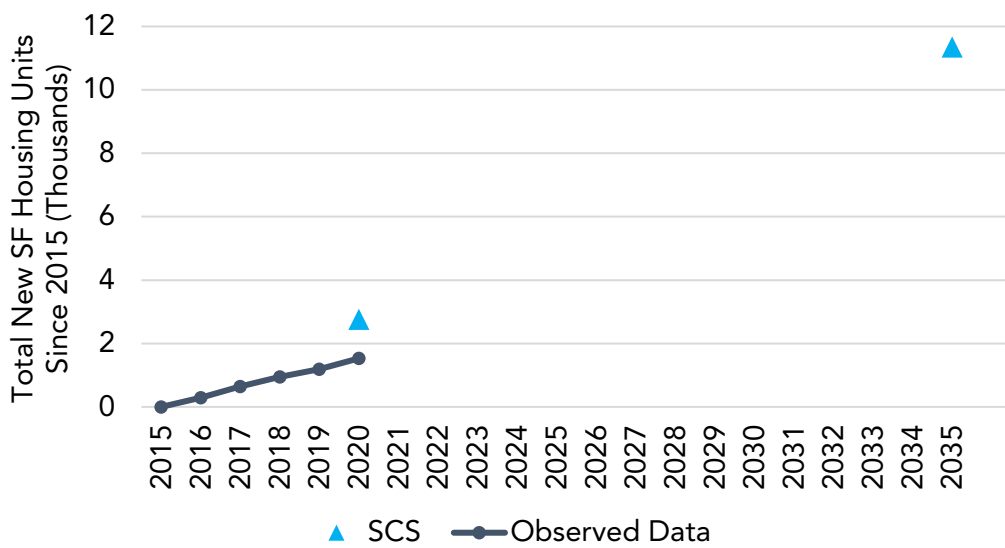
Daily Transit Ridership

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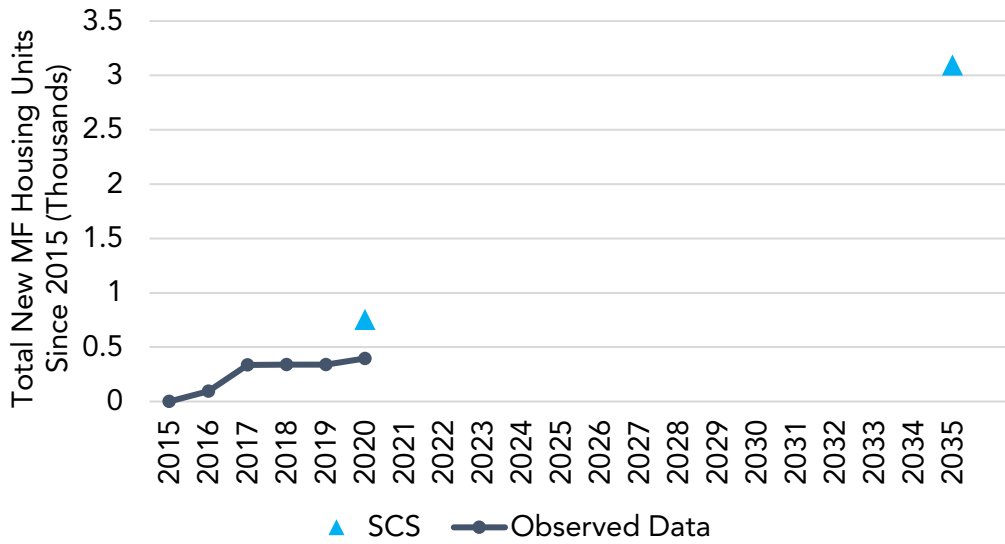
Total New Housing Units



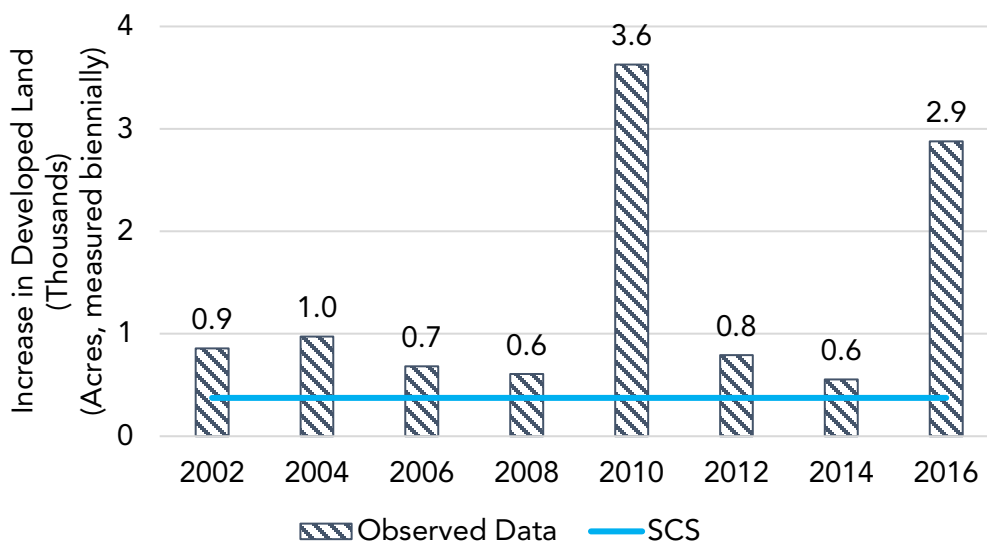
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

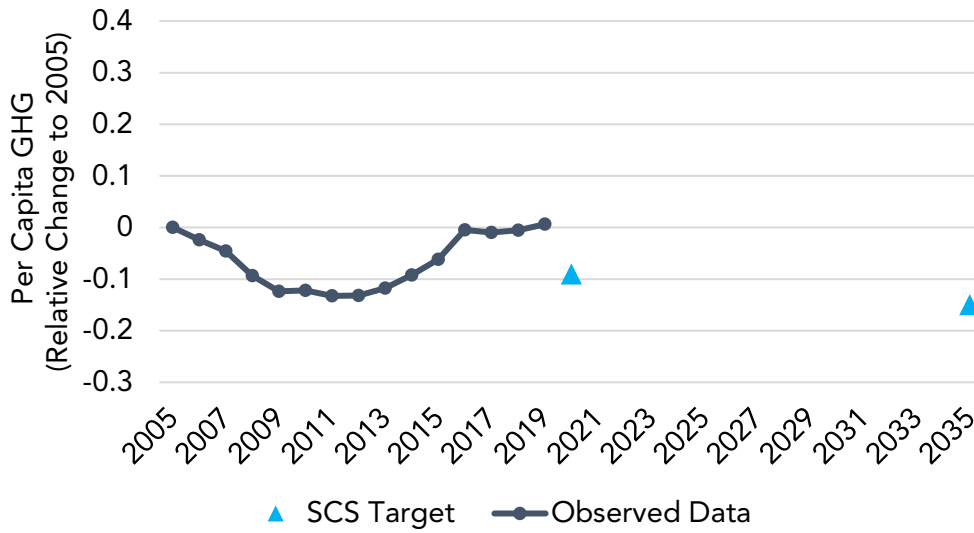


Urbanized Land

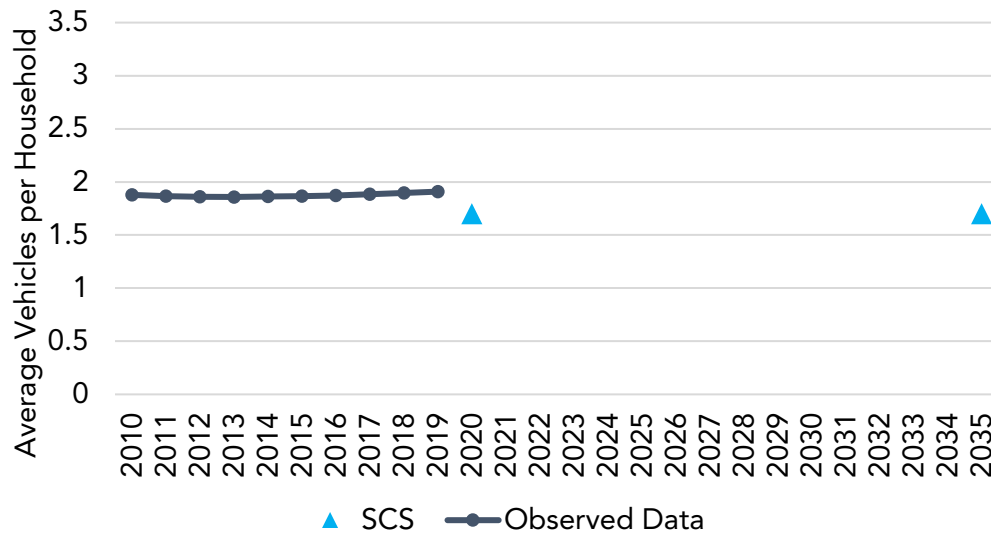


KERN COUNCIL OF GOVERNMENTS (KCOG)

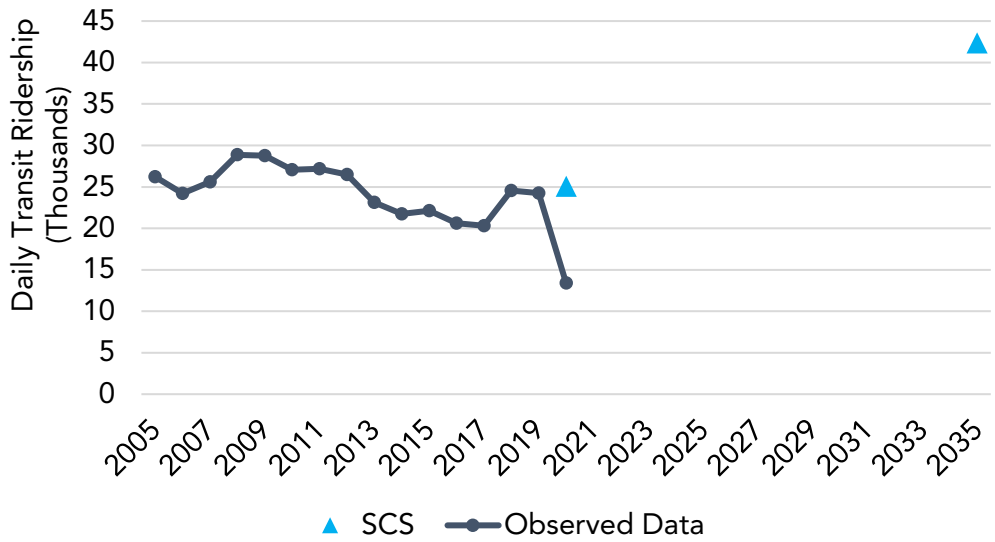
Per Capita GHG



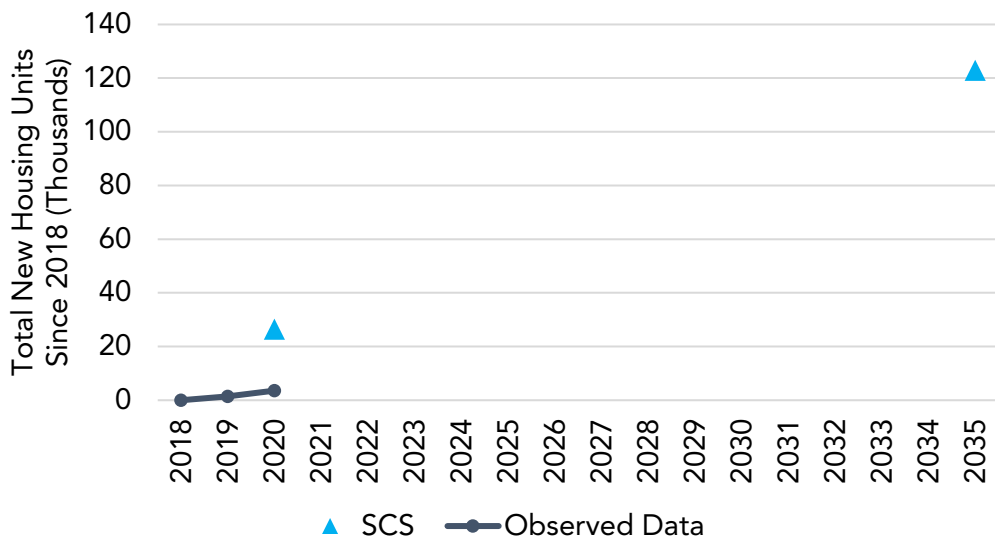
Household Vehicle Ownership



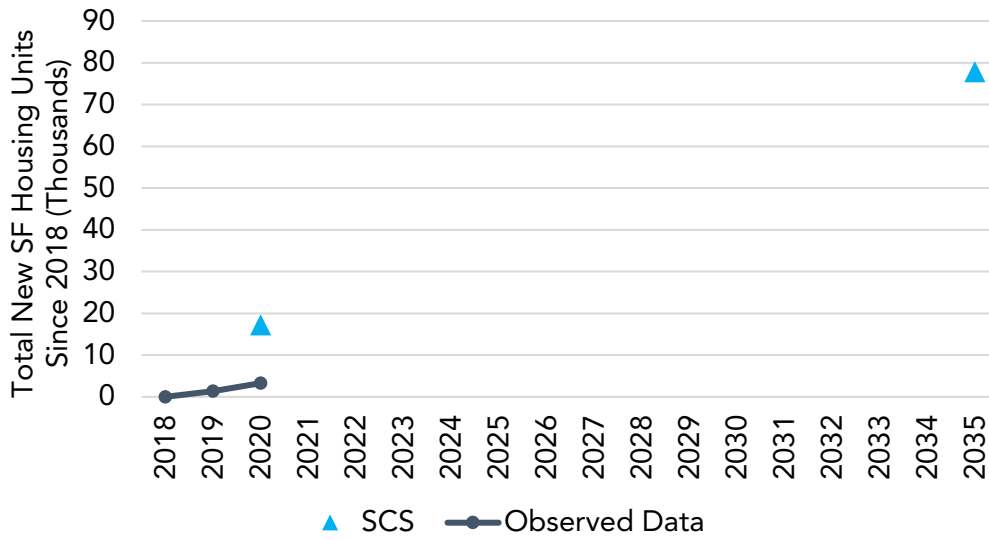
Daily Transit Ridership



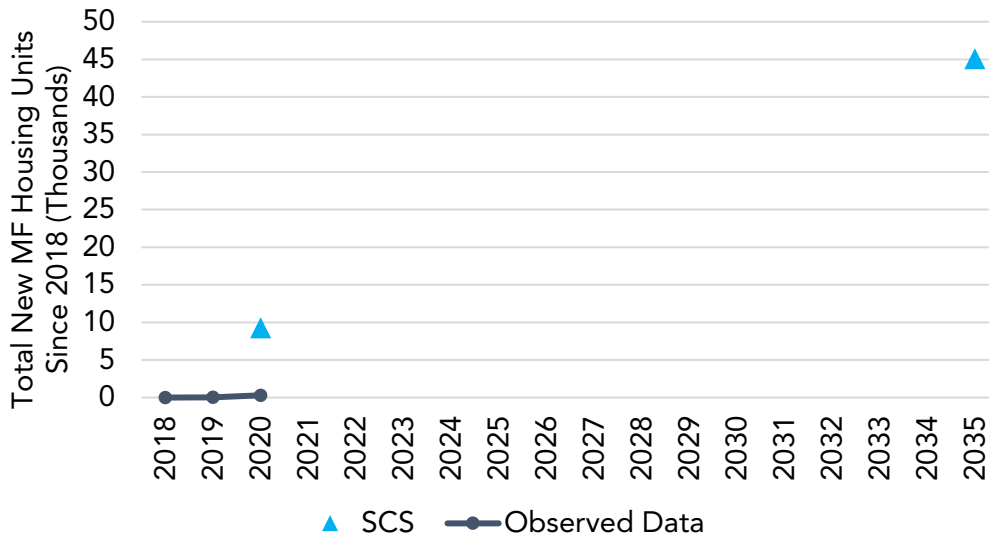
Total New Housing Units



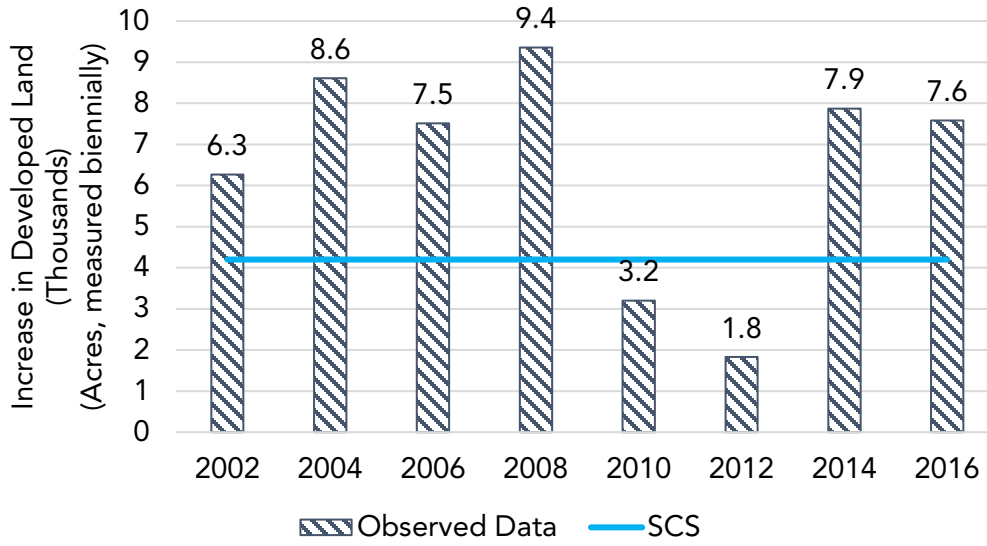
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

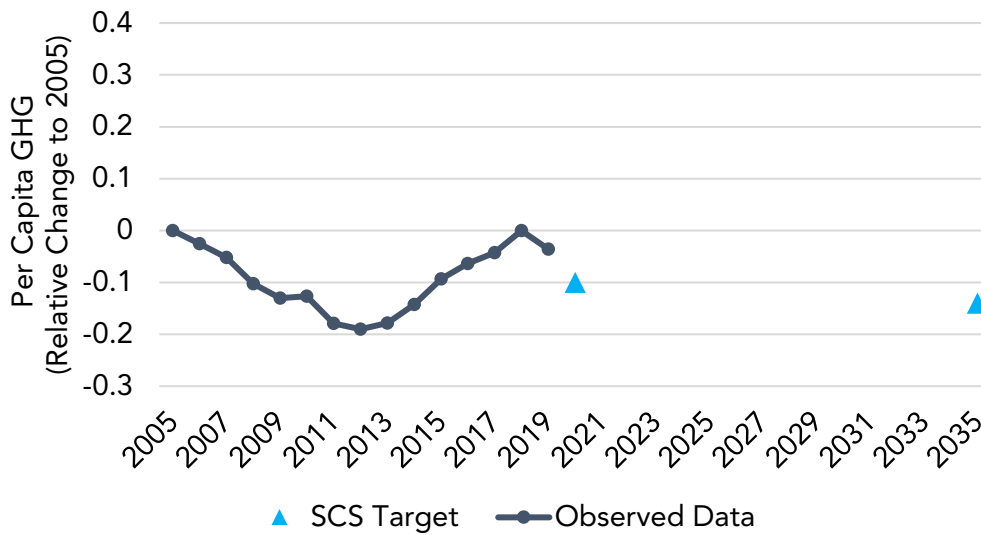


Urbanized Land

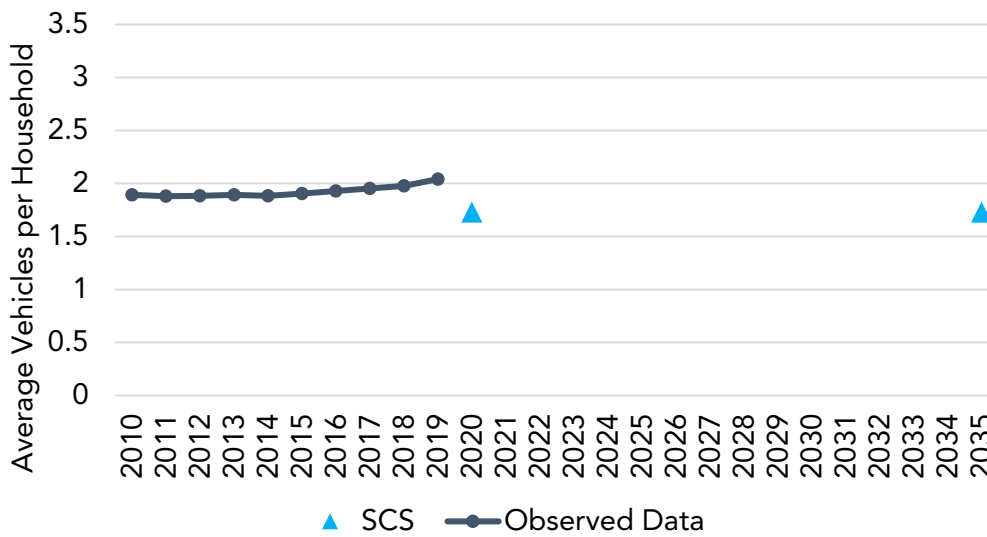


MERCED COUNTY ASSOCIATION OF GOVERNMENTS (MCAG)

Per Capita GHG



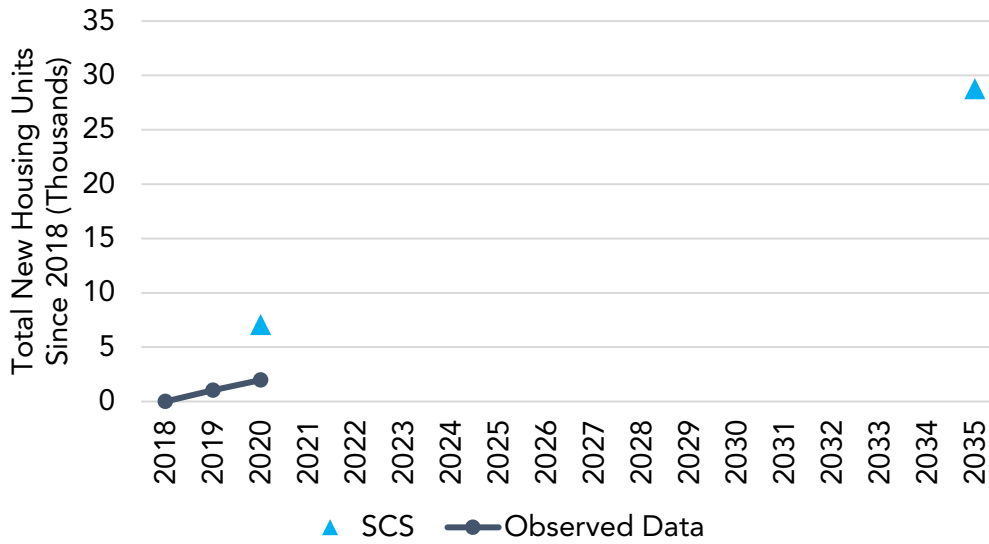
Household Vehicle Ownership



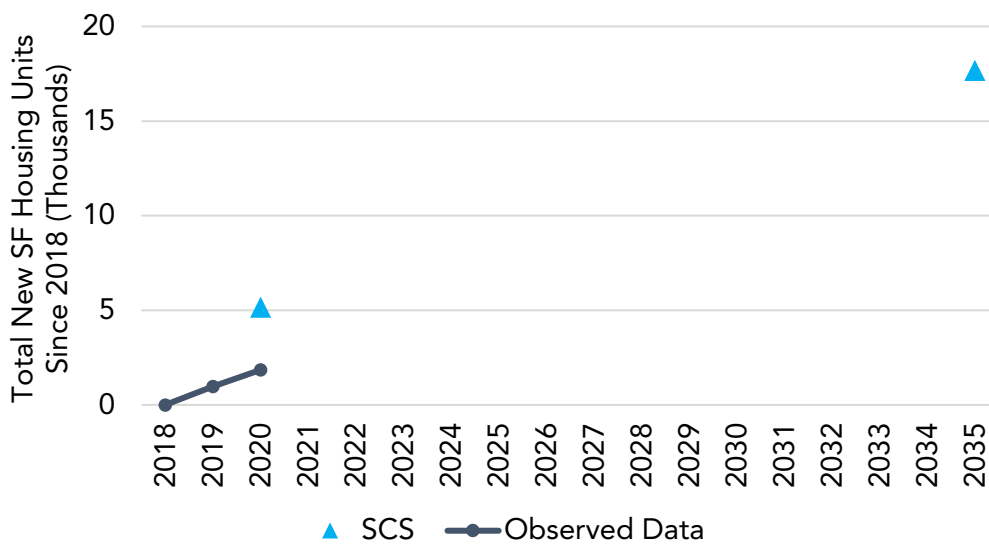
Daily Transit Ridership

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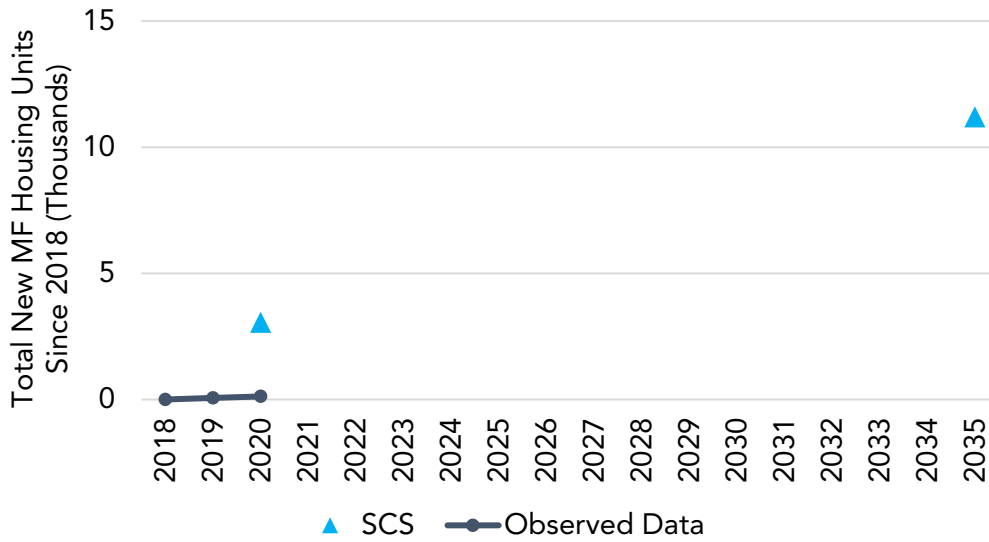
Total New Housing Units



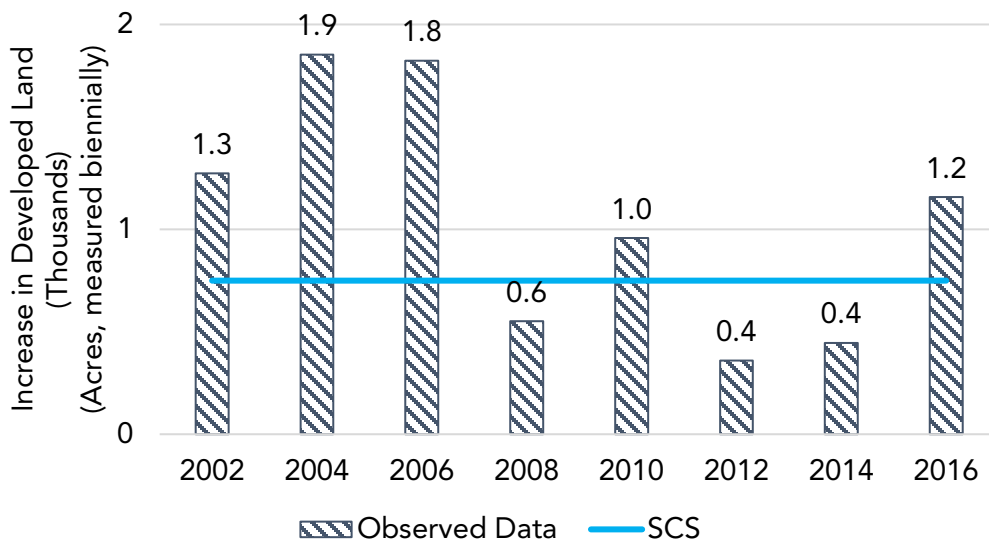
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

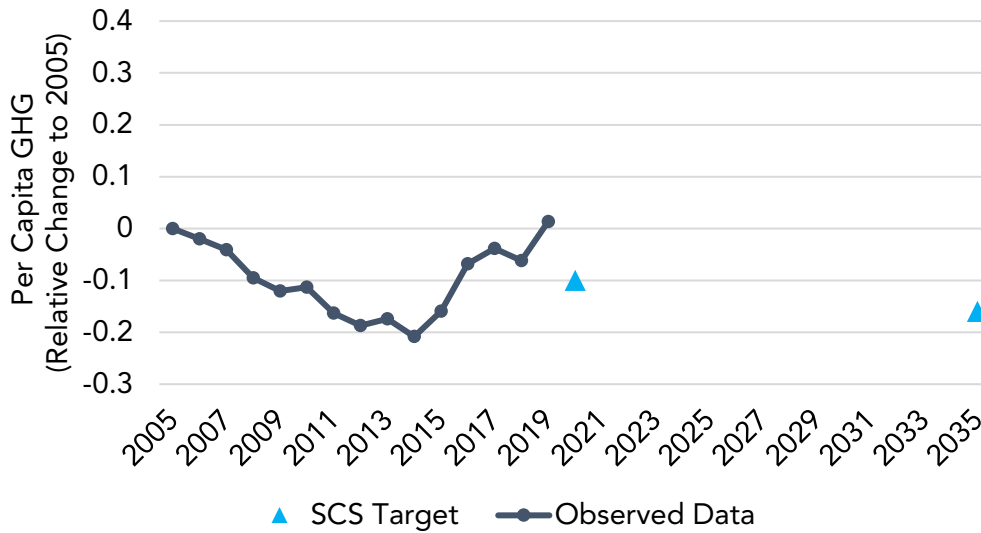


Urbanized Land

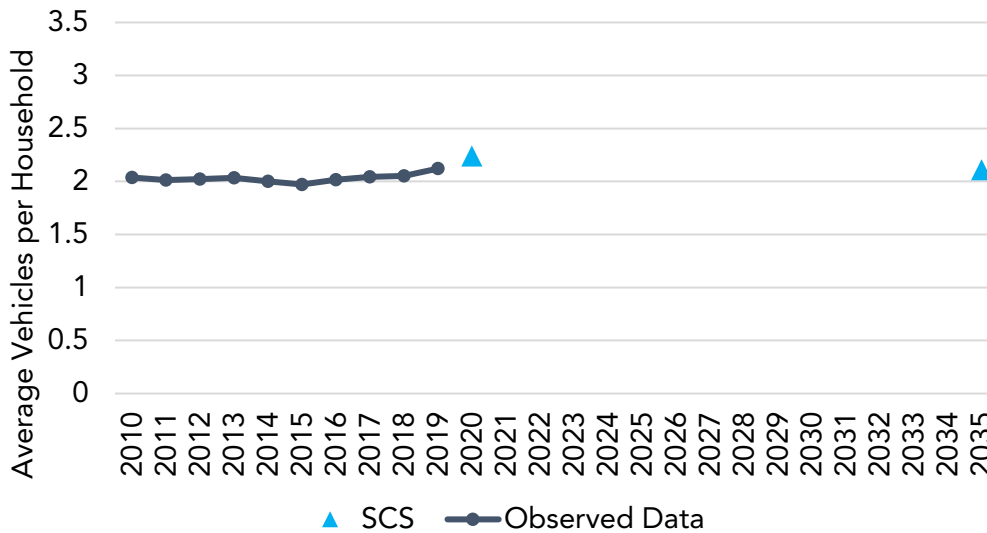


MADERA COUNTY TRANSPORTATION COMMISSION (MCTC)

Per Capita GHG



Household Vehicle Ownership



Daily Transit Ridership

Not available SCS data.

Total New Housing Units

Not available SCS data.

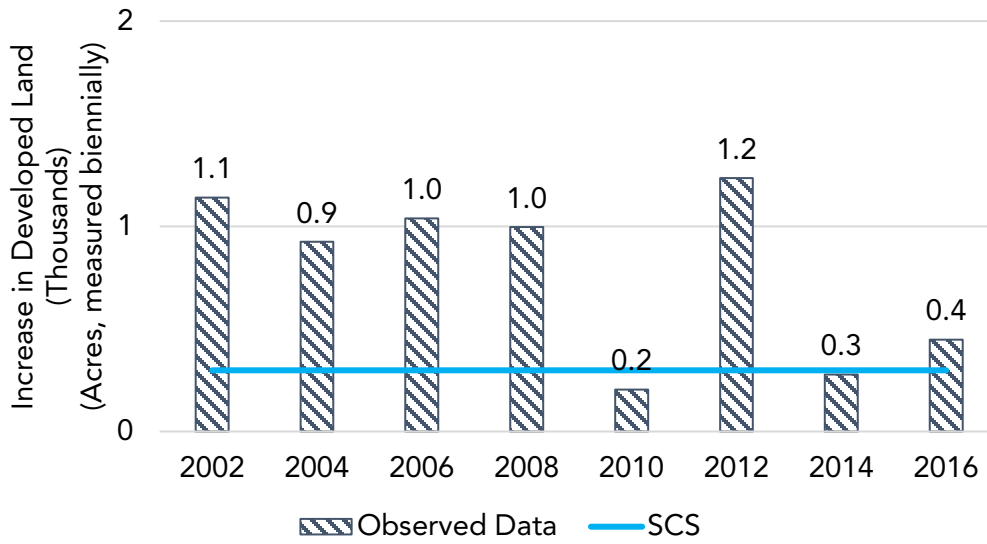
Total New Single-Family Housing Units

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Total New Multi-Family Housing Units

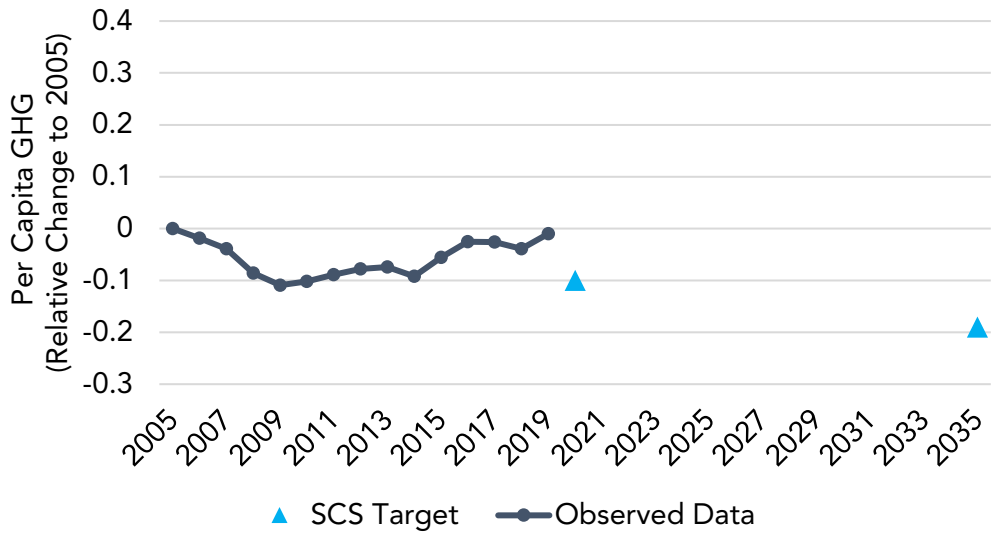
Not available SCS data.

Urbanized Land

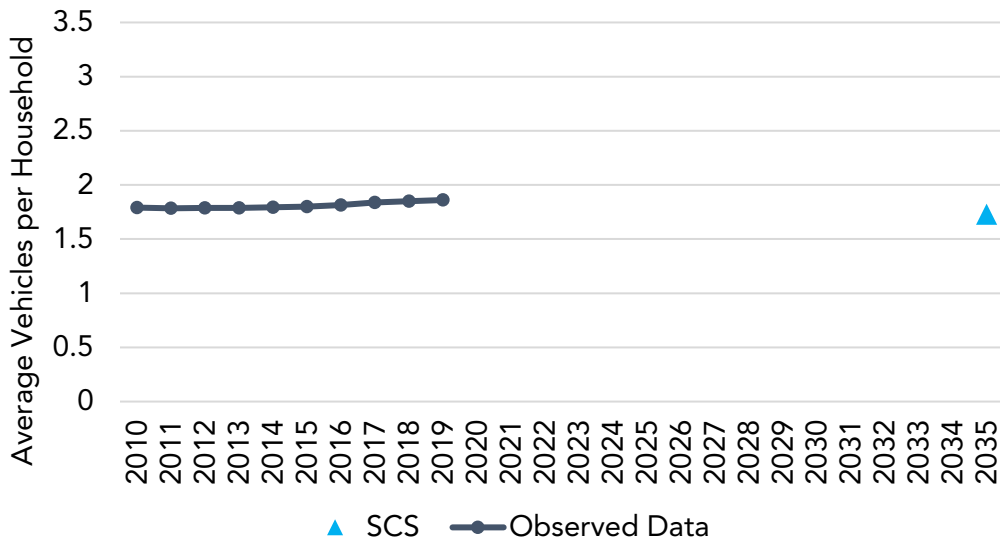


METROPOLITAN TRANSPORTATION
COMMISSION/ASSOCIATION OF BAY AREA
GOVERNMENTS (MTC)

Per Capita GHG

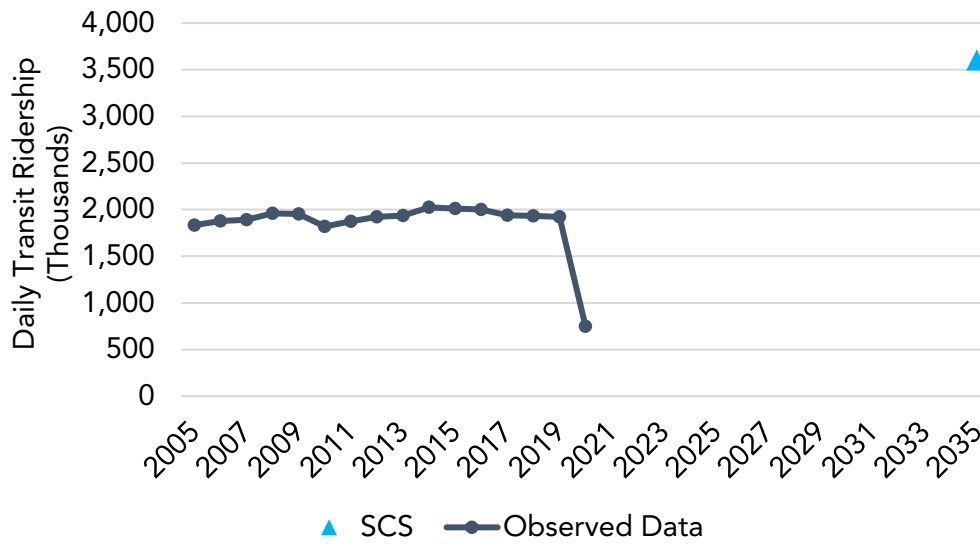


Household Vehicle Ownership



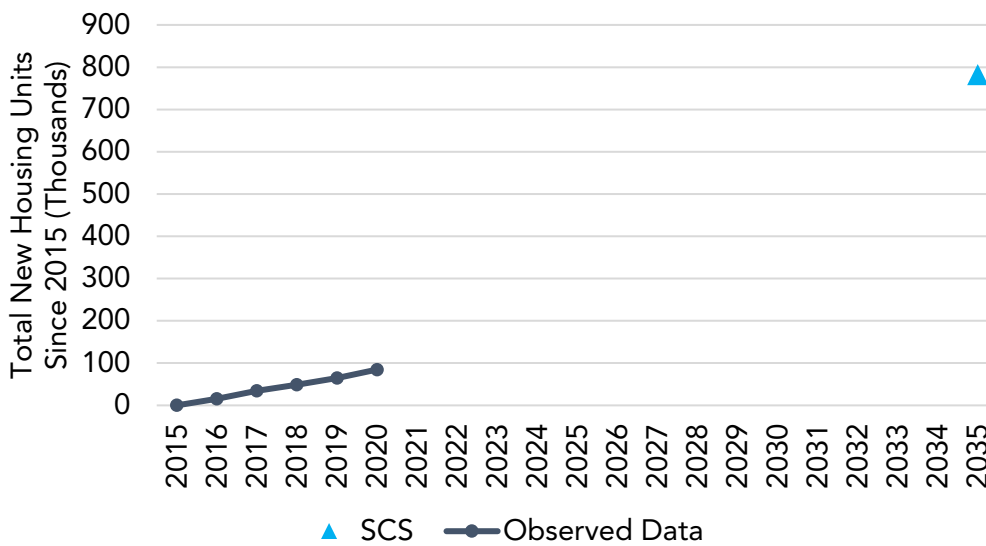
2020 SCS data are not available.

Daily Transit Ridership



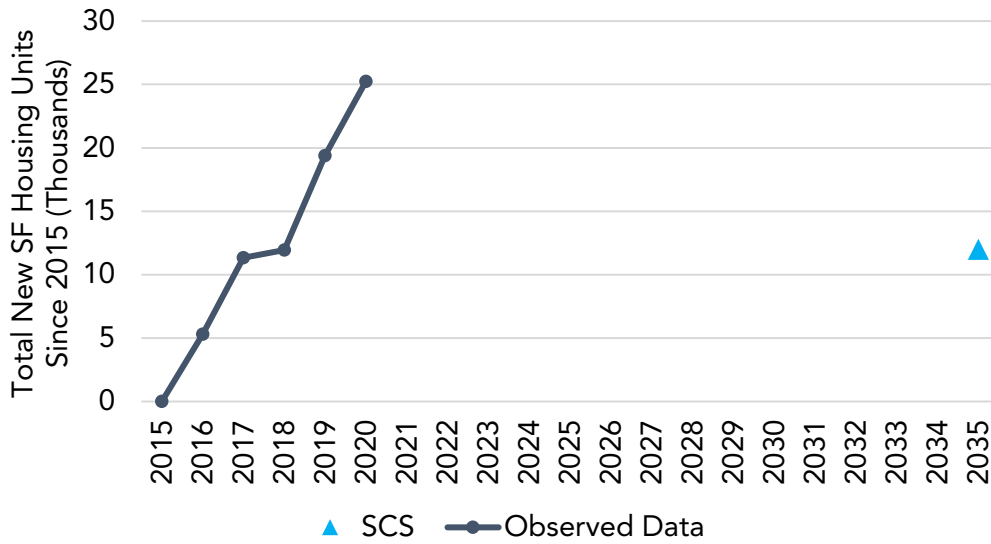
2020 SCS data are not available.

Total New Housing Units



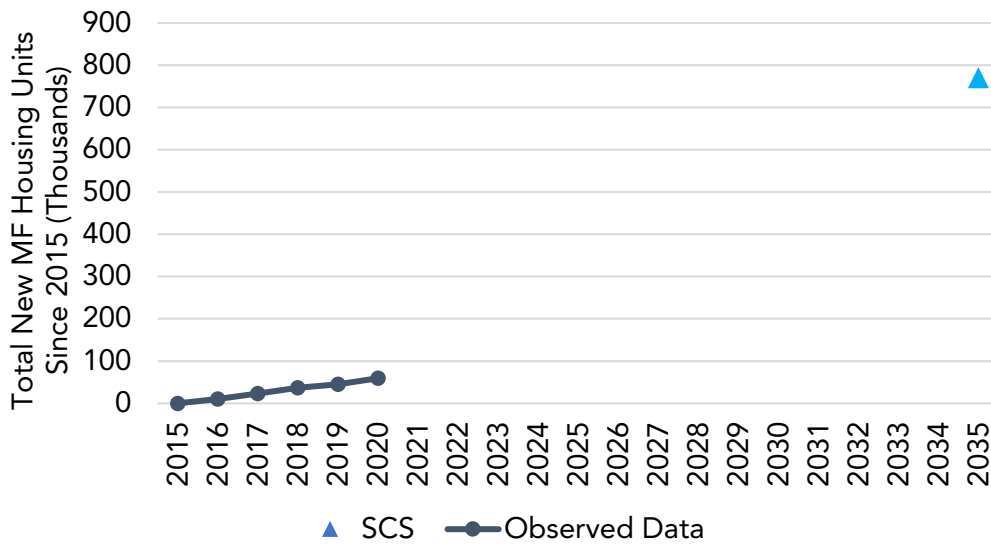
2020 SCS data are not available.

Total New Single-Family Housing Units



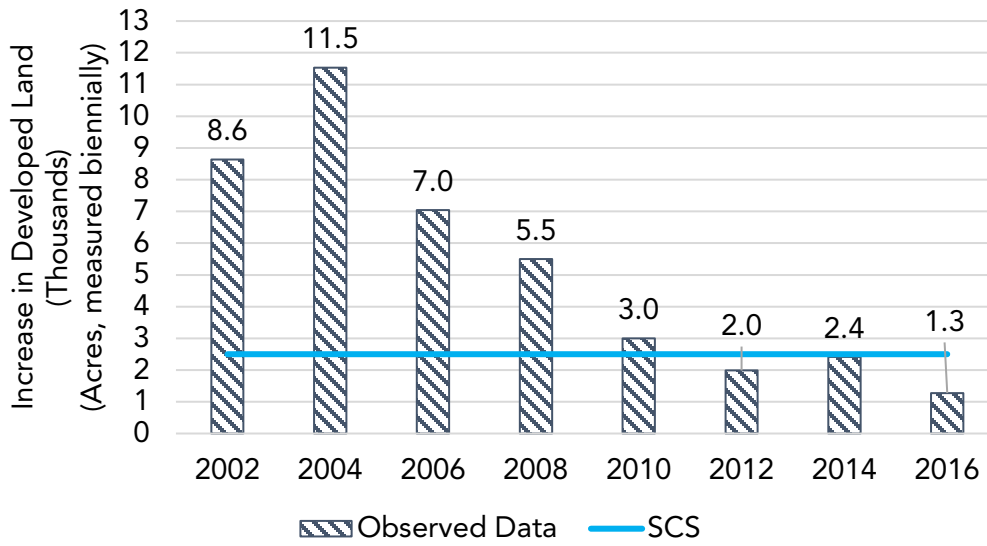
2020 SCS data are not available.

Total New Multi-Family Housing Units



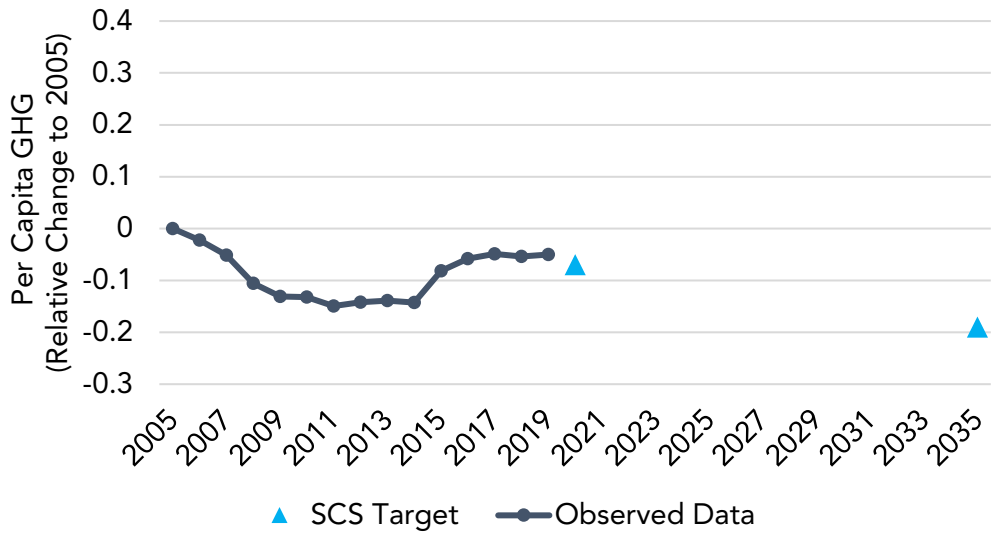
2020 SCS data are not available.

Urbanized Land

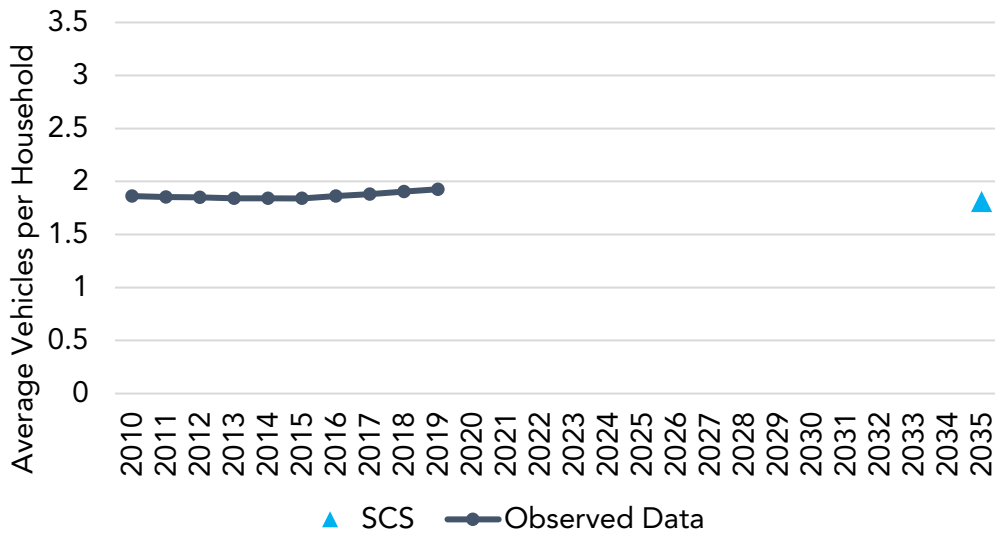


SACRAMENTO AREA COUNCIL OF GOVERNMENTS (SACOG)

Per Capita GHG

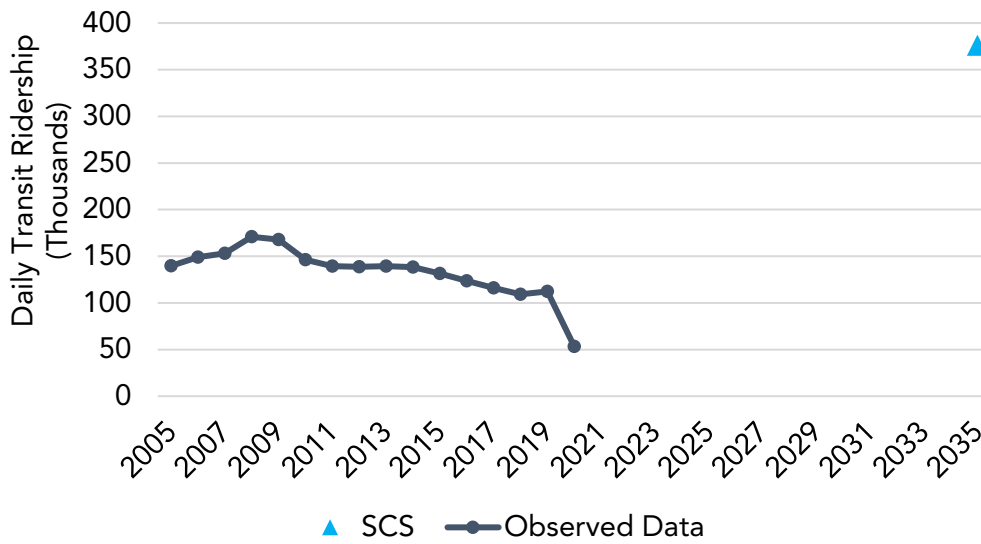


Household Vehicle Ownership



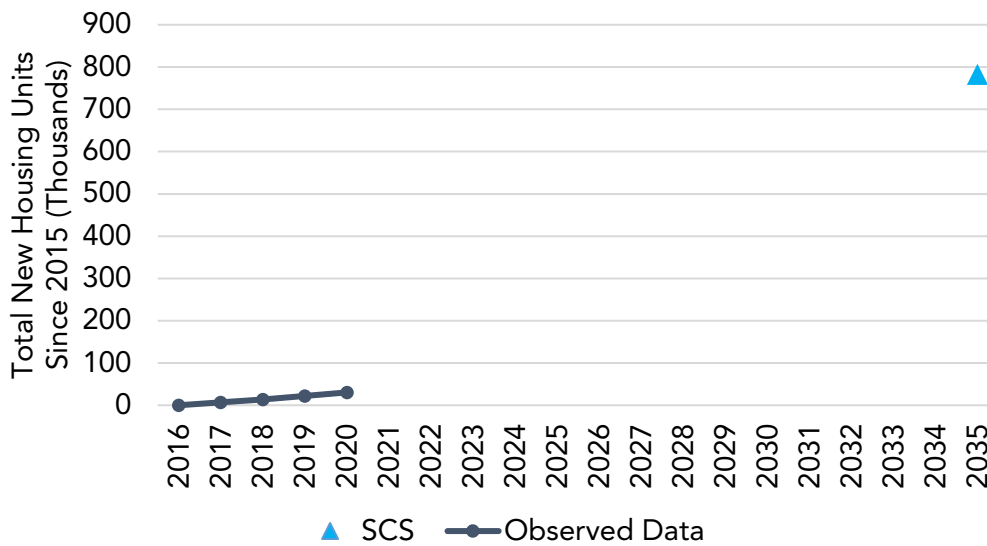
2020 SCS data are not available.

Daily Transit Ridership



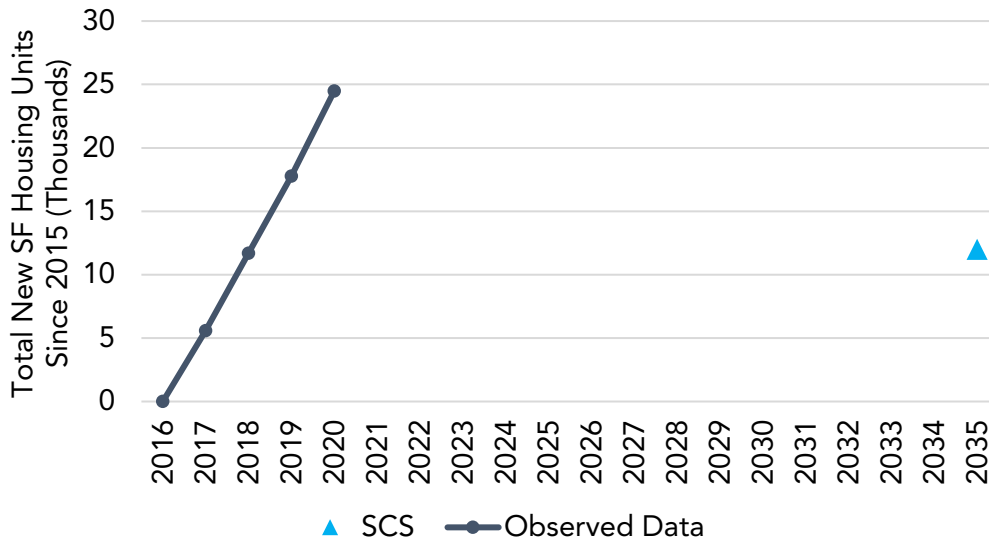
2020 SCS data are not available.

Total New Housing Units



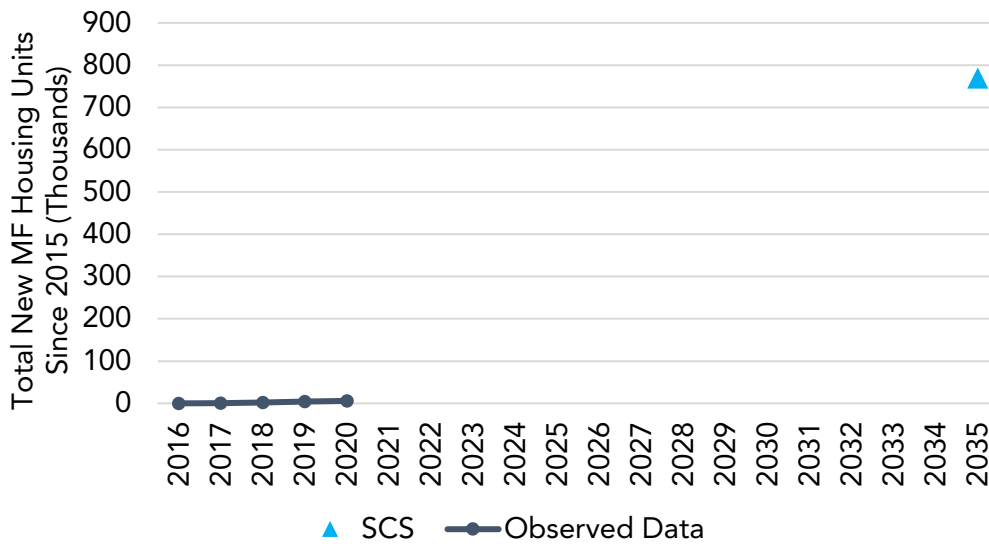
2020 SCS data are not available.

Total New Single-Family Housing Units



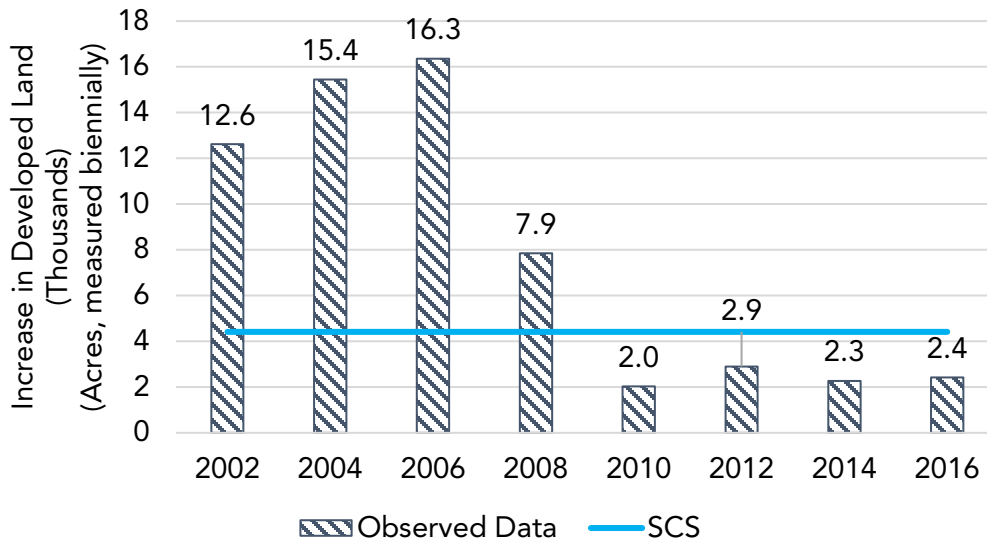
2020 SCS data are not available.

Total New Multi-Family Housing Units



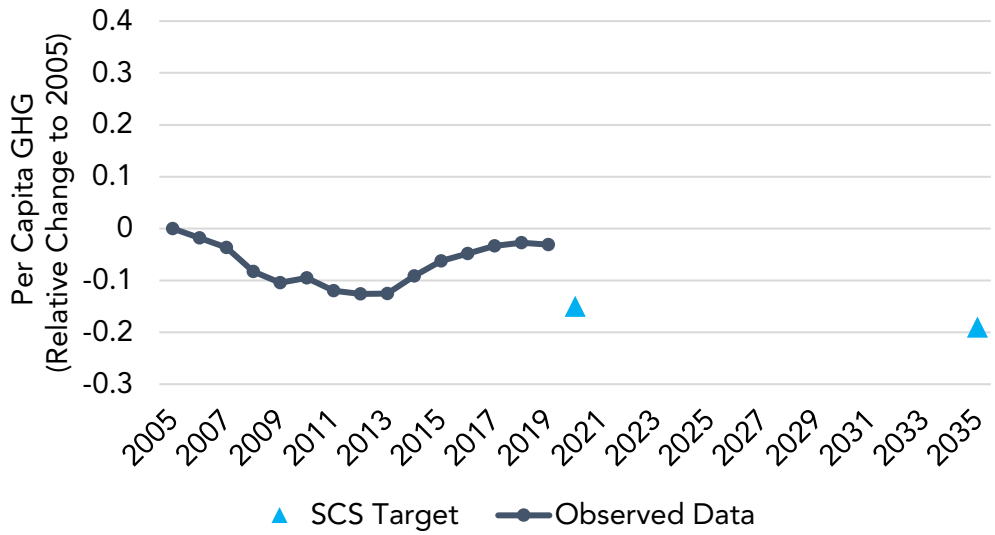
2020 SCS data are not available.

Urbanized Land

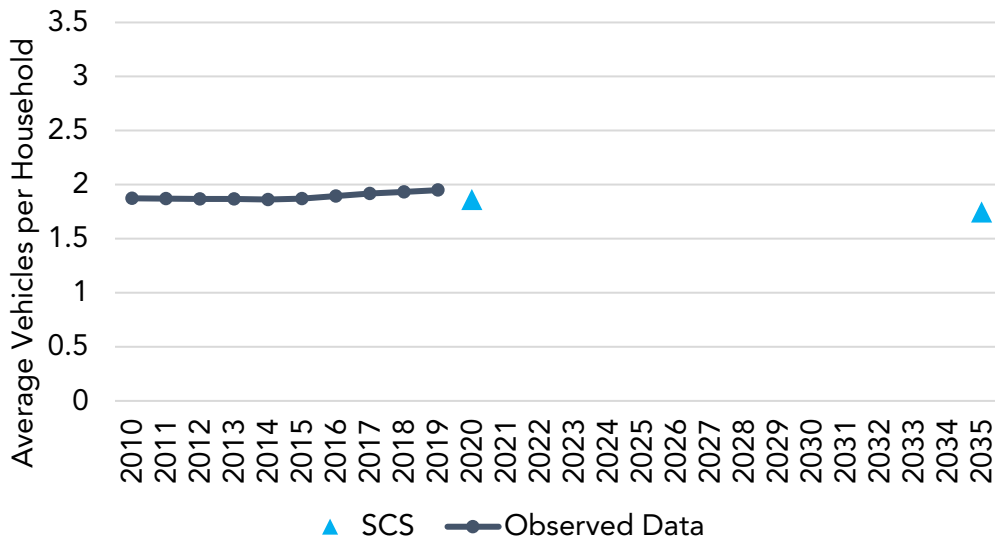


SAN DIEGO ASSOCIATION OF GOVERNMENTS (SANDAG)

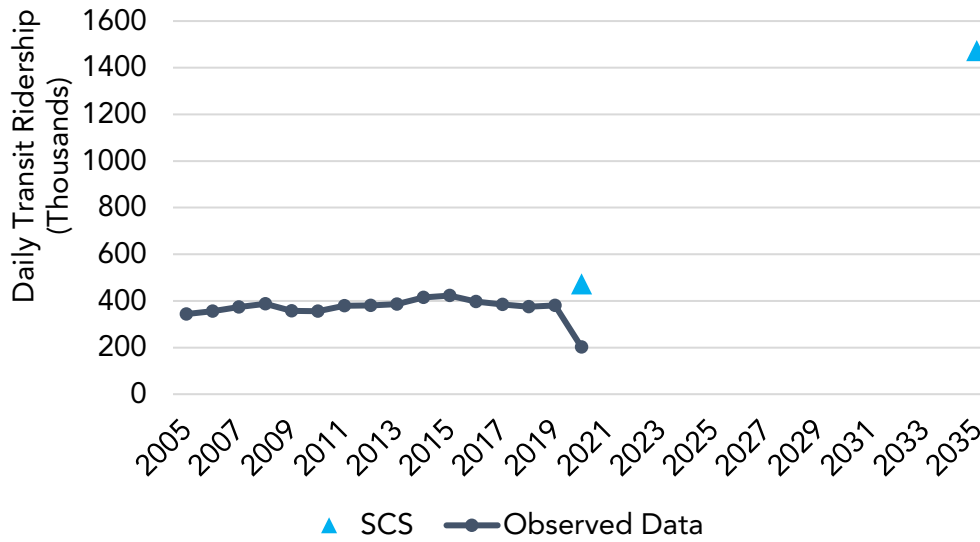
Per Capita GHG



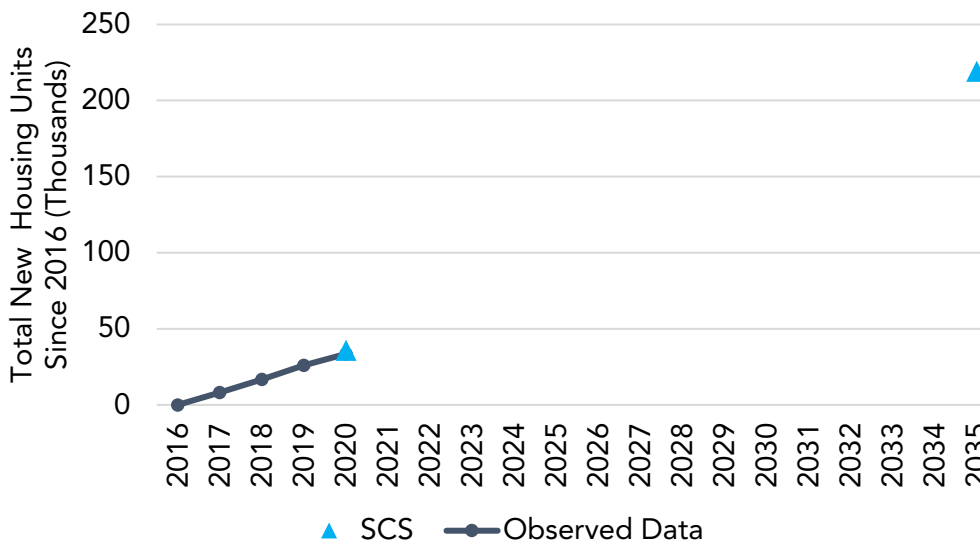
Household Vehicle Ownership



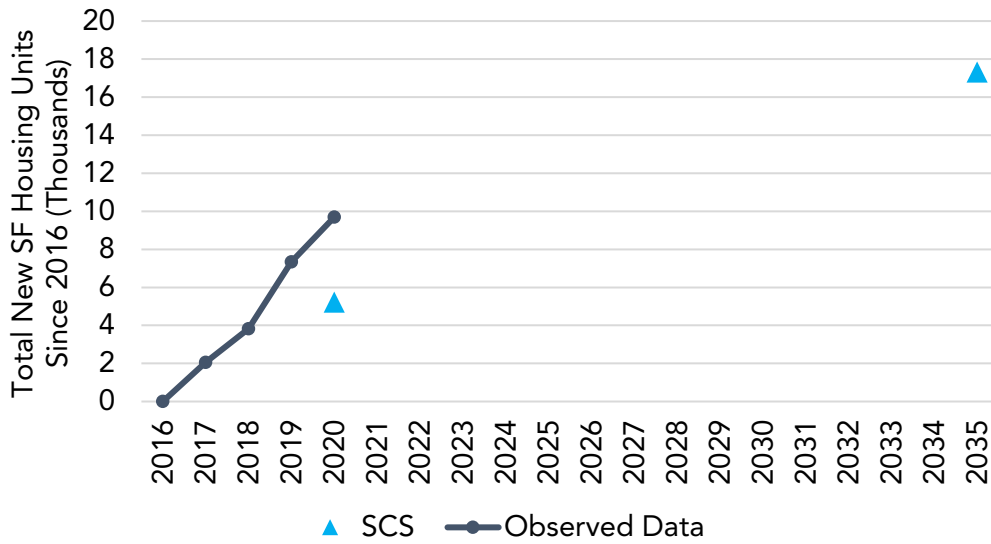
Daily Transit Ridership



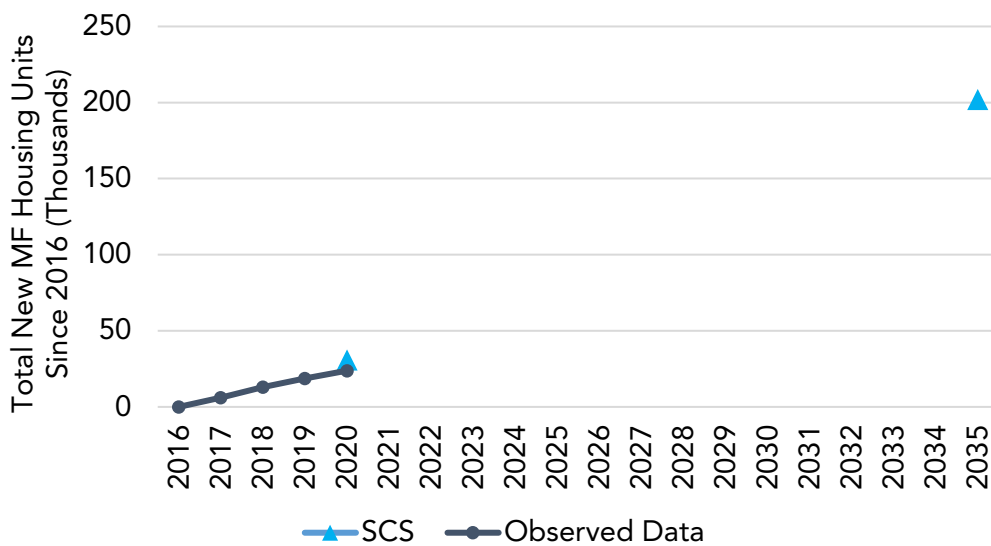
Total New Housing Units



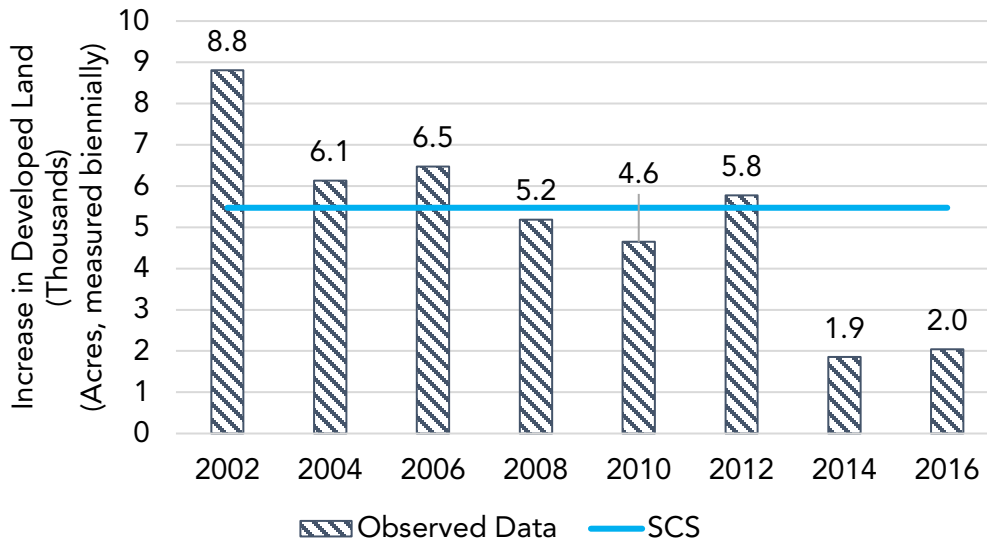
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

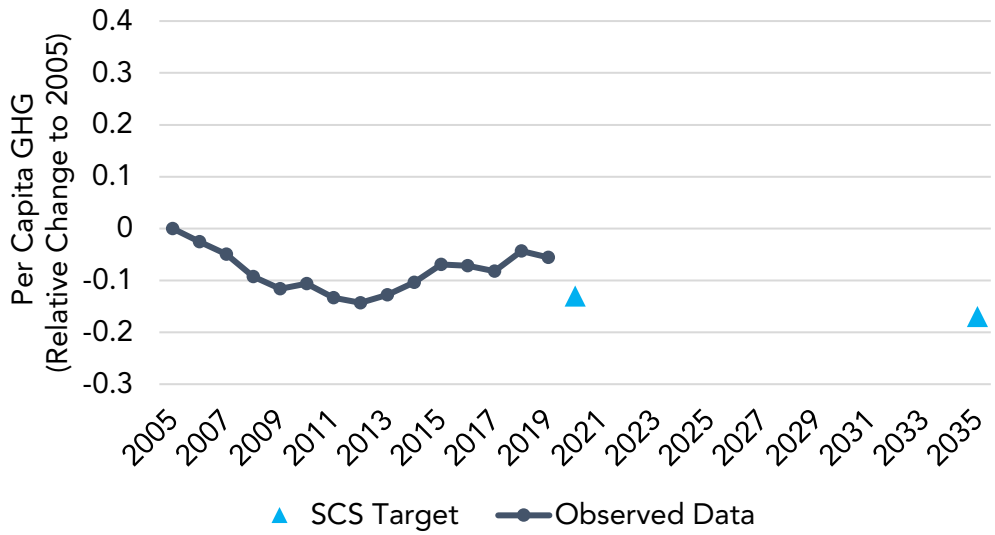


Urbanized Land

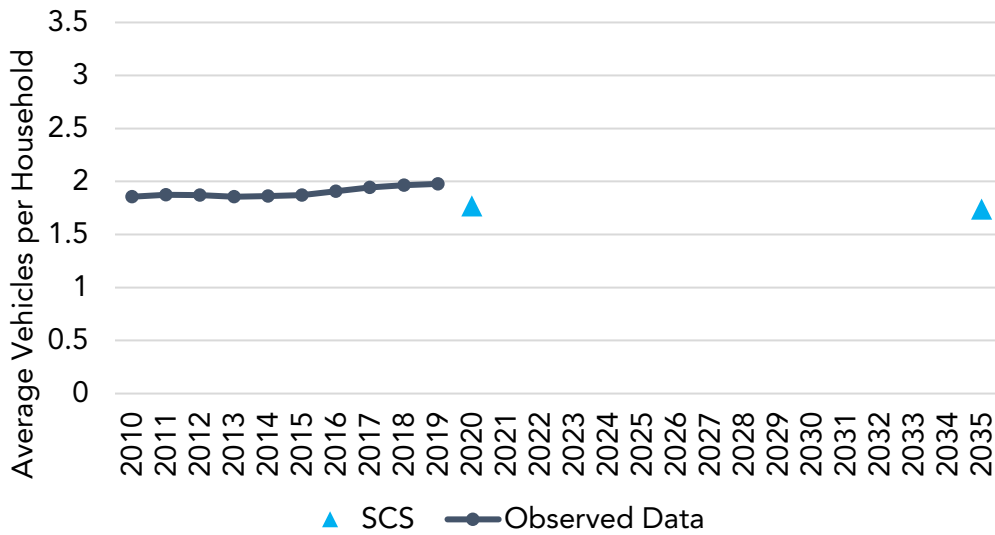


SANTA BARBARA COUNTY ASSOCIATION OF GOVERNMENTS (SBCAG)

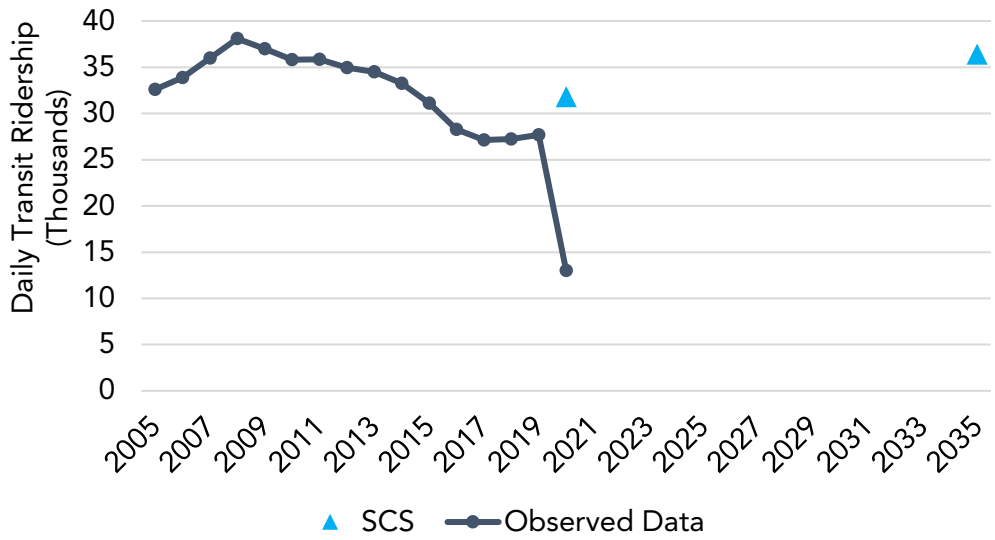
Per Capita GHG



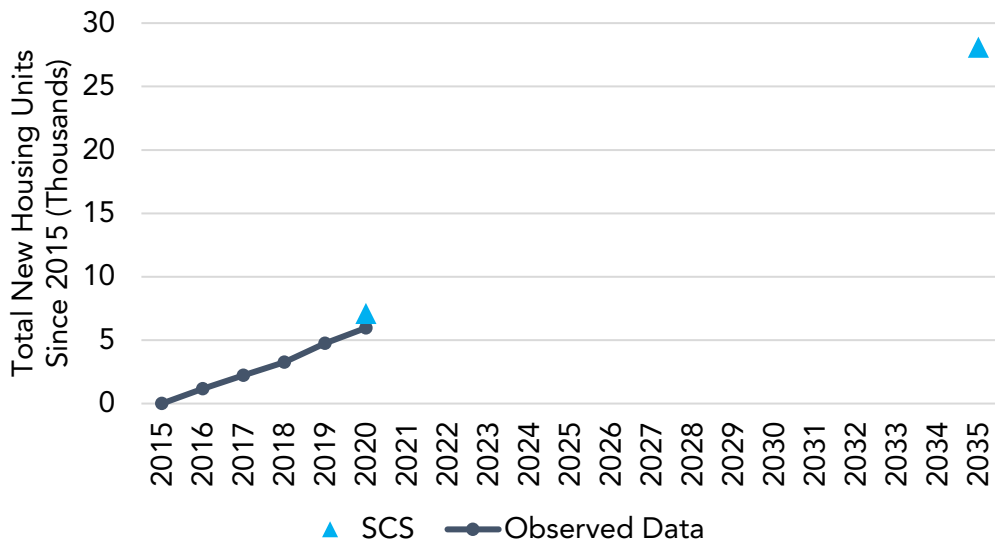
Household Vehicle Ownership



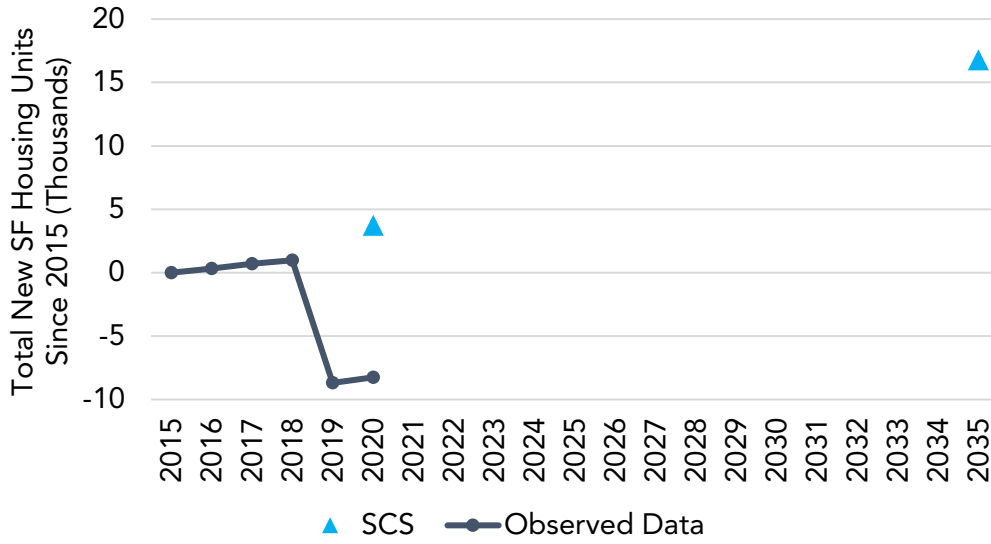
Daily Transit Ridership



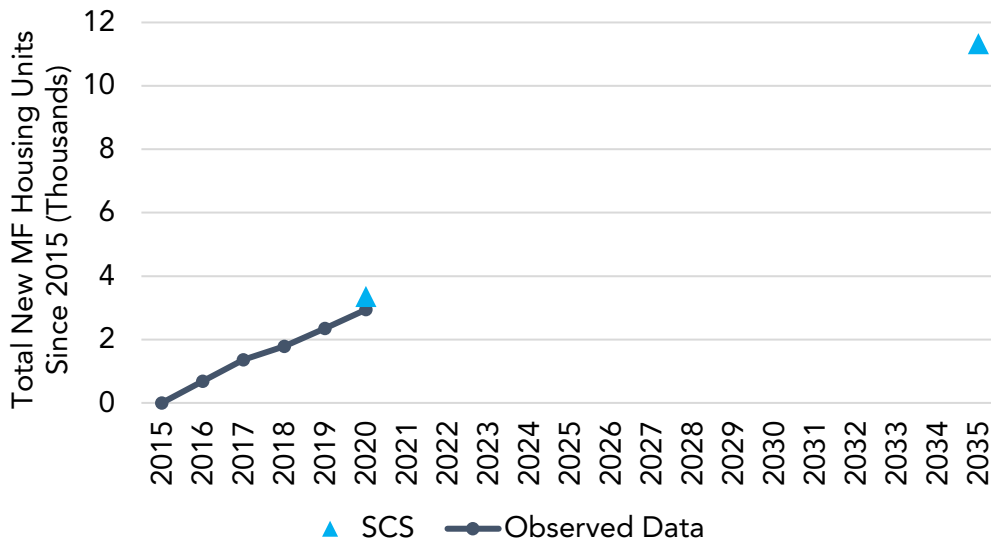
Total New Housing Units



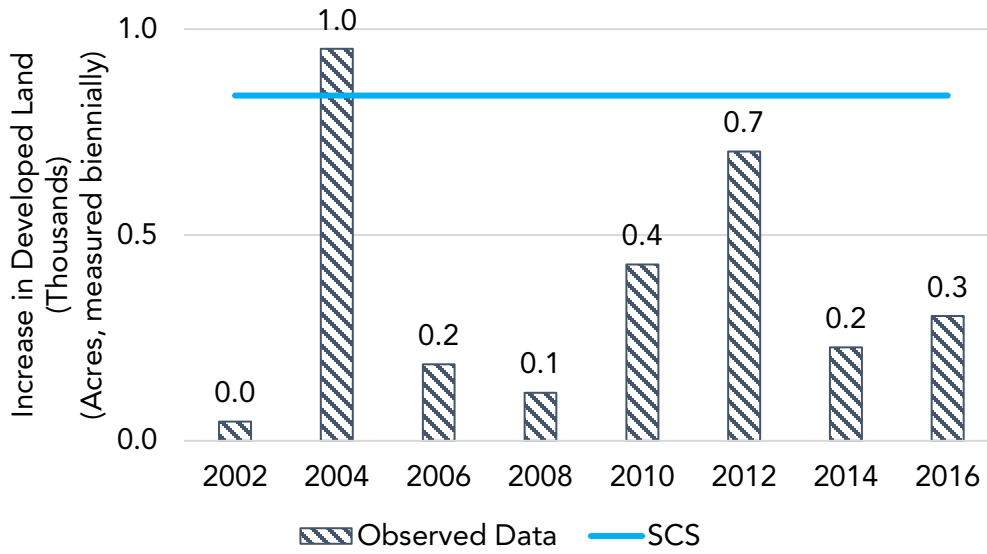
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

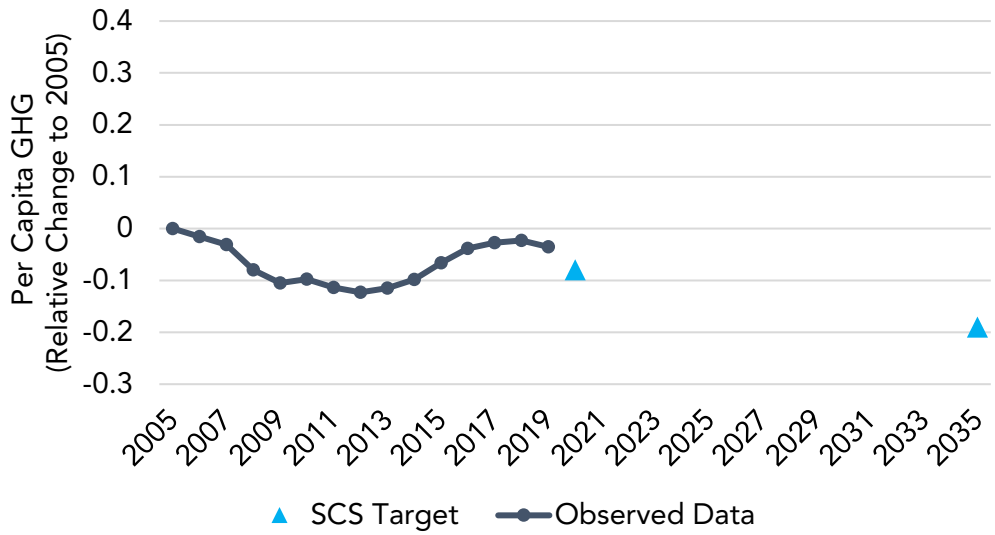


Urbanized Land

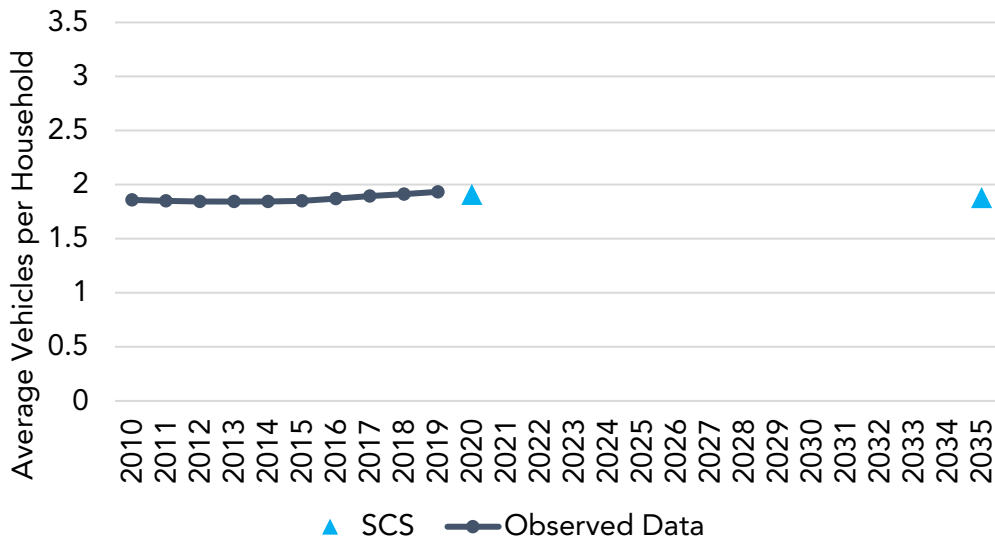


SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS (SCAG)

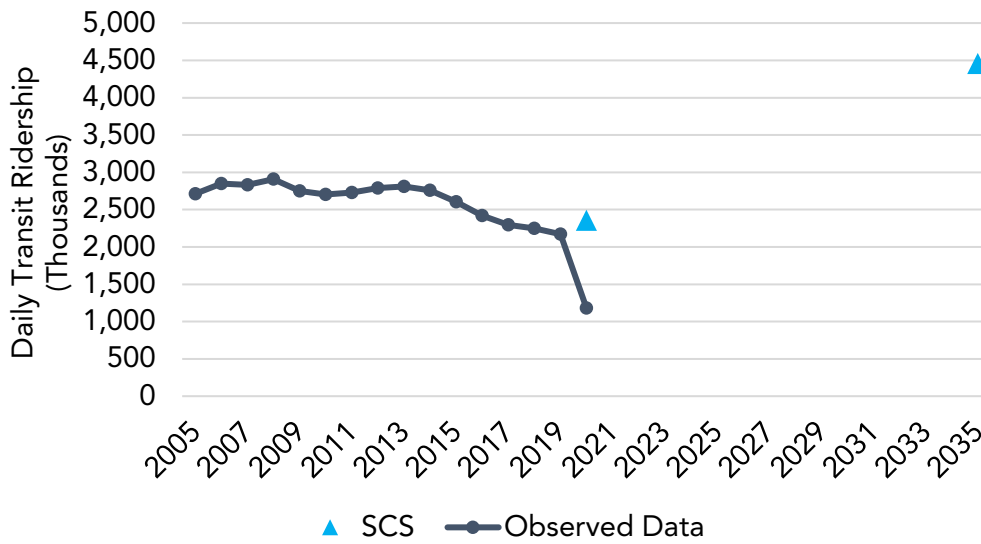
Per Capita GHG



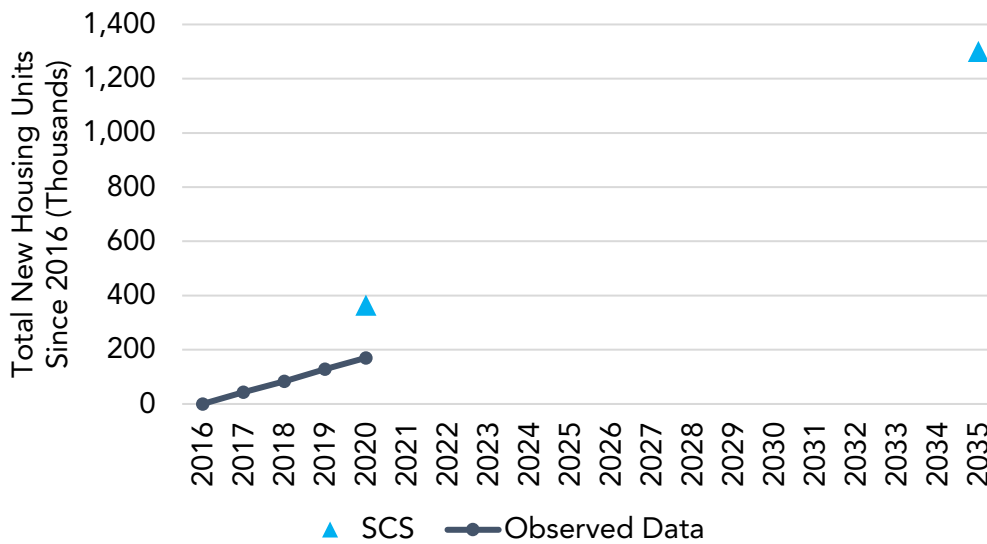
Household Vehicle Ownership



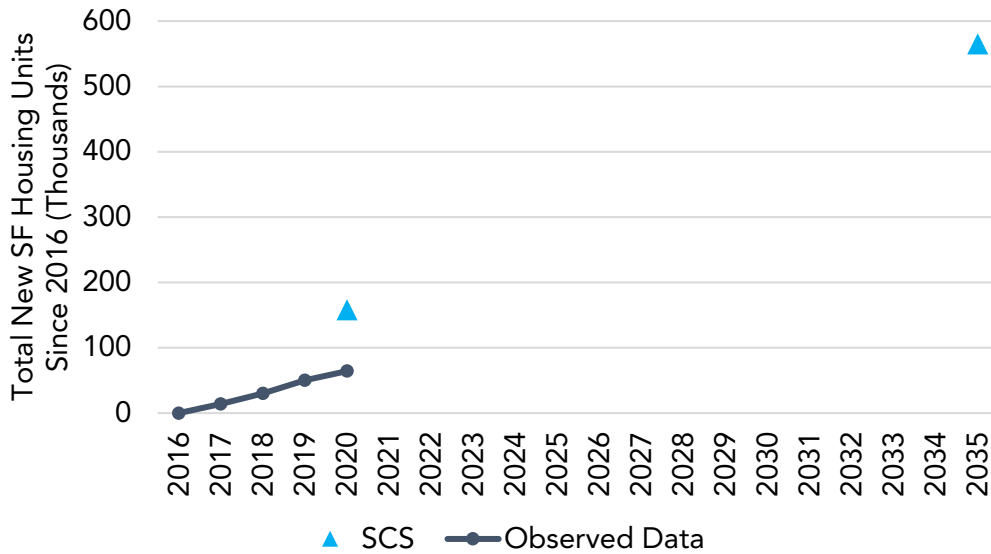
Daily Transit Ridership



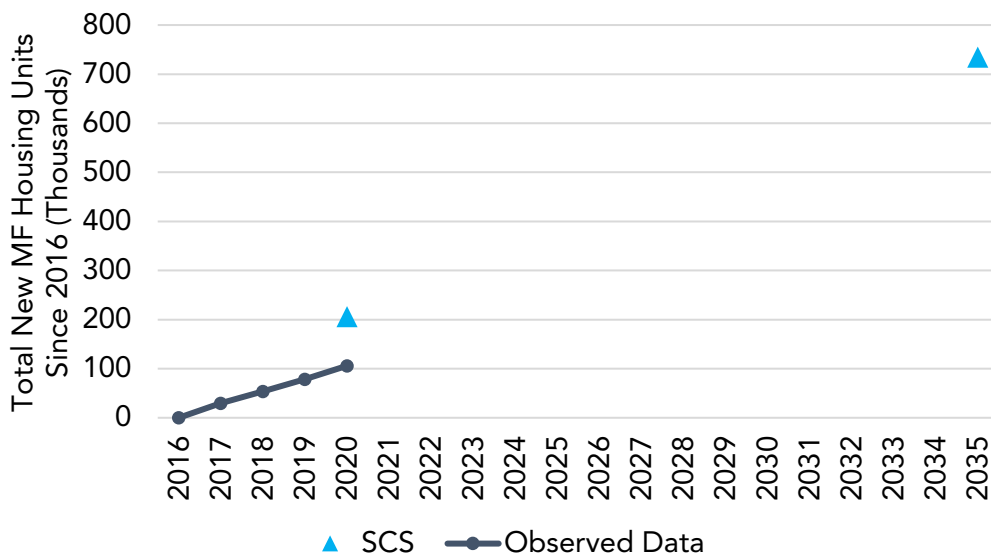
Total New Housing Units



Total New Single-Family Housing Units



Total New Multi-Family Housing Units

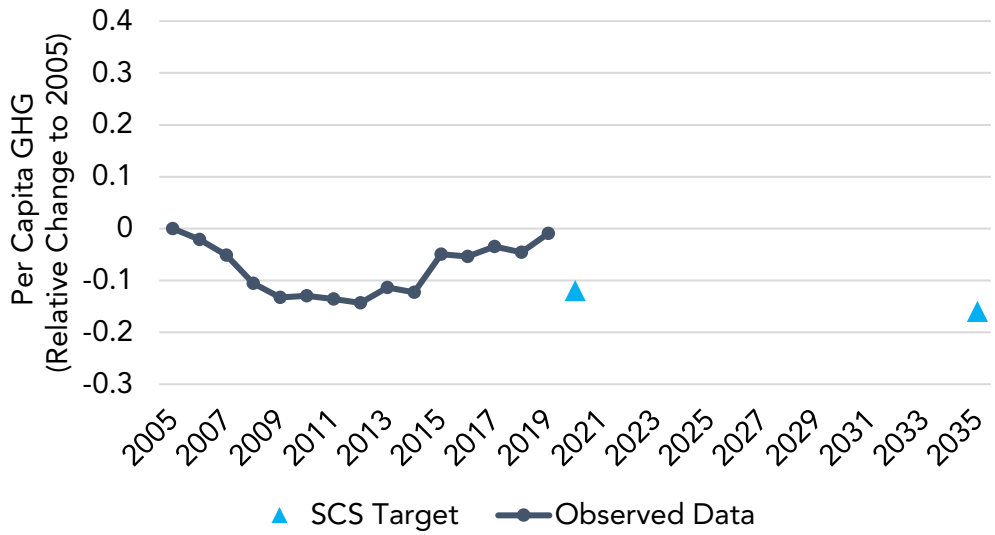


Urbanized Land

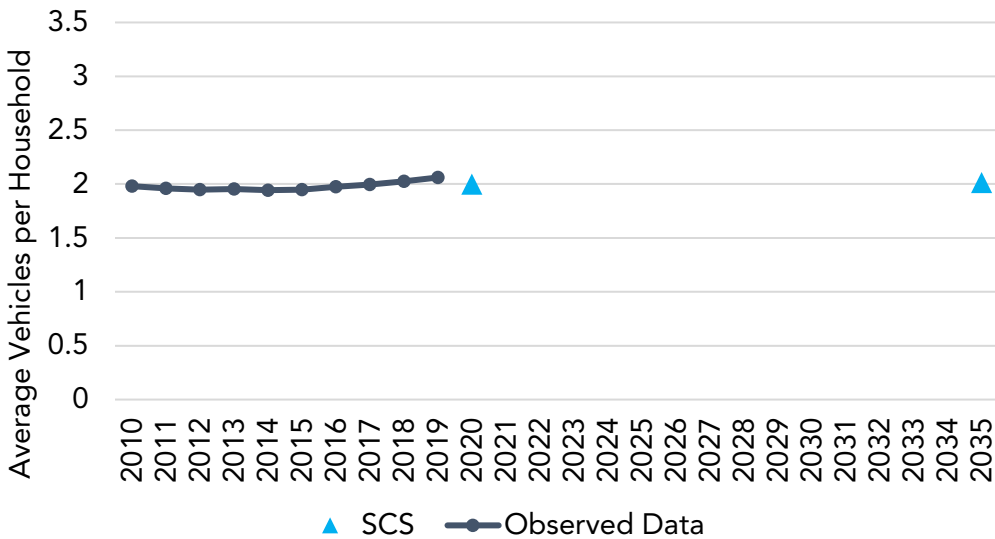
Not available SCS data.

SAN JOAQUIN COUNCIL OF GOVERNMENTS (SJCOG)

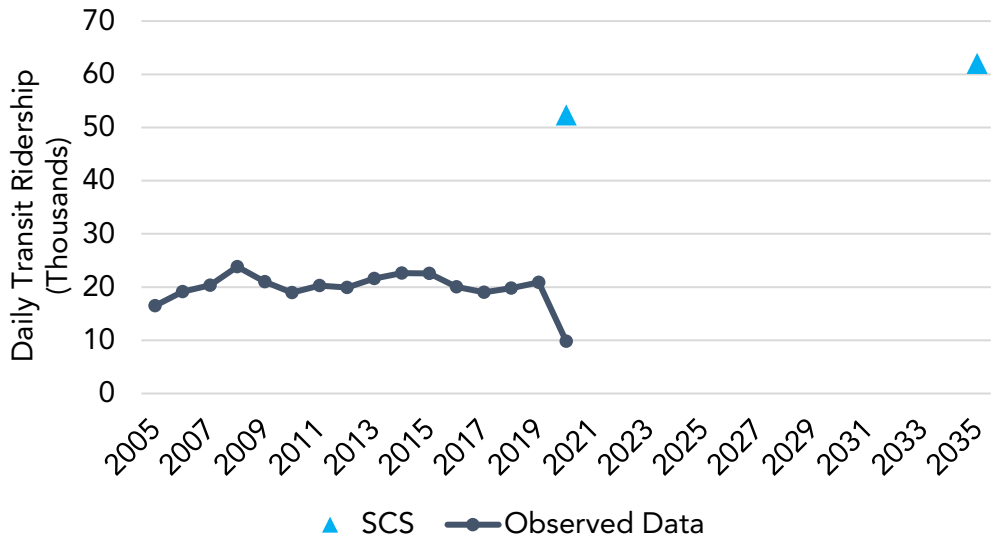
Per Capita GHG



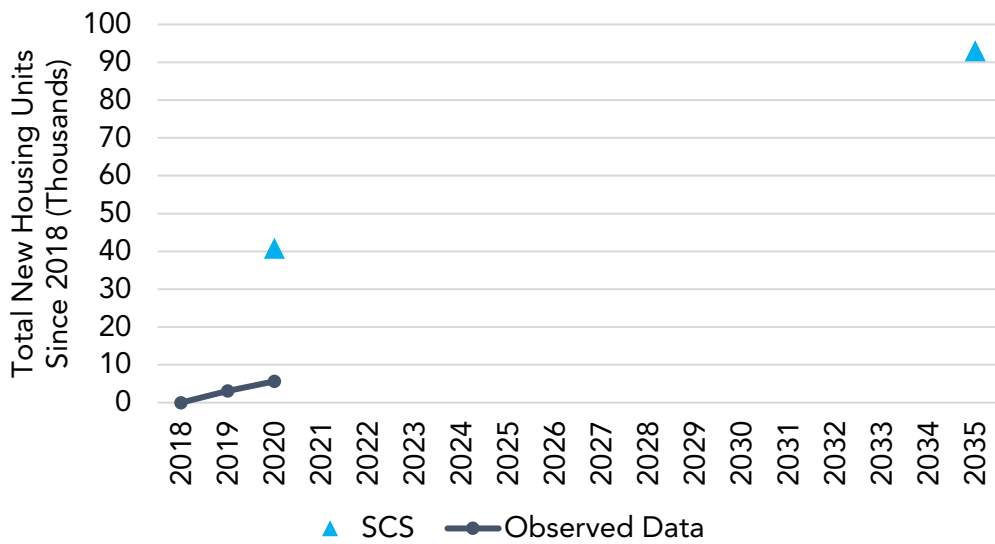
Household Vehicle Ownership



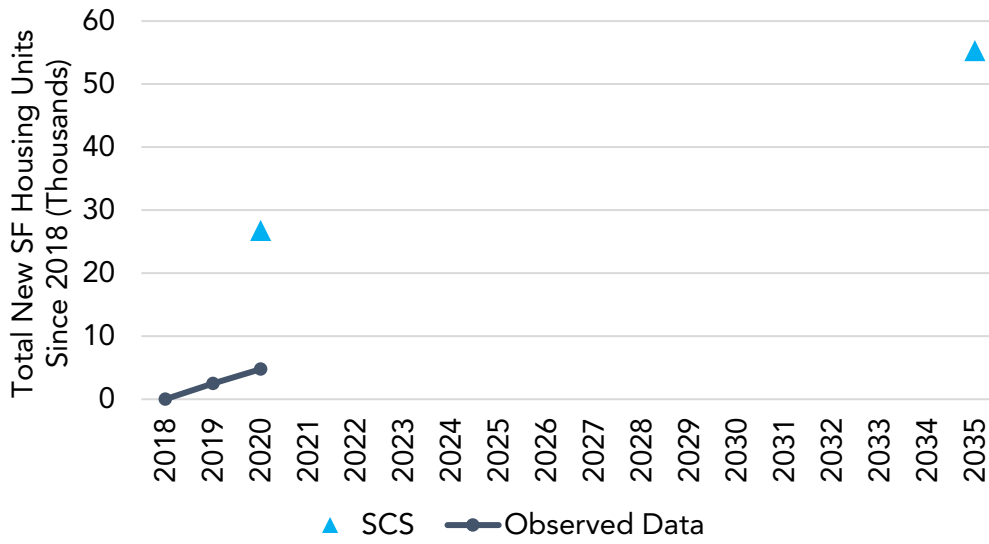
Daily Transit Ridership



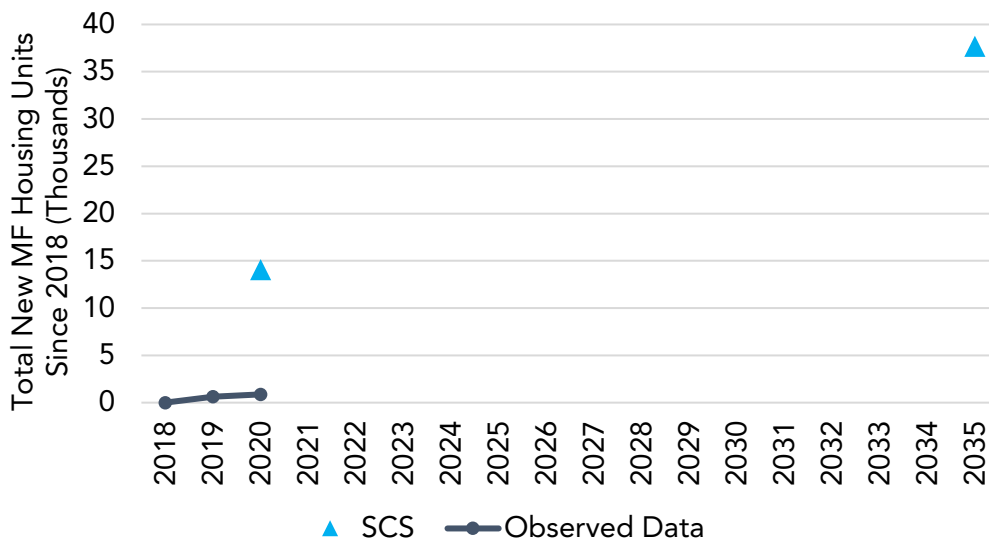
Total New Housing Units



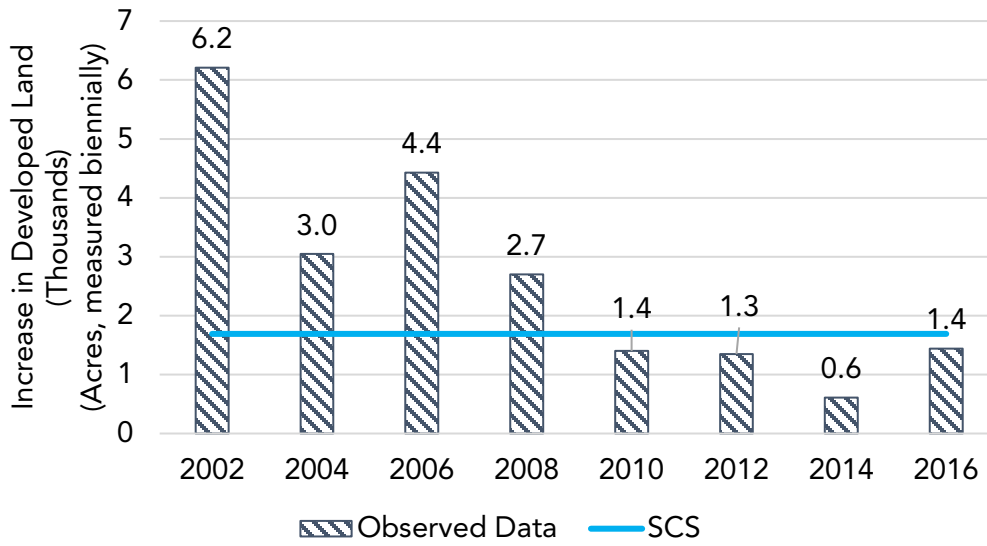
Total New Single-Family Housing Units



Total New Multi-Family Housing Units

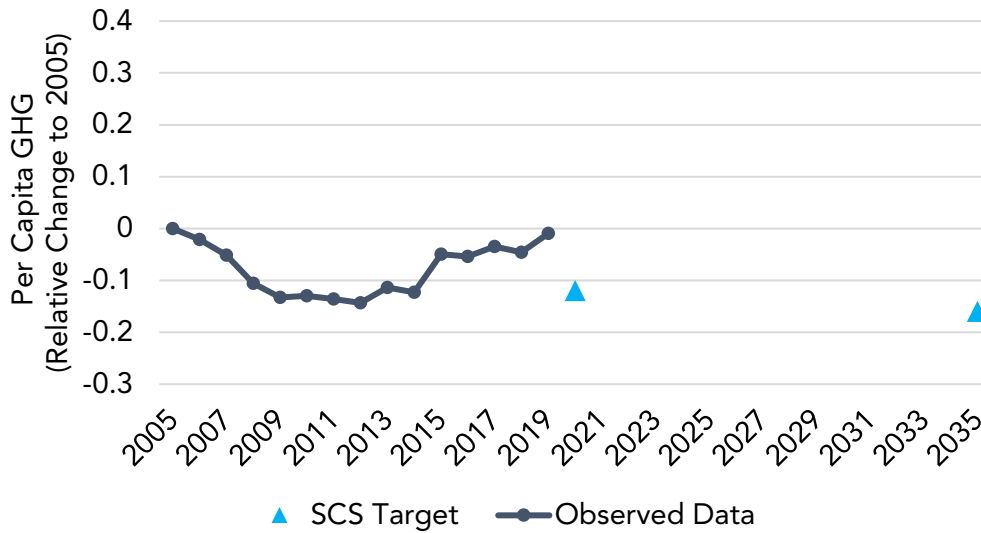


Urbanized Land



SAN LUIS OBISPO COUNCIL OF GOVERNMENTS (SLOCOG)

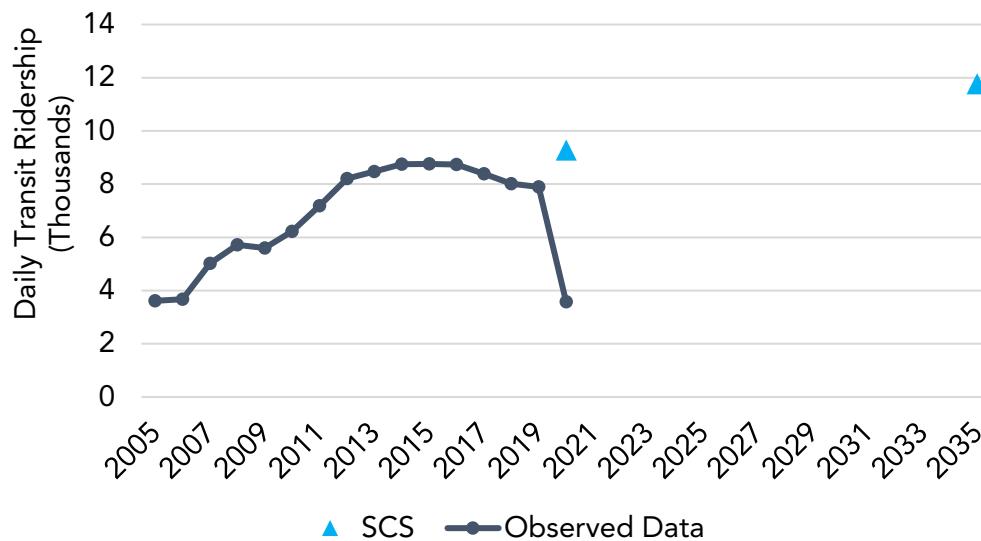
Per Capita GHG



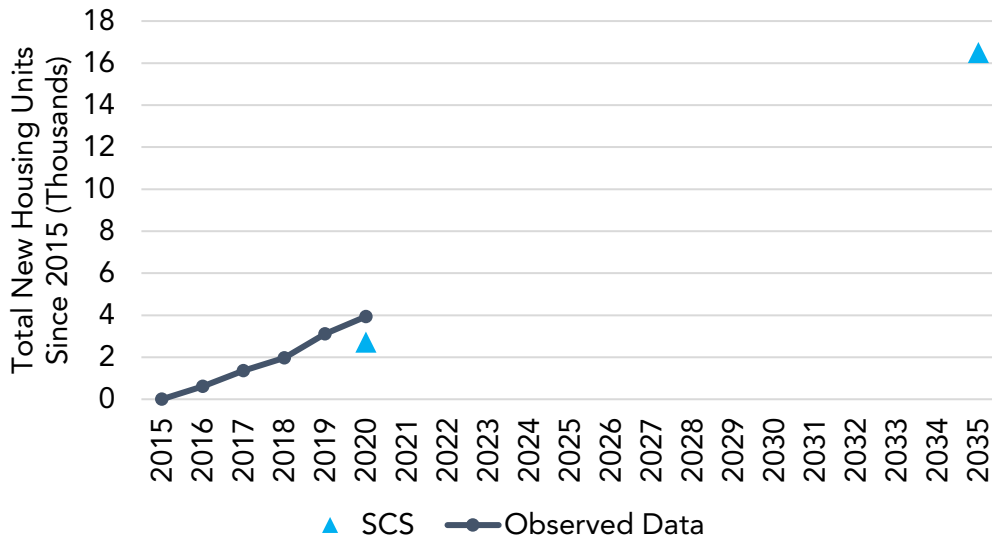
Household Vehicle Ownership

Not available SCS data.

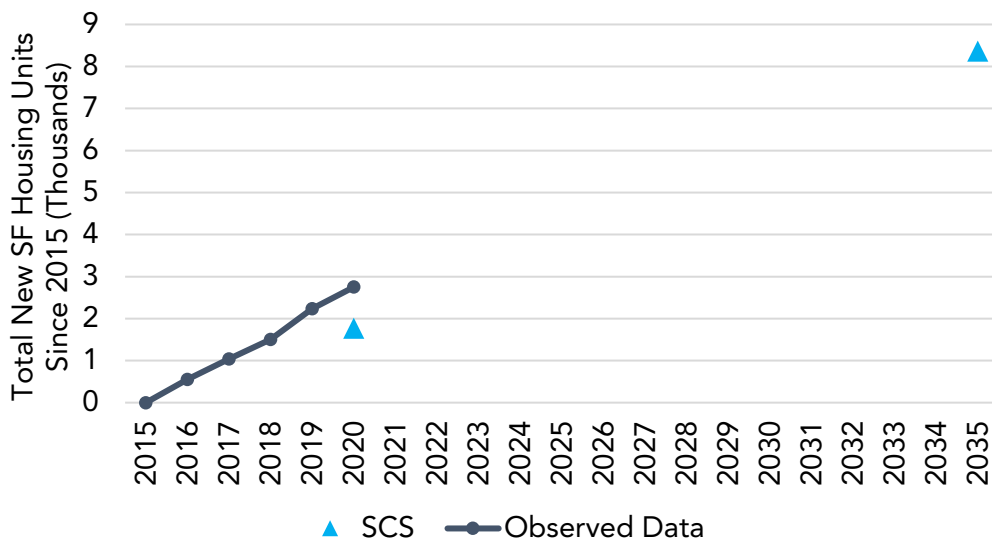
Daily Transit Ridership



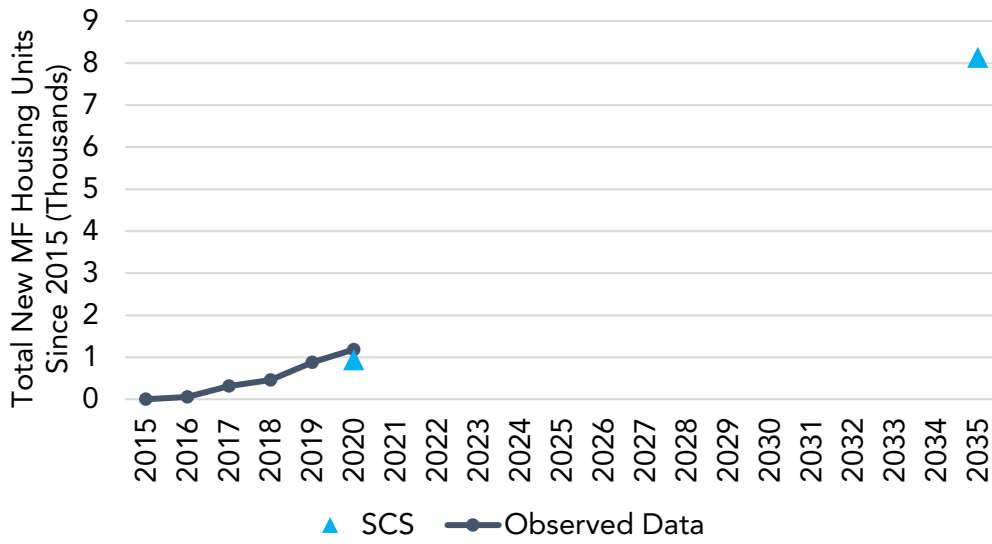
Total New Housing Units



Total New Single-Family Housing Units



Total New Multi-Family Housing Units

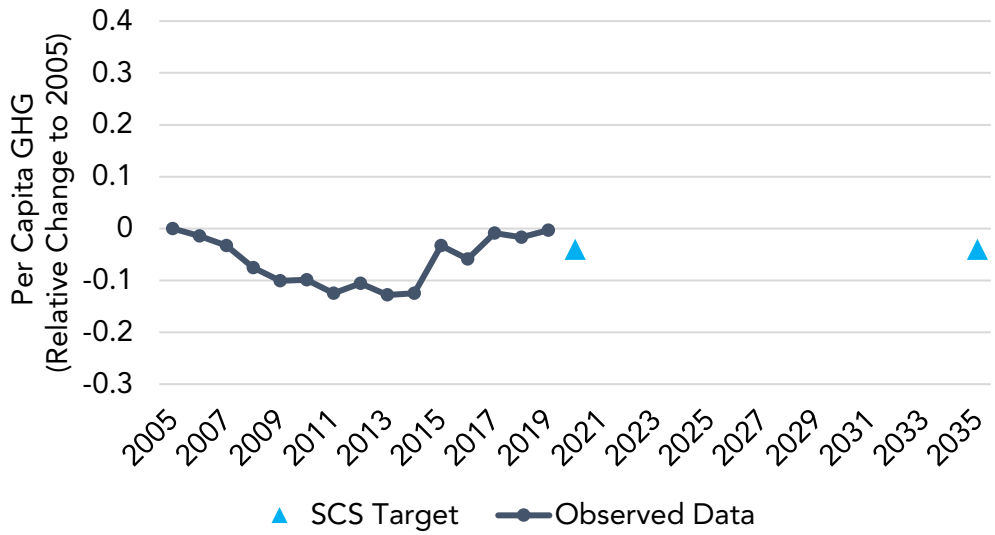


Urbanized Land

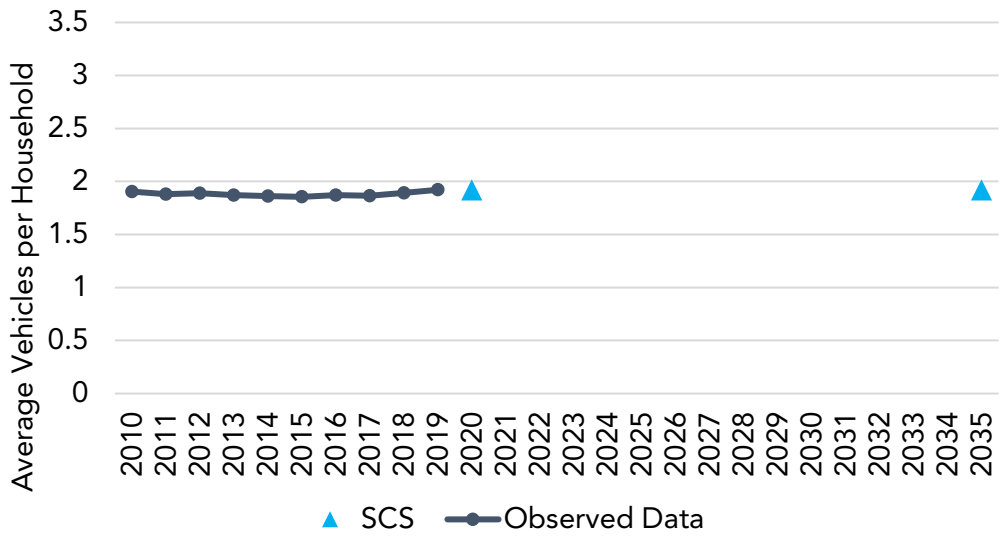
Not available SCS data.

SHASTA REGIONAL TRANSPORTATION AGENCY (SRTA)

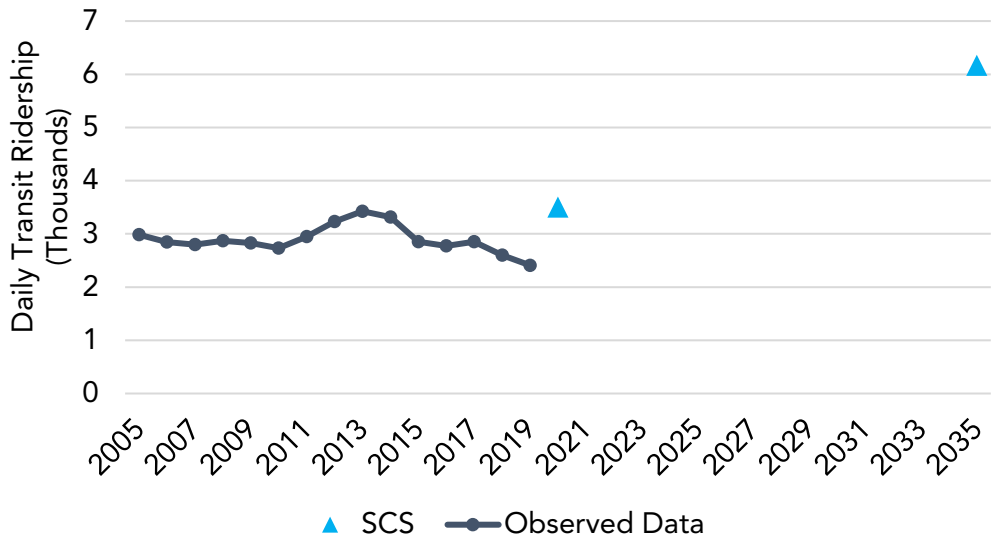
Per Capita GHG



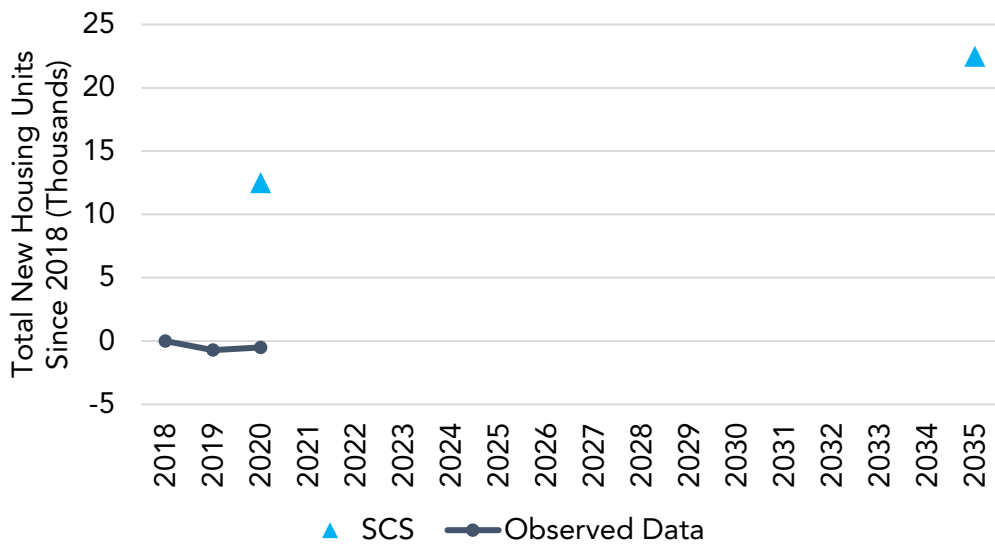
Household Vehicle Ownership



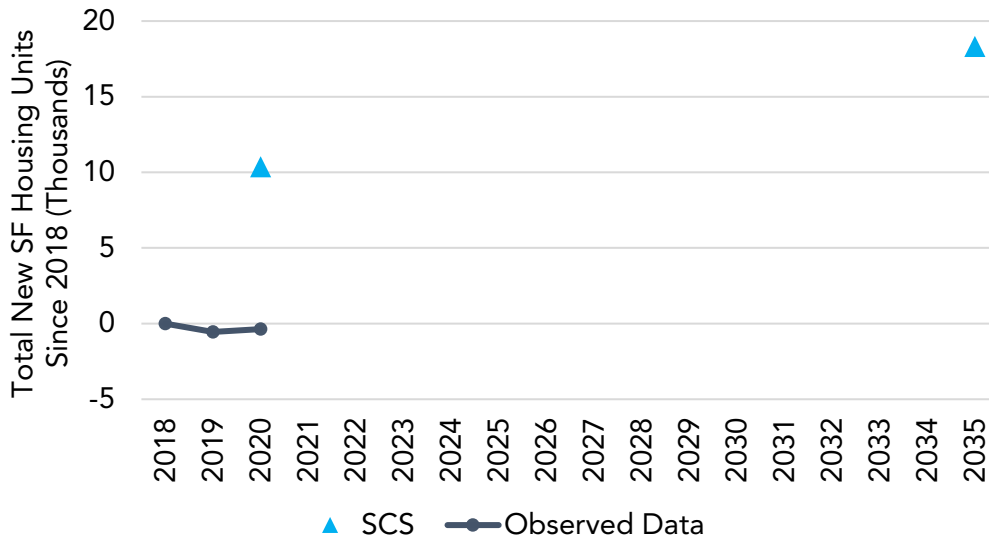
Daily Transit Ridership



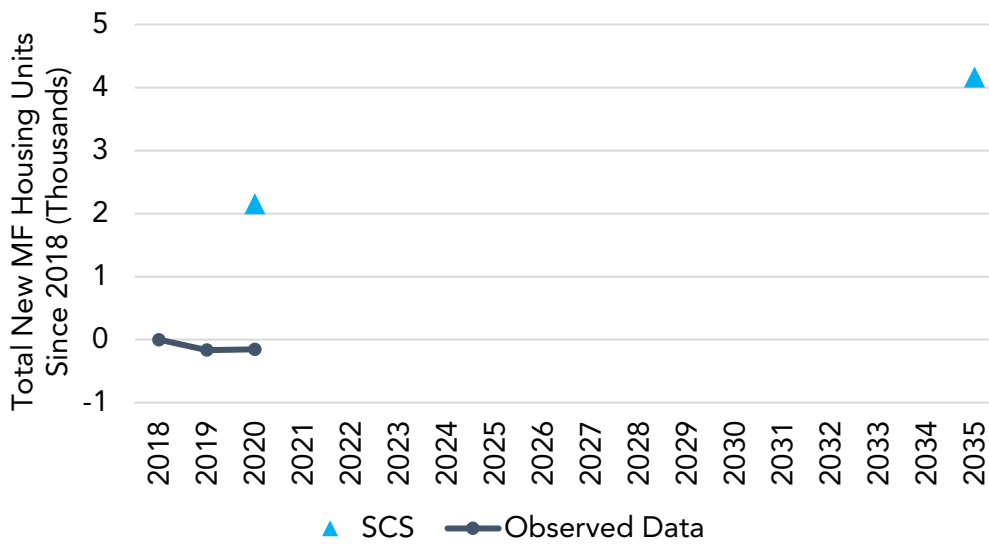
Total New Housing Units



Total New Single-Family Housing Units



Total New Multi-Family Housing Units

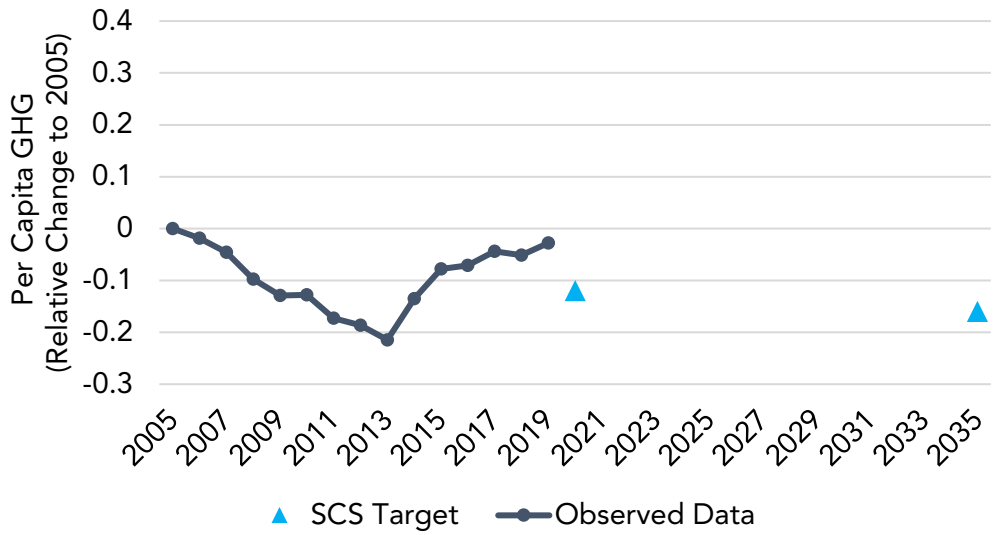


Urbanized Land

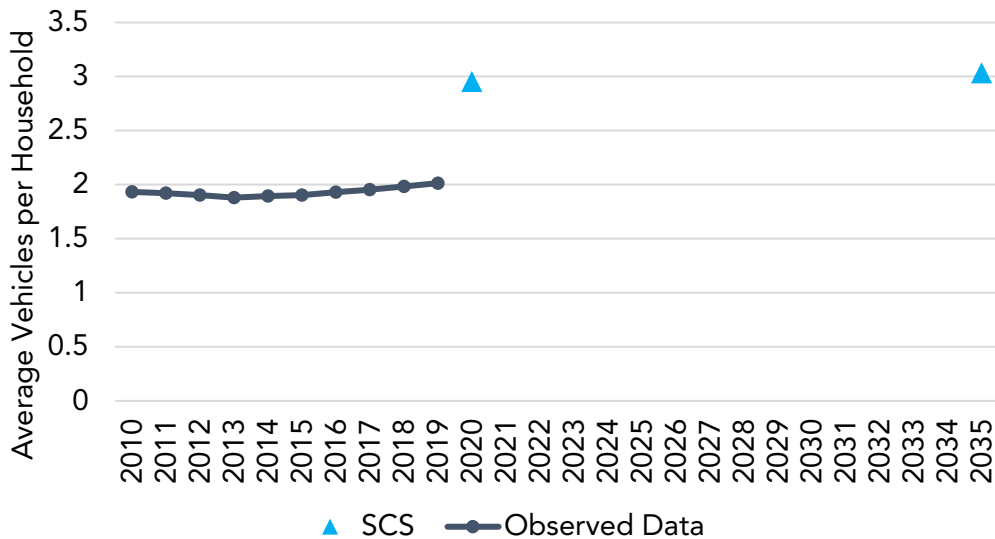
Not available SCS data.

STANISLAUS COUNCIL OF GOVERNMENTS (StanCOG)

Per Capita GHG



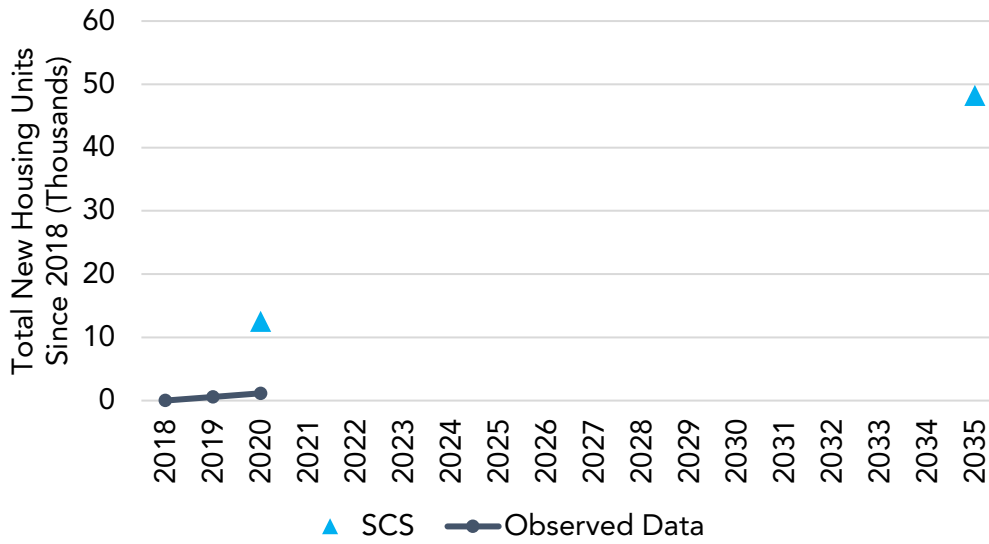
Household Vehicle Ownership



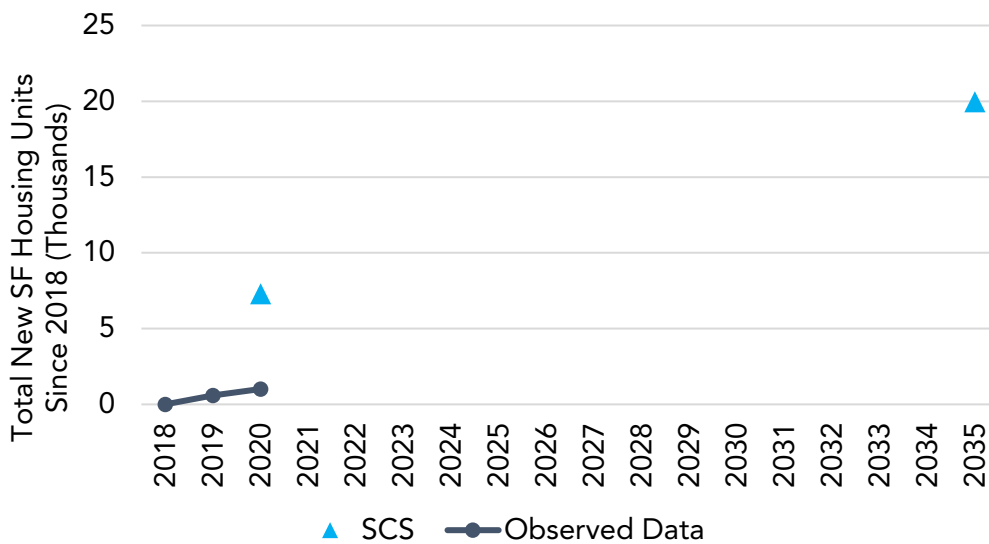
Daily Transit Ridership

Not available SCS data.

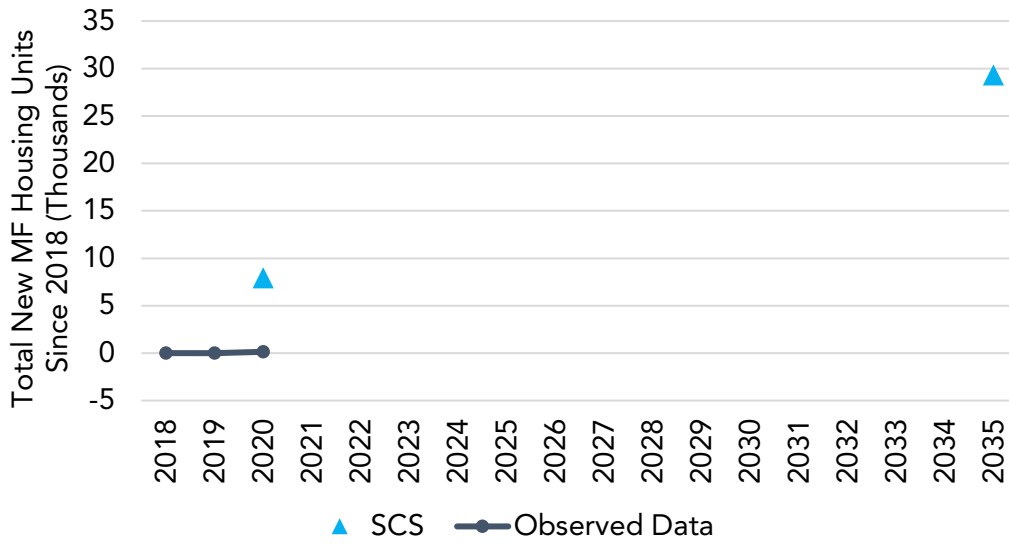
Total New Housing Units



Total New Single-Family Housing Units



Total New Multi-Family Housing Units

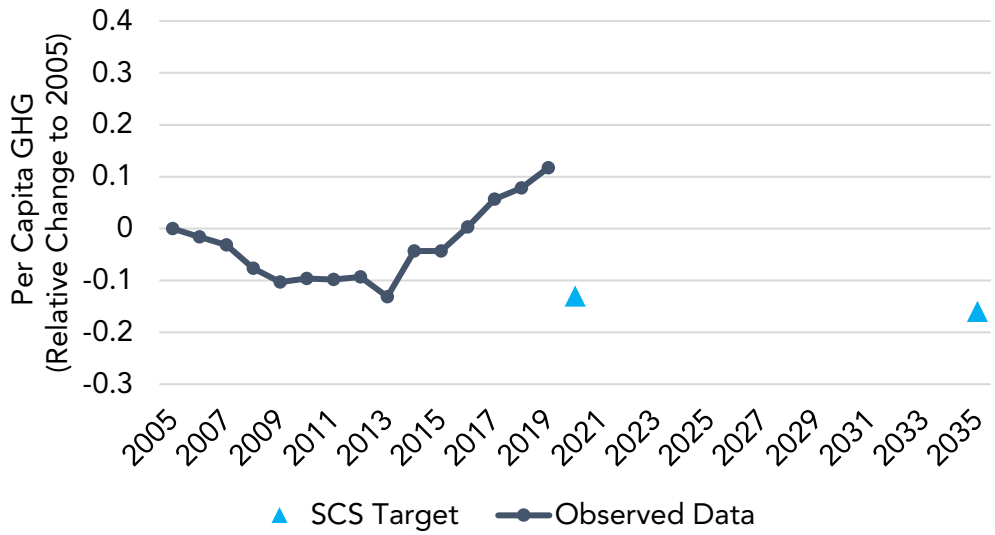


Urbanized Land

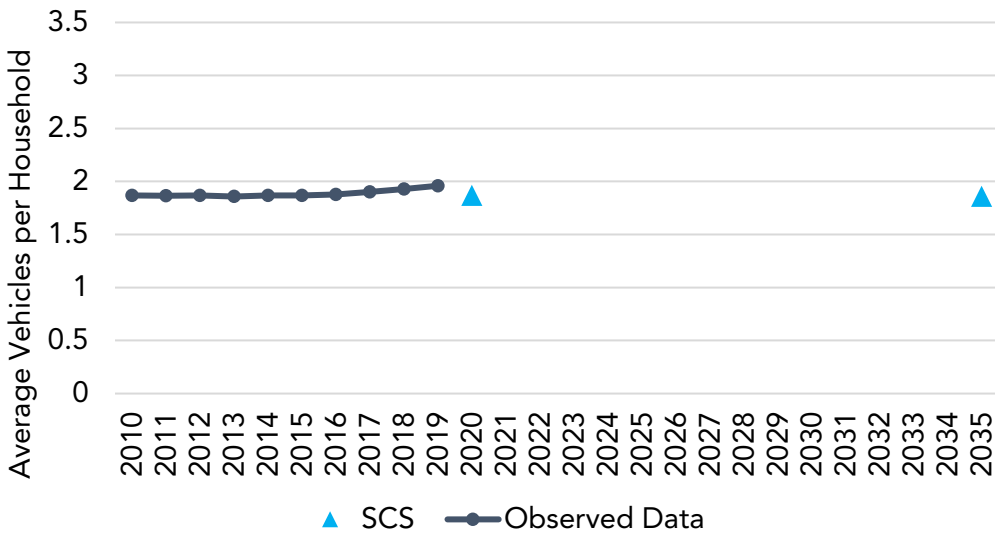
Not available SCS data.

TULARE COUNTY ASSOCIATION OF GOVERNMENTS (TCAG)

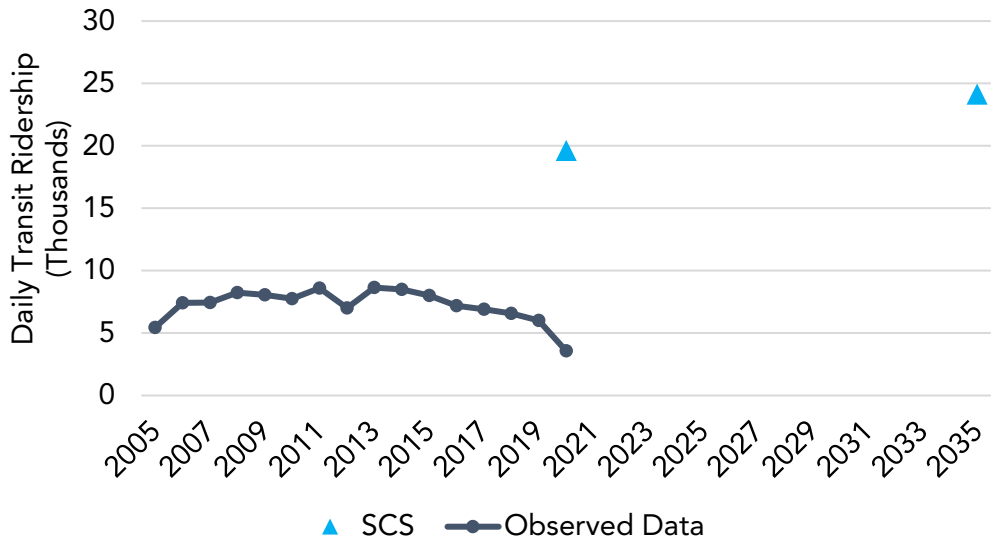
Per Capita GHG



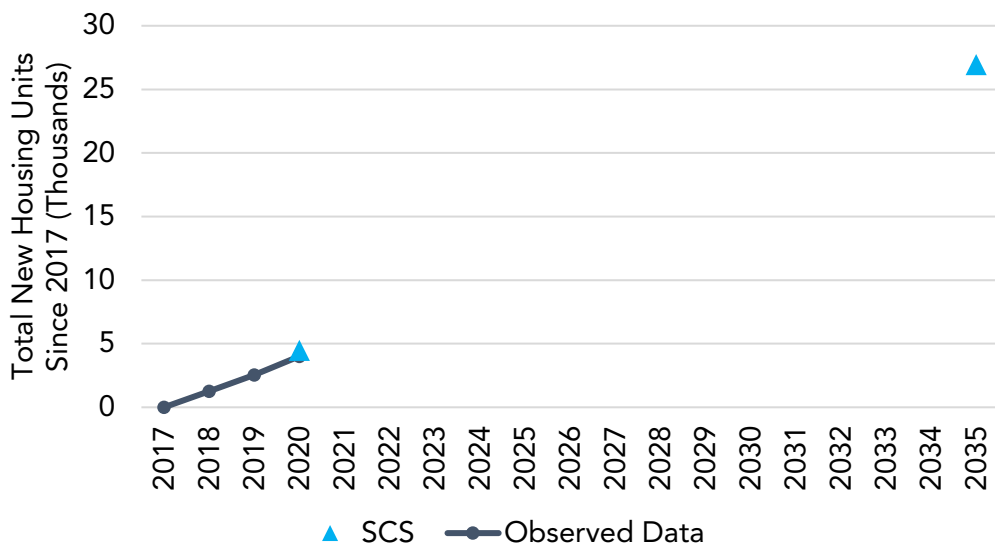
Household Vehicle Ownership



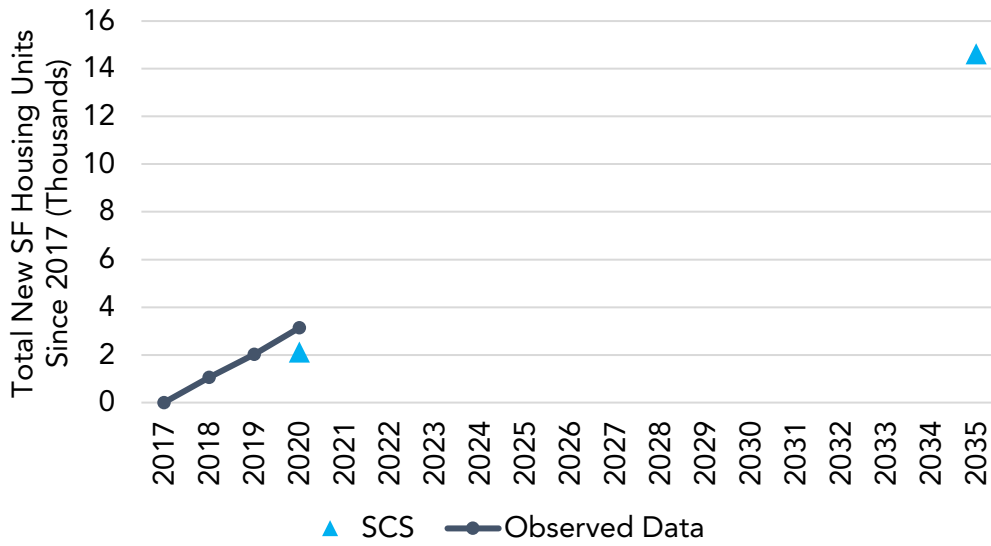
Daily Transit Ridership



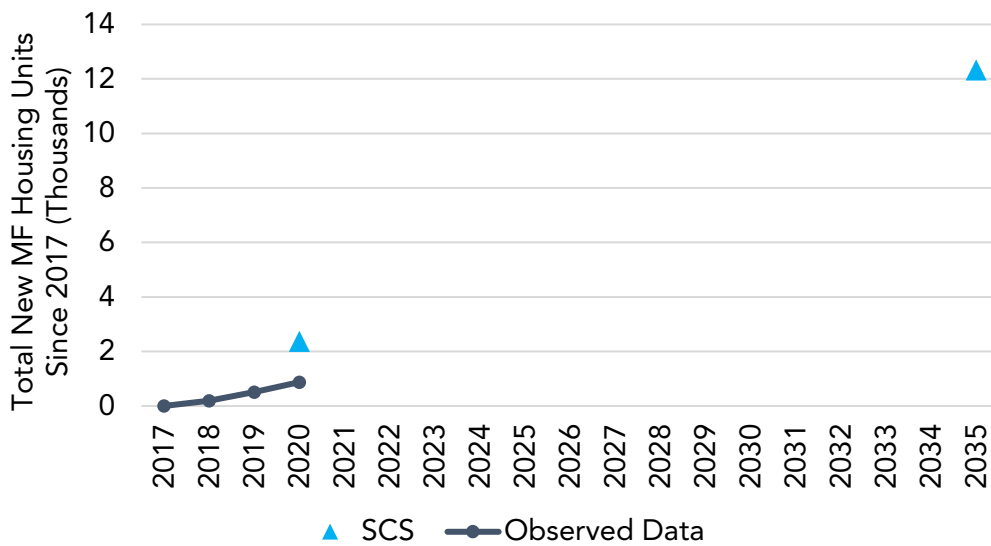
Total New Housing Units



Total New Single-Family Housing Units



Total New Multi-Family Housing Units

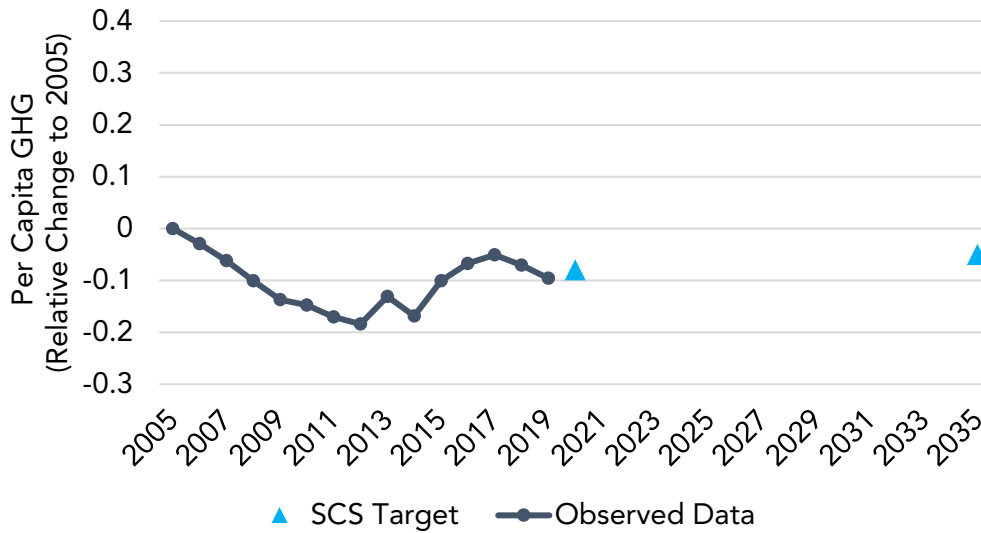


Urbanized Land

Not available SCS data.

TAHOE METROPOLITAN PLANNING ORGANIZATION (TMPO)

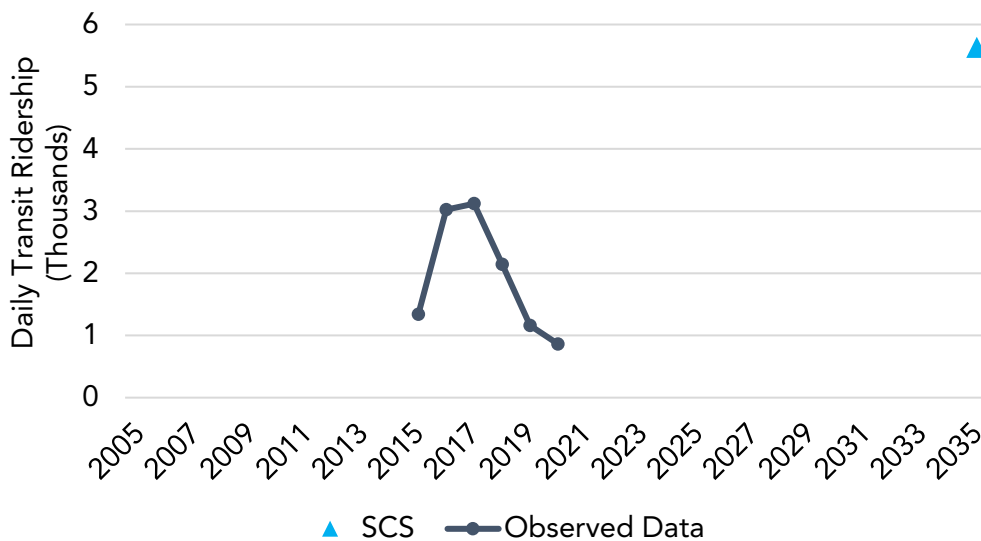
Per Capita GHG



Household Vehicle Ownership

Not available SCS data.

Daily Transit Ridership



Not available date before 2015.

Total New Housing Units

Not available SCS data.

Total New Single-Family Housing Units

Not available SCS data.

Total New Multi-Family Housing Units

Not available SCS data.

Urbanized Land

Not available SCS data.