

CHAPTER

7

System Performance

Performance-based planning is a strategic approach that uses key information to help inform investment decisions. The 2045 Monterey Bay Area Metropolitan Transportation Plan – Sustainable Communities Strategy presents a performance measures analysis for the larger AMBAG region that includes Santa Cruz County. This analysis can be found on the AMBAG website (<https://www.ambag.org>). The 2045 RTP focuses the system performance on presenting available data that monitors the performance of the transportation system to date based on the goals, policies, and targets discussed in Chapter 4. Data to monitor the transportation system can be challenging and expensive to acquire. The information presented below utilizes data that was gathered from a variety of sources. Data is not available at this time to monitor all of the measures in the 2045 RTP although many of the more fundamental indicators (injuries and fatalities, vehicle miles traveled, greenhouse gas emissions, pavement condition) are presented below. Refer to Appendix C for the complete list of goals, policies, and targets identified for the 2045 RTP.

Goal 1. Establish livable communities

Establish livable communities that improve people's access to jobs, schools, recreation, healthy lifestyles and other regular needs in ways that improve health, reduce pollution and retain money in the local economy.

Target: Improve people's ability to meet most of their daily needs without having to drive.

Target 1.A.1. – Increase the length of urban bikeway miles relative to total urban arterial and collector roadway miles to 85 percent by 2030 and to 100 percent by 2045¹.

The RTC tracks the length of all bikeway miles, including Class I bike paths or shared-use paths, Class II bike lanes on streets, Class III bike routes, and Class IV separated bikeways, throughout Santa Cruz County on an annual basis through coordination with the local jurisdictions. The percentage of urban bikeway miles is the length of bikeway miles within the urban services boundaries relative to the length of arterials and collector roadways in the county (Figure 7.1). Given data limitations, the data in Figure 7.1 is based on the assumptions that the length of the local arterials and collectors within the urban areas of the county has not changed since 2014 and that the ratio of urban to non-urban bikeways has also stayed constant. The percentage of bikeway miles relative to length of arterials and collectors within the urban

areas for 2018 was 69.5%. If the current trend continues, the percentage of bikeway miles will be 74.4% in 2030 and will not meet the 85% target.

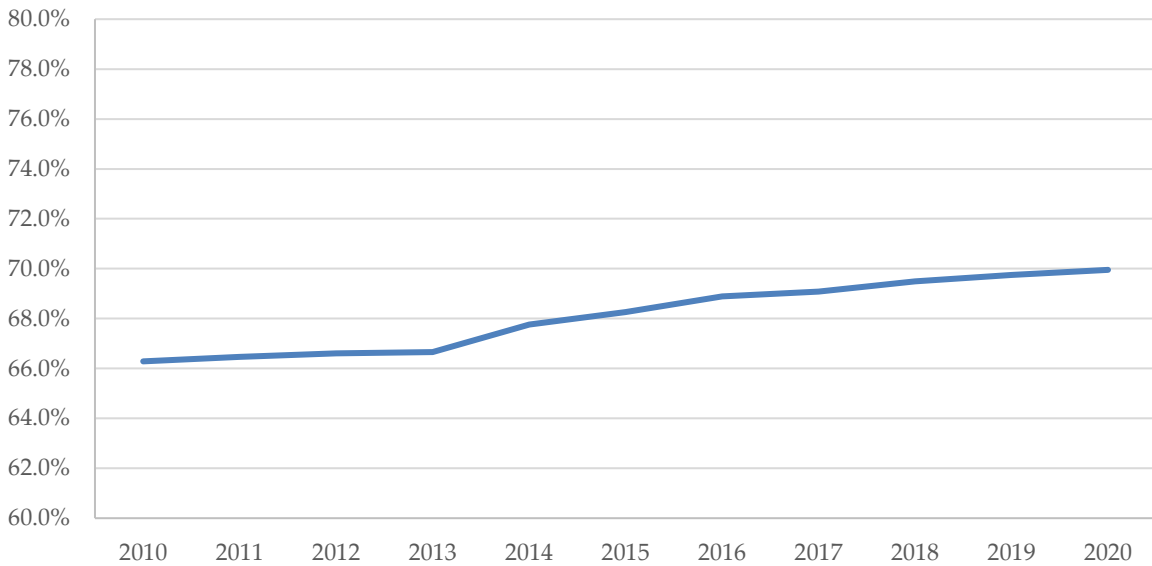


Figure 7.1 – Percentage of Bikeway Miles Relative to Lengths of Arterials and Collectors in Urban Areas

Source: SCCRTC

Target 1.A.2 – Increase the transit vehicle revenue miles by 8 percent by 2030 and 20 percent by 2045 (compared to 2020).

The total number of transit revenue miles is a measure of the availability of transit service to people within Santa Cruz County by tracking both the length or coverage of the routes offered and the frequency of service. The shorter the headway (time between consecutive buses at a bus stop), the higher the frequency of service, and thus the greater the transit revenue miles. It is well documented that in general, ridership increases as the frequency of transit service increases².

Santa Cruz METRO is the only public transit service that currently operates in Santa Cruz County. METRO tracks their fixed route revenue miles on an annual basis. Data available from fiscal year (FY) 2014 through 2019 shows a decrease of 13.7% in fixed route service as measured by transit revenue miles. The 2020 coronavirus pandemic decreased the service significantly, but service was restored in Fall 2021 to pre-pandemic levels on all routes with the exception of a few routes including the Highway 17 Express. In future monitoring of this metric, the target for transit revenue miles to increase by 8% by 2030 and by 20% by 2045 will need to be compared to an adjusted 2020 value due to the Covid-19 pandemic.

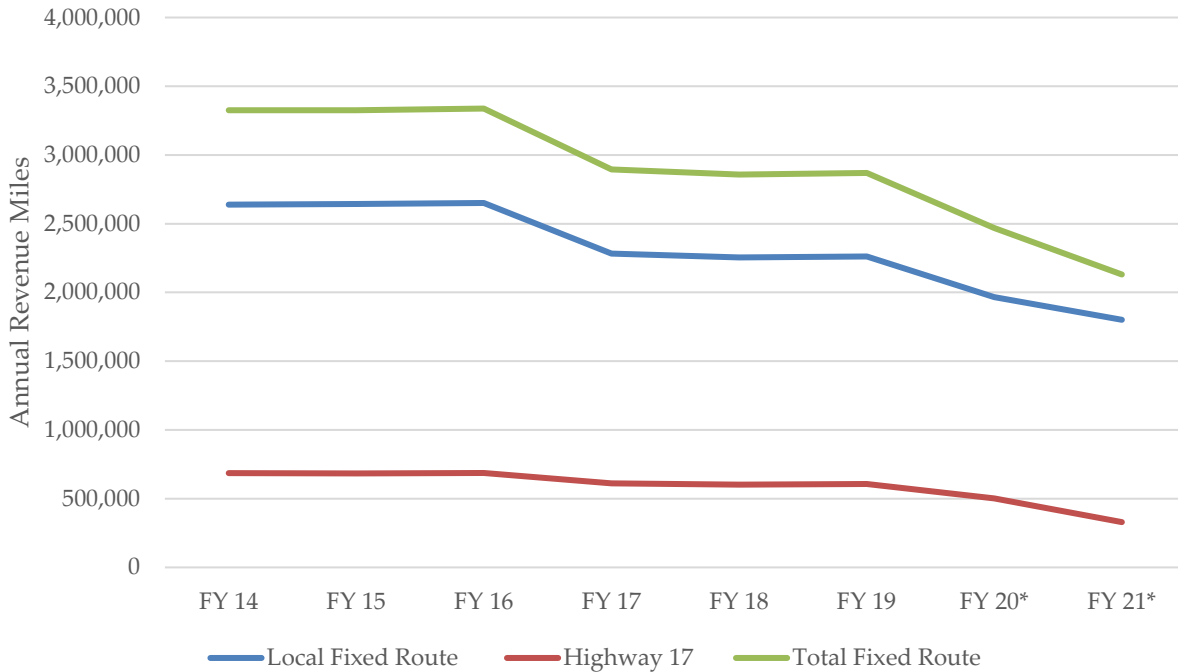


Figure 7.2 – Santa Cruz METRO Fixed-Route Revenue Miles

Source: Santa Cruz Metropolitan Transit District

*Routes and frequency of service decreased due to COVID-19 pandemic during FY 20 and FY 21

Target: Reduce smog-forming pollutants and greenhouse gas emissions.

Target 1.B.1 – Reduce per capita vehicle miles traveled by 4 percent by 2030 and by 10 percent by 2045 (compared to 2005).

If there was information for only one measure to monitor the performance of the transportation system, vehicle miles traveled is the measure to monitor. Vehicle miles traveled or VMT is the total number of miles of vehicle travel within a specified area. Changes in vehicle miles traveled provides information about whether congestion, air quality (including GHG emissions), health, and ability to walk, bike or take transit, is increasing or decreasing over time. The number of vehicle miles traveled for Santa Cruz County can be determined a few different ways. Figure 7.3 shows VMT estimates since 2005 from the Highway Performance Monitoring System (HPMS) implemented by Caltrans. The VMT data estimated through the HPMS is calculated using traffic count data collected on both the highway system and the local street and road network. Daily total VMT represents the amount of travel for all vehicles within Santa Cruz County borders. The data shows total VMT was highest in 2005, followed by a general downward trend. [Note: The 2010 data point likely represents an error in the counts used to determine the VMT.] The changes in total VMT can be due to a change in population and/or a change in the amount people driving a vehicle.

Average daily VMT per capita, calculated by dividing the total vehicle miles traveled by the population of the county, represents the average amount people drive daily. Figure 7.3 shows the highest VMT per capita occurred in 2005. The amount of driving per person has steadily decreased since 2005 and has remained relatively unchanged at 18.4 since 2016. Through prioritization of projects that promote transit use, biking, and walking, as well as changes in land use that shorten the distance people travel from

home to work and home to shopping, per capita VMT and thus per capita CO₂ emissions will continue to be reduced. This RTP prioritizes numerous projects that encourage walking, bicycling, and taking transit as an alternative to driving especially near major activity centers. Approximately 13% of the constrained RTP project list is designated for pedestrian and bicycling improvements and programs and approximately 37% is designated for transit services. See Chapter 6 for more details on projects that will help to advance this goal.

Figure 7.3 shows a downward trend with projected daily VMT per capita in 2020 that is reduced by 17% compared to the 2005 base year; this will far exceed the VMT/capita target of a 1% reduction by 2020 set in the previous version of the RTP. The VMT/capita targets of a reduction of 4% by 2030 and 10% by 2045 should be exceeded if the overall trend continues.

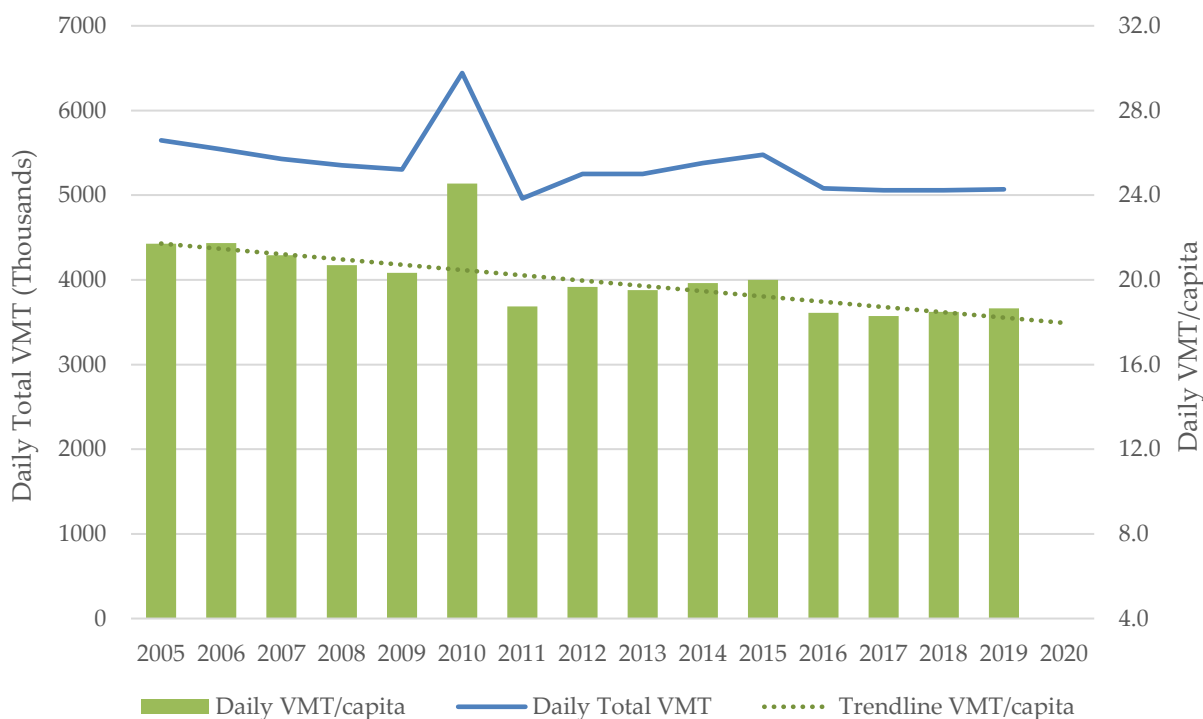


Figure 7.3 – Santa Cruz County Daily Vehicle Miles Traveled (Total and Per Capita)

Source: Highway Performance Monitoring System, Caltrans.

Data from 2010 was removed from trend line calculation due to likelihood of inaccurate count data used to determine VMT.

Target 1.B.2 – Reduce per capita greenhouse gas emissions by 50 percent by 2030 and by 78 percent by 2045 and total greenhouse gas emissions from transportation by 40 percent by 2030 and 70 percent by 2045³ (compared to 2005) through electric vehicle use, clean fuels, and other emerging technologies, reduction in vehicle miles traveled and improved speed consistency.

Climate change is the most significant global challenge of the 21st century. Reducing greenhouse gas emissions from all sectors in order to reduce the effects of climate change is a top priority for California.

Gasoline and diesel fuels used to power our cars are significant contributors to greenhouse gas emissions. Reducing these emissions is a goal of the 2045 RTP.

Data for assessing trends in greenhouse gas emissions from Santa Cruz County can be gathered from a couple of different sources. Figure 7.4 shows the total metric tons (MT) of CO₂ generated from gasoline and diesel fuel sales in Santa Cruz County from 2010 to 2019. [Note: the 2014 data point is likely not representative of fuel sales for this year given the low value compared to other years.] The total metric tons of CO₂ from transportation decreased nearly 11% between 2010 to 2019, likely to changes in vehicle miles traveled, speed consistency, population, and vehicle technology that affect the mix of vehicles on the road.

Figure 7.4 also shows a 14% decrease in CO₂ per capita from 2010 to 2019. The per capita percent reduction is greater than the reduction in total CO₂ due to an increase in population. Targets for reducing total greenhouse gasses reflect those set by the state. Based on fuel sale trends from 2010 to 2019 (excluding 2014 outlier data) and assuming similar population growth, the county is on track for a reduction of CO₂ emissions per day of 35% by 2030 and 55% by 2045 relative to a 2005 base year calculated from the trendline. Greater action is needed to achieve the targets of 40% reduction by 2030 and 70% by 2045.

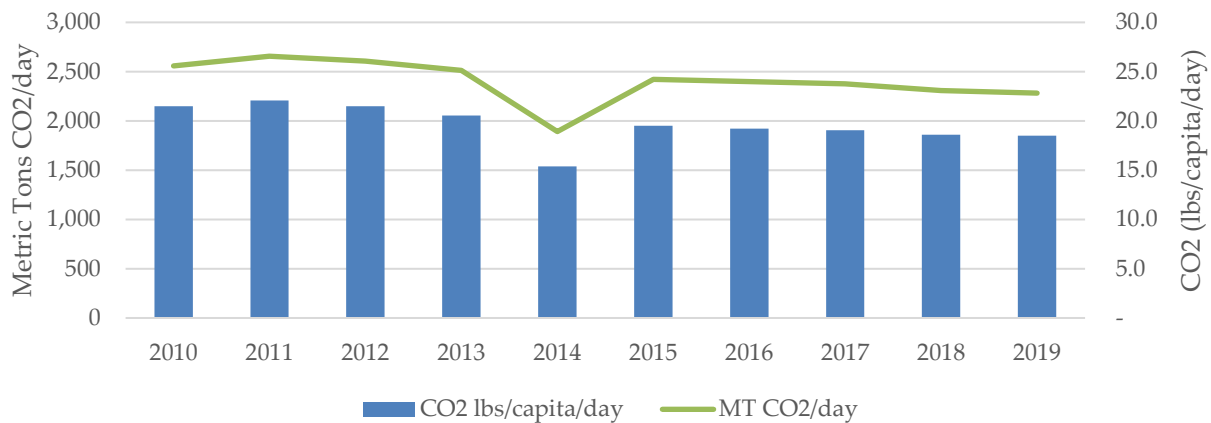


Figure 7.4 – Historic Santa Cruz County Greenhouse Gas Emissions from Transportation

Source: California Energy Commission, Annual Retail Fuel Outlet Report Results⁴

Figure 7.5 provides a comparison of the CO₂ per capita emissions in 2019 based on fuel sales data by county. Santa Cruz County is in the middle range of per capita GHG emissions relative to nearby counties. There is much to be done in Santa Cruz County and in the rest of California to meet the targets for total greenhouse gas emission reductions.

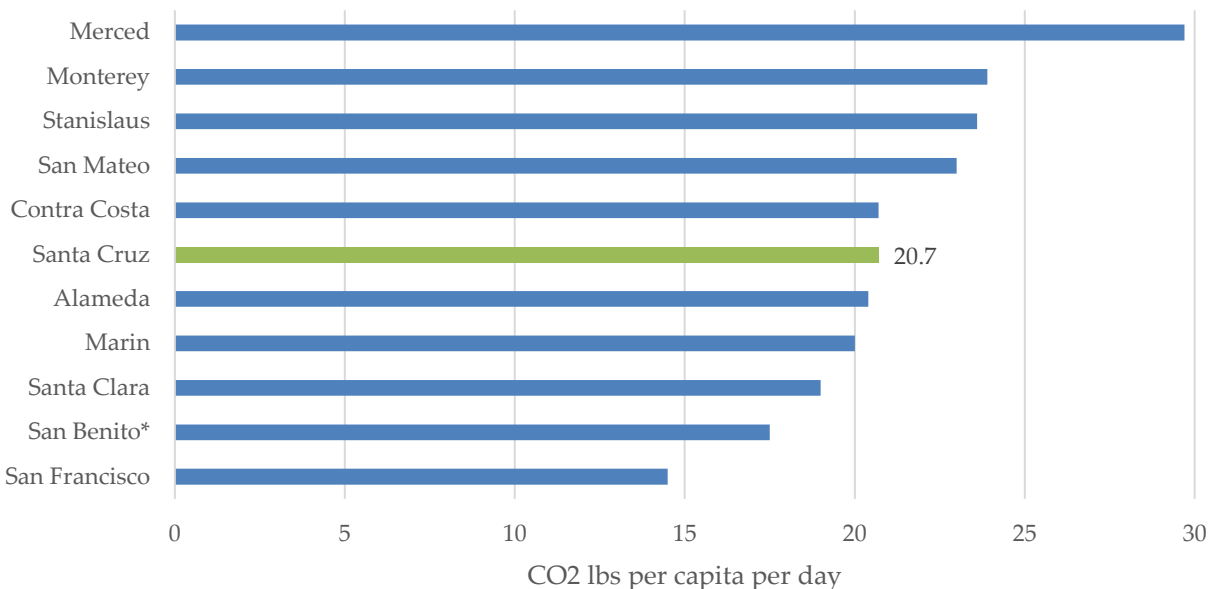


Figure 7.5 – 2019 CO₂ lbs per Capita per Day Based on Fuel Sales

Source: California Energy Commission, Transportation Fuels Data

*Diesel not included

Greenhouse gas emission reductions can also be estimated using a combination of a travel demand model and the California Air Resources Board emission factors model (EMFAC2014). The travel demand model estimates vehicle miles traveled based on future transportation scenarios and the emission factors model takes the VMT data along with existing and projected vehicle fleet mix data to estimate CO₂ emissions. The Association for Monterey Bay Area Governments (AMBAG) runs the travel demand model for the Santa Cruz, San Benito and Monterey Counties region. The AMBAG model is used for developing the Metropolitan Transportation Plan – Sustainable Communities Strategy which is developed in collaboration with the Santa Cruz County RTP (as well as the Monterey and San Benito RTPs). The greenhouse gas emission model results for the region can be found in the AMBAG 2045 Monterey Bay Area Metropolitan Transportation Plan – Sustainable Communities Strategy found on the AMBAG website (<https://www.ambag.org>).

Reduction in greenhouse gas emissions from transportation is based primarily on decreasing how much we drive and improvements in vehicle technologies that reduce the use of fossil fuels. This RTP prioritizes projects that promote transit use, biking and walking as an alternative to driving to reduce vehicle miles traveled as discussed above and in Chapter 6. Improvements in vehicle technology are not under the purview of the Regional Transportation Commission but are tracked here to provide information on how Santa Cruz County is advancing California’s GHG emission reduction goals for transportation.

In 2017, the California Air Resources Board updated the Climate Change Scoping Plan.⁵ This plan describes the existing and proposed strategies for reducing greenhouse gas emissions from all sectors including transportation. Strategies for transportation include reducing VMT through promotion of sustainable communities, increased active transportation and transit, and modernization of rail; implementing the advanced clean car program which requires vehicle manufacturers to produce an increasing number of low and zero emission vehicles; supporting federal and state incentive programs for increasing use of zero emission vehicles; and acceleration of clean fuel programs to name just a few of the

strategies that are being addressed at the state level. Governor Newsom's Executive Order N-79-20 has already directed the state to require that by 2035 all new cars and passenger trucks sold in California be zero-emission vehicles.

Target: Improve health and reduce greenhouse gas emissions

Target 1.D.1 – Decrease single occupancy commute trip mode share by 6.5 percent by 2030 and by 10 percent by 2045 (compared to 2020).

Target 1.D.2 – Increase the number of active commute trips to 16 percent of total commute trips by 2030 and to 24 percent of total commute trips by 2045.

Replacing trips traditionally made in a vehicle with walking, bicycling, or taking transit can lead to improved health through regular physical activity and reduced obesity rates. Increased walking, bicycling and taking transit can also reduce congestion on our roadways. Data is available for commute trip mode share from the American Community Survey (ACS). The mode share data from the ACS is presented in Figure 7.6 which shows that the percentage of drive alone trips has stayed essentially constant between 2000, 2011-2015, and 2015-2019, whereas the percentage of carpooling has decreased and the percentage of work from home have increased. Biking, walking and transit trips have not changed significantly. The 2045 RTP target to decrease single occupancy vehicle trip mode share by 6.5% by 2030 and increase active transportation trips to 16% of total commute trips by 2030 and to 24% of total commute trips by 2045 will likely not be met given this current trend.

While the network of bicycling and walking facilities throughout much of Santa Cruz County is substantial, improvements to this network could promote greater use. Separated or buffered bicycle facilities, wider bike lanes and lanes designed outside of the door zone of parked cars all encourage use of bicycles as a means of travel. Sidewalks exist in much of the more populated areas of Santa Cruz County but there are gaps, which limit access for people and are not always attractive due to little or no buffer between pedestrians and high volume traffic. The projects in this plan improve the quality of the active transportation network and thus will help to advance the goal of increasing the percentage of walk, bike and transit trips within key destinations by designing facilities that are safe, convenient and comfortable to the user.

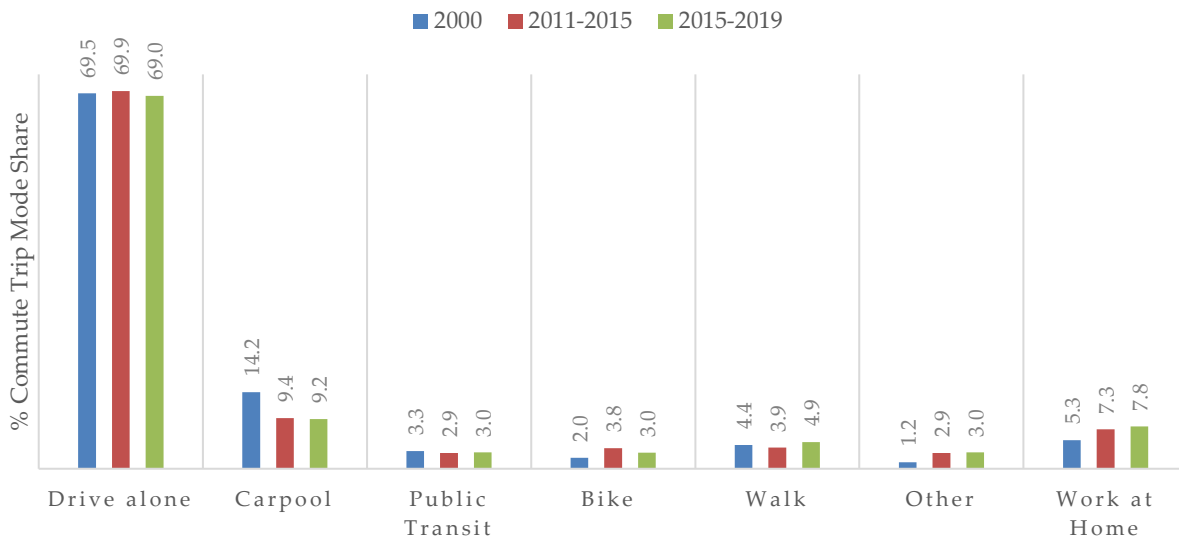


Figure 7.6 – Santa Cruz County Commute Trips Mode Share

Source: U.S. Census Transportation Planning Products, American Community Survey

Goal 2. Reduce transportation related fatalities and injuries

Target: Improve transportation safety, especially for the most vulnerable users.

Target 2.A.1 – Vision Zero: Eliminate traffic fatalities and serious injuries by 2045 for all modes. By 2030, reduce fatal and serious injuries by 50 percent (compared to 2020).

Improving the safety of transportation users, especially for the most vulnerable users, such as bicyclists and pedestrians, is a priority for Santa Cruz County as well as across California and the nation. The Statewide Integrated Traffic Records System (SWITRS) collision database tracks collision data that allows the RTC to monitor the number of collisions over time to assess how the investment of projects and programs are advancing this target. The collision data by mode is charted below. The data shows that the number of injury and fatal collisions for Santa Cruz County has increased for motor vehicles, bicyclists and pedestrians since the target base years of 2009-2011 (Figure 7.7). An increase in public awareness and a change in driving behavior will be needed in order to improve the safety of the transportation system in Santa Cruz County to reach the 2030 and 2045 targets of the 2045 RTP.

The State Highway Operation and Protection Program (SHOPP) projects which are implemented by Caltrans on Santa Cruz County Highways (1, 9, 17, 129, 152, and 236) focus on reducing collisions. Extra enforcement on Highway 17 through the Safe on 17 program, as well as separated or buffered bicycling and pedestrian facilities implemented by local jurisdictions have also been prioritized in this plan to improve safety. Educational programs such as “Vision Zero” implemented by the Community Traffic Safety Coalition are prioritized to promote driver awareness and changes in driving behavior. See Chapter 6 for more details on projects that will help to improve safety on Santa Cruz County roadways.

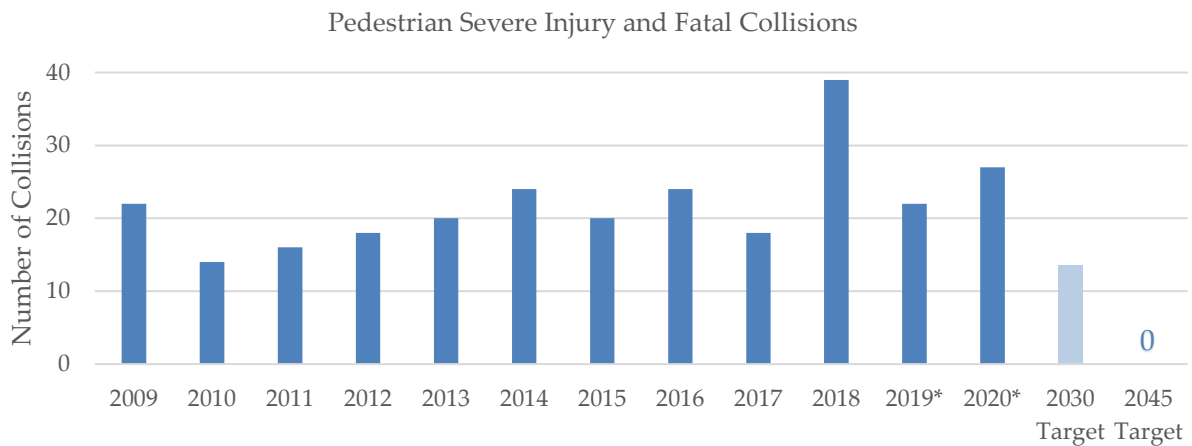
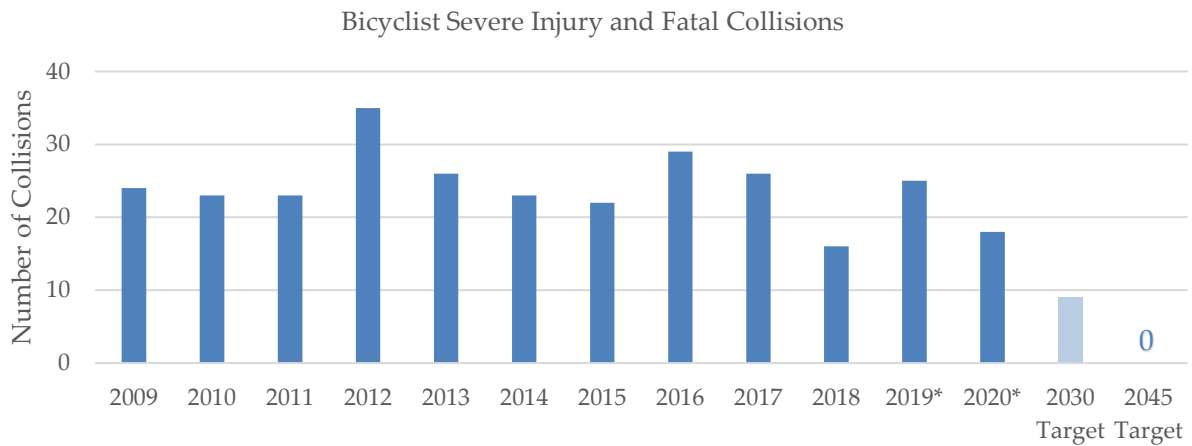
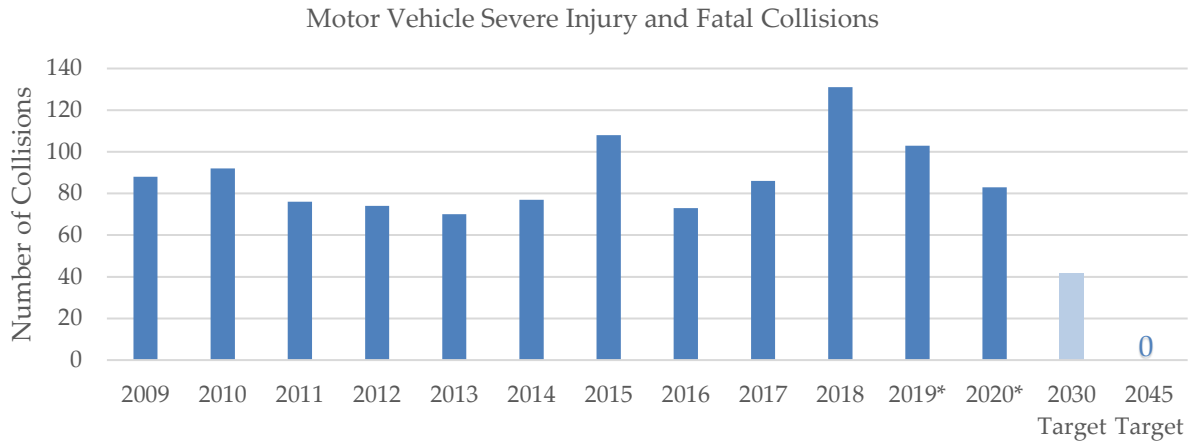


Figure 7.7 – Injury and Fatal Collisions – Motor Vehicle, Bicycle and Pedestrian

Source: Statewide Integrated Traffic Records System (SWITRS), California Highway Patrol available through the Transportation Injury Mapping System (TIMS), Safe Transportation Research and Education Center, University of California, Berkeley. *2019 and 2020 data is provisional

Goal 3. Deliver access and safety improvements cost effectively and equitably

Deliver access and safety improvements cost effectively, within available revenues, equitably and responsive to the needs of all users of the transportation system, and beneficially for the natural environment.

Target: Maintain the existing system and improve the condition of transportation facilities.

Target 3.A.1 – Increase the percentage of pavement in good condition to 50 percent by 2030 and 80 percent by 2045.

A key focus of this RTP is on preserving the existing transportation infrastructure. The “pavement condition index” or PCI is a measure of the average condition of the local street and road pavement on a scale of 0 to 100 where 0-24 is failed, 25-49 is poor, 50-69 is fair, and 70-100 is good. Figure 7.8 shows the trend in the pavement condition indices for the jurisdictions in Santa Cruz County starting in 2005. A comparison of the pavement condition index for Santa Cruz County relative to other counties in California is shown in Figure 7.9. The countywide PCI score as of 2020 is 55, with an increase of 5 points since 2016. Despite a “fair” PCI rating, the need for substantial investment in pavement maintenance remains. This plan invests in pavement repairs, sidewalk and bicycle lane maintenance, bus replacements, bus stops, and transit service vehicles that need upgrades and maintenance. Measure D and Senate Bill 1 funds will provide a significant source of funding for maintaining and improving the condition of transportation facilities in Santa Cruz County. Just under 30% of the constrained RTP project list is designated for roadway maintenance.

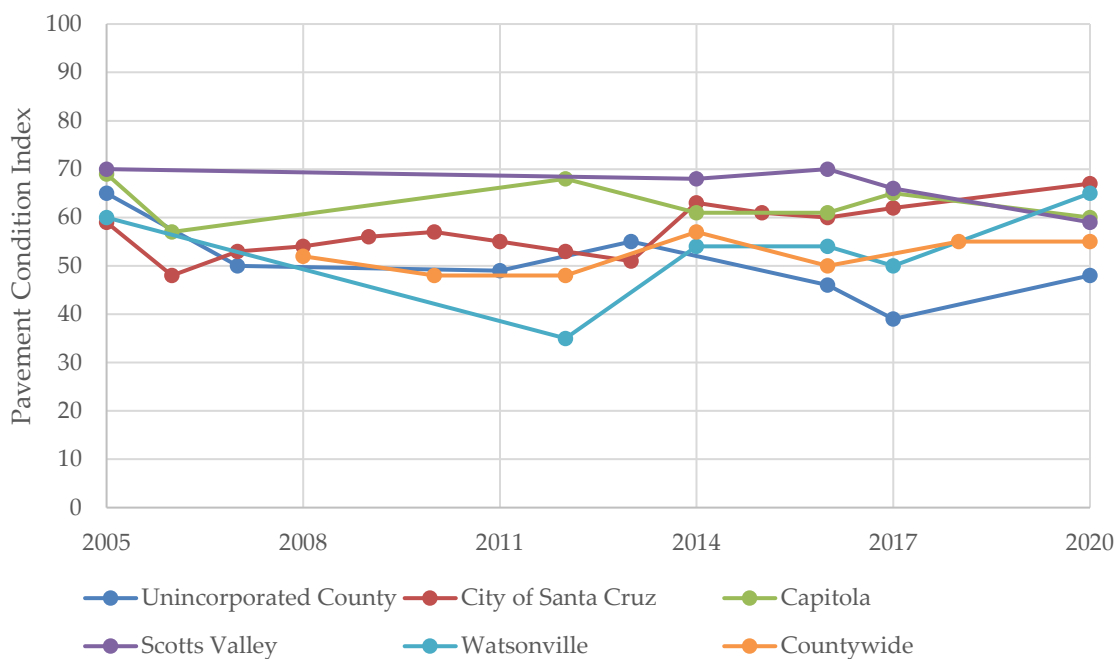


Figure 7.8 – 2005 to 2020 Pavement Condition Indices for Jurisdictions in Santa Cruz County

Source: Capitola, Unincorporated County, City of Santa Cruz, Scotts Valley, Watsonville, 2020 California Statewide Local Streets and Roads Needs Assessment⁶

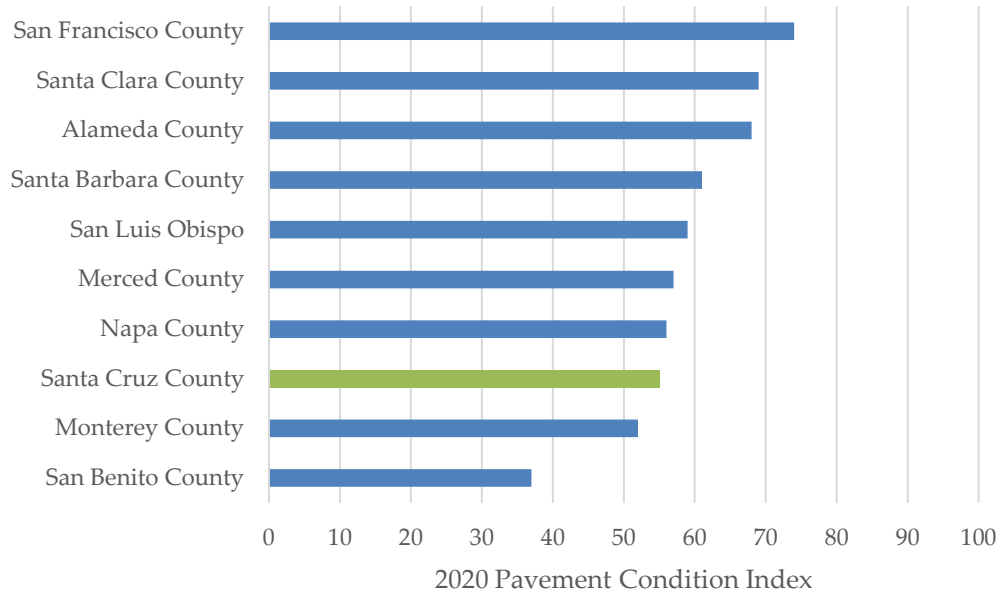


Figure 7.9 – Comparison of Santa Cruz County Pavement Condition Index with other California Counties

Source: 2020 California Statewide Local Streets and Roads Needs Assessment, Save California Streets

Target 3.A.2 – Reduce the number of transit vehicles in “distressed” condition to 20 percent to 2030 and 10 percent by 2045.

The condition of the transit system is one indicator of the level of “distressed” transportation facilities for Santa Cruz County. The Metro buses are in need of regular maintenance and/or replacement to ensure continued and cost-effective service. Figure 7.10 shows the condition of the Metro fixed-route buses from 2005 to 2020 with targets for 2030 and 2045. The number of distressed buses has decreased 62% in 2017 to 35% in 2020. The 2045 RTP prioritizes funding for 66% of the bus replacement need over the 23-year timeframe of this plan.

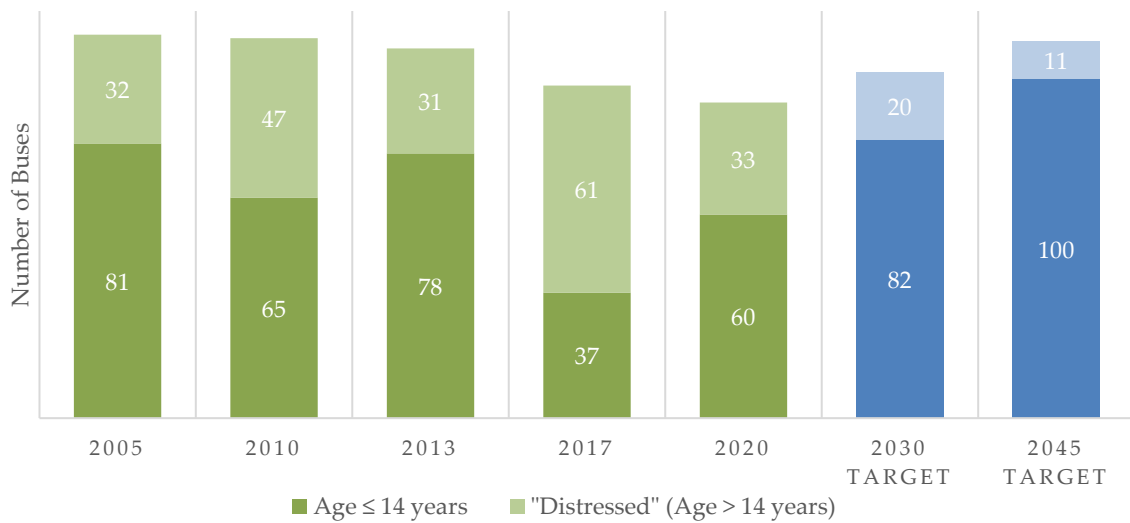


Figure 7.10 – Santa Cruz Metro Fixed-Route Bus Condition

Source: Santa Cruz Metropolitan Transit District

Target: Enhance healthy, safe access to key destinations for transportation-disadvantaged populations

Target 3.B.1 – Improve travel options for people who are transportation disadvantaged due to income, age, race, disability or limited English proficiency by increasing transit vehicle revenue miles (see Target 1.A.2.) and reducing transit travel times by 15 percent by 2030 and by 30 percent by 2045 (compared to 2020).

Bus travel time is a way to consider the quality of transit service available to residents of the county. Shorter travel times get people to where they need to go more quickly, respecting the value of everyone's time and potentially making a significant difference in their opportunities. Transit travel times were determined from the METRO bus schedules which are based on a realistic time for buses to travel the route. In Figure 7.11 the peak-time schedules of a select number of METRO bus routes, whose routing has been consistent for comparison purposes, were tracked over recent years. These routes also cover the most populous disadvantaged areas of the county. Fall of 2021 shows a positive change in travel times, however due to the lingering effects of the COVID-19 pandemic, much of the change is likely attributable to a temporary decrease in traffic congestion.

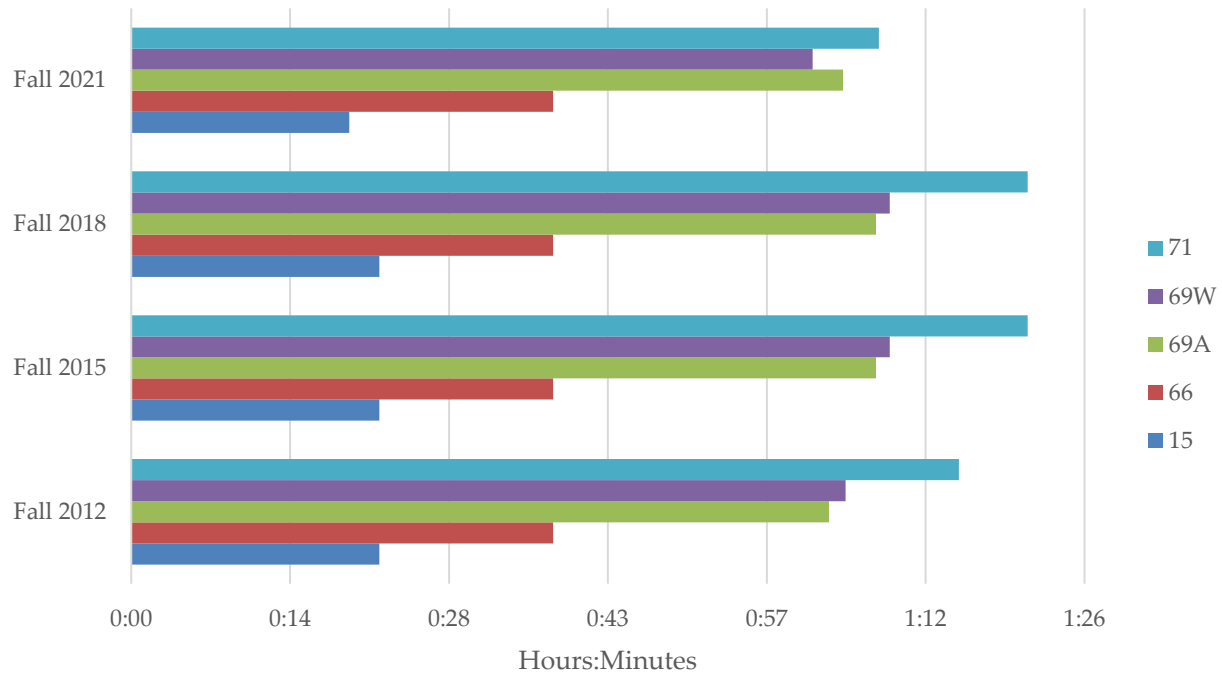


Figure 7.11 – Santa Cruz METRO Bus Travel Times

*Average run time for in- and outbound trips near peak morning (8:30am) and afternoon times (5:30pm).
Source: Santa Cruz Metropolitan Transit District*

The RTC in partnership with METRO are implementing a hybrid bus-on-shoulder/auxiliary lane operations on portions of Highway 1 to allow express buses to bypass some of the congestion on that freeway. The RTC and the County of Santa Cruz secured funding to implement the first bus-priority intersection signals in the county along a 5-mile portion of Soquel Drive in 2022/23. METRO is also currently working on a planning study to evaluate the primary transit corridors connecting Watsonville and Santa Cruz to identify opportunities for improving access and reliability.

Target: Increase transportation revenues.

Target 3.D. 1 – Increase the amount of transportation funding by 20 percent by 2030 (compared to 2020) from a combination of local, state, and federal funds.

After decades of state and federal underinvestment in the transportation system, a supermajority of Santa Cruz County voters approved Measure D in November 2016 which invests an additional \$20 million per year into the multimodal transportation system. In April 2017, the state legislature approved Senate Bill 1 (SB1) which helps stabilize transportation funding throughout the state. SB1 is expected to provide an additional \$9 million per year to the County of Santa Cruz and local cities to maintain local streets and roads, an extra \$3 million per year for local transit, and significant funding to maintain and repair state highways, bridges, and culverts.

Notes for Chapter 7

- ¹ The 2018 percentage of urban bikeway miles to urban arterials and collectors is 70 percent.
- ² The Transit Ridership Recipe, Jarrett Walker, <https://humantransit.org/basics/the-transit-ridership-recipe>
- ³ Target based on the California Executive Order B-16-12 to reduce greenhouse gas emissions from transportation by 80 percent below 1990 levels by 2050, and California Executive Order B-30-15 to reduce greenhouse gas emissions by 40 percent below 1990 levels by 2030.
- ⁴ CA Energy Commission, 2019 California Annual Retail Fuel Outlet Report Results, <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-retail-fuel-outlet-annual-reporting>
- ⁵ CA Air Resources Board, 2017 Climate Change Scoping Plan, The Strategy for Achieving California’s 2030 Greenhouse Gas Target, accessed November 2017 (<https://www.arb.ca.gov/cc/scopingplan/revised2017spu.pdf>)
- ⁶ “California Statewide Local Streets and Roads Needs Assessment, Save California Streets, August 2021. <https://www.savecaliforniastreet.org/wp-content/uploads/2021/09/Statewide-2020-Local-Streets-and-Roads-Needs-Assessment-Final-Report-August-2021.pdf>