

CONNECT SOCAL 2024

The 2024–2050 Regional Transportation Plan/Sustainable Communities Strategy
of the Southern California Association of Governments

Performance Monitoring

TECHNICAL REPORT

ADOPTED APRIL 4, 2024



Performance Monitoring

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1. EXECUTIVE SUMMARY

1.1 PERFORMANCE MONITORING OVERVIEW

Every four years, SCAG, as the regional Metropolitan Planning Organization (MPO), is required by federal law to prepare and update a long-range Regional Transportation Plan (RTP). The RTP provides a framework for the development and integrated management and operation of the transportation network and facilities that collectively function as the intermodal transportation system for the region. The setting of performance goals, outcomes, measures, and targets in support of the RTP, otherwise referred to as Connect SoCal 2024 or the Plan, serves to guide development of the Plan, its programs and investments, and implementation of its vision.

The setting of regional goals and the subsequent monitoring of performance toward achieving those goals is essential for ensuring the success of the Plan. As the MPO for a six-county region in Southern California with a population of nearly 19 million residents, SCAG is required to develop the RTP and the accompanying Sustainable Communities Strategy (SCS) to establish regional priorities for the coordination of land use and transportation planning efforts and for the allocation of resources needed to achieve the regional vision identified through the RTP/SCS. These resources most notably include the financial support available to fund much-needed regional transportation system improvements.

The performance monitoring of regional transportation system investments has always been an important means for evaluating progress being made toward meeting our regional goals and the efficiency of the various projects and policies that have been implemented to help achieve them. However, with limited funding available to support the maintenance and operation of our existing regional multimodal transportation system infrastructure, as well as to fund the numerous other projects and programs needed to help make our communities more sustainable and energy efficient, the role of performance monitoring in the regional planning process has become even more critical.

The objective of the Connect SoCal 2024 performance measures is to provide a quantitative mechanism to effectively link the regional goals identified in the Plan with actual performance at the implementation level, ensuring production of a performance-based plan relative to its development, implementation, and outcome. Performance monitoring is key to understanding which projects, programs, and strategies are proving successful in meeting specific regional goals and which ones may require modification or reconsideration. Ultimately, progress toward achieving SCAG's regional objectives is primarily made through implementation of the RTP/SCS at the local level. The implementation of a carefully calibrated monitoring program, able to provide a quantitative assessment of how our programs and strategies are performing toward achievement of the regional goals identified in Connect SoCal 2024, will serve to support future regional and local planning efforts and transportation system investment options.

As the SCAG Region continually evolves, so does our collective vision of what the region should look like, what its priorities should be, and what course should be set for its future. While the specific performance measures may change over subsequent RTP/SCS cycles, the fundamental objective of the SCAG Regional performance monitoring program of informing the task of guiding the region into the future, will remain.

The investments identified in Connect SoCal 2024 will result in significant benefits to the SCAG Region, not only for improved regional mobility and accessibility, but also to air quality, economic productivity and job creation, community sustainability, climate resilience, and equity. Once fully implemented, Connect SoCal

is expected to achieve specific performance outcomes reflective of these desired benefits. These performance outcomes, and the quantitative measures being used to assess regional progress toward achieving them, are the focus of this Technical Report.

The primary purpose of the Performance Monitoring Technical Report is to describe how the program of investments, programs, and strategies included in Connect SoCal 2024 are expected to benefit the SCAG Region. The report first presents the specific performance metrics that were used to evaluate the various planning scenarios employed in the development of the Plan. This report also presents the regional equity performance measures as featured in the Connect SoCal Equity Analysis Technical Report. Finally, the report describes the metrics that will be used to support the ongoing regional monitoring program to evaluate implementation of Connect SoCal over time. The Plan performance measures will be presented in tabular format, including a description of what is being measured and how the specific metrics relate to the regional goals defined in the Plan.

1.2 CONNECT SOCIAL 2024 PERFORMANCE SUMMARY

The plan performance assessment demonstrates that implementation of Connect SoCal 2024 will propel the region toward achievement of the identified goals for nearly every plan performance measure. An important function for developing these performance measures is to monitor how well the SCAG Region responds over time to the multimodal transportation system improvements and regional development strategies promoted through the Plan. The overall objective through the monitoring of these performance measures is to identify areas where we are experiencing success toward achieving our regional goals and to provide insight into where additional efforts or new strategies may be needed.

The performance of Connect SoCal 2024 yields substantial beneficial results for the SCAG Region over a wide range of measurable categories, all of which contribute meaningfully toward achieving our regional goals of improved mobility and accessibility, community sustainability, environmental preservation, economic productivity, transportation equity, improved public health and safety, and enhancement of the overall quality of life in Southern California.

The results of the Connect SoCal 2024 plan performance assessment are presented in TABLE 1. The table compares the Base Year performance data, which reflects existing regional conditions as reported in 2019, with the modeled results of the Connect SoCal plan performance measures for the Plan horizon year (2050) for the Baseline scenario (without implementation of the Plan), and for the Plan scenario (full implementation of the investments, programs, and strategies included in Connect SoCal). Each of the plan performance measures and results will be described in greater detail in Section 5 (Plan Assessment Measures) of this report.

Table 1. Connect SoCal 2024 Performance Assessment Results

Performance Measure	Category	Base Year (2019)	Baseline (2050)	Plan (2050)	Change*	
					Base Year to Plan	Baseline to Plan
Travel mode share (SOV)	Work Trips	68.4%	65.9%	61.9%	-6.5	-4.0
	All Trips	36.6%	37.0%	34.7%	-1.9	-2.3
Travel mode share (HOV)	Work Trips	23.1%	23.9%	21.7%	-1.4	-2.2
	All Trips	49.5%	48.7%	46.3%	-3.2	-2.4
Travel mode share (Transit)	Work Trips	3.4%	4.6%	7.9%	+4.5	+3.3
	All Trips	3.6%	3.9%	5.3%	+1.7	+1.4
Travel mode share (Walk)	Work Trips	3.5%	3.6%	4.3%	+0.8	+0.7
	All Trips	9.0%	8.8%	10.2%	+1.2	+1.4
Travel mode share (Bike)	Work Trips	1.6%	1.9%	4.1%	+2.5	+2.2
	All Trips	1.3%	1.6%	3.5%	+2.2	+1.9
Average trip distance (all modes)	Work Trips (miles)	16.6	16.2	15.9	-4.6%	-1.7%
	Non-Work Trips (miles)	6.1	6.1	6.1	0.0%	0.0%
Work trip distance distribution	Trip Length: 10 miles or less	44.6%	46.9%	47.6%	+3.0	+0.7
	Trip Length: 25 miles or less	78.4%	80.1%	80.7%	+2.3	+0.6
Percent of trips less than 3 miles	Work Trips	16.1%	16.5%	16.7%	+0.6	+0.2
	Non-Work Trips	43.0%	41.8%	41.8%	-1.2	0.0
Average Commute Travel Time	All Modes (minutes)	28.9	27.8	27.1	-6.2%	-2.5%
Percentage of trips less than 45 minutes by mode (PM peak period)	Transit	38.9%	38.6%	41.7%	+2.8	+3.1
	High Occupancy Vehicle (HOV)	77.0%	80.7%	84.4%	+7.4	+3.7
	Single Occupancy Vehicle (SOV)	75.7%	79.7%	85.3%	+9.6	+5.6
Vehicle Miles Traveled (VMT) per capita	Automobiles and light-duty trucks	22.0	20.7	19.4	-11.6%	-6.3%
Person delay per capita (minutes)	Automobiles and light-duty trucks	9.2	8.2	6.3	-31.8%	-23.8%

Performance Measure	Category	Base Year (2019)	Baseline (2050)	Plan (2050)	Change*	
					Base Year to Plan	Baseline to Plan
Person-hours of delay by facility type	Highway	1,384,644	1,266,283	1,024,863	-26.0%	-19.1%
	HOV	125,781	84,351	12,345	-90.2%	-85.4%
	Arterial	1,168,549	1,245,043	927,265	-20.6%	-25.5%
	All Facilities	2,885,906	2,868,470	2,184,952	-24.3%	-23.8%
Truck delay by facility type (hours)	Highway	100,873	140,249	119,137	+18.1%	-15.1%
	Arterial	21,974	28,457	22,621	+2.9%	-20.5%
	All Facilities	124,613	173,039	144,812	+16.2%	-16.3%
Transit boardings per capita	All Trips	36.6	47.2	77.5	+111.6%	+64.2%
Share of Housing Units in Priority Development Areas (PDAs)	Share of regional housing units in PDAs	59.1%	56.9%	61.1%	+2.0	+4.2
Share of Employment in Priority Development Areas (PDAs)	Share of regional employment in PDAs	64.8%	64.0%	64.7%	-0.1	+0.7
Access to Jobs	Auto (<30 mins travel time)	12.0%	12.2%	13.4%	+1.4	+1.2
	Transit (<45 mins travel time)	1.7%	1.8%	2.6%	+0.9	+0.8
Access to Major Destinations	Shopping (Auto <15 mins)	4.4%	4.2%	4.6%	+0.2	+0.4
	Shopping (Transit <30 mins)	0.3%	0.4%	0.6%	+0.3	+0.2
	Schools (Auto <30 mins)	11.6%	12.1%	13.4%	+1.8	+1.3
	Schools (Transit <30 mins)	0.2%	0.2%	0.4%	+0.2	+0.2
	Healthcare (Auto <30 mins)	17.6%	16.7%	18.4%	+0.8	+1.7
	Healthcare (Transit <30 mins)	0.3%	0.3%	0.5%	+0.2	+0.2
Access to Parks	Auto (<30 mins travel time)	99.8%	99.6%	99.6%	-0.2	0.0
	Transit (<30 mins travel time)	57.2%	57.6%	62.1%	+4.9	+4.5

* Changes in percent values are expressed in percentage points; changes in numerical values are expressed in percentage.

Source: SCAG 2024

1.2.1 CONNECT SOCAL 2024 REGIONAL CO-BENEFITS

In addition to achievement of the specific regional objectives defined in the Plan, the implementation of the program of projects, programs, and strategies of Connect SoCal 2024 will also provide a substantial array of ‘co-benefits’ to the SCAG Region. Co-benefits include the advantageous impacts provided by implementation of the Plan’s regional policies and strategies that are supplemental to the primary performance focus of Connect SoCal. Many of these benefits relate to household and commercial cost savings related to improved efficiencies in energy and water consumption. In addition, the program of investments and strategies provided through the Plan will collectively serve to reduce costs associated with the maintenance and expansion of urban infrastructure due to the focusing of new housing and employment into designated Priority Development Areas (PDAs). Reductions in household transportation costs may also be expected as commute distances between residential areas and employment centers are reduced and alternative modes of transportation become more viable travel options relative to the single occupancy vehicle.

TABLE 2 provides an overview of some of the co-benefits that are expected to be generated through full implementation of Connect SoCal 2024. As indicated in the table, the transportation system investments and land use strategies presented in the Plan produce very clear and positive results relative to making progress toward achieving the regional environmental sustainability and community livability goals of the SCAG Region.

Table 2. Connect SoCal 2024 Co-Benefits

Benefit Category	Comparative Benefit Performance			
	Baseline	Connect SoCal	Savings	Change
Local Infrastructure and Services Costs: Capital, operations, and maintenance costs to support new growth: 2020-2050	\$38.1 billion	\$35.3 billion	\$2.8 billion	-7.5%
Household Costs: Annual transportation and home energy/water use: 2050	\$12,891	\$12,165	\$726	-5.6%
Land Consumption: New (greenfield) land consumed to accommodate new urban growth: 2020-2050 (square miles)	79.3	41.8	37.4	-47.2%
Share of Population Residing within Priority Development Areas (PDAs)	57.1%	60.4%	3.3% higher share	+3.3 pct pts
Building Energy Use: Residential and commercial buildings: 2020-2050 (BTU)	25,888 trillion	25,626 trillion	262 trillion	-1.0%
Building Energy Costs: Residential and commercial buildings: 2020-2050	\$775.4 billion	\$768.7 billion	\$6.7 billion	-0.9%
Building Water Use: Residential and commercial buildings: 2020-2050 (acre feet)	90.3 million	90.0 million	0.3 million	-0.4%
Building Water Costs: Residential and commercial buildings: 2020-2050	\$99.5 billion	\$99.2 billion	\$361.0 million	-0.4%

Source: SCAG 2024

2. INTRODUCTION

2.1 CONNECT SOCIAL 2024 PERFORMANCE GOALS

The goals established for Connect SoCal 2024 provide a foundation for setting a vision for how the future of the SCAG Region will evolve over the next 25 years. The plan performance assessment process provides an important means for determining how well the program of investments included in Connect SoCal correspond to its foundational goals and to its vision for the future of the SCAG Region.

As part of the development of Connect SoCal 2024, a set of four high-level goals were established, as presented in TABLE 3. Each of the four Connect SoCal goals are supported by three sub-goals which provide more specific objectives within that specific focus area. The plan performance measures are designed to support achievement of these regional goals and sub-goals, with many of the measures supporting multiple Plan goals.

Table 3. Connect SoCal 2024 Goals

Category	Goal	Sub-Goals
Mobility	Build and maintain an integrated multimodal transportation network.	Support investments and programs that are well-maintained and operated, coordinated, and resilient, and result in improved safety and air quality.
		Ensure reliable, accessible, affordable, and quality travel options while striving to enhance equity in transportation resources offered in underserved communities.
		Plan for people of all ages, abilities, and backgrounds.
Communities	Develop, connect, and sustain communities that are livable and thriving.	Reinforce vibrant, human-centered communities in urban, suburban, and rural settings to increase mobility options and reduce travel distances.
		Produce and preserve a diversity of housing types to improve affordability, accessibility, and choices for all.
		Foster inclusive communities free from barriers that restrict access to opportunity, and actively seek to reduce racial and economic disparities.
Environment	Create a healthy region for the people of today and tomorrow.	Develop communities that are resilient and can mitigate, adapt to, and respond to chronic and acute stressors and disruptions, such as climate change.
		Integrate the region’s development pattern and transportation network to improve air quality, reduce greenhouse gas emissions, and enable more sustainable use of energy and water.
		Conserve and restore the region’s natural and agricultural resources.
Economy	Support a sustainable, efficient, and productive regional economic environment that provides opportunities for all.	Provide physical and digital infrastructure to improve access to education, vocational training, jobs, financial systems, and foster the growth of small business in underserved communities.
		Advance a resilient and efficient goods movement system that supports the economic vitality of the region, attainment of clean air, and quality of life for our communities.
		Improve regional multimodal transportation system infrastructure and efficiency to enhance the region’s global economic competitiveness.

2.2 CONNECT SOCAL 2024 PERFORMANCE MEASURES

Since 1998, SCAG has incorporated performance measurement in its RTP development. In the 2004 RTP, SCAG developed a set of measurable goals and performance outcomes based on the principle of sustainability, including the environment and transportation land-use connection. It holds important implications to the region's critical system preservation needs. Connect SoCal 2024 builds on the goals established in previous RTP cycles, reflecting the ever-evolving needs and priorities of the SCAG Region. This section of the report describes outcomes relative to the RTP/SCS, and how they are used to establish specific performance measures.

In 2012, transportation performance monitoring became a federal mandate through the 'Moving Ahead for Progress in the 21st Century' (MAP-21) authorization. This commitment to a national performance management and reporting system was furthered with the passage of the subsequent federal transportation authorization package (the 'FAST Act') in 2015 and, more recently, the Infrastructure Investment and Jobs Act (IIJA) in 2021. SCAG has been actively developing and using performance metrics long before MAP-21 became law, starting with the 1998 RTP, which used quantitative performance measures to evaluate its capabilities to achieve the Plan's regional goals.

California Senate Bill 375 (SB 375), the 'Sustainable Communities and Climate Protection Act of 2008', provided a statewide plan of action for addressing the challenges presented by climate change. The ambitious greenhouse gas (GHG) emission reduction goals and associated sustainability planning requirements introduced by SB 375 served to further fortify SCAG's already firm commitment to the monitoring of regional performance relative to GHG emission reduction and community sustainability objectives, as well as to strengthening the coordination of transportation and land use planning throughout our region.

For Connect SoCal 2024, SCAG focused on building upon previous successes by refining and enhancing the plan performance measures to ensure they continue to meet the region's evolving policy priorities. In the summer of 2022, the initial draft set of plan performance measures was presented to SCAG's various policy committees. With input from the committees, SCAG developed a final set of quantitative metrics to assess the performance of Connect SoCal relative to the regional goals and objectives defined in the Plan.

The Connect SoCal plan performance assessment measures are used to assess our efforts to strengthen regional land use and transportation planning connections, thereby enhancing the physical health of our region's residents while also reducing GHG emissions and ameliorating the consequential effects of climate change. The set of performance measures used to evaluate Connect SoCal 2024 are presented in TABLE 4.

The results of the plan performance assessment process are presented in TABLE 1 in the Executive Summary of this report.

Table 4. Connect SoCal 2024 Plan Performance Assessment Measures

Performance Measure	Connect SoCal Goal Area	Description
Access to Jobs*	Mobility	Share of regional jobs accessible within 30 minutes travel time by automobile and within 45 minutes by transit during peak travel periods.
Major Destination Accessibility*	Mobility	Share of major destinations (shopping, schools, and healthcare) accessible within specified travel times by automobile and by transit during peak travel periods.
Average Commute Trip Distance	Mobility	Average distance traveled for work trips, including the share of trips ten miles or less and 25 miles or less.
Travel Mode Share	Mobility	Share of total work trips and all trips by travel mode: SOV, HOV, transit, walk, and bike.
Person Hours of Delay by Facility Type	Mobility	Excess travel time resulting from the difference between a reference speed and actual speed (mixed flow, HOV, and arterials).
Person-Delay per capita	Mobility	Daily minutes of travel time delay experienced per capita due to traffic congestion.
Truck Delay by Facility Type	Mobility	Excess heavy duty truck travel time based on difference between reference speed and actual speed (highways/arterials).
Average Travel Time	Mobility	Average travel time (work and non-work trips) by mode: single occupancy vehicle (SOV), high-occupancy vehicle (HOV), walk, bike, and transit.
Travel Time Distribution by Mode	Mobility	Travel time distribution by mode: single occupancy vehicle (SOV), high-occupancy vehicle (HOV), and transit.
Transit Boardings per capita	Mobility	Number of annual transit boardings per capita.
Percent of Trips Less than 3 Miles	Communities	Share of work and non-work trips less than three miles in length.
Share of Housing Units in Priority Development Areas (PDAs)	Communities	Percent of total regional housing units located within PDAs.
Physical Activity-Related Public Health	Communities	Public health outcomes related to lack of physical activity.
Air Pollution-Related Public Health	Communities	Public health incidences and costs related to air pollution.

Performance Measure	Connect SoCal Goal Area	Description
Park Accessibility**	Communities	Share of park acreage reachable within 30 minutes by auto and 30 minutes by transit.
Vehicle Miles Traveled (VMT) per capita	Environment	Daily vehicle miles traveled (VMT) per capita.
Greenhouse Gas (GHG) Emissions	Environment	Percent reduction in GHG emissions per capita (from 2005 levels).
Land Conversion to Urban Purposes	Environment	Total square miles of greenfield and rural lands consumed to accommodate new housing. and employment.
Criteria Air Pollutant Emissions	Environment	ROG, CO, NOx, PM10, and PM2.5 emissions (tons per day).
Energy Consumption	Environment	Energy (electricity, natural gas, vehicle fuel) consumption per household.
Water Consumption	Environment	Urban water consumption per household.
New Jobs Added Due to Transportation System Investments	Economy	Number of new jobs added to regional economy directly related to the Plan’s transportation system investments.
New Jobs Added Due to Improved Regional Economic Competitiveness	Economy	Number of new jobs added to the regional economy due to improved transportation system conditions.
Share of Employment in Priority Development Areas (PDAs)	Economy	Percent of total regional employment located within PDAs.
Transportation System Investment Benefit/Cost Ratio	Economy	Ratio of monetized user and social benefits to transportation system investment costs.

*Access to jobs and to major destinations is measured by the percentage of regional locations accessible within a travel time threshold.

**Park accessibility is measured by the percent of population that may reach a park within 30 minutes by automobile and by transit.

2.3 EQUITY AND ENVIRONMENTAL JUSTICE

Equity is a regional priority focus area integrated throughout Connect SoCal 2024. Along with overall performance of the Plan, the SCAG Regional performance monitoring program evaluates the distribution of regional transportation investments to determine how improvements and potential burdens impact communities. SCAG seeks to ensure that Connect SoCal reflects the diverse array of voices, needs, and aspirations of all communities within the region, particularly those that have historically been marginalized and underserved.

The comprehensive equity analysis conducted for Connect SoCal 2024 includes a specific focus on environmental justice (EJ), a federal and state mandate, defined in Executive Order 14096 as the “the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability”. In recent developments with federal mandates on equity, the Biden Administration's Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities*, directs federal agencies to address barriers faced by underserved communities. Executive Order 14008, known as the ‘Justice 40 Initiative’, directs 40 percent of federal investments related to a wide range of environmental program areas including climate change, clean energy, affordable and sustainable housing, pollution remediation, and clean water and wastewater infrastructure, to communities that have historically been marginalized, underserved, or disproportionately burdened by environmental pollution. For more information on the federal and state regulatory framework for equity and environmental justice, see Section 3 of the Equity Analysis Technical Report.

SCAG's Regional Council adopted a resolution affirming systemic racism as a human rights and public health crisis, acknowledging resulting disparities in health, socioeconomic factors, and the environment in Southern California. In line with the shift toward a more comprehensive equity focus from one based exclusively on environmental justice at a federal and regional level, SCAG conducts a comprehensive equity analysis of the Plan to evaluate the potential impacts of the implementation of the Plan on communities, including both protected populations, as defined by federal regulation, and priority communities identified by SCAG and regional stakeholders. SCAG developed specific performance measures to assess and track regional progress toward reducing transportation-related disparities and promoting equity in underserved communities throughout the region, including the reporting of disaggregated performance information by race, ethnicity, and other demographic factors.

While equity and EJ comprise a significant element of the Connect SoCal 2024 performance monitoring program, its scope necessitates a separate Technical Report to present its findings adequately. TABLE 5 presents the equity performance measures used to evaluate regional performance on matters of social equity and disproportionate impacts.

The full results of the Connect SoCal 2024 regional equity analysis are detailed in the Equity Analysis Technical Report.

Table 5. Connect SoCal 2024 Equity Performance Measures

Performance Measure	Connect SoCal Goal Area	Definition
Share of Transportation System Usage	Mobility	Comparison of transportation system usage by mode for low income and minority households relative to each group's regional population share.
Travel Time and Travel Distance Savings	Mobility	Change in distance and hours traveled by all transit, local transit, and auto modes by race, ethnicity, and income quintile.
Access to Everyday Destinations	Mobility	Number of jobs, retail establishments, and schools reachable within 15 and 30 minutes by automobile, and within 15 and 45 minutes by transit during the morning peak period, plus 0.5-, 0.75-, and 1-mile walksheds, and 1-, 3-, and 5-mile bike sheds; Number of healthcare facilities accessible within 15 and 30 minutes by automobile and 15 and 45 minutes by transit during mid-day period, plus 0.5- 0.75-, and 1-mile walksheds and 1-, 3-, and 5-mile bike sheds; Percentage of population able to reach a park within 15 and 30 minutes by automobile and 15 and 30 minutes by transit during the mid-day period, plus 0.5- 0.75-, and 1-mile walksheds and 1-, 3-, and 5-mile bike sheds.
Bicycle and Pedestrian Collisions	Mobility	Percent of the regional bicycle/pedestrian High Injury Networks (HIN) located within Priority Equity Communities; safety projects on the bicycle/pedestrian HIN.
Jobs-Housing Imbalance	Communities	Comparison of median earnings for intra-county vs inter-county commuters by county; analysis of relative housing affordability and jobs throughout the region.
Neighborhood Change and Displacement	Communities	Examination of demographic changes, eviction filings, and households threatened with eviction within gentrifying neighborhoods.
Rail-related Impacts	Communities	Demographic analysis for areas proximal to rail corridors, planned grade separations, and railyards.
Emissions Impact Analysis	Environment	Examination of plan-related change in air pollutant emissions in the region and in Priority Equity Communities, with focus on demographics of areas proximal to freeways and highly traveled corridors.
Noise Impacts	Environment	Qualitative assessment of disproportionate impacts of roadway and aviation noise and the policies, programs, and plans to address project-level impacts.

Performance Measure	Connect SoCal Goal Area	Definition
Resilience and Climate Vulnerabilities	Environment	Assessment of overlay of Priority Equity Communities and Climate Risk Areas, including flood hazard zones, sea level rise, wildfire risk, landslide hazard areas, extreme heat, drought, and earthquake hazard zones.
Revenue Sources in Terms of Tax Burdens	Economy	Proportion of Connect SoCal revenue sources (taxable sales, income, and gasoline taxes) generated from low-income households and people of color.
Investments vs. Benefits	Economy	Analysis of Connect SoCal investments by income quintile and race/ethnicity.
Geographic Distribution of Transportation Investments	Economy	Evaluation of Connect SoCal transit, roadway, and active transportation infrastructure investments in various communities throughout the region.
Impacts from Mileage-Based User Fees	Economy	Examination of potential impacts from implementation of a mileage-based user fee on low-income households and people of color in the region.

2.4 ONGOING REGIONAL PERFORMANCE MONITORING

Connect SoCal 2024 uses two types of performance measures to monitor progress toward achieving our regional goals. The plan performance assessment measures, presented in TABLE 4, rely on modeled data to evaluate the performance of the Plan, if implemented. The second type of measure provides the basis for the monitoring of regional performance toward achievement of Plan goals over time. The ongoing performance monitoring measures are based on observed data and are not forecast or modeled. Some of the plan assessment measures, such as VMT per capita and travel mode share, are also used as ongoing measures but are based on different types of data.

TABLE 6 presents the performance measures used for the ongoing monitoring of the SCAG Regional transportation system. These measures will be discussed in greater detail later in this report, with performance results presented where data is available.

Table 6. Connect SoCal 2024 Ongoing Monitoring Performance Measures

Performance Measure	Connect SoCal Goal Area	Description
Average Travel Time	Mobility	Average travel time for work trips by travel mode (SOV, HOV, walk, bike, and transit).
Commute Travel Mode Share	Mobility	Percentage of total work trips by travel mode (SOV, HOV, active transportation, transit, and work from home).
Percent of Reliable Person-Miles Traveled on the NHS	Mobility	Share of total person miles traveled on Interstate and non-interstate NHS roadways providing reliable travel times compared to expected times.
Active Transportation Mode Share	Mobility	Share of trips that use bicycle or pedestrian travel mode.
Annual Hours of Peak Hour Excessive Delay per capita	Mobility	Total annual hours of delay experienced per capita during peak travel periods.
Managed Lanes Utilization	Mobility	High-occupancy toll (HOT) and high occupancy vehicle (HOV) lane utilization.
Local Roads Pavement Condition	Mobility	Local roads pavement condition.
National Highway System (NHS) Bridge Condition	Mobility	Share of total regional NHS bridge deck area in 'Good' and in 'Poor' condition
National Highway System (NHS) Pavement Condition	Mobility	Share of total regional NHS pavement lane miles in 'Good' and in 'Poor' condition.
Number and Rate of Collision-Related Fatalities	Mobility	Total annual number and rate of motor vehicle collision-related fatalities.
Number and Rate of Collision-Related Serious Injuries	Mobility	Total annual number and rate of motor vehicle collision-related serious injuries.
Number of Active Transportation Fatalities and Serious Injuries	Mobility	Total annual number of collision-related bicycle and pedestrian fatalities and serious injuries.
Transit Equipment, Rolling Stock, Infrastructure, and Facility Condition	Mobility	Assessment of regional transit system equipment, rolling stock, infrastructure, and facility condition.
Transit Boardings per capita	Mobility	Number of annual transit boardings per capita.

Performance Measure	Connect SoCal Goal Area	Description
Transit Seat Utilization	Mobility	Transit seat capacity utilization during peak demand hour (available seats for all transit types).
Transit System Fatalities, Injuries, Safety Events, and System Reliability	Mobility	Total annual number of transit system fatalities, injuries, and safety events.
Accessory Dwelling Unit (ADU) Development	Communities	Number of ADU units developed within Priority Development Areas (PDAs).
Housing Cost Burden	Communities	Share of median household income expended on housing costs.
Housing Vulnerable to Environmental Impacts	Communities	Percent of housing units constructed in environmental hazard areas (including wildland-urban interface areas).
Asthma Incidence	Communities	Share of adult population (18 years+) who have ever been diagnosed with asthma.
Percent of Residents within 1/2 mile Walk to Open Space	Communities	Share of residents living within 1/2 mile walk to parks or open space.
Number of Park Acres per 1,000 Residents	Communities	Number of acres of parks (local, regional, and beach parks) for every 1,000 residents.
Households Located Near High-Volume Roadways	Communities	Share of regional households located within 500 feet of a freeway or other high-volume roadway.
Vehicle Miles Traveled (VMT) per capita	Environment	Annual VMT generated per capita in the SCAG Region.
Percent of Population in Climate Risk Areas	Environment	Share of regional population living in flood hazard, wildfire risk, sea level rise, and extreme heat areas.
Urban Heat Island Reduction Strategies	Environment	Strategies implemented to reduce urban heat island impacts through development of urban tree canopy.
Air Quality by Air Basin	Environment	Existing air quality condition in the various SCAG Region air basins.
Habitat Connectivity Investments	Environment	Total value of regional investments to enhance habitat connectivity and safety.
Nature-based Mitigation Programs	Environment	Number of regional nature adaptation strategies and programs.

Performance Measure	Connect SoCal Goal Area	Description
Williamson Act Contract Acres Impacted	Environment	Percent of Williamson Act contract acreage impacted by urban growth or transportation projects.
Unemployment Rate	Economy	Percentage of labor force not employed.
Employment	Economy	Total number of regional jobs.
Share of Interstate Mileage Providing Reliable Truck Travel Time	Economy	Share of total Interstate System mileage that produce dependable truck travel times as compared to expected travel times.

2.5 OTHER CONNECT SOCAL 2024 PERFORMANCE RESOURCES

While the Performance Monitoring Technical Report focuses on the specific performance metrics used to guide the development of Connect SoCal 2024 and to monitor its implementation over time, other information related to specific topical areas is provided in the applicable Technical Report.

Connect SoCal 2024 includes a total of 15 Technical Reports. While each of these reports focuses on a specific topical area, many provide important regional performance information that is used to supplement the information provided here. For example, infrastructure investment metrics, such as the percentage of total funding invested in transit and non-motorized transportation, are addressed as part of the investment allocation descriptions in the Transportation Finance Technical Report. As discussed in the previous section, SCAG's Environmental Justice program, associated performance measures, and detailed analyses are presented in detail in the Equity Analysis Technical Report.

Because the performance metrics discussed in this report are intended to evaluate the performance of Connect SoCal over a wide range of regional planning outcomes, the scope of this Technical Report is, by necessity, limited to an overview of these very complex and substantive focal areas. The extensive set of Technical Reports that support Connect SoCal 2024 provides detailed information regarding several of the planning topics discussed in this report, including Technical Reports specific to 'Mobility', 'Demographics and Growth Forecast', 'Economic Impact Analysis', and 'Transportation Conformity Analysis'.

The Connect SoCal 2024 performance measures are designed to evaluate the integrated performance of the comprehensive set of regional investments and strategies included in the Plan. The specific projects associated with Connect SoCal are identified in the Project List Technical Report.

3. REGULATORY FRAMEWORK

3.1 STATEWIDE PERFORMANCE REPORTING REQUIREMENTS

In addition to monitoring the performance of Connect SoCal 2024 relative to the specific regional goals defined in the Plan, the SCAG Regional performance monitoring program also includes measures mandated at the statewide and federal levels.

California Senate Bill 375 (SB 375), the 'Sustainable Communities and Climate Protection Act of 2008', provided a ground-breaking statewide initiative establishing targets to reduce greenhouse gas (GHG) emissions and respond to the effects of climate change. SB 375 required the California Air Resources Board (CARB) to establish specific GHG emission reduction targets for each region in the state. The targets are relative to the GHG emissions generated in 2005. The SCAG Region's per capita GHG emission reduction targets are eight percent by 2020 and 19 percent by 2035.

SB 375 required MPOs throughout the state to develop a 'Sustainable Communities Strategy' (SCS) every four years to be included in their RTP. In 2012 SCAG produced its first SCS as part of the 2012 RTP/SCS. The SCS integrates transportation and land use planning in the region along with a set of strategies intended to reduce GHG emissions.

The success of the SCS is dependent upon implementation at the local level, and SCAG responded to this challenge by revising the structure of the Connect SoCal 2024 performance monitoring program and introducing several new measures focused on GHG reduction for evaluating the performance of various alternative scenarios, including existing conditions, Plan (build) and Plan (no-build) during development of the RTP/SCS, and for assessing the ongoing effectiveness of the implementation of the Plan over the intervening years. SCAG is firmly committed to reducing GHG emissions in our region, and more generally, to improving the sustainability and health of Southern California communities.

In preparation for the release of the draft Connect SoCal 2024, CARB conducted a preliminary review of the draft Technical Methodology developed by SCAG to quantify and assess the regional GHG emission reductions anticipated through implementation of the Plan's Sustainable Communities Strategy (SCS). Through this review process, CARB identified several issues that require further clarification to inform its final determination on whether the SCS achieves the SCAG Regional GHG emission reduction targets. In response to the feedback provided by CARB, SCAG will continue to explore opportunities to assess long-term impacts of induced travel demand on GHG emissions and will continue to coordinate with Caltrans on the assessment of travel demand elasticities related to transportation improvement projects. SCAG will also continue to explore opportunities to facilitate the integration of land use and travel demand models.

One comment provided by CARB was specifically related to the performance-based planning process used by SCAG in the development of Connect SoCal 2024 to focus on seeking opportunities to facilitate the prioritization of regional transportation system improvement projects that best align with the SCS to ensure achievement of regional GHG reduction targets.

While Connect SoCal does prioritize projects that advance the SCS, the Plan also has other regional goals that must be addressed through the project selection process, including transportation safety and goods movement. To facilitate resolution of this issue, SCAG is currently developing a new project selection strategy that emphasizes implementation of the performance-based planning process promoted through Connect SoCal 2024 to focus on the achievement of regional GHG reduction targets.

3.2 THE FEDERAL PERFORMANCE MANAGEMENT PROGRAM

Transportation system performance management at the federal level was introduced in July 2012, with passage of the 'Moving Ahead for Progress in the 21st Century' (MAP-21) transportation authorization legislation. MAP-21 was widely heralded as a significant achievement in that it provided a legislative foundation for the establishment of a national performance-based transportation planning program, which was continued with the subsequent federal authorization program, the 'Fixing America's Surface Transportation' (FAST) Act in 2015, and, more recently, with the enactment of the 'Infrastructure Investment and Jobs Act' (IIJA) in November 2022.

MAP-21 tasked FHWA to establish a uniform set of national transportation performance measures that correspond to several designated federal transportation planning goals, and to develop a standardized performance reporting protocol based on four-year cycles to be administered through State DOTs in collaboration with MPOs. MAP-21 included a requirement that MPOs incorporate a comprehensive 'System Performance Report' within every update of its Metropolitan Transportation Plan. The System Performance Report provides detailed information regarding the federal performance measures and the corresponding sets of quantitative targets adopted at both the state and regional levels. The performance targets are used to assess progress being made relative to each of the national transportation planning performance management areas and associated measures.

3.3 FEDERAL PERFORMANCE TARGETS

The federal transportation performance management program requires the setting of statewide and regional targets for each of the established national performance measures established under MAP-21 including transportation safety (PM 1), transportation system infrastructure condition (PM 2), and transportation system reliability and performance (PM 3). Performance measures are also established for transit asset management and for transit system safety. The federal performance targets must be updated every four years for all but the PM 1 safety measures, which are updated each calendar year.

A full description of the various federal performance measures, current targets, and a comprehensive report of progress that has been made toward achievement of the targets is provided in the Federal System Performance Report in Section 7 of this Technical Report.

4. ANALYTICAL APPROACH

4.1 PLAN ASSESSMENT

Comprehensive regional performance monitoring provides a critical foundation for the development and continuous refinement of SCAG's planning priorities, helping to ensure that our region stays on track toward achieving the ambitious goals outlined in Connect SoCal 2024. Performance monitoring is used to assess the trajectory of how we are evolving as a region and what efforts will be needed to get us to where we aspire to be. The monitoring process involves establishing regional goals and objectives toward attaining the future envisioned by the Plan. Regional performance monitoring includes setting targets and milestones to evaluate progress within a timely manner. It also serves to identify emerging trends in the region that may need to be accounted for in our interim planning activities as well as to inform development of the next RTP/SCS.

SCAG utilizes an integrated analytical and modeling framework to develop regional growth projections, travel forecasts, and emissions estimates to support development of Connect SoCal 2024. Three SCAG models are of specific relevance to the regional performance monitoring program. The Regional Travel Demand Model (TDM) is a trip-based model that is capable of forecasting travel mode choice and the travel impacts based on various sets of regional planning assumptions and scenarios. The Activity-Based Model (ABM) simulates daily activities and travel patterns of individuals in the SCAG Region as affected by changes in the regional transportation system. The outputs generated by the ABM facilitate a comparison of past trends with prospective future performance.

The Scenario Planning Model (SPM) is a web-based land use sketch planning tool used for scenario development and performance modeling. The SPM provides estimates of the potential regional benefits accrued through implementation of various alternative transportation and land use planning assumptions and strategies. Each of these three SCAG models provides input that is used in the plan performance assessment process.

The Connect SoCal 2024 plan assessment process includes three distinct sets of planning elements: the Base Year, and the Baseline and Plan scenarios. The two 2050 modeling scenarios (Baseline and Plan) assess the performance of the SCAG Region relative to each of the Plan performance measures. This process provides insight into how well the comprehensive program of investments and strategies included in Connect SoCal will serve to advance the achievement of the regional goals identified in the Plan. The results of the plan assessment modeling process were presented in TABLE 1 in the Executive Summary of this report.

- The '**Base Year**' represents the existing conditions of the regional transportation system as it operated in the year 2019. Typically, the Base Year reflects existing conditions during the adoption year of the previous RTP/SCS. However, 2019 was selected as the Base Year for the Connect SoCal 2024 plan analysis because regional transportation system performance during 2020, the previous Connect SoCal adoption year, was anomalously impacted by onset of the COVID-19 pandemic. Therefore, 2019 featured the most recently available transportation system performance data that was not influenced by pandemic related travel patterns.
- The '**Baseline**' scenario represents the projected future (2050) regional transportation system that will result from the continuation of current programs, including projects currently under construction or undergoing right-of-way acquisition, transportation plans and projects programmed and committed to in the 2023 Federal Transportation Improvement Program (FTIP), and/or transportation projects that have already received environmental clearance.

- The **'Plan'** scenario represents future regional transportation system conditions projected in 2050 provided the Plan is fully implemented.

To evaluate the performance of the Plan under each of the modeled scenarios, empirical performance data is compiled for the Base Year (2019). Base Year data is used as the benchmark for comparing projected performance in future years both with and without implementation of Connect SoCal. Data for the Base Year is compiled for each of the plan assessment performance measures using various publicly available data sources as indicated in the applicable tables provided at the beginning of this report. SCAG then develops varying sets of regional planning assumptions to model future year performance projections for those same measures. For Connect SoCal 2024, the future year projections are developed for the plan horizon year of 2050.

The Baseline scenario assumes that the region continues along its current trajectory of development, without the intervention of the transportation system improvement investments planned in Connect SoCal 2024. Comparing the Baseline projections with the Base Year performance data shows how the SCAG Regional transportation system will perform in 2050 relative to how it functioned in 2019 without the program of projects included in the Plan. SCAG then models the performance of the regional multimodal transportation system for those same performance metrics under the assumption that all the regional programs, projects and strategies included in the Plan are fully implemented. This set of results is referred to as the 'Plan' or 'Connect SoCal' scenario.

Comparing the performance results of the Plan scenario with the Baseline scenario reveals the impact of Connect SoCal 2024 investments on the performance of the regional transportation system in 2050. Likewise, comparison of the Base Year performance data with the Plan scenario modeling results provides insight as to how the SCAG Regional transportation system will perform in 2050 relative to how it functioned in 2019.

4.2 ONGOING MONITORING

To ensure that progress is being made over time toward achievement of Connect SoCal 2024 regional goals and objectives, SCAG conducts an ongoing comprehensive regional performance monitoring process throughout the duration of the Plan. The ongoing monitoring process seeks to identify performance areas demonstrating progress and areas that may require further efforts based on observed data over time. The performance measures utilized for the ongoing monitoring of Connect SoCal are expected to show positive momentum toward achieving desired regional performance outcomes.

SCAG actively seeks opportunities to enhance monitoring capabilities for Connect SoCal 2024 programs and policies through the acquisition of newly available data resources and the development of advanced analytical tools. This includes leveraging emerging technologies that utilize real-time and dynamically updated datasets, enabling the deployment of web-based interactive tools to provide timely reporting of current and historical regional performance information.

SCAG's ongoing regional performance monitoring program provides valuable feedback on how effectively the investments, programs, and strategies included in the Plan are serving to improve the region's quality of life. Taking advantage of opportunities provided through emergent technologies and newly available data resources enhances the precision and timeliness of the regional performance information generated through the SCAG ongoing regional performance monitoring process.

5. PLAN ASSESSMENT MEASURES

5.1 PLAN PERFORMANCE GOALS AND OUTCOMES

TABLE 3, presented at the beginning of this report, featured the Connect SoCal 2024 goals defined to guide development of the Plan. These four high-level regional goals were also used to define the specific performance measures to assess the performance of the Plan. Since the Plan goals are intentionally broad in scope and inclusive of a wide range of desired regional performance objectives, it is helpful to establish subcategories for each of the goals, referred to in this report as performance outcomes, as a means for more effectively linking the broadly defined Plan goals to the more specifically focused performance measures.

This section describes the measures used for the Connect SoCal performance assessment process. Since plan assessment is focused on the projection of regional performance into future years relative to varying sets of planning assumptions, the plan assessment performance measures are based on output provided by the SCAG Regional Travel Demand Model and Scenario Planning Model. The plan assessment metrics are presented in this report in relation to the four high-level Connect SoCal 2024 regional goal areas: Mobility, Communities, Environment, and Economy.

5.2 CONNECT SOCAL 2024 GOAL AREA 1: MOBILITY

The Connect SoCal 2024 'Mobility' goal area is defined by the building, maintenance, and operation of a robust and integrated multimodal transportation network in the SCAG Region. Monitoring mobility performance provides a comprehensive assessment of how our regional transportation investments are improving the movement of people and goods throughout the region. For performance monitoring purposes, the Connect SoCal 'Mobility' goal area has been categorized into four distinct performance outcomes: Accessibility, Infrastructure, Safety, and Transit. The performance measures established for the Plan assessment process focus on two of these mobility outcomes: Accessibility and Transit.

5.2.1 MOBILITY OUTCOME 1: ACCESSIBILITY

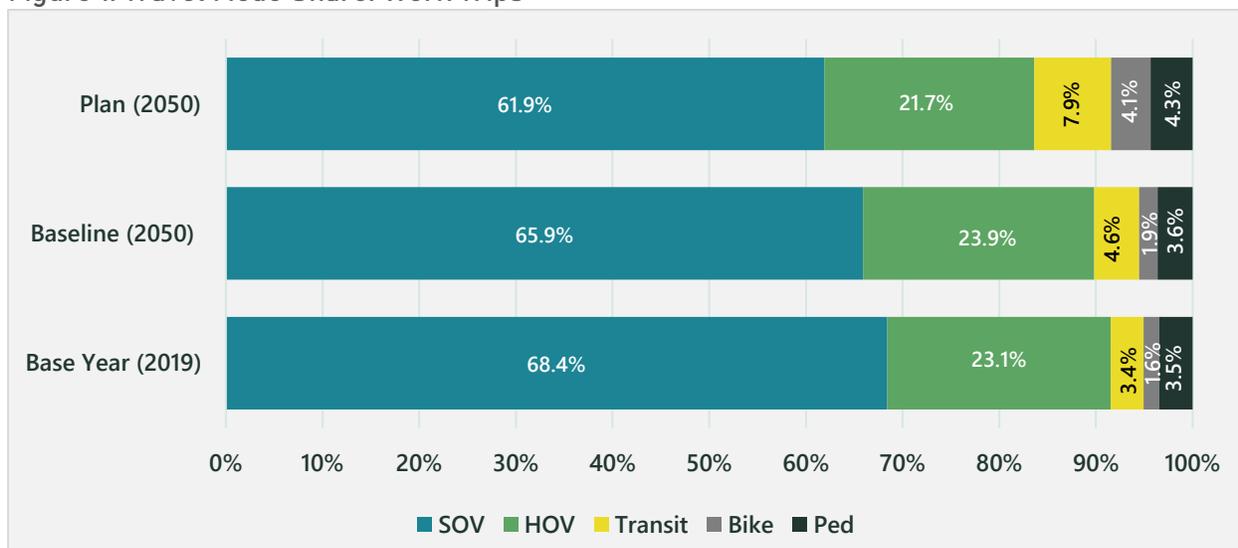
The 'Accessibility' outcome category refers to the ability of people to reach desired destinations with relative ease, with minimal obstacles or barriers, and within a reasonable amount of time using reasonably available transportation choices. Nine of the 25 performance measures used in the Connect SoCal 2024 plan assessment process specifically support the 'Accessibility' outcome. The metrics used to assess the Plan's mobility performance relative to accessibility are presented below.

TRAVEL MODE SHARE

Travel Mode Share refers to the share of total work trips and all trips taken in the SCAG Region by travel mode, including automobile, transit, non-motorized (bicycle and pedestrian), and other. The objective of the Travel Mode Share measure is to increase non-motorized and transit modes relative to automobile use at the regional level.

FIGURE 1 compares work trip mode share performance for the three Connect SoCal 2024 plan assessment scenarios: Base Year, Baseline, and Plan. The chart reveals that with the implementation of the Plan, mode shares for non-motorized and transit will increase by 2050 relative to the 2019 Base Year and the 2050 Baseline scenario. With implementation of the Plan, the single occupancy vehicle (SOV) commute mode share will decrease by four percentage points relative to the Baseline scenario (from 65.9 percent to 61.9 percent), and by 6.5 points compared to 2019 (68.4 percent).

Figure 1. Travel Mode Share: Work Trips

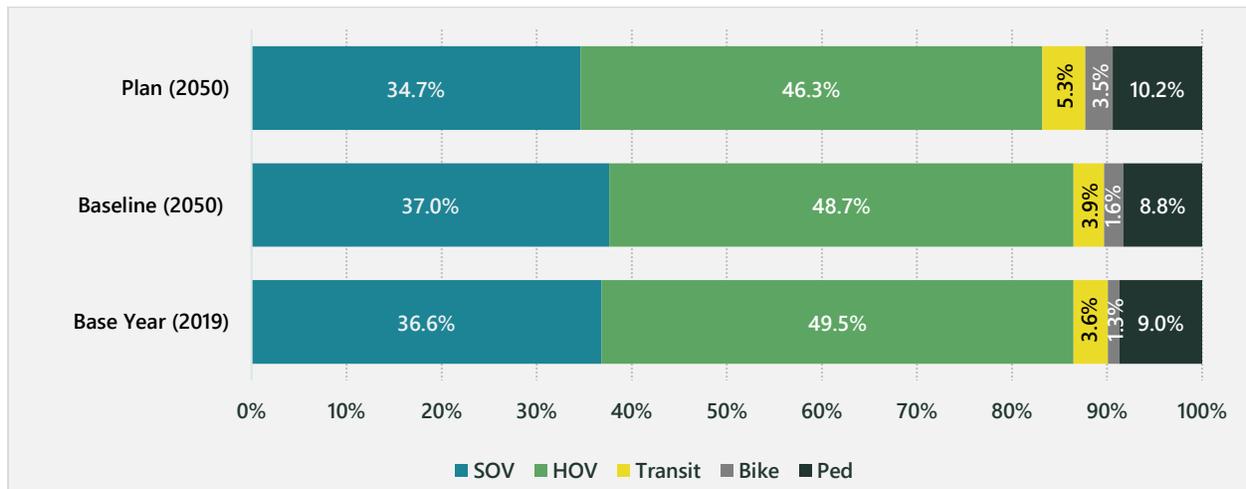


Source: SCAG 2024

FIGURE 2 presents the mode share performance for all trips. While SOV travel is the predominant travel mode choice for work trips in the SCAG Region, when considering all trip types, high occupancy vehicle (HOV) travel, or carpooling, is the preferred mode for a plurality of travelers in the region.

Once again, for all trip types, implementation of the Plan will serve to increase mode shares for non-motorized and transit travel options by 2050 relative to the 2019 Base Year and the 2050 Baseline. Under the Plan, SOV mode share for all trips will decrease by 2.3 percentage points relative to the Baseline (from 37.0 to 34.7 percent).

Figure 2. Travel Mode Share (All Trips)

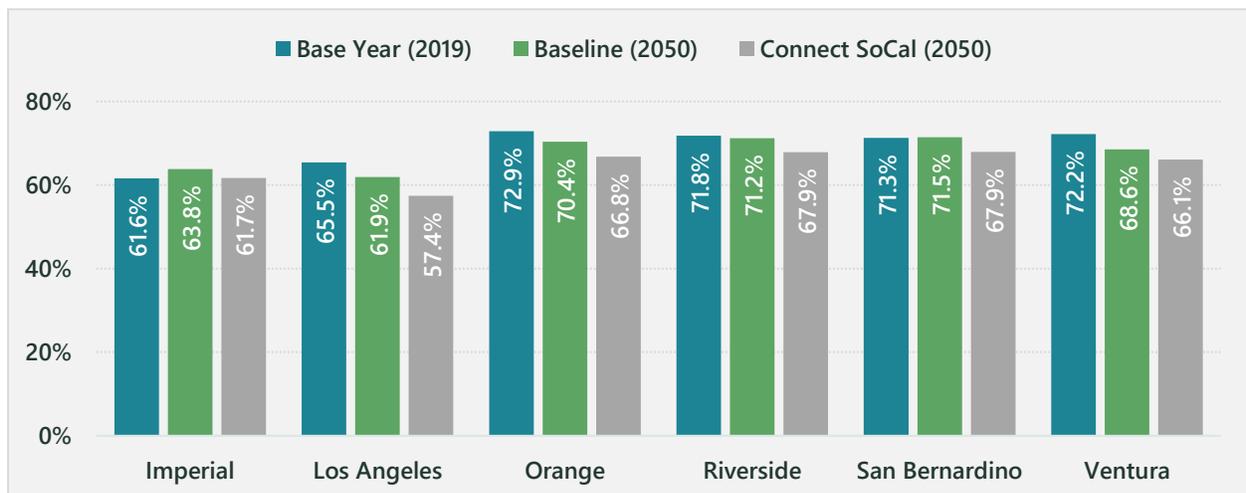


Source: SCAG 2024

One of the primary objectives of Connect SoCal 2024 is to improve the viability of alternative modes of travel to driving alone in an automobile. Reducing dependency on SOV travel provides multiple regional benefits including reduced GHG emissions, better air quality, and reduced traffic congestion. A reduction in SOV mode share indicates more people are opting for transit, carpooling, or active transportation travel modes.

FIGURE 3 compares SOV mode share for work trips for each county in the SCAG Region. Implementation of Connect SoCal 2024 will result in reduced SOV mode share by 2050 in all six of the counties, with Los Angeles County showing the greatest reduction relative to the Baseline performance (-4.5 percentage points), followed by San Bernardino County (-3.6), Orange County (-3.5), Riverside County (-3.4), Ventura County (-2.5), and Imperial County (-2.1).

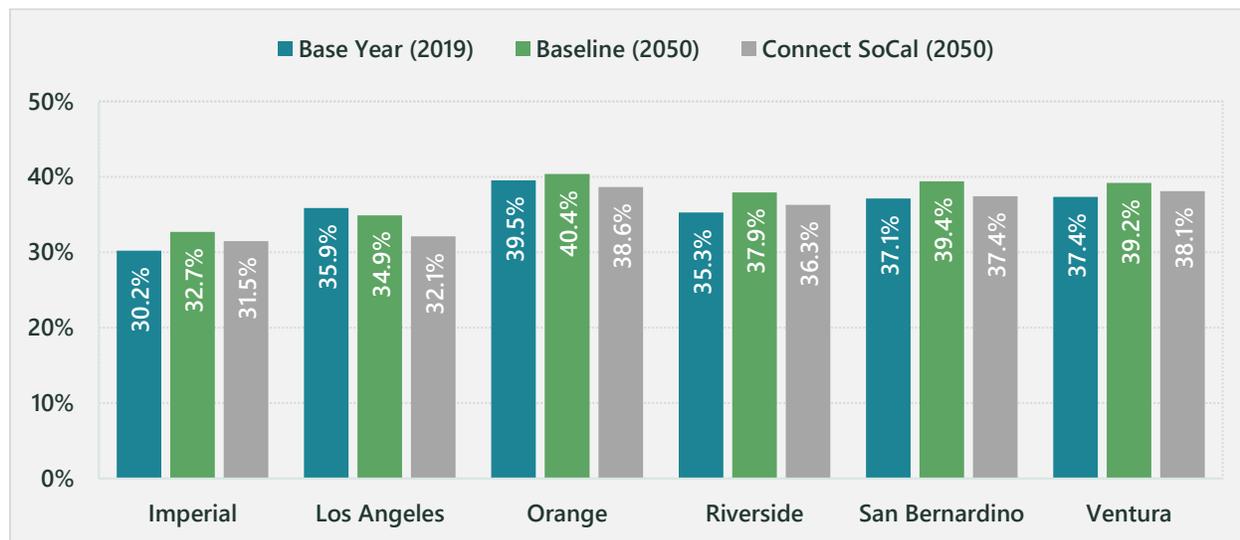
Figure 3. SOV Mode Share (Work Trips)



Source: SCAG 2024

FIGURE 4 features SOV mode share for all trips by county. SOV mode share for all trips will be reduced by 2050 for each county relative to Baseline projections. Of the six counties, Los Angeles will experience the most significant reduction (-2.8 percentage points), followed by San Bernardino (-2.0 points), Orange (-1.8), Riverside (-1.6), Imperial (-1.2), and Ventura (-1.1).

Figure 4. SOV Mode Share (All Trips)



Source: SCAG 2024

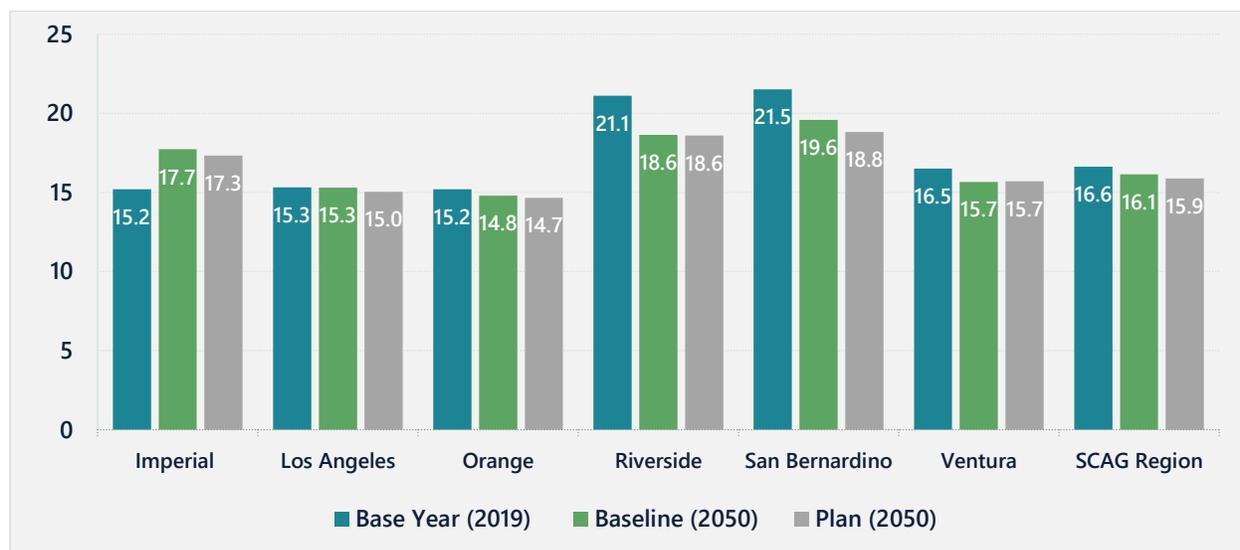
SCAG conducted an off-model analysis to account for additional variables that impact active transportation mode share, including Safe Routes to Schools, first and last-mile improvements, pedestrian infrastructure, bike share, and other micro-mobility investments. The off-model active transportation analysis results are presented in the Active Transportation section of the Connect SoCal 2024 Mobility Technical Report.

AVERAGE TRIP DISTANCE

Average Trip Distance refers to the average distance traveled for work and non-work trips. This measure also reports the share of commute distances that are ten miles or less and 25 miles or less. Assessment of average trip distance allows SCAG to determine how implementing the investments of Connect SoCal 2024 will reduce trip lengths in the region.

FIGURE 5 shows the comparison average commute distance performance for the various Connect SoCal plan assessment scenarios. By 2050, the average travel distance for work trips in the SCAG Region is projected to decrease from 16.1 miles under the Baseline to 15.9 miles under the Plan. For comparison, the average commute travel distance in 2019 was 16.6 miles, a reduction of 4.6 percent. These results indicate that the region is already trending toward reduced travel distances and Connect SoCal 2024 will serve to fortify that momentum moving forward to 2050.

Figure 5. Average Commute Trip Distance (miles)



Source: SCAG 2024

While the average work trip travel distance in the SCAG Region is projected to decrease from 16.6 miles in 2019 to 15.9 miles in 2050 with implementation of Connect SoCal 2024, there is variation among the individual counties. Only Imperial County is projected to experience an increase in projected average commute travel distance in 2050 relative to 2019, from 15.2 to 17.3 miles. This may reflect an increased number of Imperial County residents commuting to urban areas of the SCAG Region and neighboring San Diego County.

The most prominent travel distance reductions are projected for the Inland Empire counties of San Bernardino and Riverside, with anticipated average commute distance reductions of 2.7 miles (-12.5 percent) and 2.5 miles (-11.9 percent), respectively. Commute travel distance in Ventura County will be reduced by 4.9 percent, while Orange County is expected to experience a 3.5 percent reduction. A more modest reduction in average commute travel distance is anticipated for Los Angeles County, at 1.9 percent.

FIGURE 6 presents average travel distance projections for non-work trips. With implementation of Connect SoCal 2024, the average travel distance for non-work trips in the SCAG Region is expected to remain steady at about 6.1 miles for each of the three assessment scenarios (Base Year, Baseline, and Plan). There is minimal variation among most of the counties for average non-work trip distance, with each at about six miles. The exception is Imperial County, where the average non-work travel distance hovers just under four miles.

Non-work trips are typically significantly shorter than commute trips and are also more likely to include multiple passengers, and therefore their impact on regional air quality, traffic congestion, and GHG emissions is not as salient as that for work trips. However, providing viable, safe, and convenient alternatives to single-occupant automobile travel for all trip types will serve to improve overall quality of life in the SCAG Region.

Figure 6. Average Non-Work Trip Distance (miles)



Source: SCAG 2024

TABLE 7 features the distribution of projected commute travel distances in 2050 with and without implementation of Connect SoCal 2024. Based on the data provided in the table, 47.6 percent of total work trips in the SCAG Region are projected to be less than ten miles in length by 2050 under the Plan, and 80.7 percent of work trips will be less than 25 miles. Under the Baseline, 46.9 percent of commute trips will be ten miles or less (0.7 percentage points fewer than with the Plan), and 80.1 percent will be under 25 miles (0.6 percentage points lower than with the Plan). By comparison, in 2019, 44.6 percent of work trips were less than ten miles in length, and 78.4 percent of trips were less than 25 miles.

This data further supports the efficacy of Connect SoCal 2024 in reducing commute travel distances in the region, as the share of work trips under ten miles will increase by 3.3 percentage points (from 44.3 percent to 47.6 percent), while the share of trips under 25 miles will increase by 2.5 percentage points (from 78.2 percent to 80.7 percent), relative to 2019 conditions.

Table 7. Work Trip Length Distribution: 2050

Distance (miles)	Baseline		Connect SoCal	
	Trips	Share	Trips	Share
0 to <5	3,287,553	23.4%	3,379,252	24.0%
5 to <10	3,307,656	23.5%	3,311,167	23.6%
10 to <15	2,261,589	16.1%	2,242,282	15.9%
15 to <20	1,414,208	10.1%	1,421,562	10.1%
20 to <25	979,012	7.0%	987,543	7.0%
25 to <30	695,564	5.0%	694,318	4.9%
30 to <35	518,031	3.7%	509,830	3.6%
35 to <40	400,873	2.9%	386,993	2.8%

Distance (miles)	Baseline		Connect SoCal	
	Trips	Share	Trips	Share
40 to <45	308,271	2.2%	297,701	2.1%
45 to <50	238,738	1.7%	228,008	1.6%
50 to <55	175,476	1.2%	167,589	1.2%
55 to <60	127,478	0.9%	117,087	0.8%
60 to <65	89,992	0.6%	80,883	0.6%
65 to <70	62,742	0.4%	56,778	0.4%
70 to <75	42,304	0.3%	40,132	0.3%
75 to <80	28,795	0.2%	28,355	0.2%
80 to <85	21,109	0.2%	20,829	0.1%
85 to <90	15,928	0.1%	15,685	0.1%
90 to <95	12,114	0.1%	12,708	0.1%
95 to <100	9,927	0.1%	10,547	0.1%
100+	52,028	0.4%	53,465	0.4%
Total Trips	14,049,318	100.0%	14,062,714	100.0%

Source: SCAG 2024

TABLE 8 provides a summary distribution of commute travel distances for the SCAG Region aggregated into five distance ranges. As indicated in the table, 47.6 percent of work trips will be ten miles or less in 2050 with Connect SoCal 2024, as compared to 46.9 percent under the Baseline projection. Regional improvement in commute distance is even more significant when comparing 2050 performance under the Plan with the Base Year, as only 44.6 percent of regional work trips were ten miles or less in 2019.

These results confirm the effectiveness of Connect SoCal 2020 in reducing regional commute distances, a performance trajectory that will continue with implementation of Connect SoCal 2024.

Table 8. SCAG Region Commute Distance Summary

Travel Distance	Base Year (2019)	Baseline (2050)	Plan (2050)	Change	
				Base Year to Plan	Baseline to Plan
<10 miles	44.6%	46.9%	47.6%	+3.0 ppt	+0.7 ppt
<20 miles	70.7%	73.1%	73.6%	+2.9 ppt	+0.5 ppt
<30 miles	84.0%	85.0%	85.6%	+1.6 ppt	+0.6 ppt
<40 miles	91.3%	91.6%	92.0%	+0.7 ppt	+0.4 ppt
<50 miles	95.6%	95.5%	95.7%	+0.1 ppt	+0.2 ppt

Source: SCAG 2024

AVERAGE TRAVEL TIME

A primary objective of Connect SoCal 2024 and the SCAG Sustainable Communities Strategy (SCS) is to reduce the amount of time required to reach primary destinations. Reductions in average travel times may effectively indicate improved coordination between transportation and land use planning as residential development in the region is focused closer to major employment centers and other primary destinations. Shorter average travel times may also indicate improved accessibility performance as a reflection of less congested traffic conditions and reduced cost burdens associated with travel. The Average Travel Time performance measure assesses travel time for both work and non-work trips by various travel modes including SOV, HOV, walking, biking, and transit.

FIGURE 7 compares average commute travel time performance for each of the Connect SoCal planning scenarios. By 2050, the average travel time for work trips in the SCAG Region is projected to decrease from 27.8 minutes under the Baseline to 27.0 minutes with Connect SoCal 2024, a reduction of 2.7 percent.

Both scenarios (Baseline and Plan) modeled for 2050 represent significant improvement over the 2019 average commute time in the SCAG Region of 28.9 minutes. Among the six counties, all but Imperial are projected to experience reductions in commute travel time relative to the Base Year, with the counties of San Bernardino and Riverside showing the most dramatic reductions, with average travel times decreasing by more than four minutes compared to the 2019 Base Year for those two counties.

Figure 7. Average Commute Travel Time (minutes)



Source: SCAG 2024

TRAVEL TIME DISTRIBUTION BY MODE

Another useful metric used for assessing regional accessibility performance is the statistical distribution of travel times by various travel modes including SOV, HOV, and transit for work and non-work trips. Enhancing non-single occupancy vehicle (non-SOV) travel options through strategic investments in the Plan will reduce

travel times for HOV and transit modes compared to SOV travel, thereby improving accessibility, and reducing dependence on driving alone by automobile.

TABLE 9 features a comparative distribution of projected 2050 travel times for the automobile (SOV and HOV) and transit modes. With Connect SoCal 2024, 91.6 percent of auto trips will be completed within 30 minutes as compared to 32.4 percent for transit trips. Under the Plan, 97.1 percent of auto trips and 52.1 percent of transit trips will be completed within 45 minutes, while 98.9 percent of auto trips and 57.7 percent of transit trips will be completed within one hour.

Table 9. Travel Time Distribution by Mode (Auto vs Transit)

Time (min)	Auto		Transit	
	Count	Percentage	Count	Percentage
0 to <5	12,232,775	22.5%	90,665	3.2%
5 to <10	14,573,499	26.8%	223,688	8.0%
10 to <15	10,073,840	18.5%	149,176	5.3%
15 to <20	6,575,677	12.1%	129,516	4.6%
20 to <25	3,928,044	7.2%	145,698	5.2%
25 to <30	2,357,720	4.3%	167,996	6.0%
30 to <35	1,445,487	2.7%	185,484	6.6%
35 to <40	926,774	1.7%	188,172	6.7%
40 to <45	623,864	1.1%	175,412	6.3%
45 to <50	430,967	0.8%	162,605	5.8%
50 to <55	307,916	0.6%	145,474	5.2%
55 to <60	222,593	0.4%	129,111	4.6%
60 to <65	159,439	0.3%	107,092	3.8%
65 to <70	112,741	0.2%	93,200	3.3%
70 to <75	83,270	0.2%	80,024	2.9%
75 to <80	60,876	0.1%	69,189	2.5%
80 to <85	43,680	0.1%	60,056	2.1%
85 to <90	32,221	0.1%	51,701	1.8%
90 to <95	24,584	0.0%	45,376	1.6%
95 to <100	19,308	0.0%	39,705	1.4%
100 to <105	15,283	0.0%	34,353	1.2%
105 to <110	11,850	0.0%	29,770	1.1%
110 to <115	8,906	0.0%	25,381	0.9%
115 to <120	7,024	0.0%	22,260	0.8%
120+	36,559	0.1%	244,814	8.8%
Total	54,314,897	100.0%	2,795,918	100.0%

Source: SCAG 2024

Travel time analyses by trip type and time of day are provided in TABLE 10 (SOV), TABLE 11 (HOV), and TABLE 12 (Transit). The distribution tables include the cumulative share of total trips for each of the three featured modes by travel time range for five daily time periods: AM peak, mid-day, PM peak, evening, and night. The tables feature travel time performance for the Base Year (2019), and modeled projections for the Baseline (2050) and Plan (2050).

Table 10. Travel Time Distribution by Mode (SOV)

Trip Type	Time Period	Scenario	<=5 min	<=10 min	<=15 min	<=30 min	<=45 min	<=60 min	<=90 min	>90 min
Work	AM Peak	2019 Base Year	6.0%	18.8%	31.8%	62.0%	78.8%	88.9%	97.8%	100.0%
		2050 Baseline	6.1%	20.1%	35.3%	68.1%	83.4%	91.8%	97.9%	100.0%
		Connect SoCal	6.0%	20.6%	37.6%	73.6%	89.7%	96.4%	99.6%	100.0%
	Mid-Day	2019 Base Year	8.1%	25.6%	42.5%	75.1%	90.2%	96.6%	99.6%	100.0%
		2050 Baseline	7.9%	26.3%	45.0%	77.9%	91.2%	96.8%	99.6%	100.0%
		Connect SoCal	7.5%	26.1%	46.0%	80.2%	92.8%	97.5%	99.7%	100.0%
	PM Peak	2019 Base Year	6.2%	19.0%	31.7%	59.6%	75.7%	86.1%	96.3%	100.0%
		2050 Baseline	6.0%	19.6%	33.8%	64.4%	79.7%	88.8%	96.8%	100.0%
		Connect SoCal	5.8%	19.8%	35.4%	69.0%	85.3%	93.5%	98.7%	100.0%
	Evening	2019 Base Year	8.4%	26.3%	43.6%	75.6%	90.0%	96.4%	99.3%	100.0%
		2050 Baseline	8.1%	26.7%	45.4%	77.6%	90.7%	96.5%	99.3%	100.0%
		Connect SoCal	7.6%	26.2%	45.8%	79.0%	91.7%	96.8%	99.3%	100.0%
	Night	2019 Base Year	6.6%	21.3%	37.1%	68.0%	84.7%	93.5%	98.4%	100.0%
		2050 Baseline	6.4%	21.7%	38.4%	68.6%	84.3%	93.1%	98.1%	100.0%
		Connect SoCal	5.9%	21.1%	38.3%	69.4%	84.9%	93.2%	98.2%	100.0%
Non-Work	AM Peak	2019 Base Year	33.1%	64.5%	80.8%	96.3%	98.9%	99.6%	100.0%	100.0%
		2050 Baseline	32.5%	64.9%	82.1%	97.3%	99.3%	99.8%	100.0%	100.0%
		Connect SoCal	31.2%	64.7%	82.9%	98.1%	99.7%	99.9%	100.0%	100.0%
	Mid-Day	2019 Base Year	25.3%	58.5%	79.3%	97.9%	99.7%	99.9%	100.0%	100.0%
		2050 Baseline	25.0%	59.0%	80.3%	98.4%	99.8%	100.0%	100.0%	100.0%
		Connect SoCal	24.4%	58.9%	80.9%	98.7%	99.8%	100.0%	100.0%	100.0%
	PM Peak	2019 Base Year	23.4%	53.7%	73.0%	94.6%	98.6%	99.6%	100.0%	100.0%
		2050 Baseline	23.0%	54.1%	74.4%	96.0%	99.2%	99.8%	100.0%	100.0%
		Connect SoCal	22.9%	54.9%	76.1%	97.2%	99.6%	99.9%	100.0%	100.0%

Trip Type	Time Period	Scenario	<=5 min	<=10 min	<=15 min	<=30 min	<=45 min	<=60 min	<=90 min	>90 min
	Evening	2019 Base Year	22.7%	58.5%	80.6%	98.6%	99.8%	100.0%	100.0%	100.0%
		2050 Baseline	22.7%	59.0%	81.7%	98.9%	99.9%	100.0%	100.0%	100.0%
		Connect SoCal	21.9%	58.4%	81.7%	99.0%	99.9%	100.0%	100.0%	100.0%
	Night	2019 Base Year	24.7%	62.9%	85.2%	99.2%	99.9%	100.0%	100.0%	100.0%
		2050 Baseline	25.1%	64.1%	86.2%	99.3%	99.9%	100.0%	100.0%	100.0%
		Connect SoCal	24.3%	63.4%	85.9%	99.3%	99.9%	100.0%	100.0%	100.0%

Source: SCAG 2024

Table 11. Travel Time Distribution by Mode (HOV)

Trip Type	Time Period	Scenario	<=5 min	<=10 min	<=15 min	<=30 min	<=45 min	<=60 min	<=90 min	>90 min
Work	AM Peak	2019 Base Year	3.8%	14.3%	28.0%	62.5%	80.6%	90.4%	98.2%	100.0%
		2050 Baseline	3.9%	15.6%	31.5%	68.9%	85.0%	92.8%	98.1%	100.0%
		Connect SoCal	4.1%	16.8%	34.4%	73.8%	89.5%	95.7%	99.2%	100.0%
	Mid-Day	2019 Base Year	7.0%	22.1%	38.6%	71.6%	87.4%	94.9%	99.1%	100.0%
		2050 Baseline	6.5%	22.7%	41.6%	75.8%	89.1%	95.3%	99.1%	100.0%
		Connect SoCal	6.2%	22.8%	42.9%	77.9%	90.7%	96.2%	99.3%	100.0%
	PM Peak	2019 Base Year	4.8%	16.0%	29.0%	60.1%	77.0%	87.2%	96.6%	100.0%
		2050 Baseline	4.5%	16.3%	31.1%	65.0%	80.7%	89.3%	96.6%	100.0%
		Connect SoCal	4.4%	16.6%	32.8%	68.7%	84.5%	92.0%	97.6%	100.0%
	Evening	2019 Base Year	6.1%	21.6%	39.9%	75.6%	89.2%	95.2%	98.6%	100.0%
		2050 Baseline	5.5%	21.1%	40.5%	76.2%	88.7%	94.4%	97.9%	100.0%
		Connect SoCal	5.1%	20.9%	41.5%	77.6%	89.5%	94.6%	97.8%	100.0%
	Night	2019 Base Year	4.2%	15.5%	30.2%	63.0%	80.6%	90.6%	97.1%	100.0%
		2050 Baseline	3.8%	15.4%	31.0%	62.7%	78.3%	87.9%	95.4%	100.0%
		Connect SoCal	3.5%	15.0%	31.5%	64.1%	79.3%	87.9%	95.0%	100.0%
on-Work	AM Peak	2019 Base Year	43.5%	71.2%	83.4%	96.3%	98.9%	99.7%	100.0%	100.0%
		2050 Baseline	42.7%	70.7%	83.6%	96.8%	99.2%	99.7%	100.0%	100.0%
		Connect SoCal	40.9%	69.4%	83.1%	97.3%	99.5%	99.9%	100.0%	100.0%
	Mid-Day	2019 Base Year	30.2%	60.9%	79.0%	97.4%	99.6%	99.9%	100.0%	100.0%
		2050 Baseline	28.7%	59.7%	78.5%	97.6%	99.7%	99.9%	100.0%	100.0%
		Connect SoCal	27.9%	58.9%	78.3%	97.8%	99.7%	99.9%	100.0%	100.0%
	PM Peak	2019 Base Year	29.3%	55.8%	70.8%	91.6%	97.7%	99.4%	100.0%	100.0%
		2050 Baseline	27.8%	54.5%	70.4%	92.8%	98.4%	99.7%	100.0%	100.0%
		Connect SoCal	27.8%	54.7%	71.1%	94.0%	99.1%	99.8%	100.0%	100.0%

Trip Type	Time Period	Scenario	<=5 min	<=10 min	<=15 min	<=30 min	<=45 min	<=60 min	<=90 min	>90 min
	Evening	2019 Base Year	20.6%	46.8%	66.0%	94.6%	99.4%	99.9%	100.0%	100.0%
		2050 Baseline	21.3%	48.3%	67.5%	95.1%	99.5%	99.9%	100.0%	100.0%
		Connect SoCal	21.5%	48.3%	67.7%	95.4%	99.5%	99.9%	100.0%	100.0%
	Night	2019 Base Year	19.0%	43.3%	62.6%	93.2%	98.8%	99.8%	100.0%	100.0%
		2050 Baseline	19.9%	45.0%	64.4%	93.7%	98.8%	99.7%	100.0%	100.0%
		Connect SoCal	20.0%	45.0%	64.5%	93.9%	98.8%	99.8%	100.0%	100.0%

Source: SCAG 2024

Table 12. Travel Time Distribution by Mode (Transit)

Trip Type	Time Period	Scenario	<=5 min	<=10 min	<=15 min	<=30 min	<=45 min	<=60 min	<=90 min	>90 min
Work	AM Peak	2019 Base Year	0.1%	0.3%	1.2%	10.1%	25.6%	43.1%	71.9%	100.0%
		2050 Baseline	0.1%	0.4%	1.7%	11.9%	28.4%	46.8%	75.4%	100.0%
		Connect SoCal	0.1%	0.3%	1.3%	9.8%	25.8%	44.2%	73.6%	100.0%
	Mid-Day	2019 Base Year	4.9%	5.5%	7.2%	19.3%	37.4%	54.2%	78.2%	100.0%
		2050 Baseline	4.4%	5.1%	6.8%	19.4%	37.9%	55.8%	79.8%	100.0%
		Connect SoCal	7.7%	8.2%	9.7%	19.9%	37.2%	54.6%	78.4%	100.0%
	PM Peak	2019 Base Year	11.9%	12.4%	13.6%	23.4%	38.9%	54.3%	76.9%	100.0%
		2050 Baseline	9.9%	10.3%	11.9%	22.3%	38.6%	55.1%	78.0%	100.0%
		Connect SoCal	16.0%	16.4%	17.6%	26.5%	41.7%	57.1%	78.2%	100.0%
	Evening	2019 Base Year	8.6%	9.1%	10.5%	22.7%	41.3%	58.4%	80.6%	100.0%
		2050 Baseline	7.5%	8.1%	9.7%	21.8%	40.5%	57.8%	80.3%	100.0%
		Connect SoCal	13.6%	14.2%	15.6%	25.8%	42.8%	59.3%	80.2%	100.0%
	Night	2019 Base Year	3.1%	3.5%	4.5%	14.5%	30.8%	47.0%	71.9%	100.0%
		2050 Baseline	3.1%	3.5%	4.7%	14.7%	30.6%	47.1%	72.0%	100.0%
		Connect SoCal	4.5%	4.8%	5.8%	12.7%	25.9%	40.4%	65.0%	100.0%
Non-Work	AM Peak	2019 Base Year	16.1%	48.1%	62.3%	76.7%	85.9%	91.9%	97.3%	100.0%
		2050 Baseline	13.3%	41.6%	55.5%	71.8%	83.2%	90.6%	97.3%	100.0%
		Connect SoCal	11.2%	36.6%	50.5%	68.6%	81.9%	90.6%	97.4%	100.0%
	Mid-Day	2019 Base Year	5.7%	17.7%	23.6%	42.8%	67.3%	83.5%	96.1%	100.0%
		2050 Baseline	4.1%	12.0%	16.9%	38.4%	64.7%	82.3%	96.1%	100.0%
		Connect SoCal	3.8%	10.1%	14.9%	36.2%	63.4%	82.2%	96.2%	100.0%
	PM Peak	2019 Base Year	11.5%	36.3%	48.0%	63.9%	78.2%	87.7%	96.1%	100.0%
		2050 Baseline	8.8%	28.4%	39.2%	57.6%	74.9%	86.5%	96.3%	100.0%
		Connect SoCal	7.4%	23.0%	32.6%	53.4%	73.5%	86.7%	96.6%	100.0%

Trip Type	Time Period	Scenario	<=5 min	<=10 min	<=15 min	<=30 min	<=45 min	<=60 min	<=90 min	>90 min
	Evening	2019 Base Year	3.3%	8.7%	12.1%	30.8%	57.3%	75.0%	91.2%	100.0%
		2050 Baseline	3.2%	6.9%	9.9%	30.3%	57.9%	76.8%	92.9%	100.0%
		Connect SoCal	3.8%	6.8%	9.8%	30.6%	59.0%	78.4%	94.1%	100.0%
	Night	2019 Base Year	4.9%	9.6%	12.3%	30.4%	57.2%	75.1%	91.4%	100.0%
		2050 Baseline	4.6%	7.6%	10.1%	29.6%	57.0%	76.6%	93.2%	100.0%
		Connect SoCal	5.1%	7.4%	9.9%	29.3%	57.5%	77.7%	93.8%	100.0%

Source: SCAG 2024

PERSON DELAY PER CAPITA

Travel delay refers to the extra amount of time required to travel from one place to another due to traffic congestion. ‘Person delay,’ which normalizes the total aggregated hours of travel delay by the number of people living in an area, provides insight as to how well the region is performing relative to traffic congestion while accounting for population growth. Under the Baseline projection, person delay per capita would be expected to increase significantly by 2050, especially in the Inland Empire counties of Riverside and San Bernardino, which are continuing to experience substantial population growth.

FIGURE 8 illustrates daily per capita person delay experienced by county for the Base Year, Baseline, and for the Plan. The chart indicates that implementation of Connect SoCal 2024 would reduce delay in the SCAG Region substantially, to below the 2019 level of 9.2 minutes. Average daily travel time delay per capita in the region is expected to improve significantly by 2050, from 8.2 minutes under the Baseline to 6.3 minutes with Connect SoCal. Not only does this represent a 23.8 percent reduction relative to the Baseline, but also a 31.8 percent improvement over the Base Year (2019).

All six counties in the SCAG Region are projected to experience a significant reduction in daily per capita minutes of delay by 2050, with the counties of San Bernardino and Ventura expected to achieve reductions of 45.8 percent and 38.6 percent, respectively, with implementation of Connect SoCal 2024. Daily travel delay will also be reduced by more than 30 percent in the counties of Imperial (-36.1 percent) and Riverside (-31.3 percent). Orange County and Los Angeles County will experience daily per capita person delay reductions of 29.5 percent and 15.7 percent, respectively.

Figure 8. Daily Total Person Delay per capita (minutes)



Source: SCAG 2024

PERSON-HOURS OF DELAY BY FACILITY TYPE

Another useful way for understanding the impact of traffic congestion on regional accessibility is by analyzing the differential amount of excess travel time experienced on various roadway facility types, including mixed flow, HOV lanes, and major arterials. The Connect SoCal 2024 plan assessment measure used for this purpose is the 'Person-Hours of Delay by Facility Type' metric.

FIGURE 9 illustrates the total person-hours of delay in the SCAG Region on highway mixed flow lanes, HOV facilities, and major arterials. Total person-hours of delay in the region, including all roadway facility types, is expected to decline by about 24 percent by 2050 with implementation of Connect SoCal 2024. This performance compares very favorably to the Baseline projection, which would reduce total hours of delay experienced in the region by less than one percent relative to the 2019 Base Year. All roadway facility types are expected to improve delay performance under the Plan, with delay on highways projected to be reduced by about 19 percent, HOV lanes by over 85 percent, and major arterials by over 25 percent.

Figure 9. Daily Person-Hours of Delay by Facility Type (thousands)



Source: SCAG 2024

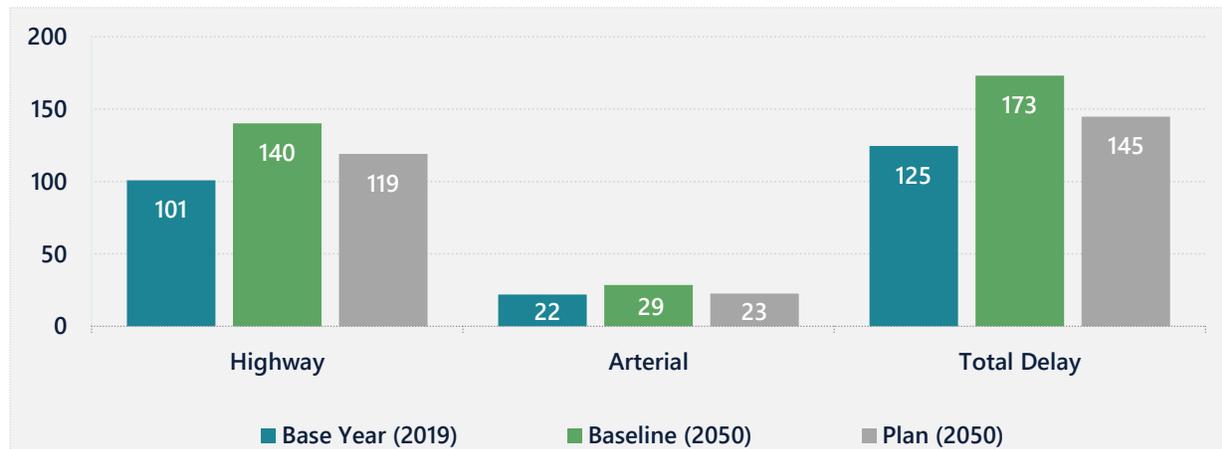
TRUCK DELAY BY FACILITY TYPE

The efficient and timely movement of freight through the SCAG Region promotes both regional accessibility and economic productivity. The 'Truck Delay by Facility Type' performance measure assesses the average daily amount of travel time delay experienced by heavy duty trucks on regional freeways and major arterial roadways. Connect SoCal 2024 includes significant investments in regional freight corridors and other improvements to facilitate the efficient movement of goods.

As illustrated in FIGURE 10, Connect SoCal 2024 is expected to reduce heavy-duty truck delay in 2050 by about 15 percent over the Baseline projection on regional freeways and by about 20 percent on major arterials. While total truck delay for all facility types will be reduced in 2050 by about 16 percent with Connect SoCal (145 thousand hours) relative to the Baseline (173 thousand hours), total daily hours of truck

delay is still expected to exceed 2019 Base Year performance (125 thousand hours) by about 16 percent due to projected increases in demand for truck-based goods movement in the SCAG Region.

Figure 10. Daily Truck Hours of Delay by Facility Type (thousands)



Source: SCAG 2024

ACCESS TO JOBS

A new accessibility performance measure being introduced for Connect SoCal 2024 in support of the plan assessment process is 'Access to Jobs'. As its name implies, this measure seeks to identify improvement in the ability of commuters to efficiently travel to employment locations. This measure focuses on the assessment of the share of regional jobs that may be reached during peak travel times by automobile within 30 minutes and by public transit (rail and bus) within 45 minutes. By enhancing accessibility to employment opportunities, Connect SoCal will reduce commute times, boost economic productivity, improve air quality, and enhance the overall quality of life of residents.

The results of the Connect SoCal 2024 performance assessment indicate that accessibility to regional jobs within a 30-minute drive by automobile will improve by 1.2 percentage points in 2050 between the Baseline (12.2 percent) and the Plan (13.4 percent). Access to jobs by transit within 45 minutes of travel time also improves by 0.8 percentage points under the Plan (2.6 percent) relative to the Baseline (1.8 percent) projection.

MAJOR DESTINATION ACCESSIBILITY

Similar to the previously described 'Access to Jobs' measure, the 'Major Destination Accessibility' performance measure evaluates how effectively Connect SoCal 2024 enhances access to high demand travel destinations in the region including shopping centers, schools, and healthcare facilities. The 'Major Destination Accessibility' metric measures the share of these important regional destinations that may be reached within defined timeframes by automobile and by transit. The expectation is that the accessibility improvements provided through the Plan will increase the share of major destinations accessible to residents within reasonable travel times for all modes.

The share of major regional retail shopping destinations accessible within a 15-minute automobile drive would increase by 0.4 percentage points with Connect SoCal 2024 (4.6 percent), relative to the Baseline projection (4.2 percent). For transit users, 0.6 percent of regional shopping destinations would be accessible within 30 minutes of travel time in 2050 under the Plan, as compared to 0.4 percent for the Baseline.

The share of regional educational destinations accessible within a 30-minute automobile drive time in 2050 would be 13.4 percent with Connect SoCal, 1.3 percentage points higher than the share provided in the Baseline projection (12.1 percent). Using transit, the share of educational destinations accessible within 30 minutes travel time would be 0.4 percent with Connect SoCal 2024, two times higher than the 0.2 percent share provided under the Baseline. Regarding accessibility to regional healthcare facilities, 18.4 percent of destinations would be accessible within a 30-minute automobile drive with the Plan, 1.7 percentage points higher than the 16.7 percent share projected under the Baseline. Using transit, 0.5 percent of regional healthcare destinations would be accessible within a 30-minute trip with the Plan, compared to 0.3 percent for the Baseline.

5.2.2 MOBILITY OUTCOME 2: TRANSIT

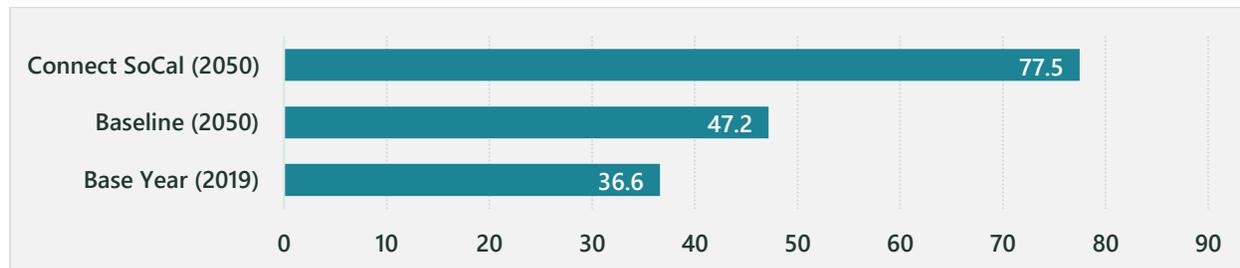
The 'Transit' outcome category includes performance measures used to monitor progress made toward achievement of the Connect SoCal 2024 'Mobility' goal area through improvement of regional transit service, facilities, and resources including commuter rail, light rail, and bus.

TRANSIT BOARDINGS PER CAPITA

One performance measure specific to the Transit outcome, 'Transit Boardings per capita,' is used in support of the Connect SoCal plan assessment process. By calculating the total number of transit boardings (including all transit modes) divided by the total population, this metric helps determine how the program of projects, strategies, and policies developed through Connect SoCal 2024 will contribute toward increasing the use of transit in the SCAG Region over the duration of the Plan.

FIGURE 11 displays the annual number of transit boardings per capita reported in the SCAG Region for the Base Year (2019) as compared to the modeled projections for the year 2050 for both the Baseline and Plan scenarios. The graph indicates that transit boardings per capita would increase from 36.6 in 2019 to 47.2 in 2050 under the Baseline, an increase of 28.8 percent. However, under Connect SoCal 2024, transit ridership will increase even more significantly to 77.5 boardings per capita, representing an increase of 64 percent over the Baseline, and 112 percent over 2019.

Figure 11. Transit Boardings per capita



Source: SCAG 2024

While transit use is impacted by a wide range of economic, demographic, and local land use factors that extend beyond the scope of SCAG’s regional planning purview, these results suggest that implementation of Connect SoCal 2024 will significantly improve the viability of transit as an alternative to single occupancy vehicle travel. More information regarding the SCAG Regional transit system and its performance is provided in the Connect SoCal Mobility Technical Report.

5.3 CONNECT SOCAL 2024 GOAL AREA 2: COMMUNITIES

The Connect SoCal 2024 ‘Communities’ goal area is defined by fostering the development, connectivity, and sustainability of communities in the SCAG Region. Monitoring regional performance toward achievement of the ‘Community’ goal area helps us assess how successful our regional transportation investments are performing relative to the promotion of sustainability in the SCAG Region.

For regional performance monitoring and assessment purposes, outcomes related to the Connect SoCal 2024 ‘Communities’ goal area have been categorized into three categories: Sustainability, Public Health, and Housing. The performance measures established for the plan assessment process focus on two of these outcomes: Sustainability and Public Health.

5.3.1 COMMUNITIES OUTCOME 1: SUSTAINABILITY

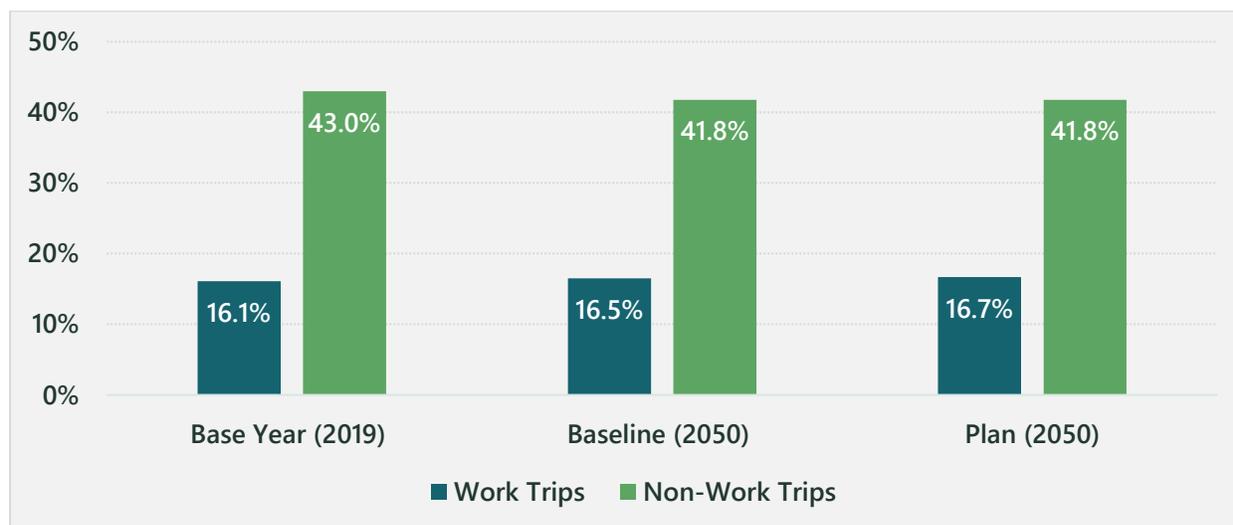
The ‘Sustainability’ outcome category involves the effective management of the natural resources of a community to meet present needs while ensuring the continued availability of these resources for future generations. Two performance measures are specifically supportive of this outcome in the Connect SoCal 2024 plan assessment process.

PERCENT OF TRIPS LESS THAN THREE MILES

The first plan assessment performance measure for the Sustainability outcome is ‘Percent of Trips Less than Three Miles.’ One of the primary objectives of Connect SoCal 2024 is to reduce vehicle miles traveled (VMT) to preserve natural resources and support the long-term sustainability of the communities of the SCAG Region. Currently, most trips in the SCAG Region are made by individuals driving alone in a motor vehicle. However, as trip distances decrease, especially to within a few miles, people are more likely to use alternative modes of travel such as transit, biking, walking, and other more sustainable alternatives to driving alone.

As illustrated in FIGURE 12, by 2050, the share of work trips less than three miles in length is projected to increase from 16.5 percent under the Baseline, to 16.7 percent under the Plan. This performance improvement is more meaningful in comparison with the 2019 base year, when only 16.1 percent of work trips were under three miles. For non-work trips, no change is expected, with 41.8 percent of trips being less than three miles in 2050 under both Connect SoCal 2024 and the Baseline. Improved coordination between land use and transportation planning, investments in active transportation, and improvements in the regional jobs/housing balance all contribute toward achieving trip distance reductions.

Figure 12. Percent of Trips Less than Three Miles



Source: SCAG 2024

SHARE OF REGIONAL HOUSING IN PRIORITY DEVELOPMENT AREAS

The second plan assessment ‘Sustainability’ performance measure, ‘Share of Regional Housing in Priority Development Areas,’ examines the distribution of new housing units into areas of the region that maximize community sustainability benefits through high levels of multimodal accessibility, minimal environmental impact, community cohesion, and decreased dependency on single occupancy vehicle travel.

Priority Development Areas (PDAs) are areas that offer high levels of accessibility and connectivity to job centers and other primary destinations and opportunities. Connect SoCal 2024 encourages new regional residential and commercial development into these highly accessible areas. By doing so, dependency on single occupancy vehicle travel, vehicle miles traveled (VMT), and greenhouse gas (GHG) emissions may all be effectively reduced.

Connect SoCal 2024 seeks to focus future development into PDAs to help achieve regional mobility, environmental, and community goals. PDA is a general designation that includes a several specific place types that promote sustainable, connected communities. Connect SoCal 2024 PDAs include Neighborhood Mobility Areas (NMAs), Transit Priority Areas (TPAs), Livable Corridors, and Spheres of Influence. In general, PDAs feature easy access to multiple modes of transportation and provide residents closer proximity to employment and other major destinations, resulting in shorter trips.

Livable Corridors are locations where local jurisdictions are encouraged to plan and zone for increased density at nodes along key corridors and to re-purpose existing under-performing retail with well-designed, higher density housing and employment centers. Focusing urban growth at strategic nodes along these corridors, many of which are within High Quality Transit Areas (HQTAs), will make transit a more convenient and viable option and will reduce dependency on single occupancy vehicle travel.

Neighborhood Mobility Areas are locations which feature a relatively high number of intersections, low observed travel speeds, a high mix of uses, and high accessibility to primary destinations. These are areas where Complete Streets and sustainability policies may be effectively implemented to encourage replacing

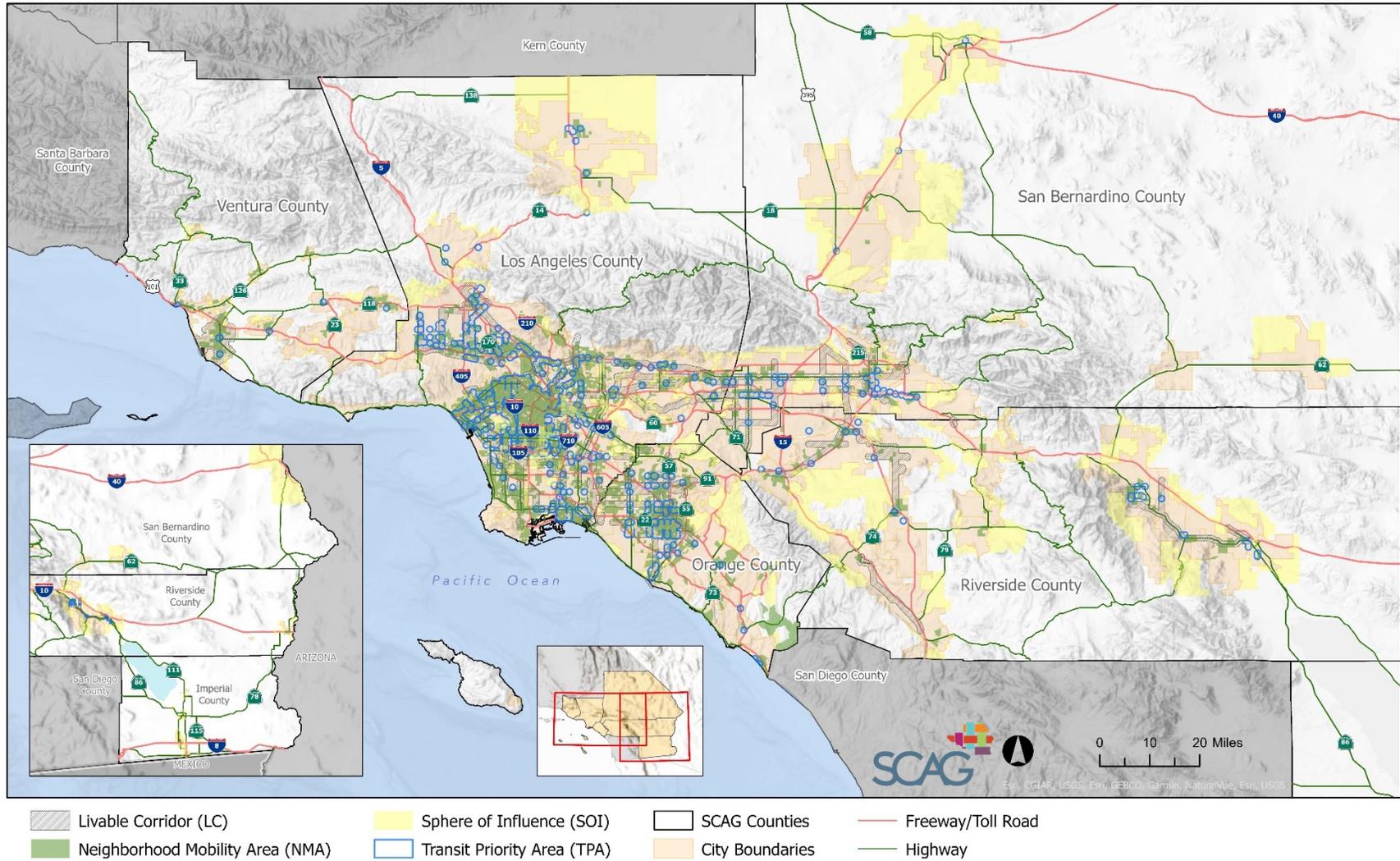
or reducing automobile use with walking, bicycling, and slow-speed electric vehicles (such as e-bikes, scooters, mobility devices, and neighborhood electric vehicles).

Sphere of Influence refers to the planning area extending beyond an agency's existing jurisdictional boundary that designates that agency's probable future boundary and service area.

Transit Priority Areas are areas located within one-half mile of an existing or planned major transit stop.

MAP 1 shows areas of the SCAG Region that have been designated as PDAs in Connect SoCal 2024. In addition to reduced regional VMT and GHG emissions, the allocation of new households and employment into these travel efficient locations will serve to reduce regional traffic congestion, travel times, and travel distances, while also improving public health outcomes through improved air quality.

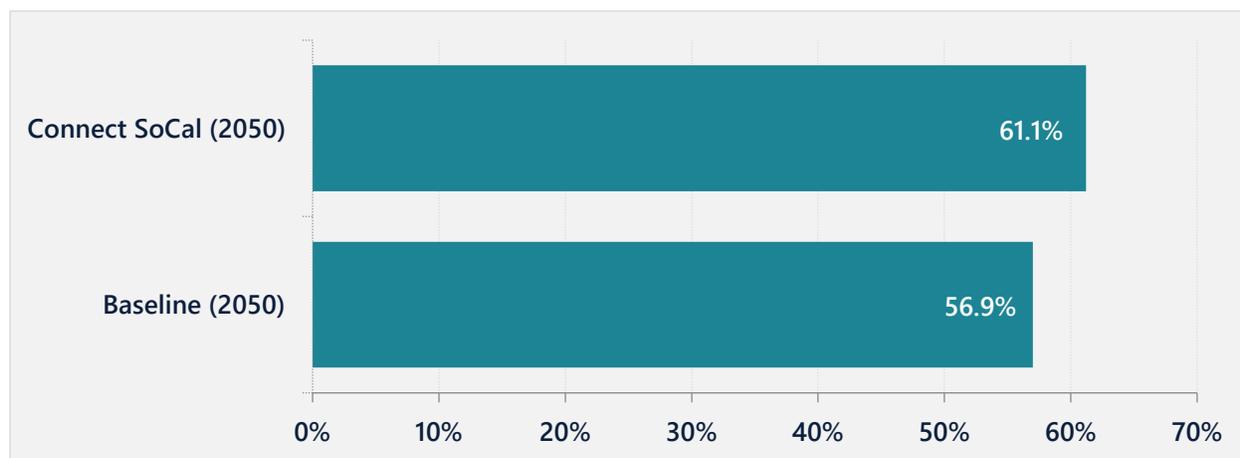
Map 1. SCAG Region Priority Development Areas (PDAs)



Source: SCAG 2023

FIGURE 13 shows the share of regional housing units projected to be located within at least one designated PDA in 2050 under Connect SoCal 2024 as compared to Baseline projections. By 2050, the share of regional housing located within PDAs is expected to increase by 4.2 percentage points with implementation of Connect SoCal, from 56.9 percent under the Baseline, to 61.1 percent under the Plan.

Figure 13. Share of Regional Housing Units in Priority Development Areas



Source: SCAG 2024

5.3.2 COMMUNITIES OUTCOME 2: PUBLIC HEALTH

The second outcome category of the Connect SoCal 2024 ‘Communities’ goal area is Public Health. The plan assessment process employs two performance measures to evaluate the plan’s effectiveness toward improving public health outcomes in the SCAG Region, both of which reference the incidence and cost associated with environmentally related health conditions.

PHYSICAL ACTIVITY-RELATED PUBLIC HEALTH

The first of these two measures, ‘Physical Activity-Related Public Health,’ monitors the rate of various public health consequences related to insufficient opportunities for engagement in regular physical activity. Low levels of physical activity correlate with adverse health outcomes including obesity, hypertension, cardiovascular disease, and diabetes. Connect SoCal seeks to enhance opportunities for daily physical activity by reducing commute times (less time stuck in traffic provides more time for recreational pursuits) and through investments in the regional active transportation network, such as first-last mile improvements, Safe Routes to School projects, and regional bikeway infrastructure. Connect SoCal 2024 is also focused on improving access to natural lands and parks to encourage regular physical activity to further enhance public health outcomes.

The SCAG Scenario Planning Model includes a Public Health module used to assess the impact of the Plan on environmentally related community health outcomes. Connect SoCal 2024 is expected to increase opportunities for regular physical exercise by reducing commute times and improving access to open space and parks. These enhanced opportunities for daily physical activity are expected to result in modest reductions in the rates of obesity, cardiovascular disease, and type 2 diabetes in the SCAG Region.

AIR POLLUTION-RELATED PUBLIC HEALTH

The second performance measure of the 'Public Health' outcome assesses the health impacts and costs associated with air pollution. The impact of regional air quality on the quality of life in the SCAG Region is multi-faceted. Air pollution negatively affects public health, climate, and the regional economy. The 'Air Pollution-Related Public Health' plan performance measure is used to assess respiratory-related health issues triggered by poor air quality, such as asthma, and the total costs associated with air quality related respiratory health impacts in the SCAG Region.

Connect SoCal 2024 is projected to reduce the annual number of pollution-related public health incidences occurring in the SCAG Region by 6.2 percent in 2050 compared to the Baseline, from 66,579 incidents per year, to 62,428. In addition, total annual costs associated with air pollution-related health impacts will be reduced by \$66 million, from \$1.05 billion to \$989 million, also providing a reduction of 6.2 percent.

PARK ACCESSIBILITY

Access to natural lands, open spaces, and parks is an important element in the fostering of healthy, sustainable communities. Being able to easily travel to a local or regional park allows residents to engage in regular physical activity, socialize with neighbors, and to participate in other community-building activities. Access to parks and open spaces also provides a respite from the urban continuum, allowing residents the opportunity to decompress and enjoy nature without the need to travel far from home.

To ensure that Connect SoCal 2024 effectively enhances regional public health and community sustainability outcomes by improving access to open space, the 'Park Accessibility' metric is used to project the share of the regional population that may access a park within 30 minutes travel time by automobile and within 30 minutes by transit.

It is expected that nearly all (99.6 percent) of the population in the SCAG Region will be able to access a park within 30 minutes by automobile in 2050, both with implementation of the Plan and with the Baseline projection. However, the results are more significant with access to parks by transit, with 62.1 percent of the regional population able to access a park within 30 minutes by transit in 2050 with Connect SoCal, as compared to 57.6 percent under the Baseline, representing an improvement of 4.5 percentage points.

More information regarding Connect SoCal 2024 regional land use strategies is featured in the Land Use and Communities Technical Report.

5.4 CONNECT SOCAL 2024 GOAL AREA 3: ENVIRONMENT

The Connect SoCal 2024 'Environment' goal area fosters the creation of a healthy region that is capable of effectively responding to, and adapting to, chronic and acute environmental stressors and disruptions including climate change. It also seeks to promote the integration of regional land use and transportation planning to improve air quality and reduce regional greenhouse gas (GHG) emissions. The conservation and restoration of the region's natural and agricultural resources is also a primary focus of the Connect SoCal 'Environment' goal area.

For performance monitoring purposes, the 'Environment' goal area is divided into three outcome groups: 'Climate Resilience,' 'Resource Efficiency,' and 'Conservation.' The performance measures established for the

plan assessment scenario modeling process focus on two of these categories: 'Climate Resilience' and 'Resource Efficiency.'

5.4.1 ENVIRONMENT OUTCOME 1: CLIMATE RESILIENCE

In reference to the challenges presented by climate change, "resilience" refers to the ability of communities to effectively respond to changes in climate, both through development of effective and sustainable adaptation strategies and through the implementation of proactive efforts to mitigate the scale and reduce the impacts of climate change.

DAILY VMT PER CAPITA

A key metric used to assess plan performance relative to climate resiliency is daily vehicle miles traveled (VMT) per capita. According to the U.S. Environmental Protection Agency, the transportation sector contributes approximately 29 percent of all GHG emissions nationwide, with automobiles and light-duty trucks accounting for the majority (58 percent) of transportation sector emissions. Since motorized vehicles are a major source of GHG, monitoring the average number of miles a person travels each day using a motor vehicle is helpful for determining how well the plans, projects, and programs included in the Plan collectively serve toward achieving SCAG's GHG reduction objectives. By decreasing commute distances and making alternatives to single occupancy vehicle travel more feasible and appealing, Connect SoCal 2024 is expected to significantly reduce per capita VMT.

FIGURE 14 illustrates projected daily per capita VMT performance for the SCAG Region in 2050 as compared to the Baseline projection and to the Base Year 2019. By 2050, per capita VMT is projected to decrease to 19.4 miles with Connect SoCal 2024, as compared to 20.7 miles under the Baseline, a reduction of 6.3 percent. However, when compared to the 2019 Base Year regional VMT per capita performance of 22.0 miles, the reduction of 11.6 percent indicates that Connect SoCal 2024 will fortify existing regional efforts to reduce VMT.

Figure 14. Daily Vehicle Miles Traveled (VMT) per capita



Source: SCAG 2024

FIGURE 15 presents daily per capita VMT performance projections for each of the six counties in the SCAG Region. By 2050, per capita VMT is projected to decrease under Connect SoCal 2024 relative to the Baseline in all counties. Among the individual counties, Los Angeles and San Bernardino are projected to experience the most significant reduction at 8.3 percent and 6.4 percent, respectively. VMT per capita in Orange County is projected to decrease by 4.6 percent by 2050, with Ventura County (-4.4 percent), Riverside County (-2.5 percent), and Imperial County (-1.7 percent) also expected to experience meaningful reductions in VMT per capita.

Figure 15. Daily VMT per capita by County



Source: SCAG 2024

GREENHOUSE GAS (GHG) EMISSIONS

Like all of California’s MPOs, SCAG must prepare its RTP/SCS within the context of the requirements of California Senate Bill 375 (SB 375). In general, SB 375 requires MPOs to coordinate regional housing development and transportation system planning in a manner to promote reduction in the amount of GHG emissions generated by motor vehicles.

According to the California Air Resources Board (CARB), the transportation sector is the largest single contributor to GHG emissions in the state. In response, SB 375 required CARB to set per capita GHG emissions reduction targets from passenger vehicles for each of the state’s 18 MPOs. CARB updated the regional targets in 2018 to align with the more stringent statewide GHG reduction goals set forth by AB 32 and SB 32. For the SCAG Region, the target is to achieve an eight percent reduction in per capita GHG emissions by 2020 and a 19 percent reduction by 2035, relative to 2005 emission levels.

SCAG measures the GHG emissions reductions from a suite of land use and transportation strategies. Most of these strategies are incorporated into SCAG’s regional travel demand modeling processes. For those strategies the SCAG models are not equipped to accurately measure, SCAG develops off-model quantification methodologies. Details of this process are included in the SCS Technical Methodology which is submitted to CARB.

The specific GHG emission reduction strategies included in Connect SoCal 2024 are:

1. **Congestion Pricing:** Congestion pricing may be applied to improve the efficiency of existing roadway capacity, to improve travel time reliability, and to increase person-throughput. Cordon/area pricing involves charging a variable or fixed fee to drive into or within a highly congested area.
2. **Express Lane Pricing:** The SCAG Regional express lane network integrates congestion pricing to optimize existing capacity on freeways and offer users greater travel time reliability and choices. When appropriately priced to reflect demand, express lanes may outperform non-priced lanes in terms of throughput, especially during congested periods. Express lanes operate on the principle of congestion pricing: when more vehicles are using those lanes, the price increases accordingly to manage congestion in the lanes. Express lanes generate revenues that may help fund construction and operation of the facilities, as well as reduce air pollution and GHG emissions associated with congestion.
3. **Improved Bike Infrastructure:** The bike infrastructure improvement strategy is expected to be applied at different intensities (network density, upgrade in class) to align with land use plans and transit investments. This strategy is closely aligned with the first-last mile, technology and micro-mobility, and Safe Routes to School strategies. A key difference is that the bicycle infrastructure investments will be focused on the development of a base network of on-street facilities designed for the completion of short trips and network connections for longer bicycling trips.
4. **Infill Development and Increased Density Near Transit Infrastructure:** This strategy is embedded within several Priority Development Areas, such as Transit Priority Areas and Livable Corridors, to reflect the regional benefits gained when development occurs near transit infrastructure.
5. **Mileage-Based User Fee:** Mileage-based user fees would be implemented to replace existing federal and state gas taxes. As mileage-based user fee administrative technologies improve, we assume implementation of a regional road fee on a county basis. This road charge would provide a choice among multiple pricing options tailored to local needs, similar to the diverse expenditures in current local sales tax initiatives, thereby allowing local agencies the ability to better manage their transportation systems, especially as VMT increases with the introduction of connected and autonomous vehicles.
6. **New Transit Capital Projects:** Connect SoCal 2024 includes \$97.5 billion in capital improvements and \$287 billion in operations and maintenance for transit and passenger rail. This includes new light rail routes, extensions and/or service enhancements in Los Angeles, Orange, Riverside, and San Bernardino counties; systemwide enhancements to improve commuter rail service; new bus rapid transit and rapid bus routes across Los Angeles, Orange, Riverside, and San Bernardino counties; and high-quality transit corridors in all counties.
7. **Shorter Trips Through Land Use Strategies and Job/Housing Balance:** The objective of this strategy is to reduce the distance of vehicle trips by promoting growth in geographies beyond high quality transit areas such as neighborhood mobility areas and job centers. By enabling more housing development near job centers and commercial corridors, trip lengths may be effectively reduced.
8. **Job Center Parking Strategy:** Increase parking price to all vehicles entering and parking to access activities in job centers, which will reduce use of SOV and increase use of carpool and transit modes. Job centers are places in the region with generally higher existing employment density than the

areas around them. By 2050, the 16 job centers would cover roughly 0.43 percent of the region's land area, but about 20 percent of the region's employment and take advantage of existing density and infrastructure. These centers were evaluated for parking pricing, assessing base rates, and adjusting to grow parking rates starting in FY25.

9. **Dedicated Transit Lanes:** Conversion of traffic lanes to prioritize transit or active transportation modes. This strategy involves the conversion of auto traffic lanes to dedicated lanes for transit and/or bicycle travel. Complete Streets is a policy and design approach where streets are planned, designed, and operated for all users, not just automobiles. However, the specific implementation of Complete Streets varies depending on context and what is suitable for a particular location. Complete Streets implementation may include dedicated bus lanes in some instances.
10. **Improved Pedestrian Infrastructure:** Installation of pedestrian facilities to support safe conditions for walking trips and to encourage additional walking trips. This includes the installation of new sidewalks, repair of existing sidewalks, improvement of intersection designs, installation of ADA compliant infrastructure, walking paths, traffic control devices, crosswalks, curb extensions/bulb outs, ADA requirements, tree canopy coverage, and other traffic calming projects that reduce vehicle speeds.
11. **Safe Routes to School:** The Safe Routes to School strategy seeks to reduce the number of vehicle trips to schools and shorten commute trips where one stop of the trip is at a school. It focuses on encouragement programs based on the five 'E's: Encouragement, Education, Evaluation, Enforcement, and Equity.
12. **Parking Deregulation:** Provide support to local jurisdictions in eliminating parking minimums within a half mile of high-quality transit stops, excluding transit priority areas – consistent with AB 2097 (in the same fashion as adopted by the City of San Diego and the City of Santa Monica).
13. **Mobility Hubs:** This strategy combines microtransit, car share, bike share/micromobility. Each of these mobility services have a car-free or car-light common-user type that expands upon existing transit services.

As shown in TABLE 13, the comprehensive program of investments and strategies included in Connect SoCal 2024 achieves the SCAG Regional goal for a per capita GHG emissions reduction of eight percent by 2020 and 19 percent by 2035, relative to 2005 emissions.

Since adoption of Connect SoCal 2020, SCAG has been analyzing regional vehicle miles traveled (VMT) data reported annually through the Highway Performance Monitoring System (HPMS). HPMS data shows that total VMT for SCAG Region in 2020 was 10.9 percent lower than in 2019. SCAG will use the 2020 observed VMT data to report on actual GHG reductions relative to the CARB-adopted eight percent regional emissions reduction target for 2020. SCAG used the validated year 2019 (Base Year) model to calculate the GHG emission rate per VMT and applied that rate to estimate regional per capita GHG emissions reduction for 2020.

Table 13. Greenhouse Gas (GHG) Emission Reductions

Year	% Reduction from 2005 Levels	
	CARB Target	Connect SoCal
2020	8.0%	19.8%
2035	19.0%	19.8%

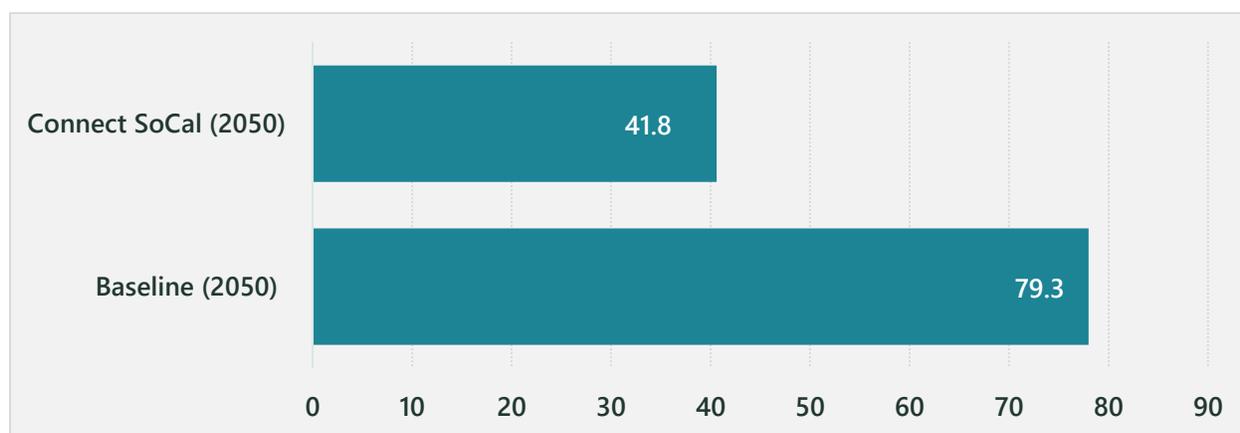
Source: SCAG 2024

LAND CONSUMPTION FOR URBAN PURPOSES

The 'Land Consumption for Urban Purposes' metric measures the extent to which agricultural and other rural lands in the region have been transformed into urban development to accommodate new housing and employment. It specifically looks at the consumption of greenfield land, which refers to land that has not been previously developed or otherwise impacted by urbanization, including agricultural land, forests, deserts, and other undeveloped sites. As previously discussed, Connect SoCal 2024 focuses new urban development into Priority Development Areas (PDAs) to reduce dependency on single occupancy vehicle travel.

As illustrated in FIGURE 16, Connect SoCal 2024 is projected to consume about 47 percent fewer square miles of previously rural or agricultural (greenfield) land by 2050 as compared to the Baseline, with 41.8 square miles of greenfield lands converted to urban use under the Plan, compared to 79.3 square miles with the Baseline. Since most PDAs in the SCAG Region are located within existing urbanized areas, the allocation of new urban development into these locations reduces the need to expand into the rural periphery.

Figure 16. Land Consumption for Urban Purposes (square miles)



Source: SCAG 2024

CRITERIA AIR POLLUTANT EMISSIONS

The Climate Resiliency outcome category for the Connect SoCal 'Environment' goal area is also supported by the 'Criteria Air Pollutant Emissions' performance measure. There are four common transportation-related air pollutants that are monitored in the SCAG Region. These 'criteria' air pollutants include ground

level ozone, particulate matter (PM10 and PM2.5), carbon monoxide (CO), and nitrogen dioxide (NO₂). These pollutants require careful monitoring because of their known adverse effects on human health. Emissions are estimated using results of the SCAG Regional Travel Demand Model, which are then input to the CARB Emission Factors (EMFAC) model.

Ground level ozone is formed by the reaction between reactive organic gases (ROG) and oxides of nitrogen (NO_x) in the presence of sunlight and may cause respiratory illness among vulnerable populations, including children, the elderly, and persons with existing respiratory illnesses. However, the health effects of long-term ozone exposure are a concern for everyone in the region. Some of the major health concerns of exposure to high levels of ozone include respiratory irritation, reduced lung capacity, chest pain, aggravation of asthma, and other respiratory illnesses.

Particulate matter (PM) consists of extremely small airborne particles and liquid droplets associated with dust, soot, and combustion byproducts. Particulate pollution, especially from fine particulate matter (PM_{2.5}), has been linked to significant human health impacts, including aggravated asthma, increases in respiratory diseases, chronic bronchitis, decreased lung function and even premature death.

Carbon monoxide (CO) is a harmful gas that is a byproduct of automobile exhaust. Elevated levels of carbon monoxide may be especially dangerous for people with existing respiratory or coronary diseases because it reduces the flow of oxygen through the body. Each year, approximately 20,000 Americans end up in the emergency room due to carbon monoxide poisoning. To address this risk, many new homes are now equipped with carbon monoxide detectors since CO is odorless and hard to detect without CO detectors.

Nitrogen dioxide (NO₂) is formed in the high-pressure and temperature conditions found in internal combustion engines. NO₂ pollution is known to have adverse impacts on the human respiratory system, including the aggravation of asthma symptoms. Due to its brownish color NO₂ pollution may also reduce visibility, increasing the risk for roadway collisions as well as generally degrading the visual aesthetic of the natural environment.

While air quality has been an ongoing challenge for the SCAG Region over the decades due to topography, land use, and an ever-expanding population, it is expected that regional CO and PM_{2.5} emissions will be reduced by 2050 with implementation of Connect SoCal 2024 relative to observed performance in 2019 and the 2050 Baseline projection. The SCAG Region is expected to experience a significant reduction in CO emissions due to improvements in vehicle fuel efficiency, increased use of cleaner energy sources, and reduced regional dependence on driving alone by automobile. Regional PM_{2.5} emissions are also projected to decrease by 2050 in response to implementation of the Plan.

Additional details on criteria pollutants and regional air quality performance may be found in the Connect SoCal 2024 Transportation Conformity Analysis Technical Report.

5.4.2 ENVIRONMENT OUTCOME 2: RESOURCE EFFICIENCY

The 'Resource Efficiency' outcome category measures the environmental sustainability objectives of Connect SoCal 2024 by evaluating how effectively the SCAG Region is conserving its limited energy and water resources over time. With growing concern over the consequences of climate change, including periodic conditions of severe drought and higher risks of wildfire, monitoring the consumption of natural resources has become even more crucial. By keeping track of resource usage, the SCAG Region can better address and adapt to the challenges posed by climate change. The results of resource efficiency metrics provide valuable insights into the region's performance and help guide efforts to confront climate challenges effectively.

ENERGY CONSUMPTION

The first of the two performance measures used to assess Connect SoCal plan performance relative to resource efficiency is energy consumption per capita. Rates of energy consumption impact GHG emissions and other regional sustainability objectives. As discussed previously, with SB 375 and subsequent supportive state legislation, the reduction of GHG emissions has become a focal point in the development of community sustainability strategies among state, regional, and local agencies throughout California.

The energy consumption performance measure assesses per capita energy consumption (electricity, natural gas, vehicle fuel) in the SCAG Region. The analysis of how Connect SoCal 2024 affects the rate of energy consumption supports regional goals for reducing GHG emissions and increasing climate resilience. While the correlation of regional VMT reduction strategies with vehicle fuel use is apparent, Connect SoCal also provides energy conservation benefits through the promotion of policies related to the location and transportation efficiency of jobs and housing.

In 2019, the average household in the SCAG Region consumed around 61.2 million British Thermal Units (BTU) of energy. With implementation of Connect SoCal 2024, it is projected that, by 2050, the average annual household energy use will decrease to 44.6 million BTU, which is a reduction of about 25 percent. In comparison, without the Plan, the Baseline scenario projects per household energy consumption in the SCAG Region to be 45.8 million BTU in 2050, a comparative reduction of 2.7 percent.

WATER CONSUMPTION

The second 'Resource Efficiency' plan performance measure assesses the impact of Connect SoCal 2024 on the rate of water consumption in the region. Along with energy consumption, the 'Water Consumption' metric helps evaluate the performance of the Plan toward achieving regional environmental sustainability goals. This measure projects per household water consumption rates in the urbanized areas of the SCAG Region. With periodic conditions of drought affecting the entire state, along with escalating concern regarding the regional impacts of climate change, it is imperative that effective strategies be identified for conserving water in the SCAG Region.

In 2019, the average household in the SCAG Region consumed about 108.5 thousand gallons of water. Connect SoCal 2024 will significantly reduce household water use in the region by 31.2 percent in 2050, to 74.6 thousand gallons, compared to 2019. Implementation of the Plan will also reduce average household water consumption by 454 gallons (0.6 percent) relative to the projected 2050 Baseline of 75.1 thousand gallons per household. As discussed above for energy consumption, Connect SoCal strategies for the allocation of more housing and employment centers into designated priority development areas that

minimize the environmental impacts caused by urban expansion will also meaningfully contribute to reducing water consumption and promoting water conservation within the SCAG Region.

5.5 CONNECT SOCAL 2024 GOAL 4: ECONOMY

The Connect SoCal 2024 'Economy' goal area seeks to promote and nurture a sustainably robust and productive regional economy that produces opportunity for all residents. Achievement of regional economic objectives require the balance of multiple factors that contribute to economic prosperity including fostering a regional business climate that is amenable to the creation of high paying jobs, ensures that all communities have access to enhanced economic opportunities, and is focused on maintaining long-term economic, environmental, and climate sustainability.

The 'Economy' goal area is supported by two specific outcome categories: 'Jobs' and 'Competitiveness.' These categories guide efforts to promote job growth and enhance the region's overall economic competitiveness.

5.5.1 ECONOMY OUTCOME 1: JOBS

The 'Jobs' outcome category assesses performance of Connect SoCal 2024 in fostering new employment opportunities in the region. To assess this outcome, two measures are used:

- **New Jobs:** This measure quantifies the number of new jobs that are directly created due to Connect SoCal 2024 regional transportation system investments.
- **Share of Regional Employment in Priority Development Areas (PDAs):** This measure is used to assess the proportion of regional jobs located within designated PDAs. PDAs are preferred locations identified in Connect SoCal 2024 for the concentration of new urban development and economic growth in the region. Monitoring the share of employment growth occurring in PDAs helps assess the plan's effectiveness in promoting economic opportunities in these highly accessible areas.

These measures help to evaluate Connect SoCal 2024 performance in creating new jobs and driving regional employment growth, both in general and specifically in PDAs.

NEW JOBS ADDED DUE TO TRANSPORTATION INVESTMENTS

For the plan assessment process, the 'Jobs' outcome is measured using two performance metrics. The first metric focuses on the number of new jobs directly created as a result of the construction and operation of the regional multimodal transportation system investments planned in Connect SoCal 2024. Regional transportation system investments provided through the plan will continue to maintain a level of expenditure at and beyond historical levels for several categories. It is projected that, on average, 277,800 new jobs will be generated each year in the SCAG Region in direct response to Connect SoCal regional transportation system investments.

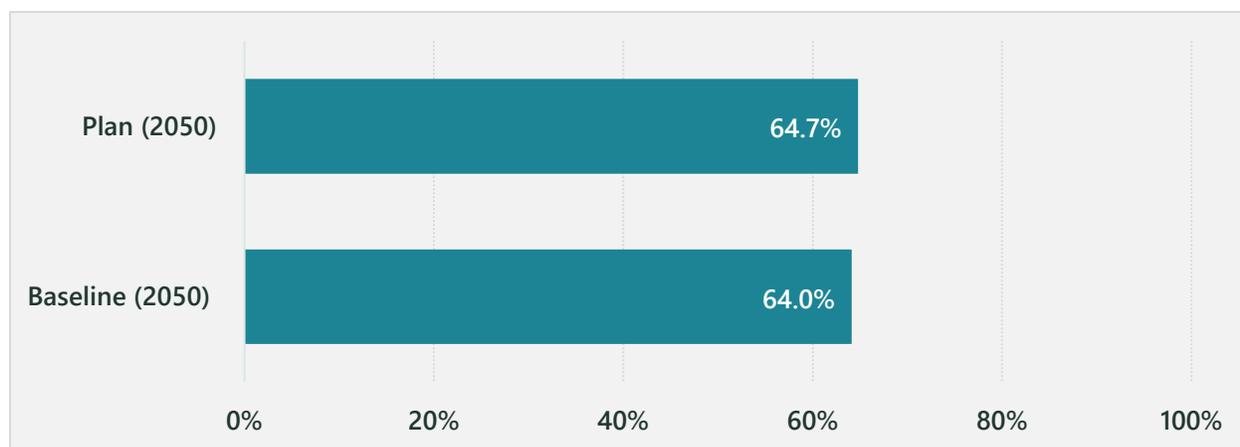
SHARE OF REGIONAL EMPLOYMENT IN PDAS

The second measure used to assess the impact of the Plan relative to the 'Jobs' outcome is the share of regional employment within designated Priority Development Areas (PDAs). As described previously, PDAs

are areas in the region that offer high levels of accessibility and connectivity to job centers and other primary destinations and opportunities. Focusing new employment centers within designated PDAs throughout the SCAG Region will promote job growth within areas that offer more mobility choices and provide easy access to other destinations. This outcome will facilitate achievement of multiple Connect SoCal 2024 regional objectives including economic development, climate resilience, accessibility, and air quality improvement. MAP 1, presented previously in this report, features a map of PDA locations in the SCAG Region.

As indicated in FIGURE 17, with the implementation of Connect SoCal 2024, the share of regional employment located in at least one designated PDA in 2050 is projected to increase by 0.7 percentage points. Under the Baseline scenario, 64.0 percent of regional employment would be within PDAs, while with the Plan, the share increases to 64.7 percent.

Figure 17. Share of Regional Employment in Priority Development Areas



Source: SCAG 2024

5.5.2 ECONOMY OUTCOME 2: COMPETITIVENESS

The second performance outcome category supporting the Connect SoCal 2024 ‘Economy’ goal area is improvement in overall regional economic competitiveness due to the comprehensive program of transportation system investments, improvements, and projects included in the Plan.

NEW JOBS DUE TO IMPROVED REGIONAL ECONOMIC COMPETITIVENESS

The first of two performance measures used to assess the Plan’s performance relative to the ‘Competitiveness’ outcome is the number of new jobs generated in the SCAG Region. These new jobs are the result of improved conditions of regional economic competitiveness resulting from the enhanced transportation infrastructure, better air quality, reduced congestion, and overall better quality of life provided through the implementation of Connect SoCal. It is projected that approximately 202,300 new jobs will be generated throughout the SCAG Region each year due to the improved regional economic environment fostered by Connect SoCal 2024 multimodal transportation system investments.

The combined annual number of new jobs generated by Connect SoCal, including those resulting directly through Plan investments and those generated through an improved regional economic environment, is projected to total 480,100.

TRANSPORTATION SYSTEM INVESTMENT BENEFIT/COST RATIO

The economic competitiveness impact of Connect SoCal 2024 is assessed by considering the benefit/cost ratio of the transportation system investments provided through the Plan. This ratio quantifies the monetary value of the social benefits conferred to the SCAG Region relative to the total Connect SoCal 2024 transportation system investment costs. The benefit/cost ratio metric is used to assess how effectively the Plan utilizes funding resources by projecting the benefits that users of the regional transportation system directly experience from Plan expenditures. This metric serves to evaluate Plan performance relative to the generation of regional benefits as compared to the amount of funding invested.

The benefit/cost ratio is determined by monetizing the regional benefits accrued in various performance categories such as travel time savings, air quality improvements, transportation system safety enhancements, and vehicle operating costs. The monetized benefits are then added together and divided by the total incremental costs of the transportation system investments provided through Connect SoCal 2024. A resulting ratio that is greater than 1.0 signifies that the monetized benefits of the Plan outweigh the costs.

The results of the Connect SoCal 2024 benefit/cost analysis indicate that the investments of the Plan will provide a return of \$2.00 for every dollar invested. In this analysis, benefits and costs are measured in 2021 dollars, using a four percent discount rate. The estimated benefits cover the 26-year planning period of the Plan, from 2024 to 2050. The benefits analyzed include travel time savings, travel time reliability benefits, vehicle operating cost savings, as well as accident and emissions cost savings. The evaluation of user benefits utilizes the Cal-B/C benefit/cost framework and incorporates output from the SCAG Regional Travel Demand Model. The costs include the incremental public expenditures incurred for capital projects over the planning period of Connect SoCal 2024.

The economic benefits provided through implementation of the Plan are discussed in greater detail in the Connect SoCal 2024 Economic Impact Analysis Technical Report. Financial assessment of the Plan is provided in depth in the Transportation Finance Technical Report.

6. ONGOING PERFORMANCE MONITORING

6.1 CONNECT SOCAL 2024 ONGOING PERFORMANCE MEASURES

In addition to the performance measures used to assess performance of Connect SoCal 2024, SCAG developed a separate set of metrics to support ongoing performance monitoring of the Plan over time. While some of the ongoing performance metrics are also used to evaluate the Plan, many of them are not readily forecast or modeled and are therefore not appropriate for use in the plan scenario assessment process. However, they are useful for tracking progress being made toward achievement of SCAG's regional performance goals over time. The measures to be used for ongoing regional performance monitoring are presented at the beginning of this report in TABLE 6.

A total of 33 performance metrics have been established for the ongoing regional monitoring process, ten of which are newly introduced for Connect SoCal 2024. The ongoing performance measures are aligned with the four primary goal areas of the Plan, ensuring that progress towards the defined regional objectives may be effectively monitored and reported throughout the duration of the Plan. Monitoring progress over time enables SCAG to review the performance of specific programs and strategies employed through the Plan to assess their continued efficacy toward achieving intended objectives and to identify areas where additional effort may be needed.

6.2 CONNECT SOCAL GOAL AREA 1: MOBILITY

One of the four foundational goal areas established by Connect SoCal 2024 is 'Mobility'. As discussed in the previous section, the concept of 'Mobility' may be broadly defined as the ability of people and freight to move through the region with minimal burdens or limitations related to time, modal choice, or accessibility.

The Connect SoCal 2024 ongoing regional performance monitoring program includes 16 metrics that specifically support the Mobility goal area. The Mobility metrics are categorized into four outcome categories: 'Accessibility,' 'Infrastructure,' 'Safety,' and 'Transit.' These categories are designed to track and measure the performance of the Plan relative to improving mobility and accessibility in the region.

6.2.1 MOBILITY OUTCOME 1: ACCESSIBILITY

The 'Accessibility' outcome is supported by five specific, quantitatively defined performance metrics. The transportation system investments featured in Connect SoCal 2024 are coordinated to improve the overall travel experience in the SCAG Region. A primary determinant of success of regional transportation system investments is how much time the average commuter spends traveling to work and to other destinations.

AVERAGE TRAVEL TIME

One of the five ongoing performance measures used to support the 'Accessibility' outcome is 'Average Travel Time.' Unlike the plan assessment performance assessment measures described previously, the ongoing metrics are not modeled or projected. Rather, ongoing performance monitoring requires the collection and analysis of observed data to identify existing and emergent regional performance trends relative to the goals outlined in the Plan. Data for average travel time is collected for both work and non-work trips, categorized by travel mode including SOV, HOV, walking, biking, and transit.

While SCAG has no influence over the high population growth rates that the Southern California region has experienced over previous decades, our efforts to coordinate regional land use and transportation planning through Connect SoCal 2024 will serve to orient the region toward a more sustainable and efficient urban form. While average travel times should not be expected to significantly decrease over time, they may be reduced relative to regional population growth.

FIGURE 18 shows average commute travel times in the region for single occupancy vehicle (drive alone), high occupancy vehicle (carpool), and transit modes over the last ten years (2011-2021). Between 2011 and 2015 average travel times increased slightly for each of the three modes. A decrease was observed for transit in 2017, followed by increases across all modes in 2019. While it is possible that the pandemic continued to impact average travel times reported for 2021, with decreases observed for all three modes, it is anticipated that continued implementation of Connect SoCal 2020 and the adoption of Connect SoCal 2024, will mark the start of a trend toward reduced travel times for all modes.

Figure 18. Average Commute Travel Time by Mode (minutes)



Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates

COMMUTE TRAVEL TIME

Supplemental to the mean commute time information provided above, FIGURE 19 shows average work trip travel times reported for each county in the SCAG Region in 2021. The longest commute time reported among the six counties was in Riverside County at 34.0 minutes, followed closely by San Bernardino County at 32.4 minutes. Many residents of the Inland Empire travel to employment destinations in adjacent counties, specifically Los Angeles and Orange, resulting in relatively longer commute times compared to the SCAG Regional average of 30.9 minutes. Imperial County had the shortest average commute time in the region in 2021 (22.0 minutes), followed by Ventura County at 26.8 minutes. The relatively short commute times observed in Imperial County reflects the generally lower levels of congestion on that county's roadways as compared to more urban areas of the region.

Figure 19. Average Commute Travel Time by County (2021)



Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates

TRAVEL TIME RELIABILITY

Another performance area that relates to the ‘Accessibility’ outcome is the concept of reliability. Reliability refers to the predictability of travel time for users of the regional transportation system, including people and goods. Reliability performance measures assess the amount of time required to travel from one place to another and how it may vary on specific roadways from day to day. Reliability performance may reflect the impacts of accidents, incidents, weather, and special events in reaching travel destinations in a predictable and timely manner.

There are currently no established methods to accurately forecast reliability because, while existing travel demand models may generate accurate estimates of average travel times and delays, they are not yet equipped to evaluate daily variations in travel times. A commonly used method to assess travel time reliability is to calculate the amount of ‘planning time’ needed for a traveler to arrive at their destination on time.

A useful metric for assessing planning time requirements is calculation of the 95th percentile travel time. The 95th percentile travel time represents the five longest commute times observed along a specific travel corridor out of a total of 100 commuting days (or 19 out of 20 workdays per month). This means that a commuter may expect to reach a desired destination on time 95 percent of the time, accounting for atypical events that may affect travel times. Atypical events, such as collisions or adverse weather conditions, could extend travel times, but the 95th percentile represents a balance between the relatively few days when commutes are impeded by unexpected events and more typical travel days.

The additional time needed to ensure timely arrival (the difference between the planning time and the average travel time) is referred to as the ‘buffer time’ and the percentage of additional buffer time added to the reference travel time is known as the ‘Buffer Index.’

The Connect SoCal 2024 ongoing performance measure used to monitor travel time reliability performance over time is the share of total person-miles traveled on the National Highway System (NHS) that are

considered reliable based on the 95th percentile travel time. The 'Percent of Reliable Person-Miles Traveled on the NHS' performance measure reports the share of total person miles traveled on NHS roadways in the SCAG Region that produce dependable travel times as compared to expected travel times.

Travel time reliability on NHS roadways in the SCAG Region is expected to improve with implementation of Connect SoCal 2024. This metric is included among the federal performance measures used in support of the NHS system performance (PM 3) monitoring program which is discussed in greater detail in the Federal System Performance Report featured in Section 7 of this report.

COMMUTE TRAVEL MODE SHARE

The 'Commute Travel Mode Share' performance measure monitors the share of commute travel that is conducted using various modes, including single occupancy vehicle (SOV), high occupancy vehicle (HOV), transit, and active transportation (bicycle and pedestrian). Strategic regional investments in bicycle and pedestrian infrastructure, safety, and supportive land use changes are expected to result in increasingly higher shares of commuters choosing more sustainable transportation options for reaching workplace destinations. These options include active transportation such as walking and biking, carpooling, and utilizing public transit. The objective is to encourage and facilitate the adoption of these sustainable modes of transportation as viable alternatives to private vehicle usage.

Travel by single occupancy vehicle remains the preferred option for most commuters in the region. However, given the role of transit in meeting regional sustainability and GHG reduction goals, Connect SoCal 2024 includes policies and strategies to make the regional transit system a more viable and attractive alternative to SOV travel. Additionally, the provision of a safe, connected, and high-quality active transportation network is essential for reducing dependency on SOV travel. Enhancing accessibility for bicycles and pedestrians to key destinations such as major employment centers, retail, and schools will facilitate achievement of regional mobility and GHG emission reduction objectives. Connect SoCal seeks to promote development of communities with safe, viable, and efficient multimodal transportation options.

PEAK HOUR EXCESSIVE DELAY

The 'Annual Hours of Peak Hour Excessive Delay' metric reports the total annual hours of delay experienced per capita during peak travel periods (AM and PM). This is both a federally defined PM 3 performance measure and is also included in the Connect SoCal 2024 ongoing performance monitoring program to provide insight into traffic congestion conditions occurring during peak travel demand periods in the SCAG Region.

With implementation of Connect SoCal 2024, it is expected that peak hour excessive delay will be reduced in the SCAG Region. More details regarding this federal performance measure, including associated targets and performance information, is provided in the Federal System Performance Report included in this report.

6.2.2 MOBILITY OUTCOME 2: INFRASTRUCTURE

The second performance outcome category developed to support the Connect SoCal 2024 'Mobility' goal area is 'Infrastructure'. This outcome focuses on ongoing performance measures that monitor the condition of regional transportation system infrastructure, including roadways and bridges.

MANAGED LANES UTILIZATION

The 'Managed Lanes Utilization' measure is a newly introduced ongoing performance metric for Connect SoCal 2024 which focuses on monitoring utilization trends for various types of managed lanes in the SCAG Region, including high-occupancy toll (HOT) and high-occupancy vehicle (HOV) lanes. Since the implementation of managed lanes comprise an important element of SCAG's overall approach to congestion management and mobility improvement, tracking usage rates of these facilities provides valuable insight into their effectiveness toward achieving those regional objectives.

Data collected for this metric will be used to assess usage rates of managed lanes in the SCAG Region over the duration of the Connect SoCal 2024 plan horizon. It is expected that managed lane use will increase over time with implementation of the Plan, as lane management and pricing represent a primary regional strategy for reducing congestion and improving air quality through encouraging multi-passenger vehicle travel and discouraging discretionary trips during peak travel times.

TRANSPORTATION SYSTEM INFRASTRUCTURE CONDITION

To ensure the long-term sustainability of the regional transportation system it is necessary to prioritize the maintenance of its functionality and effective performance over time in a manner that minimizes damage to the environment and does not compromise the ability of future generations to meet their transportation needs. In summary, it is essential to prioritize the preservation and enhancement of existing transportation infrastructure in planning for our current and future mobility needs.

Connect SoCal 2024 is committed to maintaining a sustainable regional multimodal transportation system by allocating approximately \$384 billion toward maintaining and operating the system in a State of Good Repair over the period of the Plan. This amounts to an average annual per capita investment of about \$780 per person (in nominal dollars) for each year of the Plan period, or about \$2.00 per person per day.

Maintaining existing transportation infrastructure in a state of good repair in an expansive region with a large population and a global economy that is highly dependent on the efficient movement of goods presents a significant challenge for SCAG.

TABLE 14 presents the total freeway lane miles for each of the six counties in the SCAG Region in 2019 and projections for 2050 (Baseline and Plan). Even with the current priority for preserving existing roadways in the region over the construction of new capacity, freeway lane mileage in the SCAG Region is expected to increase by about four percent, from 11,195 miles in 2019 to 11,627 miles by 2050. Much of this expanded capacity will be to accommodate a still growing population in suburban areas of the SCAG Region, as indicated by the increasing relative share of regional freeway lane miles projected for Riverside and Orange counties, and a relatively smaller share for Los Angeles County.

Table 14. Freeway Lane Miles by County

County	Base Year (2019)		Baseline (2050)		Plan (2050)	
	Lane Miles	Share	Lane Miles	Share	Lane Miles	Share
Imperial	379	3.4%	379	3.4%	417	3.6%
Los Angeles	4,599	41.1%	4,651	40.8%	4,684	40.3%
Orange	1,322	11.8%	1,387	12.2%	1,424	12.3%
Riverside	1,799	16.1%	1,857	16.3%	1,936	16.6%
San Bernardino	2,558	22.8%	2,577	22.6%	2,596	22.3%
Ventura	538	4.8%	538	4.7%	570	4.9%
SCAG Region	11,195	100.0%	11,389	100.0%	11,627	100.0%

Source: Highway Performance Monitoring System (HPMS); SCAG

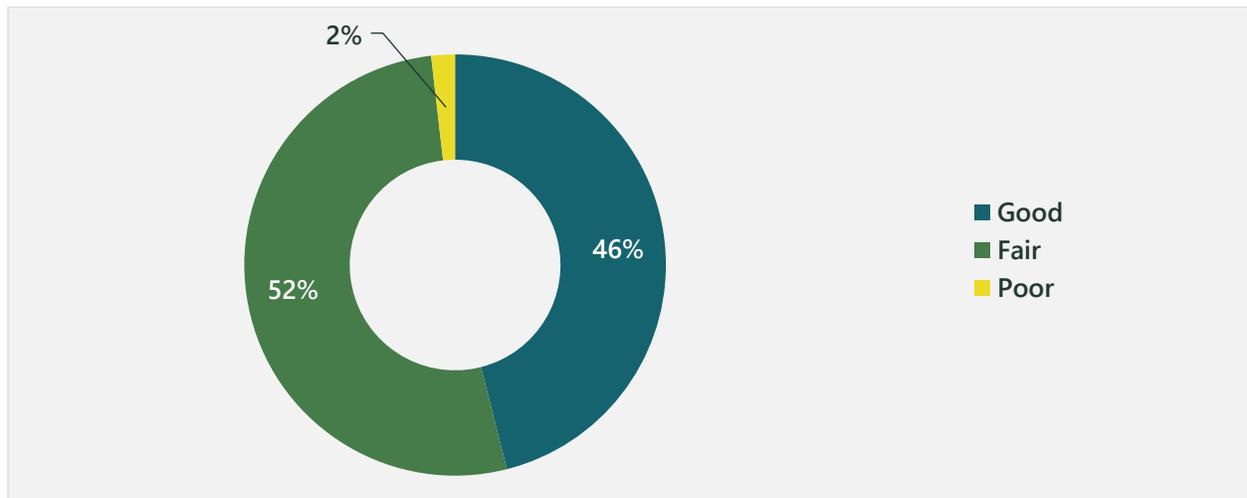
An important measure used to monitor the sustainability of our regional transportation system is pavement condition of local roadways in the SCAG Region. Roadway condition impacts transportation safety for all modes of travel. Smooth, well-maintained pavement reduces hazards for motor vehicles and bicycles by improving roadway traction and vehicle control. Due to a growing population and a robust regional economy, the condition of our regional transportation infrastructure, including highway pavement, has deteriorated over the years. For this reason, the preservation and maintenance of our existing transportation system infrastructure has become increasingly important.

Monitoring the condition of regional roadways and highways over time helps to identify and allocate resources to facilities that are most in need. Pavement condition is monitored for both the State Highway System (SHS) and for locally maintained arterial roadways. The Caltrans Automated Pavement Condition Survey reports SHS pavement condition within three categories based on surface cracking, rutting, faulting, and the International Roughness Index (IRI).

Pavement is classified as being in 'Good' condition when it has a smooth surface, minimal cracking, and strong structural integrity. 'Fair' condition refers to roadways with some surface cracking and areas of roughness but not enough to substantially impact the quality or safety of the ride. These pavements may require some capital investment for preventative maintenance. The 'Poor' condition category refers to pavements with substantial surface roughness, cracking, or rutting that negatively impacts ride quality and safety. Pavements in 'Poor' condition should be prioritized for rehabilitation investment to ensure their continued viability and operational safety.

FIGURE 20 illustrates Base Year (2019) SHS pavement condition in the SCAG Region using the three classifications described above. In 2019, 46 percent of SHS pavement in the region was classified as being in 'Good' condition, meaning it is structurally sufficient to safely accommodate existing regional travel demand. However, more than half (52 percent) of regional SHS pavement is classified as being in 'Fair' condition, indicating it will require some investment to ensure continued safe and comfortable travel conditions. While only two percent of SHS pavement in the SCAG Region has been designated as being in 'Poor' condition, these roadways should be prioritized for significant investment in maintenance or rehabilitation to improve travel safety and structural integrity.

Figure 20. State Highway System (SHS) Pavement Condition



Source: Caltrans

For local roadways, pavement condition is usually reported by local agencies using the Pavement Condition Index (PCI). PCI evaluates pavement condition using a scale of 0 to 100, with 100 being the best possible score and 0 being the worst. In 2019, local arterials in the SCAG Region had an average PCI rating of 69 out of 100, where scores above 70 typically translate to conditions that are considered adequate, and ratings below 50 indicating a likely need for major roadway rehabilitation. These findings suggest that a substantial share of local roadways in the SCAG Region will require pavement improvements or rehabilitation to enhance multimodal safety and to enhance the longevity of existing regional transportation infrastructure.

FIGURE 21 provides a summary of local roadway pavement condition in the SCAG Region by county. In 2019, average countywide PCI ratings ranged from a low of 56 in Imperial County to a high of 79 in Orange County. With a score of 70 indicating good pavement condition, four of the six SCAG Region counties have average PCI scores below that threshold, suggesting the need for significant investment in our existing roadway pavement infrastructure to ensure continued travel safety and to maintain the structural integrity of the local roadway network that connects communities throughout the region.

Figure 21. Local Roadway Pavement Condition Index (PCI)



Source: Caltrans

The federal transportation performance management program includes two measures for monitoring pavement condition on the National Highway System (NHS). These metrics include the share of total lane miles on the Interstate System with pavement that is classified as being in 'Good' and the share in 'Poor' condition. The second measure is the share of non-interstate NHS lane miles classified within each of those two condition categories. The federal performance management program also includes a measure for monitoring the condition of bridges on the NHS.

The NHS pavement and bridge condition performance measures are also used to support the ongoing monitoring of Connect SoCal 2024 over time. The regional performance and targets associated with these metrics is reported and discussed in greater detail in the Federal System Performance Report included in this Technical Report.

6.2.3 MOBILITY OUTCOME 3: SAFETY

Highway safety is an important element of the ongoing evaluation of the performance of the SCAG Regional transportation system as well as for target setting, monitoring, and reporting for the federal transportation performance management program. Regional transportation system safety performance is reported in historical context, allowing for the identification of past patterns and emerging trends over time.

The transportation safety performance measures used for the ongoing monitoring of Connect SoCal 2024 are congruent with the metrics established for the federal performance management program (PM 1) which include the total number of fatalities associated with highway collisions; the rate of collision-related fatalities per million vehicle miles traveled (VMT); the total number of serious injuries reported due to traffic collisions; the rate of collision-related serious injuries per million VMT; and the total combined number of active transportation (bicycle and pedestrian) fatalities and serious injuries that have resulted from traffic collisions in the SCAG Region.

Because of the high priority accorded to regional transportation safety by Connect SoCal, a separate section of this report has been created to specifically address the topic of transportation safety. The transportation safety section of the report follows the discussion of the ongoing regional performance measures. Additional information regarding transportation safety performance may be found in the Connect SoCal 2024 Mobility Technical Report.

6.2.4 MOBILITY OUTCOME 4: TRANSIT

The 'Transit' outcome category includes four ongoing measures used to monitor performance of the regional transit system, including equipment, service efficiency, safety, and infrastructure.

TRANSIT BOARDINGS PER CAPITA

The first of the ongoing transit performance measures monitors the number of transit boardings per capita for both work trips and for all trips. This metric is used to help identify regional transit use trends that have been occurring in the SCAG Region over recent years with a focus on what might be expected in the future. Monitoring the average annual number of transit trips taken per capita provides a complementary metric to transit mode share. While transit mode share captures the relative proportion of all travelers who use transit, transit boardings per capita provides a more precise assessment of the intensity in which transit is being used by residents of the SCAG Region.

FIGURE 22 shows the trend for annual per capita transit boardings in the SCAG Region since 2010. Per capita transit boardings have been steadily declining in the SCAG Region since reaching a high point in 2007 with 42.5 boardings per capita. By 2010, transit ridership had dropped by 7.5 percent from the 2007 peak to 39.3 boardings per capita. After several years of hovering near the 39 boardings per capita mark, transit use began another decline in 2015 that has gained momentum over the intervening years. After experiencing a reduction of about five percent each year between 2014 and 2019, per capita transit boardings dropped by nearly 20 percent in a single year from 2019 to 2020 in response to the travel impacts of the COVID-19 pandemic. By 2021, transit ridership fell another 20 percent, to 14.9 boardings per capita.

Transit is a primary and indispensable element of SCAG’s strategy for fostering a more sustainable, resilient, and equitable region. While much of the recent decline in transit use may be explained by the unavoidable travel impacts of the pandemic and to economic and other structural factors that are beyond the reach of SCAG’s long range planning efforts, the projects, plans, and strategies included in Connect SoCal 2024 are designed to improve the transit experience and to increase its viability as an alternative to single occupancy vehicle use.

Figure 22. Transit Boardings per capita



Source: National Transit Database (NTD)

TRANSIT SEAT UTILIZATION

A new ongoing transit performance measure being introduced for Connect SoCal 2024 is ‘Transit Seat Utilization’. This metric tracks the utilized capacity of available transit seats during peak demand hours for all transit types. Monitoring trends in the utilization of available transit seats during times of peak service demand provides useful insights into how transit service might be optimized to offer an efficient, comfortable, and feasible alternative to single occupancy vehicle travel especially during periods of peak travel demand.

TRANSIT ASSET MANAGEMENT AND TRANSIT SAFETY

The remaining ongoing regional performance measures supportive of the 'Transit' outcome category includes 'Transit Asset Management,' which addresses the condition of regional transit system equipment, rolling stock, infrastructure, and facilities; and 'Transit Safety,' which monitors the total annual number of fatalities and injuries related to transit system safety incidents, and the total annual number of transit system safety events.

Since these two transit system measures are also included in the federal transportation performance management program, more detailed information, including regional transit system performance results and targets, are presented in the Federal System Performance Report featured in Section 7 of this report. In addition, regional transit system information is provided in depth in the Transit/Rail section of the Connect SoCal 2024 Mobility Technical Report.

6.3 CONNECT SOCAL 2024 GOAL AREA 2: COMMUNITIES

As described previously in the Plan Assessment section of this report, the Connect SoCal 2024 'Communities' goal area is focused on the development and nurturing of highly connected and sustainable communities throughout the SCAG Region. The 'Communities' goal area seeks to enhance the livability of neighborhoods through the building and maintenance of a robust multimodal transportation network that is well integrated within the land use context of a locality and is focused on the needs and aspirations of that community.

Three outcome categories are used in this report to present the performance measures supportive of the Connect SoCal 2024 'Communities' goal area: Sustainability, Public Health, and Housing. The eight measures established for the ongoing Connect SoCal regional performance monitoring program are included within two of these outcomes: Housing and Public Health.

6.3.1 COMMUNITIES OUTCOME 1: HOUSING

Due to the housing crisis, which is not limited just to Southern California or the SCAG Region, it has become crucial to closely monitor housing performance regarding availability, affordability, and accessibility at a regional level. In response, three specific metrics have been established to continuously track regional housing performance in support of the Connect SoCal 2024 'Communities' goal area. These metrics include assessment of the relative cost burden of housing in the SCAG Region and evaluating the vulnerability of existing and planned regional housing to the impacts of environmental hazards, including those generated or exacerbated by climate change. These measures help us understand the regional housing situation and identify areas that require attention and improvement.

More information regarding the Plan's regional housing strategies, and the role of Accessory Dwelling Units (ADUs) in providing affordable housing opportunities, is provided in the Connect SoCal 2024 Housing Technical Report.

HOUSING COST BURDEN

The 'Housing Cost Burden' measure is used to monitor housing affordability trends in the SCAG Region. This metric monitors the share of median household income consumed by housing costs. Estimates for the share of annual household income used for housing-related expenses are based on average rent and

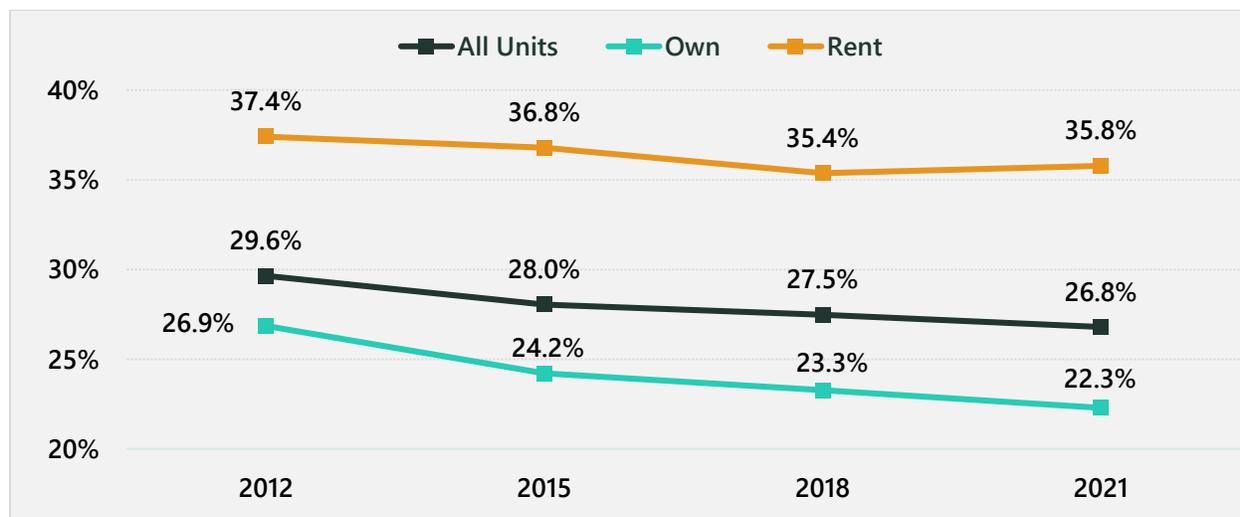
mortgage cost data. This information provides insights into housing affordability and helps identify regional trends related to housing costs.

As shown in FIGURE 23, in 2021, the average share of median annual household income spent on housing for all occupied units in the SCAG Region was 26.8 percent (middle line on graph). This continues a trend of slow but steady decline since 2012, when the housing cost share was 29.6 percent, with 28.0 percent and 27.5 percent reported for the intervening years of 2015 and 2018, respectively. However, there are significant disparities in cost burden experienced by renters and homeowners. The top line on the graph shows the housing cost burden borne by renters in the SCAG Region. While the cost burden for all households declined by 2.8 percent between 2012 and 2021, the burden experienced by renters declined by only 1.6 percent, from 37.4 percent in 2012 to 35.8 percent in 2021.

The bottom line on the graph indicates the share of median annual household income expended for housing costs by homeowners. Declining by 4.6 percent from 26.9 percent in 2012 to 22.3 percent in 2021, the relative burden borne by homeowners relative to renters in the SCAG Region is evident, as rents continue to rise each year, while mortgage payments often remain constant from year to year. Cost burden disparity among the six counties was minimal in 2021, with Los Angeles County registering the highest share of median household income spent on housing at 28.1 percent, and Imperial County reporting the lowest share at 23.3 percent.

More detailed analysis on the burden of housing costs in the SCAG Region is provided in the Connect SoCal 2024 Housing Technical Report.

Figure 23. Housing Cost Burden



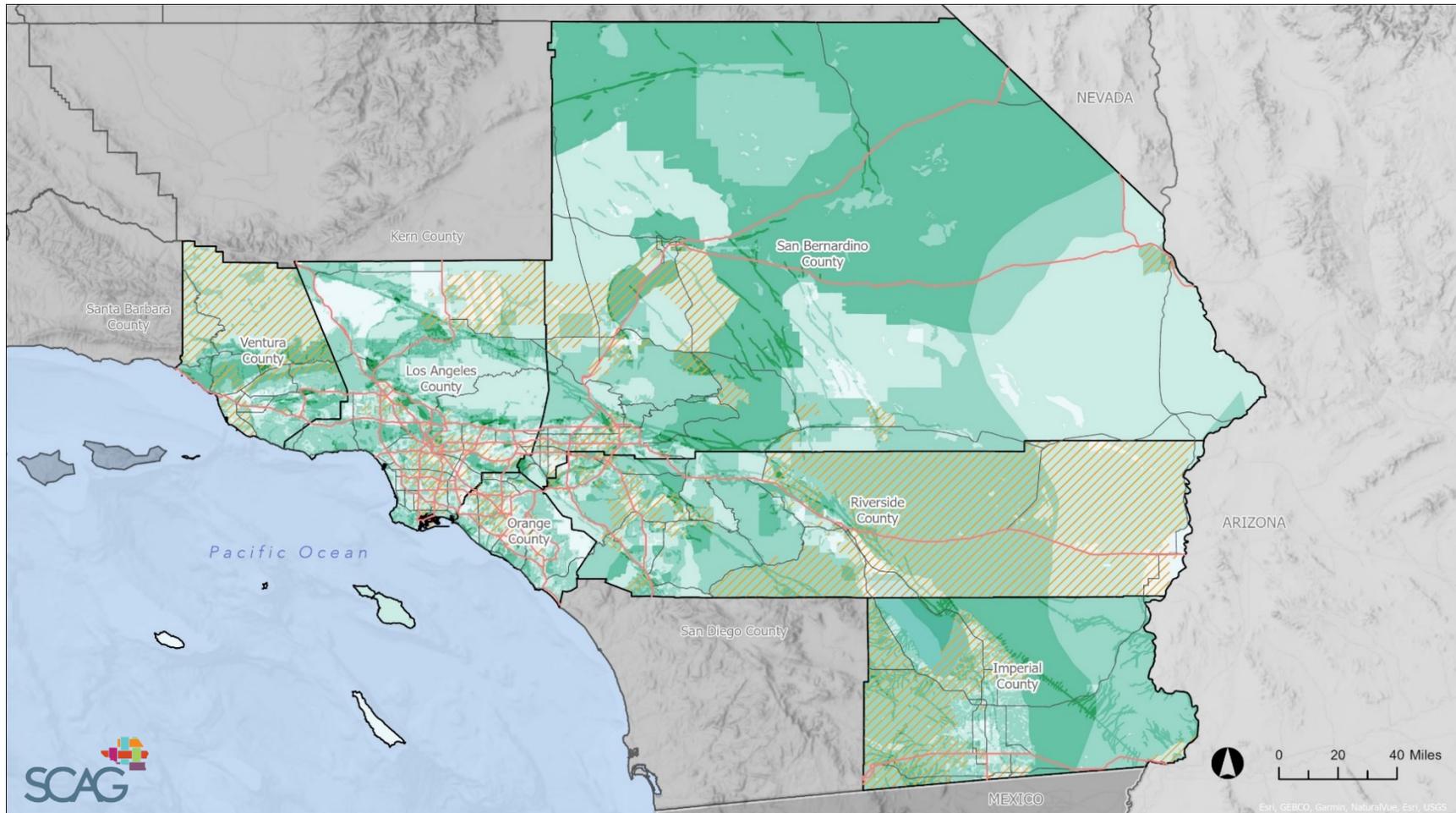
Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates

HOUSING VULNERABLE TO ENVIRONMENTAL IMPACTS

Two new performance measures have been added for Connect SoCal 2024 to provide additional support to the ongoing monitoring of housing in the SCAG Region. The first of these assesses the vulnerability of existing and planned housing to environmental hazards, including the effects of climate change.

The map provided in MAP 2 shows areas of the region that are at comparatively high risk of environmental hazards related to climate change. Environmental hazard risks that may potentially impact housing in the SCAG Region include sea level rise, wildfire, flooding, and urban-wildlife interface areas. More detailed information regarding regional natural lands preservation strategies may be found in the Connect SoCal Land Use and Communities Technical Report.

Map 2. SCAG Region Environmental Impact Hazard Areas



- Freeways
- Highways
- ▨ Priority Equity Communities
- ▭ SCAG Counties
- 1 Hazard
- 2 Hazards
- 3 Hazards
- 4 Hazards
- 5 Hazards
- 6 Hazards

Source: FEMA, CGS, CosMos, CalFIRE, California Heat Assessment Tool, U.S. Drought Monitor, U.S. Census Bureau ACS, 2017-2021

ACCESSORY DWELLING UNIT (ADU) DEVELOPMENT

Another new housing-related performance measure introduced for Connect SoCal 2024 evaluates the availability of much needed housing units in the region through development of Accessory Dwelling Units (ADUs). An ADU is a living unit constructed as an accessory unit to a single-family or multifamily residential building. ADUs represent an affordable housing option because they do not require paying for land, major new infrastructure, structured parking, or elevators. Additional benefits provided by ADUs is their potential to provide a source of income for homeowners while providing much needed independent living space to accommodate extended family members, students, small families, and older adults.

This new metric will track the number of ADUs developed within Priority Development Areas (PDAs) in each county of the SCAG Region over the Connect SoCal 2024 plan horizon. It is anticipated that implementation of the Plan will result in the provision of increased numbers of ADUs throughout the region, as this strategy represents a cost-efficient and sustainable way for providing much needed affordable housing. More detailed information about ADUs and their role in the provision of affordable housing in the SCAG Region is provided in the Connect SoCal 2024 Housing Technical Report.

6.3.2 COMMUNITIES OUTCOME 2: PUBLIC HEALTH

The second performance outcome category of the 'Communities' goal area is Public Health. The Connect SoCal 2024 ongoing performance monitoring program includes five specific metrics, all of which are continued from the 2020 Plan, which are used to monitor the performance of the Plan over time toward improving public health outcomes in the SCAG Region. The first of these measures is focused on the accessibility of residents to parklands and open space.

PERCENT OF RESIDENTS WITHIN 1/2 MILE WALK TO OPEN SPACE

This performance measure evaluates the proximity of residents to neighborhood parks and natural lands. If there are recreational spaces available near enough for people to walk to from their homes, they will have greater opportunities to engage in daily physical exercise and improve overall quality of life. According to analysis provided in the Connect SoCal 2024 Equity Analysis Technical Report, as of 2019, 32 percent of residents in the SCAG Region were able to reach a public park within a one-half mile walk.

NUMBER OF PARK ACRES PER 1,000 RESIDENTS

Another ongoing Connect SoCal 2024 public health performance measure monitors the availability of local parks and open spaces for residents in the SCAG Region to maximize opportunities to engage in daily physical exercise and to improve overall quality of life. One of the objectives of Connect SoCal 2024 is to increase the availability and accessibility of regional open spaces and parks to provide opportunities for physical activity and to enhance community cohesion. In 2019, there were approximately 268 acres of parks and open space per 1,000 residents in the SCAG Region (about six acres of local parks and 262 acres of open space).

HOUSEHOLDS LOCATED NEAR HIGH-VOLUME ROADWAYS

For purposes of the SCAG on ongoing regional performance monitoring program, high volume roadways are defined as having daily traffic volumes exceeding 100,000 vehicles in urban areas and 50,000 vehicles in rural areas. As air pollution from sources such as diesel and airborne particulate concentrations disperse with distance from the pollution source, specifically major highways, the associated health risk also declines. Studies conducted by the California Air Resources Board (CARB) have demonstrated that air pollution levels may be significantly higher within 500 feet of high-volume roadways before diminishing rapidly with increased distance. For this reason, it is important to monitor the share of regional households that are located within that proximity to ensure that pollution-related health impacts may be minimized.

In 2019, about six percent of households in the SCAG Region were located within 500 feet of a freeway or high-volume roadway. Connect SoCal 2024 seeks to reduce the prevalence of households in the region located in areas at high risk of public health impacts due to proximity to freeways and other major roadways that produce dangerously high levels of airborne contaminants.

ASTHMA INCIDENCE AND AIR QUALITY HEALTH IMPACTS

SCAG also monitors public health outcomes that correlate with regional air quality and lifestyle choices that are impacted by community context. The impact of regional air quality on the quality of life in Southern California is multi-faceted. Air pollution affects our health, our climate, and even our regional economy. For these reasons, air pollution-related health outcomes are included as performance measures for Connect SoCal 2024. Specifically assessed under this outcome is the incidence and exacerbation of respiratory-related health events triggered by poor air quality, including asthma, and the total costs associated with air pollution-related respiratory pathology in the SCAG Region.

Connect SoCal 2024 monitors regional public health outcomes such as incidence of asthma and other chronic diseases that may be caused or exacerbated by air pollution. According to the California Health Interview Survey (CHIS), as of 2020, 14.5 percent of the SCAG Region's adult population (18 years of age and over) had been diagnosed with asthma at some point in their lives.

Diabetes, cardiovascular disease, hypertension, and obesity have all been linked to air quality and/or environmental conditions. Nearly 12 percent of adults in the SCAG Region have been diagnosed with diabetes, with rates ranging from a low of 9.3 percent in Orange County to a high of 15.7 percent in Imperial County. Cardiovascular disease affects 6.4 percent of adults in the region, with only minor variations (within one percentage point) among the six counties. The obesity rate among adults in the SCAG Region was 28.8 percent in 2020, ranging from 22.5 percent in Orange County to around 37.8 percent in Imperial County.

Overall, the regional transportation system investment program outlined in Connect SoCal 2024 seeks to improve public health outcomes by investing in a system that enhances air quality, promotes physical activity, and reduces the amount of time spent driving in traffic.

6.4 CONNECT SOCAL 2024 GOAL AREA 3: ENVIRONMENT

The Connect SoCal 2024 'Environment' goal area seeks to enhance the capacity of the SCAG Region and its constituent communities to effectively mitigate, adapt to, and respond to chronic and acute environmental impacts, including those caused by climate change. This goal also seeks to enhance the integration of regional land use and transportation planning to improve air quality and reduce GHG emissions. The

Connect SoCal 'Environment' goal area is also focused on the conservation and restoration of natural and agricultural resources in the region. The seven measures established for the Connect SoCal 2024 ongoing performance monitoring program are organized within two outcome categories: 'Climate Resiliency' and 'Conservation'.

6.4.1 ENVIRONMENT OUTCOME 1: CLIMATE RESILIENCE

As introduced in the Plan assessment measures section of this report, the 'Climate Resilience' outcome category refers to the ability of communities to effectively respond to changes in climate, both through development of effective and sustainable adaptation strategies, and through the implementation of proactive efforts to mitigate the scale and reduce the impacts of climate change.

Climate change presents a global challenge which requires a coordinated, globally focused approach. However, it is equally imperative that meaningful efforts be taken at more locally based scales to effectively address its impacts. At the regional level, Connect SoCal 2024 employs four specific ongoing performance measures to monitor climate-related outcomes over time. These metrics are designed to focus on reducing the GHG and emissions and other air pollutants that contribute to climate change, monitoring the exposure of residents to climate adversity, and the assessment of opportunities to reduce the impacts of climate change within communities.

VEHICLE MILES TRAVELED (VMT) PER CAPITA

The Connect SoCal 2024 ongoing performance monitoring metrics used to support the 'Climate Resilience' outcome focus on the impacts of improved regional land use and transportation coordination and the degree to which this integration impacts the efficient movement of people and goods as a means for reducing regional GHG emissions.

One ongoing performance metric that is also employed as a metric in the Plan assessment process is the per capita vehicle miles traveled (VMT). Tracking the daily amount of VMT generated per capita in the SCAG Region helps to identify regional trends over time in motorized vehicle travel. As presented in FIGURE 14 in the Plan performance assessment section of this report, daily VMT per capita in the SCAG Region will be reduced from 22.0 miles in 2019 to 19.4 miles by 2050 with implementation of Connect SoCal 2024, a reduction of 2.6 miles each day, or 11.6 percent.

Because of its importance to the monitoring of regional GHG emission reductions, VMT per capita is also used as an ongoing regional performance measure. FIGURE 24 shows regional trends in regional VMT per capita as reported for the years 2011 through 2020. Between 2010 and 2018, the line remains relatively flat, indicating minimal variation in VMT per capita reported over those nine years, with annual values ranging close to 23 miles each year. However, in 2019, VMT per capita dropped to 22.0 miles, a trend that continued into 2020 with a reported value of 20.2 miles. It is important to note that the anomalously low value recorded in 2020 was influenced by the significant changes in regional travel behavior brought on by the COVID-19 pandemic.

Nevertheless, with implementation of Connect SoCal 2024, it is expected that there will continue to be a gradual reduction in VMT per capita over time. This projected decrease in the daily amount of motorized vehicle travel in the SCAG Region will produce meaningful regional benefits in GHG emissions reduction,

air quality, and environmental sustainability. With implementation of Connect SoCal, per capita VMT in the SCAG Region is projected to continue to decrease, to 19.4 miles, in 2050.

Figure 24. SCAG Region VMT per capita: 2010-2020



Source: Highway Performance Monitoring System (HPMS); SCAG

PERCENT OF POPULATION IN CLIMATE RISK AREAS

A new ongoing performance metric established for Connect SoCal 2024 monitors the share of the SCAG Regional population that reside within high-risk areas relative to climate-related environmental impacts.

As presented previously in MAP 2, many areas of the SCAG Region are vulnerable to the potential environmental impacts of climate change, including sea level rise and wildfires. The residents of these locations of increased vulnerability must be prepared to effectively respond to, and mitigate, these risks. Accordingly, Connect SoCal 2024 seeks to allocate new residential development into areas of the region that are at minimal risk of severe climate related impacts.

URBAN HEAT ISLAND REDUCTION STRATEGIES

A second new ongoing performance measure introduced for Connect SoCal 2024 to evaluate progress being made toward regional climate resilience objectives is the assessment of strategies being implemented throughout the region to reduce the adverse impacts of the urban heat island effect. Urban heat islands are urbanized areas that experience higher temperatures than outlying, less intensely urbanized, areas due to the existence of structures such as buildings and roadway pavement that absorb more solar heat during the day than natural landscapes that feature trees and other green spaces that function to reflect solar heat back into the atmosphere.

Because of the lack of natural landscaping, densely urbanized areas may produce pockets of higher daytime temperature extremes relative to outlying areas. The new 'Urban Heat Island Reduction Strategies' metric quantifies the various strategies implemented in the SCAG Region to reduce the impact of the urban heat island effect through the implementation of urban tree canopies in applicable places. This ongoing measure

will track the number, and monitor the performance, of various strategies being implemented throughout the SCAG Region to address the impacts of the urban heat island effect.

AIR QUALITY BY AIR BASIN

Air quality monitoring throughout the state is performed by CARB, with the local support of five regional air management districts that administer air quality monitoring for the four air basins located within the SCAG Region.

The five regional air districts of the SCAG Region include:

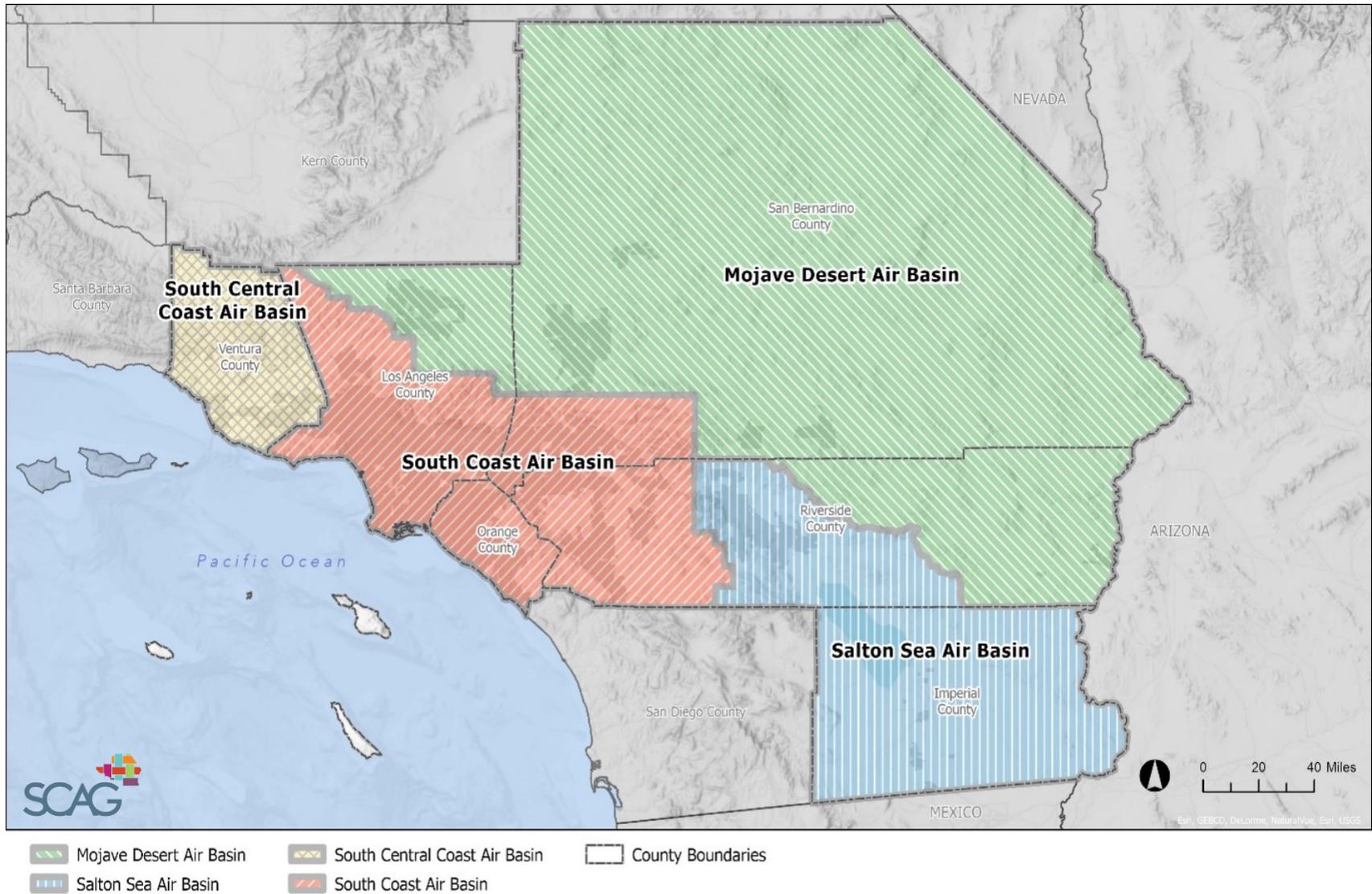
- **South Coast Air Quality Management District (SCAQMD):** The SCAQMD consists of most of Los Angeles County (except for the Antelope Valley in the northern part of the county), all of Orange County, the southwestern San Bernardino County urbanized area, and most of Riverside County (except for the Colorado River Valley in the far eastern part of the county).
- **Antelope Valley Air Quality Management District (AVAQMD):** The AVAQMD consists of the desert areas of northern Los Angeles County, including the cities of Palmdale and Lancaster.
- **Imperial County Air Pollution Control District (ICAPCD):** The ICAPCD includes the entirety of Imperial County.
- **Mojave Desert Air Quality Management District (MDAQMD):** The MDAQMD includes the desert areas that cover a large expanse of northern and eastern San Bernardino County, along with the Colorado River Valley area of eastern Riverside County.
- **Ventura County Air Pollution Control District (VCAPCD):** The VCAPCD covers the entirety of Ventura County.

The map featured in MAP 3 shows the four air basins of the SCAG Region, including the South Coast Air Basin, which is administered by SCAQMD; the South Central Coast Air Basin, administered by VCAPCD; the Mojave Desert Air Basin, which is largely administered by MDAQMD, except for northern Los Angeles County which is covered by AVAQMD, and central Riverside County areas that are within the SCAQMD administrative region; and the Salton Sea Air Basin, which is administered by ICAPCD within Imperial County, and by SCAQMD in the Coachella Valley of Riverside County.

Details regarding federal air quality conformity requirements and regional performance relative to the National Ambient Air Quality Standards (NAAQS) may be found in the Connect SoCal 2024 Transportation Conformity Analysis Technical Report.

The setting of targets and performance reporting for criteria pollutant emissions reduction is also a requirement of the federal transportation performance management program (PM 3). More detailed information on this federal performance measure is provided in the 'Federal System Performance Report' section of this report.

Map 3. SCAG Region Air Basins



Source: SCAG 2022

6.4.2 ENVIRONMENT OUTCOME 2: CONSERVATION

The 'Conservation' outcome category includes three ongoing regional performance measures for monitoring the preservation of the natural environment of the SCAG Region including its lands, habitat, and resources.

HABITAT CONNECTIVITY INVESTMENTS

Connect SoCal facilitates the preservation of natural habitat connectivity in the region to ensure the continued health and distribution of native plant and animal communities found throughout the SCAG Region. A new metric introduced for Connect SoCal 2024, 'Habitat Connectivity Investments', accounts for the total value of regional investments intended to enhance regional habitat connectivity and safety of movement.

The monitoring of the 'Habitat Connectivity Investments' metric will allow SCAG to track the number, and assess the performance, of various habitat connectivity programs and investments being implemented throughout the region to promote the health and safety of native habitat communities.

NATURE-BASED MITIGATION PROGRAMS

SCAG's ongoing performance monitoring program includes several new measures to support the Connect SoCal 2024 goal for preserving the region's natural environment. One of these is a new metric for monitoring the implementation of nature-based mitigation programs. SCAG recognizes the need to protect wildlife communities in the region from the impacts of continued urban encroachment. The 'Nature-based Mitigation Programs' performance measure will monitor the number of regional nature adaptation strategies and programs implemented in the region to preserve and protect native wildlife communities.

WILLIAMSON ACT CONTRACT ACREAGE IMPACTED

Another newly introduced ongoing performance measure used to support the Connect SoCal 2024 'Environment' goal area seeks to assess efforts to preserve open and natural spaces in the region. The 'California Land Conservation Act,' also known as the 'Williamson Act,' was passed by the California state legislature in 1965 as a means for protecting agricultural lands and open spaces from intensive urban development. This objective is achieved by developing contractual agreements with landowners to restrict the use of designated land parcels to only agricultural purposes during the contract period, typically ten years. The 'Williamson Act' provides an effective means for local governments to integrate the protection of open space and agricultural resources into more comprehensive strategies for planning urban growth within their jurisdiction.

The 'Williamson Act Contract Acres Impacted' performance measure will monitor the percentage of Williamson Act contract acreage that has been impacted by urban growth or transportation infrastructure projects in the SCAG Region, with the objective of improving compliance with the provisions of the Act to conserve regional rural land resources. SCAG will continually monitor the impact of urbanization on protected lands to help ensure that they are preserved as indicated by the Williamson Act.

6.5 CONNECT SOCAL 2024 GOAL AREA 4: ECONOMY

6.5.1 ECONOMY OUTCOME 1: JOBS

In addition to the measures discussed previously in this report that are used to assess performance of the Plan relative to sustainable regional economic productivity, additional economic metrics have been established to support the ongoing performance monitoring of Connect SoCal 2024 over time toward achieving the regional objectives identified by the 'Economy' goal area.

Three quantitatively defined economic measures are used in the ongoing regional performance monitoring program: 'Total Employment,' 'Unemployment Rate,' and 'Percent of Interstate Mileage Providing Reliable Truck Travel Time.'

TOTAL EMPLOYMENT

'Total Employment' is a new ongoing performance measure introduced for Connect SoCal 2024. As its name implies, this metric will be used to monitor the total number of jobs in the SCAG Region over time.

FIGURE 25 shows the total number of jobs in the SCAG Region by year from 2011 through 2022. Regional employment increased at a steady rate each year between 2011 and 2019, with about 7.8 million total jobs in the region in 2011, increasing to a peak of 8.9 million jobs in 2019, representing an increase of about 15 percent over that eight-year period.

The impact of the pandemic on employment in the SCAG Region is evident with the precipitous year to year decline experienced between 2019 and 2020, with the loss of about 850 thousand jobs in the region representing an annual reduction of about ten percent. However, many of those lost jobs were restored over the following two years, with employment increasing by nearly nine percent between 2020 and 2022.

Figure 25. SCAG Region Total Employment (thousands)



Source: SCAG 2024

UNEMPLOYMENT RATE

Another new Connect SoCal 2024 ongoing performance measure is 'Unemployment Rate.' As expected, this measure will monitor trends over time in the share of the SCAG Regional labor force that is not employed. It is expected that implementation of the Plan will result in improved economic performance in the SCAG Region, including the generation of new job opportunities.

As shown in FIGURE 26, the unemployment rate in the SCAG Region declined steadily between the years 2011 and 2019, as the region continued to recover from the Great Recession. During this eight-year period, regional unemployment rates dropped each year, from 12.0 percent in 2011, to 4.2 percent in 2019. With the significant job loss, particularly in the service sector, brought about by the COVID-19 pandemic, the unemployment rate increased markedly to 11.1 percent in 2020. However, over the two subsequent years many of the lost jobs were recovered, bringing the unemployment rate back down to 8.0 percent in 2021 and to 4.4 percent in 2022.

Figure 26. SCAG Region Unemployment Rate: 2011–2022



Source: California Employment Development Department

6.5.2 ECONOMY OUTCOME 2: COMPETITIVENESS

An ongoing performance measure used to monitor regional progress toward achievement of the Connect SoCal 2024 'Economy' goal area relative to regional economic competitiveness is the reliability of truck travel times on the Interstate System. As home to two of the nation's largest seaports and being a primary international trade hub, the SCAG Region is highly dependent on the efficient and timely movement of goods to ensure the continuance and enhancement of economic productivity throughout the region. Accordingly, the monitoring of freight truck travel time on the regional Interstate highway network is a critical element of the SCAG ongoing performance monitoring program.

TRUCK TRAVEL TIME RELIABILITY

The 'Percent of Interstate System Mileage Providing Reliable Truck Travel Time' performance measure monitors the total Interstate System mileage in the SCAG Region that produces dependable truck travel times as compared to expected travel times. As the truck travel time reliability performance measure is also included in the federal transportation management (PM 3) program, a detailed presentation of this metric, its performance targets, and regional performance trends are presented in greater detail in the 'Federal System Performance Report' which is featured in Section 7 of this report.

More information regarding Connect SoCal 2024 regional economic performance is provided in the Economic Impact Analysis Technical Report.

6.6 TRANSPORTATION SAFETY

Improving transportation system safety has become an increasingly high priority at the national, statewide, and regional levels. Highway safety monitoring seeks to assess how well the transportation system performs over time in minimizing serious incidents and is typically measured by the rate of collisions involving fatalities or serious injuries per million vehicle miles traveled. It is not feasible to accurately project future highway incidents due to the multitude of factors that contribute to such events. However, a shift to safer travel modes may reduce the total number of collisions that result in fatalities or serious injuries.

Policies, infrastructure, and mode choice impact the safety of travel throughout the region. Traffic related fatalities and serious injuries represent a critical, and often preventable, public health issue in the SCAG Region. Providing a safe multimodal transportation network is essential for the region for achieving its mobility, community sustainability, environmental, and economic goals. Improving regional transportation safety outcomes will require optimization of the existing system to strategically incorporate complete streets enhancements while supporting a range of other safety strategies.

6.6.1 TRANSPORTATION SAFETY IN THE SCAG REGION

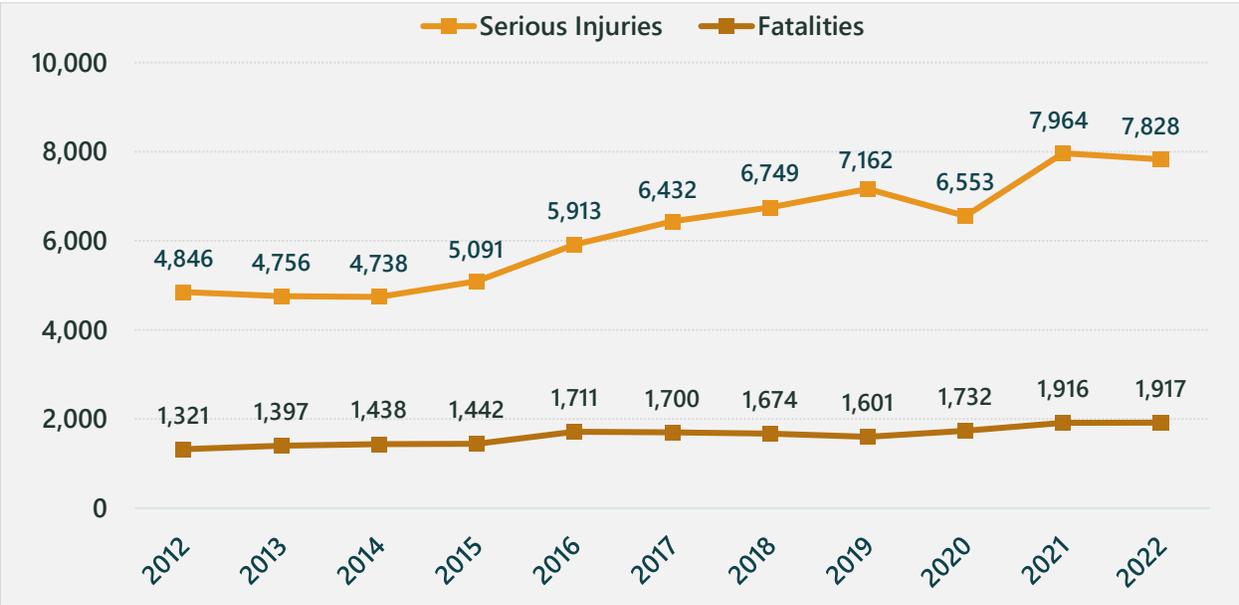
On average, approximately 1,600 people are killed, and seven thousand are seriously injured on roadways throughout the SCAG Region every year. While traffic collisions occur in communities throughout the region, 90 percent occur in urban areas, and about 65 percent of collision-related fatalities happen on local roads, as compared to 15 percent on arterials and 20 percent on highways. In the SCAG Region, 65 percent of fatalities and serious injuries occur on only about five percent of the regional roadway network.

The SCAG Regional High Injury Network (HIN) was developed to identify roadway segments that experience the highest risk for serious collisions. It should be noted that 81 percent of the SCAG Regional HIN roadway miles are within designated disadvantaged communities. Therefore, transportation safety is also very much an equity issue. In addition to the intolerable burdens endured due to serious traffic safety events, collisions also worsen congestion, increase travel time delay, reduce regional air quality, and generate additional GHG emissions due to the resultant traffic bottlenecks.

FIGURE 27 reveals the historical trend of collision-related serious injuries and fatalities reported in the SCAG Region over the eleven-year period from 2012 through 2022. Roadway fatalities steadily increased each year over the first five years of this period, peaking at 1,711 in 2016 from a low of 1,321 reported in 2012. Regional roadway fatalities decreased moderately over next three years through 2019, when 1,601 fatalities were reported.

Surprisingly, traffic fatalities during the pandemic year of 2020 increased from the previous year to 1,732, an increase of about eight percent. Unfortunately, this trend continued into 2021, with 1,916 reported fatalities on roadways in the six-county SCAG Region, an increase of nearly 11 percent from the previous year. The 1,917 fatalities reported for 2022 indicates that much more needs to be done to improve safety performance on regional roadways.

Figure 27. SCAG Region Serious Injuries and Fatalities: 2012-2022



Source: Statewide Integrated Traffic Records System (SWITRS); Fatality Analysis Reporting System (FARS)

While fatalities have been increasing in the SCAG Region over the past several years, the number of serious injuries has been more volatile from year to year. The annual number of serious injuries reported on SCAG Region roadways remained relatively stable between 2012 and 2014 before beginning a trend of annual increases over the next five years, reaching a peak of 7,162 in 2019. The pandemic year of 2020 saw a significant decrease in traffic-related serious injuries in the region, dropping by 8.5 percent to 6,553. Unfortunately, the number of serious injuries rebounded in 2021 to 7,964, an increase of 21.5 percent from 2020. However, data for 2022 indicates a moderate (1.7 percent) reduction from 2021. It is expected that the investments in regional travel safety provided through Connect SoCal 2024 will initiate a trend toward improved safety performance in SCAG Region.

TABLE 15 presents the total number of fatalities and serious injuries reported by the California Statewide Integrated Traffic Records System (SWITRS) for each of the six counties in the SCAG Region for the year 2019. The table also shows the rate of fatalities and serious injuries per 100 million vehicle miles traveled. Non-motorized (bicycle and pedestrian) fatalities and serious injuries are also presented in the table. The 2019 VMT data used to calculate the rates was obtained through the Highway Performance Monitoring System (HPMS).

The 'Regional Share' columns in the table represent the proportion of fatalities and serious injuries reported in 2019 relative to the respective SCAG Regional population share for each of the six counties. The cells

highlighted in green indicate safety performance in that county is significantly better than its regional population share. Conversely, cells highlighted in orange indicate a relatively higher share of fatalities or serious injuries. For all fatalities, Los Angeles, Orange, and Ventura counties each reported lower numbers of fatal incidents than their population share, while Imperial, Riverside, and San Bernardino counties had higher relative numbers of fatalities than their population shares.

For non-motorized (bicycle and pedestrian) fatalities, the counties of Orange and Ventura each reported numbers below their associated regional population share, while Los Angeles and San Bernardino counties experienced higher rates of non-motorized fatalities than their respective shares of the total regional population in 2019, indicating an urgent need for bicycle and pedestrian safety enhancements.

Table 15. SCAG Region Fatalities and Serious Injuries: 2019

County	Regional Population Share	Fatalities (All)			Serious Injuries (All)			Non-Motorized			
		Total	Rate*	Regional Share	Total	Rate*	Regional Share	Fatalities	Regional Share	Serious Injuries	Regional Share
Imperial	1.0%	32	1.29	2.0%	127	5.12	1.8%	6	1.0%	8	0.5%
Los Angeles	53.4%	724	0.94	45.2%	3,858	4.98	53.9%	329	56.4%	1,144	68.2%
Orange	16.9%	180	0.67	11.2%	775	2.9	10.8%	69	11.8%	200	11.9%
Riverside	12.7%	288	1.35	18.0%	1,030	4.84	14.4%	75	12.9%	122	7.3%
San Bernardino	11.5%	328	1.44	20.5%	1,058	4.64	14.8%	90	15.4%	150	8.9%
Ventura	4.5%	49	0.75	3.1%	314	4.82	4.4%	14	2.4%	54	3.2%
SCAG Region	100.0%	1,601	1.02	100.0%	7,162	4.55	100.0%	583	100.0%	1,678	100.0%

* Rate refers to the number of fatalities and serious injuries reported per 100 million VMT.

Source: Statewide Integrated Traffic Records System (SWITRS); Fatality Analysis Reporting System (FARS)

6.6.2 VULNERABLE ROAD USERS

Safety is of particular concern to vulnerable roadway users including pedestrians, bicyclists, children, older adults, motorcyclists, and other non-motorized travelers who do not have the protections provided by automobiles, which results in higher rates of fatalities in collisions involving these more vulnerable travelers. In recent years, trends for pedestrian and bicycle related collisions have been increasing.

Statewide, pedestrians accounted for 16.8 percent of all collision-related fatalities and nearly one-quarter (24.3 percent) of pedestrian fatalities resulting from hit-and-run crashes in 2020. From 2011 to 2020, pedestrian fatalities increased 46.2 percent while other traffic deaths only increased by 14.4 percent. From 2019 to 2020, pedestrian fatalities increased 3.9 percent, despite a 13.2 percent reduction in driving due to pandemic-related travel impacts.

Older adults are significantly over-represented among pedestrian fatalities. While persons over 65 years of age represent only about 12 percent of the total regional population, they account for 26 percent of all pedestrian fatalities in the SCAG Region. Multimodal transportation system infrastructure improvements may support the reversal of this trend by creating safer streets that accommodate all travel modes. Reduction in speed limits helps manage the severity of impacts from higher speed collisions.

Pedestrian and bicycle safety is a high priority for SCAG, and it is expected that Connect SoCal will improve the safety of travel on our regional transportation system, particularly for its most vulnerable users.

FIGURE 28 presents the number of pedestrian fatalities and serious injuries reported on roadways in the SCAG Region between the years 2012 and 2021. The number of pedestrian fatalities (bottom line on the graph) increased moderately each year between 2012 and 2015, from 363 in 2012 up to 402 in 2015, an average annual increase of about 3.5 percent over that four-year period. However, in 2016 the number of pedestrian fatalities jumped to 493, an increase of 22.6 percent over the previous year. After another three percent increase in 2017 (507 fatalities), the upward trend stabilized over the next two years at just over 500 annual fatalities. Unfortunately, the trend toward increasing numbers of pedestrian fatalities resumed in 2020, with 531 incidents, and then up to 586 in 2021, representing a nearly 16 percent increase since 2019.

It is not yet fully understood how the pandemic may have influenced this unacceptable performance, but the data for 2022 suggests the trend may be reversing, with 562 pedestrian fatalities reported in the SCAG Region, representing a 4.1 percent reduction from 2021.

Figure 28. Pedestrian Fatalities and Serious Injuries: 2012-2022



Source: Statewide Integrated Traffic Records System (SWITRS); Fatality Analysis Reporting System (FARS)

The number of serious injuries experienced by pedestrians in the SCAG Region (top line on the graph) has shown more annual volatility over the last decade, with annual totals declining from 887 to 846 between 2012 and 2014, before beginning a steady climb over the next five years, before peaking at 1,273 in 2019, representing an average annual increase of more than ten percent. In 2020, the number of pedestrian serious injuries dropped to 1,060, a 16.7 percent decline from the previous year, likely due to pandemic-related changes in travel behavior experienced during that year.

The concurrent increase in the number of pedestrian fatalities reported in 2020 suggests that reduced levels of roadway congestion encouraged more unsafe driving practices, such as speeding, that may have increased the severity of pedestrian-related crashes that year, resulting in a relatively higher share of fatalities relative to serious injuries. Regardless, in 2021, the number of pedestrian serious injuries reported in the six-county SCAG Region jumped back up to 1,300, an increase of nearly 23 percent from 2020. Data for 2022 shows a slight annual decrease (2.5 percent) in the number of pedestrian serious injuries in the region, at 1,268. It is anticipated that this may signal an emergent trend toward lower pedestrian serious injury rates.

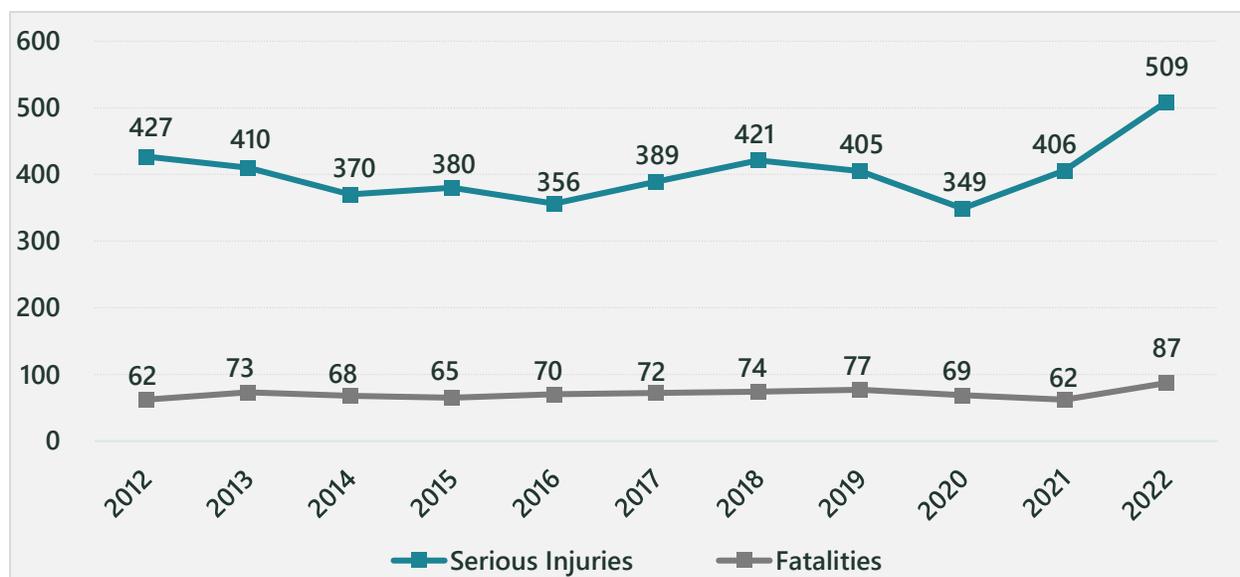
FIGURE 29 shows the number of bicyclist fatalities and serious injuries that occurred in the SCAG Region between 2012 and 2021. The number of bicycle-involved fatalities jumped from 62 to 73 between 2012 and 2013, before decreasing to 65 by 2015. However, bicyclist fatalities began a four-year trend of annual increases in 2016, reaching a peak of 77 in 2019, a six percent increase over the previous year, and then up to 77 in 2019. The initial year of the pandemic (2020) saw a 10.4 percent annual decrease in the number of bicycle fatalities in the SCAG Region, dropping to 69, which was followed up in 2021 by another ten percent year to year decline, to 62. Unfortunately, the 87 reported bicyclist fatalities reported in 2022 indicates more effort is needed to improve the viability of bicycle travel as a safe and healthful alternative to the automobile.

The trend in bicycle-related serious injuries had generally been decreasing in the region between 2012 and 2016, from a high of 427 in 2012 down to 356 in 2016, a reduction of nearly 17 percent. The trend in bicycle

serious injuries began moving upward again over the following two years, reaching a peak of 421 in 2018, before beginning another period of decline, reaching a low of 349 during the pandemic year of 2020.

Unfortunately, the 406 bicycle-related serious injuries observed in 2021, and 509 reported for 2022, seems to indicate a disturbing trend toward reduced bicycle safety performance in the region. The increasing rate of serious injuries suggests that more needs to be done to improve safety conditions for bicyclists in the SCAG Region. While bicyclist fatalities had been trending downward, the number of incidents reported for 2022 (87) represents a 40 percent increase over 2021. This outcome, in combination with the alarming increase in bicycle-related serious injuries reported in 2022, suggests the need for significant investment to improve safety for bicyclists in the SCAG Region. It is anticipated that Connect SoCal 2024 will serve as a catalyst toward improved regional bicycle safety performance moving forward.

Figure 29. Bicycle Fatalities and Serious Injuries: 2012-2022



Source: Statewide Integrated Traffic Records System (SWITRS); Fatality Analysis Reporting System (FARS)

6.6.3 CONNECT SOCAL 2024 APPROACH TO REGIONAL SAFETY

Connect SoCal places a high priority on the safety of travelers on the regional multimodal transportation system, including automobile drivers, passengers, transit users, pedestrians, and bicyclists. On average, 92,000 roadway collisions occur each year in the SCAG Region, equating to about 250 every day. On any given day in Southern California, five people are killed in collisions involving an automobile or truck, most of which occur on local roadways. Connect SoCal 2024 maintains the protection of vulnerable road users as an urgent priority in regional safety planning, as the number of pedestrians killed in crashes in the SCAG Region has increased by about 47 percent between 2012 and 2021. A continued focus on the improved safety of bicycle and pedestrian travel in the SCAG Region must be prioritized to make active transportation a viable alternative to single occupancy vehicle travel.

Through the integrated program of regional multimodal transportation system investments, strategies, and policies included in Connect SoCal 2024, SCAG seeks to:

- Eliminate transportation-related fatalities and serious injuries (especially those involving vulnerable road users, such as people, especially older adults and children, walking and biking) on the regional multimodal transportation system.
- Integrate the assessment of equity into the regional transportation safety and security planning process, focusing on the analysis and mitigation of disproportionate impacts on disadvantaged communities.
- Support innovative approaches for addressing transit safety and security issues to reduce risk to the traveling public and to transit system staff.
- Promote the use of transportation safety and system security data to support investment decision-making, including the evaluation of investments and strategies to improve transportation system safety and security performance.

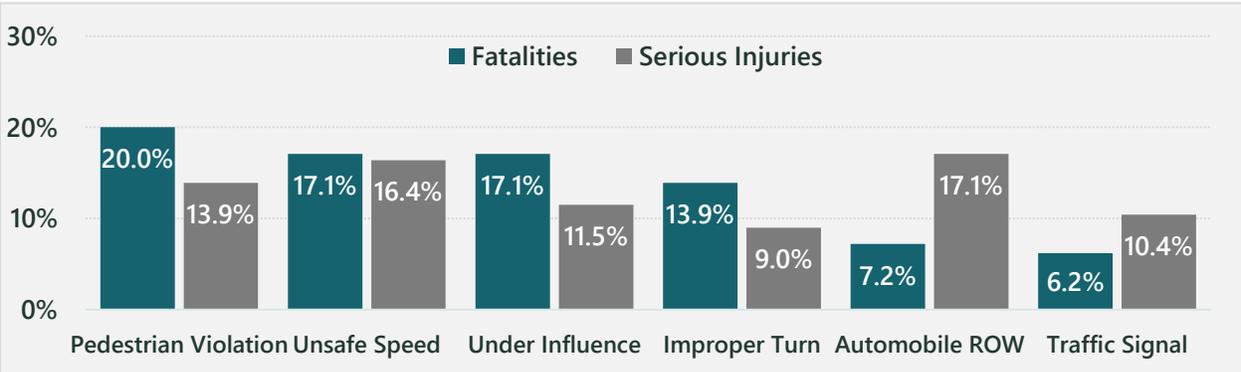
6.6.4 ROADWAY COLLISION FACTORS

Improving travel safety in the SCAG Region begins with reducing the incidence and severity of roadway collisions. Traffic collisions are caused by a multitude of factors, many of which may ameliorated through infrastructure design, law enforcement, and policy considerations.

FIGURE 30 presents the six highest primary factors that led to collision-related fatalities and serious injuries in the SCAG Region in 2019. Understanding the causes of serious collisions may offer valuable insights into how they may be avoided or mitigated in the future. While pedestrian violations were the leading cause of fatalities, accounting for 20 percent of all traffic-related deaths in 2019, motor vehicle right of way (ROW) infractions were the most frequently reported cause of serious injuries, at 17.1 percent. Unsafe travel speeds accounted for a significant share of both roadway fatalities and serious injuries, at 17.1 percent and 16.4 percent, respectively.

Driving under the influence (DUI) of a controlled substance was reported as the primary causal factor for 17.1 percent of all traffic fatalities and for 11.4 percent of serious injuries, suggesting that more needs to be done to enforce DUI laws. Other major factors that have resulted in serious roadway collisions include improper turn movements (13.9 percent of fatalities and 9.0 percent of serious injuries) and traffic signal violations (6.2 percent of fatalities and 10.4 percent of serious injuries).

Figure 30. SCAG Region Primary Collision Factors: 2019



Source: Statewide Integrated Traffic Records System (SWITRS); Fatality Analysis Reporting System (FARS)

6.6.5 SCAG TRANSPORTATION SAFETY ACTIVITIES

As an integral part of ongoing efforts to promote safety on the regional transportation system, SCAG will continue to partner with local agencies in the provision of technical support for transportation safety planning and will maintain our leadership role in support of statewide and national transportation safety initiatives, including active participation on the California Strategic Highway Safety Plan (SHSP) Steering Committee and Executive Leadership Committee. The SHSP is a comprehensive, data-driven statewide transportation system safety effort that establishes targets, fosters interagency communication, and seeks innovative strategies for reducing serious injuries and fatalities on all public roads in California.

THE 'SAFE SYSTEM' FRAMEWORK

SCAG has endorsed the national 'Zero Deaths' vision in its ongoing effort to achieve zero transportation-related fatalities and serious injuries in the region and will continue to employ the 'Safe System' framework, which emphasizes a systematic approach toward achievement of the ultimate objective of zero crash-related fatalities. The Safe System approach seeks to optimize the use of engineering, technological, and communications strategies to improve the adaptation of transportation system structure and functionality to the complexities of human behavior with the understanding that many transportation system safety incidents may be preventable through human-centered roadway structural design enhancements and the implementation of proactive transportation safety policy. The Safe System approach recognizes that people may make unsafe driving decisions and seeks to design a transportation system with many redundancies in place to protect everyone, especially the most vulnerable road users.

TRANSPORTATION SAFETY EQUITY

SCAG's regional transportation safety program strives to incorporate equity in all phases of planning and programming. These efforts include the analysis of disproportionate safety impacts on historically underserved communities and the pursuit of opportunities to protect vulnerable roadway users such as pedestrians, bicyclists, older adults, and children. In the continuing effort to strive toward the goal of 'Zero Deaths,' SCAG engages with a wide range of stakeholders in the development of regional transportation safety policy and in the implementation of projects and strategies that serve to support achievement of that ultimate vision.

TECHNOLOGICAL RESOURCES

SCAG's comprehensive regional transportation safety program actively seeks to harness opportunities provided through newly available real-time traffic data resources and modeling tools to better inform regional safety planning and to facilitate a strategic approach toward implementation of safety investments throughout the region. In support of its commitment to foster a more proactive and data-centered approach toward local and regional transportation safety planning and investment decision-making, SCAG has developed a Regional High Injury Network (HIN) to improve our ability to identify specific locations on the regional roadway network where safety investments are most needed and to better understand how transportation safety impacts are often disproportionately experienced by underserved populations and disadvantaged communities in the region.

6.6.6 TRANSPORTATION SAFETY PERFORMANCE MEASURES

Connect SoCal 2024 uses five specific performance metrics to monitor regional transportation safety performance over time. These five metrics are identical to the federally defined measures developed in support of the national transportation performance monitoring program and includes:

- Total number of collision-related fatalities
- Rate of collision related fatalities per 100 million VMT
- Total number of collision-related serious injuries
- Rate of collision-related serious injuries per 100 million VMT
- Total number of active transportation related fatalities and serious injuries

A full description of all five of the highway safety performance measures, targets, and reporting of regional safety performance trends, is presented in greater detail in the 'Federal System Performance Report' featured in the next section of this report.

The federal performance management program also includes a set of transit system safety measures that are used for monitoring the number of transit fatalities, serious injuries, safety incidents, and system reliability. Details of the national transit system safety performance measures, targets, and trends are presented in the Federal System Performance Report provided in the next section of this Technical Report. More information and performance analysis on the SCAG Regional transit system is provided in the Transit/Rail section of the Connect SoCal 2024 Mobility Technical Report.

7. FEDERAL SYSTEM PERFORMANCE REPORT

7.1 FEDERAL TRANSPORTATION PERFORMANCE MANAGEMENT

7.1.1 PROGRAM OVERVIEW

MAP-21 required states and MPOs to establish performance targets focused on performance outcomes supportive of seven key national transportation priorities to improve the nation's transportation system infrastructure, safety, reliability, and investment efficiency. The national transportation performance goals include:

- Transportation system safety
- Infrastructure condition
- Congestion reduction
- System reliability
- Freight movement and economic vitality
- Environmental sustainability
- Reduced project delivery delay

To provide a quantitative basis for evaluating progress toward achieving these seven national goals, MAP-21 also required the Federal Highway Administration (FHWA) to develop a corresponding set of performance measures and performance targets. The performance measures provide a standardized quantitative metric for evaluating progress toward meeting each of the national goals.

The Federal System Performance Report for the SCAG Region provided in this section of the Connect SoCal 2024 Performance Monitoring Technical Report describes the specific performance measures and targets used in assessing trends in statewide and regional transportation system performance and reports progress being made toward achieving the performance targets for each of the defined performance areas.

7.1.2 PERFORMANCE MANAGEMENT (PM) PACKAGES

In response to the federal performance-based planning mandate promulgated through MAP-21, FHWA issued several individual packages of rulemakings in 2016 and 2017 to establish a set of national performance measures and guidelines for use in the setting of statewide and regional performance targets. The FHWA rulemakings established a four-year performance target setting and reporting cycle for most of the metrics, including a mid-term progress assessment after two years. SCAG coordinated closely with Caltrans in the establishment of specific performance targets for the state and for the region relative to each of the transportation performance areas defined by MAP-21. Through these rulemakings, FHWA established guidelines for implementing transportation system performance management planning at a national level.

FHWA established performance measures, target-setting guidance, and reporting requirements for the monitoring of highway performance through three performance management (PM) packages:

- PM 1: Transportation System Safety
- PM 2: Pavement and Bridge Condition (National Highway System)
- PM 3: National Highway System, Freight Movement, and CMAQ Program Performance

In addition to the three PM packages, federal performance measures and reporting requirements were also established for Transit Asset Management (TAM) and Transit System Safety. Performance metrics for TAM focus on the maintenance of the regional transit system in a state of good repair. Transit system safety performance monitoring is focused on assessment of the number of transit incidents resulting in fatalities or serious injuries and transit system reliability.

Each of the federal performance management focus areas include an associated set of metrics for which statewide and regional targets must be set. The specific performance measures established for each of the federal performance management areas include the following elements.

TRANSPORTATION SYSTEM SAFETY (PM 1)

- Total number of motor vehicle collision fatalities
- Rate of motor vehicle collision fatalities per 100 million VMT
- Total number of motor vehicle collision serious injuries
- Rate of motor vehicle collision serious injuries per 100 million VMT
- Total number of non-motorized fatalities and serious injuries

NATIONAL HIGHWAY SYSTEM PAVEMENT AND BRIDGE CONDITION (PM 2)

- Percentage of Interstate System pavement in 'Good' condition
- Percentage of non-interstate NHS pavement in 'Good' condition
- Percentage of Interstate System pavement in 'Poor' condition
- Percentage of non-interstate NHS pavement in 'Poor' condition
- Percentage of NHS bridges in 'Good' condition
- Percentage of NHS bridges in 'Poor' condition

NATIONAL HIGHWAY SYSTEM (NHS) PERFORMANCE (PM 3)

- Percent of Interstate System mileage reporting reliable person-mile travel times
- Percent of non-interstate NHS mileage reporting reliable person-mile travel times

FREIGHT MOVEMENT (PM 3)

- Percent of Interstate System mileage reporting reliable truck travel times

CMAQ PROGRAM (PM 3)

- Annual hours of peak hour excessive delay per capita
- Total emissions reduction by criteria pollutant (PM10, PM2.5, Ozone, CO)
- Non-Single Occupancy Vehicle (non-SOV) mode share

TRANSIT ASSET MANAGEMENT (TAM)

- Equipment: Share of non-revenue vehicles that meet or exceed Useful Life Benchmark

- Rolling Stock: Share of revenue vehicles that meet or exceed Useful Life Benchmark
- Infrastructure: Share of track segments with performance restrictions
- Facilities: Share of transit assets with condition rating below 3.0 on FTA 'TERM' scale

TRANSIT SYSTEM SAFETY

- Number of transit-related fatalities
- Number of transit-related injuries
- Number of transit system safety events
- Transit system reliability

7.2 FEDERAL PERFORMANCE MANAGEMENT TARGETS

Performance targets provide a numeric threshold by which the performance measures may be interpreted as having made acceptable progress toward achieving a specific performance goal. Just as the federal performance measures were selected to support the monitoring of each of the national transportation goals, performance targets are established to support the measures.

The establishment of performance targets provides a specific and quantifiable achievement objective for each measure over the federal performance period. Targets act as quantitative thresholds for determining whether an acceptable level of progress has been achieved for a specific measure. Performance targets are required to be set for each of the designated federal measures at the statewide and regional levels.

SCAG coordinates closely with Caltrans throughout the process of developing the statewide targets for each of the federally designated transportation performance measures. For most of the measures, once the statewide targets are established, MPOs are provided the option to either adopt the statewide targets or to develop a separate set of performance targets specific to the region.

The following section of this report will present both the statewide and regional targets developed in support of each of the federal performance measures. A summary of observed performance information will also be provided to illustrate whether significant progress has been made toward achievement of each of the statewide and regional targets.

7.2.1 TRANSPORTATION SYSTEM SAFETY (PM 1) TARGETS

While the targets for most of the federal performance measure are required to be updated every four years in correspondence to the four-year federal reporting period, the PM 1 (transportation safety) measures are required to be updated and reported annually. As indicated previously, the federal transportation safety targets are focused on the assessment of the frequency and rate of serious collisions occurring on all roadways that result in either fatalities or serious injuries to road users.

In developing the annual statewide safety targets, Caltrans employs a trend-based methodology which extrapolates existing safety performance trends into the future. Three steps of analysis are used in this process, the first of which is an assessment of current safety trends in the state conducted through a review of observed data. This step is followed by an evaluation of any external factors that may impact safety

performance over the coming year that might suggest a change in trend projections. The third step is the estimation of appropriate statewide performance targets for the upcoming year.

TABLE 16 features the currently adopted statewide PM 1 transportation system safety targets established for calendar year 2023 along with the percentage of targeted annual change in performance. Annual safety targets are expressed as five-year rolling averages of the five consecutive calendar years ending in the year for which the targets are established.

As shown in the table, Caltrans expects roadways in the State of California to become incrementally safer in 2023, with a 0.3 percent decrease in the number of crash-related fatalities, a 1.7 percent reduction in the rate of highway fatalities per 100 million vehicle miles traveled (VMT), and a more substantial decrease of 2.3 percent for both the number and rate of serious injuries. Similarly, the statewide targets project an annual reduction in the number of active transportation fatalities of 0.3 percent, and a 2.3 percent decrease in serious injuries.

Table 16. Statewide Transportation Safety Targets for 2024

Performance Measure	Data Source	2024 Target	Annual Change
Total Number of Fatalities	FARS	4,080.6	-0.3%
Rate of Fatalities (per 100M VMT)	FARS/HPMS	1.30	-1.7%
Total Number of Serious Injuries	SWITRS	16,628.1	-2.3%
Rate of Serious Injuries (per 100M VMT)	SWITRS/HPMS	5.27	-2.3%
Total Number of Non-Motorized Fatalities and Serious Injuries	FARS/SWITRS	4,380.5	-0.3% (fatalities) -2.3% (serious injuries)

The data source used both by Caltrans and SCAG for obtaining collision-related fatality information is the National Highway Traffic Safety Administration (NHTSA) 'Fatality Analysis Reporting System' (FARS), which compiles annual motor vehicle fatality data for roadways throughout the nation. Serious injury data for both the state and the SCAG Region is obtained through the California Highway Patrol's 'Statewide Integrated Traffic Records System' (SWITRS). The SWITRS database maintains police reports for collisions that occur on roadways throughout the state. Rates of roadway fatalities and serious injuries are calculated by normalizing the FARS and SWITRS data by annual VMT data provided through the national 'Highway Performance Monitoring System' (HPMS). For California, HPMS program is administered by Caltrans with the support of regional MPOs, including SCAG. Annual rates for both fatalities and serious injuries are calculated by dividing the totals provided through FARS and SWITRS by 100 million VMT.

Annual transportation safety performance targets are also required to be established at the MPO level. As with the other federal performance measures, SCAG is provided the option to either adopt the statewide targets for implementation at the regional level or to submit to Caltrans a separate set of targets specific to the SCAG Region. Calendar year 2024 is the seventh year for which annual transportation safety targets have been developed pursuant to federal transportation performance management and reporting requirements.

For the first three PM 1 federal reporting years (2018-2020), SCAG opted to support the statewide targets by adopting a set of regional safety targets based on the Caltrans methodology. However, starting 2021, SCAG has opted to establish regionally specific targets that are consistent with SCAG’s existing transportation safety modeling capabilities that account for traffic, travel behavior, socioeconomic, and other emergent trends that impact regional safety performance.

TABLE 17 presents the calendar year 2024 PM 1 targets for the SCAG Region as adopted by the Regional Council in February 2024. SCAG develops the regional safety targets with the use of a transportation safety model which forecasts trends through 2025, reflecting moderate increases in both fatalities and serious injuries. As indicated in the table, a total of 1,861 collision related fatalities and 7,461 serious injuries are forecast in the SCAG Region for calendar year 2024. Additionally, the combined total of active transportation (bicycle and pedestrian) involved fatalities and serious injuries in the region is projected to be 2,368 in 2024.

While these figures offer significant opportunity for improvement, when compared to our regional share of total statewide VMT (46.9 percent), the SCAG Region’s targeted share of statewide roadway fatalities (45.6 percent) and serious injuries (44.9 percent) represent better relative safety performance than for the state as a whole. However, for non-motorized fatalities and serious injuries, the SCAG Region exceeds our expected statewide share (54.1 percent), indicating that much more needs to be done to improve bicycle and pedestrian safety performance in the region.

Table 17. SCAG Regional Transportation Safety Targets for 2024

Performance Measure	2024 Target	Statewide Share*
Total Number of Fatalities	1,861.4	45.6%
Rate of Fatalities (per 100M VMT)	1.26	3.1% below statewide rate
Total Number of Serious Injuries	7,460.8	44.9%
Rate of Serious Injuries (per 100M VMT)	5.04	4.4% below statewide rate
Total Number of Non-Motorized Fatalities and Serious Injuries	2,368.2	54.1%

* The SCAG Region’s share of statewide VMT in 2022 was 46.9%

While collision related fatalities and serious injuries in the SCAG Region have generally stabilized over recent years, we are still a long way off from achieving our goal of zero roadway fatalities. Additionally, the rate of incidents involving pedestrians and bicyclists has been increasing in the SCAG Region relative to the state.

To motivate reductions in serious roadway safety incidents and to improve regional transportation safety outcomes, SCAG has developed a High Injury Network (HIN) to help local safety planning agencies focus improvements where they are most needed. In addition, SCAG offers support to local jurisdictions in securing safety planning grants and convenes a quarterly Safe and Active Streets Working Group (SASWG) meeting as a forum to facilitate safety information sharing among regional partners. Additionally, SCAG has implemented a highly successful community outreach and advertising campaign, *Go Human*, which is focused on regional bicycle and pedestrian safety through the provision of safety awareness programs and grant opportunities.

7.2.2 NHS PAVEMENT AND BRIDGE CONDITION (PM 2) TARGETS

The PM 2 measures provide a standard basis for assessing the structural integrity of critical transportation infrastructure, specifically the nation's highways and bridges. This information is used to prioritize transportation infrastructure investments at the national, state, and regional levels based on an assessment of which facilities are in greatest need of rehabilitation. Prioritizing investments through this data-driven, or performance-based, planning process enhances transportation system safety and maximizes the service life of existing infrastructure.

NHS PAVEMENT CONDITION

NHS pavement condition is assessed using three categories: 'Good,' 'Fair,' and 'Poor.' These categories are assigned based on a combined assessment of four condition elements of a highway pavement segment:

- **Roughness:** Indicator of discomfort experienced by road users traveling over pavement and is measured using the International Roughness Index (IRI).
- **Rutting:** Measurement of the depth of ruts along the wheel path on a roadway segment. Rutting is commonly caused by a combination of heavy traffic and heavy vehicles.
- **Cracking:** Percentage of the pavement surface area that is cracked. Cracks may be caused or accelerated by excessive loading, poor drainage, or extreme temperature changes.
- **Faulting:** Quantification of uneven pavement surface due to defective base support.

NHS pavement condition is assessed using these criteria for each 0.1-mile section of pavement. A segment is rated as being in good condition if all four of the metrics described above are rated as good. A pavement segment is designated as being in poor condition when two or more of the criteria are rated as poor. All pavements not meeting one of those two criteria are classified as being in fair condition. Lane miles in good, fair, and poor condition are then tabulated for all sections to determine the overall percentage of NHS pavement within each of those three categories.

NHS BRIDGE CONDITION

For NHS bridges, condition assignment is based on the combined ratings for deck, superstructure, and substructure condition. Bridge deck condition refers the quality of its surface pavement and is used to assess the driving experience over the span. NHS bridge condition is also classified using the three categories of good, fair, and poor. An NHS bridge is classified as being in good condition if its lowest score for any of the three performance elements is seven or higher. A bridge is classified in poor condition if it receives a rating of four or lower for any of the three elements. All NHS bridges not meeting one of those two criteria are classified as being in fair condition.

TABLE 18 shows the statewide PM 2 NHS pavement and bridge condition targets for the current four-year reporting period, including the two-year mid-point and the four-year targets. The statewide PM 2 targets were developed by Caltrans with substantial input from SCAG and the other California MPOs. In addition to fulfilling federal PM 2 reporting requirements, the statewide asset performance targets are also used to evaluate progress being made toward achievement of Caltrans' ten-year Transportation Asset Management Plan (TAMP) performance goals.

As of 2022, the NHS in California consisted of 57,699 lane miles of pavement and 10,936 bridges totaling 243,347,047 square feet of bridge deck area. Caltrans collects pavement inventory and condition data for NHS pavements through its annual Automated Pavement Condition Survey (APCS). The APCS uses high-definition images and lasers to measure pavement condition for every 0.1 mile for NHS pavements. Caltrans reports pavement condition data to the Highway Performance Monitoring System (HPMS), a national database maintained by FHWA.

Table 18. Statewide NHS Pavement and Bridge Condition (PM 2) Targets

Statewide PM 2 Performance	Base Year (2019)		Target (2025)	
	Good	Poor	Good	Poor
Interstate System Pavement	47.9%	1.9%	49.2%	1.7%
Non-Interstate NHS Pavement	23.8%	9.9%	28.2%	9.0%
NHS Bridge Condition	48.5%	5.4%	46.6%	4.6%

As revealed in the table, Caltrans anticipates a 1.3 percent increase in the share of statewide Interstate System pavement in 'Good' condition over the four-year performance period from 47.9 percent in 2019, to 49.2 percent by the end of 2025. The share of Interstate pavement in 'Poor' condition is expected to decrease by 0.2 percent over that same four-year period, from 1.9 percent to 1.7 percent. For the non-interstate NHS, the share of statewide pavement in 'Good' condition is targeted to increase by 5.6 percent between 2019 and 2025, from 23.8 percent to 28.2 percent; while the share of non-interstate pavement in 'Poor' condition is projected to decrease by nearly one percent, from 9.9 percent to 9.0 percent.

For NHS bridges in California, Caltrans expects a 1.9 percent decrease in the share of structures in 'Good' condition, from 48.5 percent in 2019 to 46.6 percent by 2025. However, the share of statewide NHS bridges in 'Poor' condition is targeted to decrease by 0.8 percent from 5.4 percent in 2019 to 4.6 percent by 2025.

TABLE 19 presents the NHS pavement and bridge condition targets for the SCAG Region.

Table 19. SCAG Region NHS Pavement and Bridge Condition (PM 2) Targets

Regional PM 2 Performance	Base Year (2019)		Target (2025)	
	Good	Poor	Good	Poor
Interstate System Pavement	47.9%	1.9%	49.2%	1.7%
Non-Interstate NHS Pavement	2.7%	20.6%	9.3%	18.3%
NHS Bridge Condition	38.6%	12.2%	34.6%	12.0%

Since the Interstate System in California is operated and maintained by Caltrans, the targets shown for the SCAG Region are reflective of the statewide targets. For non-interstate NHS roadways, a significant improvement of 6.6 percent is targeted for the share of SCAG Region pavements in good condition between 2019 and 2025, increasing from 2.7 percent to 9.3 percent. In addition, the share of non-interstate NHS

pavements in the SCAG Region that are in poor condition are expected to decrease by 2.3 percent, from 20.6 percent in 2019 to 18.3 percent by 2025.

For NHS bridges in the SCAG Region, the share of structures in good condition are expected to decrease by four percent, from 38.6 percent in 2019 to 34.6 percent in 2025. However, the share of regional NHS bridges in poor condition will also decrease, from 12.2 percent in 2019 to 12.0 percent by 2025.

TABLE 20 shows non-interstate NHS pavement condition by county in the SCAG Region as observed in 2019. As shown in the table, the SCAG Region includes a total of 12,170 lane miles of locally maintained non-interstate NHS roadways which comprises 58.5 percent of the statewide total. Pavement condition varies significantly among the six counties in the SCAG Region, with Imperial County having the largest share of NHS pavements classified as being in ‘Good’ condition, at 12.7 percent; and Los Angeles County having the lowest share, at 0.9 percent. The County of Los Angeles also has the highest share of pavements in ‘Poor’ condition, at 27.6 percent; with Ventura County reporting the lowest share of poor condition pavements, at only 9.0 percent. A significant majority of non-Interstate NHS pavements in the SCAG Region, and in each of the six counties, are in ‘Fair’ condition.

Table 20. SCAG Region NHS Pavement Condition by County

Jurisdiction	Lane Miles	Good	Fair	Poor
Imperial County	288	11.7%	62.2%	26.1%
Los Angeles County	6,451	0.9%	71.5%	27.6%
Orange County	3,059	3.9%	85.9%	10.2%
Riverside County	678	5.3%	79.7%	15.0%
San Bernardino County	1,156	4.9%	79.0%	16.1%
Ventura County	538	5.0%	86.0%	9.0%
SCAG Region	12,170	2.7%	76.7%	20.6%
Statewide	20,803	3.0%	79.0%	18.0%
SCAG Statewide Share	58.5%	52.7%	56.8%	58.5%

Source: Caltrans

As compared to the statewide value of 3.0 percent, the SCAG Region had a slightly lower share of pavements in ‘Good’ condition (2.7 percent) in 2019, while the regional share of non-interstate NHS pavements in ‘Poor’ condition (20.6 percent) also exceeded the statewide share (18.0 percent). Highways and bridges in the SCAG Region experience an inordinate level of wear due to multiple factors related to the prominence of the SCAG Region as an international trade hub.

For the SCAG Region, 2.7 percent of non-interstate NHS pavements were reported as being in ‘Good’ condition in 2019, with 20.6 percent in ‘Poor’ condition. This 2019 observed value is 1.3 percent lower than the 2022 target value of 4.0 percent. 20.6 percent of pavements in the region were classified as being in ‘Poor’ condition in 2019, as compared to the 2022 target value of 12.7 percent, indicating significant work remains to be done to preserve existing NHS pavement infrastructure in the SCAG Region.

The SCAG Regional share of total statewide lane miles of non-interstate NHS pavements in 'Good' condition (52.7 percent) is nearly six percent below our share of total statewide lane mileage, indicating that the SCAG Region had a smaller share of pavement segments in 'Good' condition relative the state overall in 2019. However, the corresponding share of SCAG Region pavements in 'Poor' condition was equal to our share of total statewide NHS lane mileage (58.5 percent).

7.2.3 NHS PERFORMANCE, FREIGHT, AND CMAQ PROGRAM (PM 3) TARGETS

The PM 3 group of performance measures includes three separate sets of metrics corresponding to three specific planning areas including travel time reliability, goods movement efficiency, and performance of the CMAQ program. The PM 3 measures feature a total of six performance metrics under three general categories including NHS system performance, Interstate freight movement, and CMAQ program performance. NHS system performance assessment is focused on travel time reliability of the NHS, including both Interstate and non-interstate NHS roadways. The PM 3 freight movement metric evaluates travel time reliability for heavy duty trucks carrying freight on the Interstate System. The CMAQ program evaluation measures are used to determine the effectiveness of CMAQ investments for achieving the program's objectives of relieving traffic congestion and improving air quality.

NHS SYSTEM PERFORMANCE

The PM 3 'NHS System Performance' category includes two specific measures to assess travel time reliability on major highways in the SCAG Region. The system performance metrics are used to assess how long it may realistically be expected to take to travel from one location to another along a particular highway. Expected travel time is calculated based on the distance between two locations and the applicable highway speed limit. Travel time reliability refers to the difference between the expected travel time and the actual travel time experienced on a specific highway.

Travel time reliability differs from congestion in that a congested roadway may be considered 'reliable' if travel time may be dependably estimated. Travel time reliability measures the variability in travel time on a specific roadway from day to day. If a route is 'dependably' congested, a traveler may plan sufficient time to reach a desired destination on time. Unreliable highways, conversely, are not amenable to dependable travel planning. Unreliable travel times not only increase levels of stress and frustration among drivers, but also impact the regional economy as many commercial activities are highly dependent on a transportation system that provides for reliable travel times.

For federal performance reporting purposes, travel time reliability is quantified by determining the percentage of total person miles travelled on an NHS roadway that are considered 'reliable' through use of a methodology referred to as 'Level of Travel Time Reliability' (LOTTR). LOTTR is based on a comparison of the longest travel times with the average travel times observed along a highway segment at a specified time of day and is calculated by dividing the 80th percentile (longer travel time) traffic speed by the 50th percentile (average) traffic speed along a segment. A roadway is considered 'reliable' if its LOTTR value is less than 1.50, meaning a greater share of total trips taken on that segment are near the average travel time. A higher LOTTR ratio indicates a less reliable travel time. The LOTTR metric is based on the analysis of observed travel time data generated through the National Performance Management Research Data Set (NPMRDS).

TABLE 21 provides the statewide targets and observed performance for the PM 3 ‘NHS System Performance’ measures. The system performance metrics assess travel time reliability on both the Interstate System and non-interstate NHS roadways. Travel time reliability is calculated as a percentage of total person miles traveled along a roadway that produces reliable travel times.

Table 21. Statewide PM 3 Travel Time Reliability Targets

Reliable Person Miles Traveled	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Observed Performance				Baseline (2021)	2-Year Target (2023)	4-Year Target (2025)
				2019	2021	2017-2019	2017-2021			
Interstate System	64.6%	65.1% (+0.5%)	65.6% (+1.0%)	65.2%	73.8%	+0.6%	+9.2%	73.8%	74.3% (+0.5%)	74.8% (+1.0%)
Non-Interstate NHS	73.0%	N/A	74.0% (+1.0%)	76.1%	83.7%	+3.1%	+10.7%	83.7%	84.2% (+0.5%)	84.7% (+1.0%)

The Baseline (2017) values indicate the observed share of reliable person miles traveled in the year 2017, which was used as the comparative baseline for development of targets for the initial four-year federal performance reporting period (2018-2021). As shown in the table, the statewide four-year travel time reliability targets established for both the Interstate System and non-interstate NHS projected an increased share of reliable person miles traveled of one percent by 2021. An interim two-year target of 0.5 percent was established for the Interstate System however interim targets were not required for non-NHS highways for the initial federal reporting period. The observed 2019 share of reliable person miles traveled on the Interstate System was 65.2 percent in 2019 and 73.8 percent in 2021, both of which achieved the respective targets.

For the second four-year federal reporting period (2022-2025), the travel time reliability values observed for the year 2021 were used as the comparative base year. Target-setting for the second federal performance cycle presented a challenge in that travel time reliability remained anomalously high in 2021 due to the residual travel impacts of the pandemic. For example, the 2021 observed Interstate System travel time reliability share (73.8 percent) is 9.2 percent higher than the 2017 value (64.6 percent), while the non-interstate share of reliable person miles traveled was 10.7 percent higher between 2017 (73.0 percent) and 2021 (83.7 percent). By comparison, the targeted increase in share projected by Caltrans for both facility types over that timeframe was only 1.0 percent.

In close consultation with the state’s MPOs, including SCAG, Caltrans opted to establish moderate statewide travel time reliability improvement targets for both the Interstate System and non-interstate NHS, with the understanding that roadway conditions will likely return to more normal patterns in the post-pandemic years. The statewide targets were set at 0.5 percent after two years (2023), and one percent after four years (2025).

TABLE 22 features observed travel time reliability performance of NHS roadways in the SCAG Region between 2017 and 2021. NHS travel time reliability performance is represented by the calculated percentage of total person miles travelled along a roadway segment that meet a quantitatively defined travel time performance threshold to be classified as ‘reliable.’

Table 22. SCAG Region Travel Time Reliability Performance

Reliable Person Miles Traveled	2017	2018	2019	2020	2021
Interstate System	59.6%	61.0%	60.3%	74.8%	65.2%
Non-Interstate NHS	68.9%	71.4%	73.3%	81.8%	79.2%

Source: National Performance Management Research Data Set (NPMRDS)

For purposes of federal reporting, travel time 'reliability' refers to the ability for a traveler to reach a destination within a planned timeframe with a high level of confidence. A 'reliable' roadway will allow travelers to feel confident in their ability to get to a desired location with a minimum amount of unexpected delay due to congested conditions. The extra travel time required to ensure arrival at a destination at a particular time is referred to as 'buffer time.' Conversely, an 'unreliable' highway will require a significant amount of buffer time into travel scheduling to ensure timely arrival to a destination.

Interstate travel time reliability in the SCAG Region has remained relatively stable since 2017, with about 60 percent of highways meeting the criteria for being 'reliable'. The one outlier year to this otherwise consistent performance trend was in 2020, when regional travel patterns were significantly impacted by the COVID-19 pandemic, resulting in less vehicle traffic on the transportation system and, therefore, more reliable travel times.

The change in travel time reliability on Interstate highways in the SCAG Region improved by 0.7 percent between 2017 and 2019, from 59.6 percent of segments reporting reliable travel times in 2017, to 60.3 percent in 2019. This two-year improvement exceeds the regional performance target of 0.5 percent. By 2021, Interstate System travel time reliability in the region improved by an additional 4.9 percent from 2019, with 65.2 percent of segments reporting reliable travel times. It must be noted that this substantial improvement in travel time reliability reflects the continued impact of the COVID-19 pandemic on overall travel demand, as the value reported for 2020 was even higher at 74.8 percent. Regardless, the observed improvement in Interstate travel time reliability performance of 5.6 percent significantly exceeded the regional target of 1.0 percent.

A similar (pre-pandemic) travel time reliability performance pattern is evident for non-interstate NHS roadways in the SCAG Region, with about 70 percent of highways reporting reliable travel times, again with the notable exception of the 2020 pandemic year, when more than 80 percent of non-interstate NHS roadways produced reliable travel times.

While two-year performance targets were not required for non-interstate travel time reliability, the share of reliable non-interstate roadway segments in the SCAG Region improved by 4.4 percent between 2017 and 2019. At the conclusion of the initial federal performance reporting period in 2021, non-interstate travel time reliability improved by a total of 8.3 percent since 2017, again reflecting the ongoing travel reduction impacts of the COVID-19 pandemic.

FREIGHT MOVEMENT

The PM 3 'Freight Movement' category features one performance measure to assess travel time reliability for heavy duty trucks on the Interstate system. This metric may be used to answer questions on how

efficiently the Interstate network in the SCAG Region serves in facilitating the transport of freight from our ports to distribution facilities located throughout the region and beyond. The efficient and timely movement of goods on the Interstate highway system is major factor for ensuring regional economic productivity and for promoting an economically competitive region.

PM 3 uses the ‘Truck Travel Time Reliability Index’ (TTTRI) to calculate the share of regional Interstate mileage that produces reliable truck travel times. Like the LOTTR methodology described above, the TTTRI assesses the difference between the expected travel times along an Interstate segment and actual travel times recorded by the NPMRDS. The TTTRI compares the longest travel times with the average travel times observed along an Interstate segment at a particular time to calculate an indexed value that may be used to identify, compare, and quantify major freight truck bottlenecks along regional Interstate highways.

Freight bottleneck locations are often caused by recurrently congested roadway conditions due to traffic volumes exceeding capacity. The TTTRI is defined as the 95th percentile truck travel time divided by the 50th percentile (average) truck travel time, with a lower index value representing a higher level of reliability.

TABLE 23 shows the statewide performance targets supporting the PM 3 ‘Freight’ category. As illustrated in the table, truck travel time reliability performance on the statewide Interstate System worsened between 2017 and 2019, with a TTTRI increase of 0.02 points (1.69 to 1.71). However, by 2021 TTTI improved significantly to 1.60, for a four-year total reduction of 0.09 points from the 2017 base year. However, this improvement must be considered within the context of the continued impact of the pandemic on traffic conditions in 2021.

Regardless, the 2021 TTTI value of 1.60 will serve as the baseline for the second four-year federal reporting period. Caltrans established moderate truck travel time reliability improvement targets of 1.59 by 2023 and 1.58 by 2025, with these aspirational targets tempered by the understanding that traffic conditions will have likely returned to more normal patterns over the course of the performance period.

Table 23. Statewide PM 3 Truck Travel Time Reliability Targets

Reliable Truck Miles Traveled	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Observed Performance				Baseline (2021)	2-Year Target (2023)	4-Year Target (2025)
				2019	2021	2017-2019	2017-2021			
Truck Travel Time Reliability Index	1.69	1.68 (-0.01)	1.67 (-0.02)	1.71	1.60	+0.02	-0.09	1.60	1.60 (No Change)	1.60 (No Change)

TABLE 24 provides Interstate truck travel time reliability performance results for the SCAG Region from 2017 to 2021. The table indicates that truck travel time has generally not been very reliable in the region over recent years, with observed TTTRI values above 1.70 for all but one of the five reported years. Again, the exception to this trend was in 2020, with pandemic induced congestion reduction resulting in a more ‘reliable’ TTTRI value of 1.67. Truck travel time reliability for non-interstate NHS roadways was not required for the initial federal reporting period.

Table 24. SCAG Region Truck Travel Time Reliability Performance

Truck Travel Time Reliability Index	2017	2018	2019	2020	2021
Interstate System	1.70	1.76	1.72	1.67	1.70

Source: National Performance Management Research Data Set (NPMRDS)

Between 2017 and 2019, truck travel time reliability in the SCAG Region worsened from a TTTI of 1.70 to 1.72 and did not achieve the target of 1.69 after the first two years of the federal performance period. However, by the conclusion of the initial four-year reporting period in 2021, truck travel time reliability in the region improved to 1.70. Again, this improvement must be considered within the context of ongoing pandemic-related travel impacts that still affected freight movement in 2021. Even so, the 2021 reported value reflects no improvement over the 2017 reported value (also 1.70) and did not achieve the four-year regional target of 1.68.

CMAQ PROGRAM PERFORMANCE

The third element of the PM 3 performance management package applies to implementation of the federal Congestion Management and Air Quality (CMAQ) program. The CMAQ program was established to help support implementation of the federal Clean Air Act through the provision of funding to reduce traffic congestion and improve air quality in areas where National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide, or particulate matter are not met (nonattainment areas); and in previous nonattainment areas that are now in compliance (maintenance areas). The CMAQ program provides SCAG a major resource in helping to address significant regional issues related to air quality, mobile source emissions, and traffic congestion.

CMAQ projects programmed in the SCAG FTIP are subject to intensive review and evaluation process by SCAG and its six County Transportation Commissions to ensure that the program functions cohesively to contribute toward achievement of regional emissions and congestion reduction goals. As the nation's largest MPO, with a continuously expanding economy and an exceptionally diverse land use and settlement pattern, the SCAG Region has encountered significant challenges confronting the air quality and traffic congestion issues that have been, and continue to be, very consequential to the public health and quality of life for residents of Southern California. SCAG structures its CMAQ investments to ensure that the composite program, and its component projects, work synergistically to maximize air quality improvement and traffic congestion relief benefits across the region.

The PM 3 'CMAQ Program Performance' element consists of four metrics used to assess performance of the CMAQ program toward achievement of the program's objectives for improved air quality and reduced traffic congestion.

The first of these four measures, 'Criteria Pollutant Emissions,' evaluates progress being made relative to improved air quality by measuring the daily emissions for five specific criteria pollutants. As its name implies, the 'Annual Hours of Peak Hour Excessive Delay' (PHED) metric is used to monitor traffic congestion conditions during periods of peak travel demand. Specifically, the PHED measure assesses the difference between free flow travel time along a highway segment and the actual time observed.

Unlike the reliability measures described above, the PHED metric is used specifically to assess highway congestion. The third CMAQ program performance measure, 'Percent of Non-Single Occupancy Vehicle Travel' is used to assess the impact of regional strategies for reducing the number of single passenger motor vehicles on NHS highways through improved opportunities for alternative travel choices.

In July of 2022, FHWA released a Notice of Proposed Rulemaking (NOPR) for a fourth CMAQ program performance measure that would require the monitoring and reporting of transportation-related greenhouse gas (GHG) emissions. The proposed GHG performance measure would assess the change in tailpipe carbon dioxide emissions compared to a designated reference year. The final FHWA rulemaking establishing the new federal GHG performance measure was published in December 2023. Additional information regarding the new measure and the target-setting process to be used in support of this new federal transportation performance reporting requirement is provided at the end of this report.

Criteria Pollutant Emissions

The first of the CMAQ program performance assessment areas included in PM 3 is criteria air pollutant emission reductions. The two-year and four-year performance targets were set with the understanding that air pollutant emissions would be expected to worsen over the initial federal reporting period, although at a slower pace than would otherwise be expected without planned CMAQ program investments.

TABLE 25 presents the statewide PM 3 CMAQ program emissions reduction targets for the first federal performance reporting period. The five reported criteria pollutants include carbon monoxide (CO), large particulate matter (PM10), small particulate matter (PM2.5), nitrates of oxygen (NOx), and volatile organic compounds (VOC). A minimal increase in emissions for each applicable criteria pollutant was anticipated after two years (1.0 percent) and after four years (2.0 percent).

Table 25. Criteria Pollutant Emissions Targets

Pollutant	2017 Baseline	2-Year Target (2019)		4-Year Target (2021)	
		Target	Change from Baseline	Target	Change from Baseline
CO	1,524.35	1,539.59	+1.0%	1,554.84	+2.0%
PM-10	74.45	75.19	+1.0%	75.94	+2.0%
PM-2.5	61.25	61.86	+1.0%	62.48	+2.0%
NOx	420.24	424.44	+1.0%	428.64	+2.0%
VOC	208.86	210.95	+1.0%	213.04	+2.0%

Peak Hour Excessive Delay

The second PM 3 CMAQ program performance focus area provides a measure for traffic congestion through the assessment of annual hours of 'Peak Hour Excessive Delay' (PHED) experienced per capita. PHED is a calculated value based on data reported through the NPMRDS that represents the difference between the observed travel time along a roadway segment and a designated threshold travel time. The amount of time required to travel the length of a particular roadway segment beyond an established travel time threshold value is referred to as 'excessive delay.'

For the initial four-year federal reporting period (2018-2021), the PHED metric was only required to be reported for U.S. Census designated Urban Areas that had populations of more than one million in 2010 and were also in air quality nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. For each applicable Urban Area, the State Department of Transportation (Caltrans) is required to coordinate with the applicable MPO (SCAG) to establish a single, unified four-year PHED performance target.

TABLE 26 features the ten Urban Areas in the SCAG Region that meet the updated criteria for the reporting and monitoring of PM 3 PHED and non-SOV mode share targets, including the eight newly applicable reporting areas (shown in *italics*).

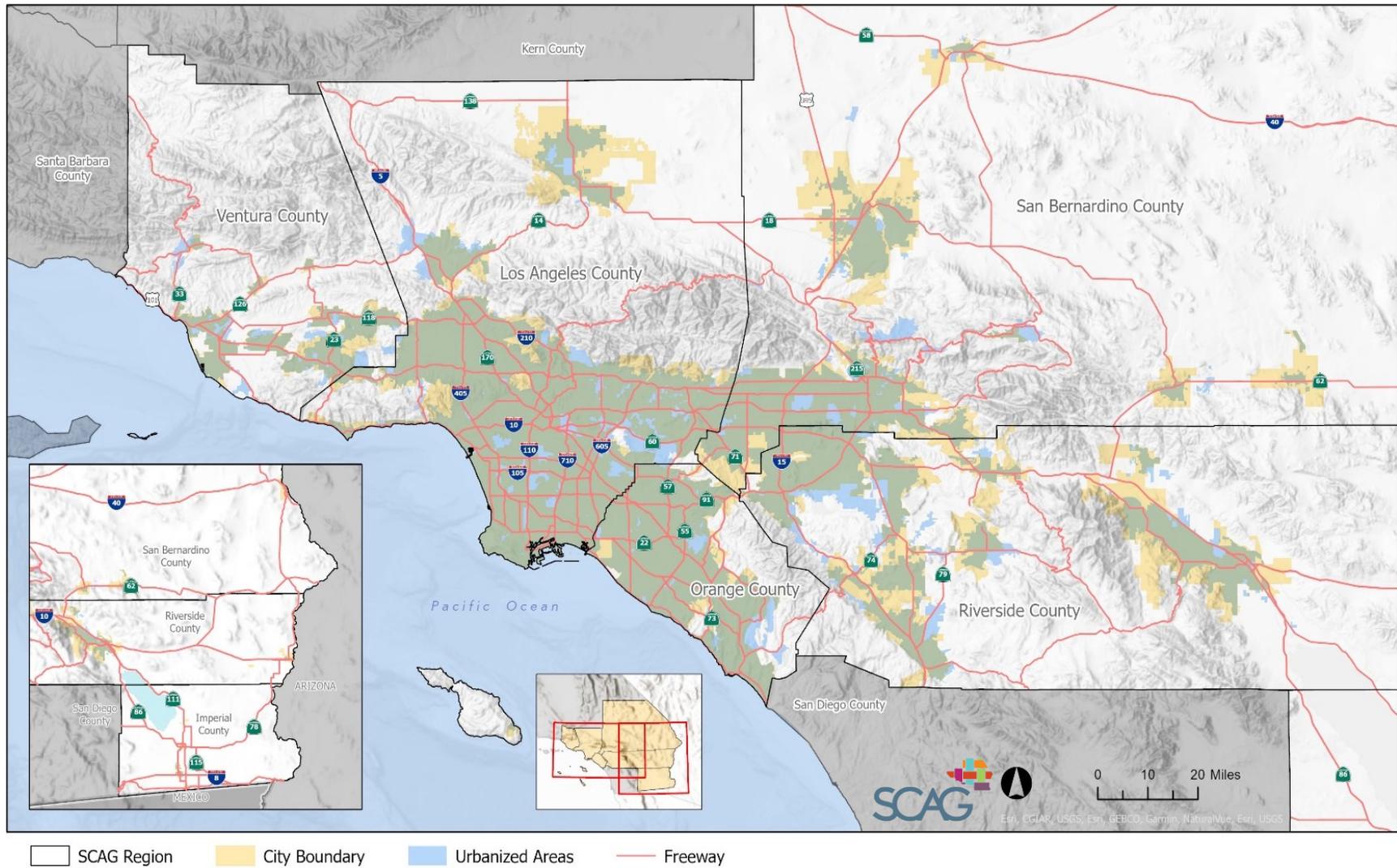
Table 26. SCAG Region Urban Areas (Population 200,000+)

Urban Area	Population (2020)
<i>Los Angeles-Long Beach-Anaheim</i>	<i>12,237,376</i>
<i>Riverside-San Bernardino</i>	<i>2,276,703</i>
<i>Mission Viejo-Lake Forest-Laguna Niguel</i>	<i>646,843</i>
<i>Temecula-Murrieta-Meniffee</i>	<i>528,991</i>
<i>Oxnard-Ventura</i>	<i>376,117</i>
<i>Indio-Palm Desert-Palm Springs</i>	<i>361,075</i>
<i>Palmdale-Lancaster</i>	<i>359,559</i>
<i>Victorville-Hesperia-Apple Valley</i>	<i>355,816</i>
<i>Santa Clarita</i>	<i>278,031</i>
<i>Thousand Oaks</i>	<i>213,986</i>

In the SCAG Region there were two Urban Areas that met the requirements for PHED monitoring for the initial federal performance reporting cycle: the Los Angeles/Long Beach/Anaheim Urban Area and the Riverside/San Bernardino Urban Area. However, for the second federal reporting cycle (2022-2025), the population threshold for applicable Urban Areas was reduced to 200,000, which includes eight additional reporting areas in the SCAG Region.

MAP 4 shows the locations of all U.S. Census designated Urban Areas in the SCAG Region (blue shaded areas).

Map 4. SCAG Region Urban Areas



Source: SCAG 2022

Table 27. Peak Hour Excessive Delay (PHED) Targets

Urban Area	2017	4-Year Target (2021)		2021	4-Year Target (2025)	
	Baseline	Value	Change	Baseline	Value	Change
Los Angeles/Long Beach/Anaheim	45.7	45.2	-1.0%	32.7	32.7	0.0%
Riverside/San Bernardino	16.2	16.1	-1.0%	16.6	16.6	0.0%
Mission Viejo/Lake Forest/San Clemente	N/A	N/A	N/A	9.4	9.4	0.0%
Temecula/Murrieta/Menifee	N/A	N/A	N/A	9.2	9.2	0.0%
Oxnard/San Buenaventura	N/A	N/A	N/A	11.1	11.1	0.0%
Indio/Palm Desert/Palm Springs	N/A	N/A	N/A	6.4	6.4	0.0%
Lancaster/Palmdale	N/A	N/A	N/A	4.3	4.3	0.0%
Victorville/Hesperia/Apple Valley	N/A	N/A	N/A	6.2	6.2	0.0%
Santa Clarita	N/A	N/A	N/A	11.5	11.5	0.0%
Thousand Oaks	N/A	N/A	N/A	7.1	7.1	0.0%

TABLE 27 presents the PHED targets for the applicable Urban Areas in the SCAG Region for the initial federal performance period (green highlighted columns) and the second reporting period (purple highlighted columns).

As indicated in the table, SCAG and Caltrans agreed on a four-year PHED improvement target of one percent for each of the two applicable Urban Areas in the SCAG Region for the first federal performance reporting period, with the Los Angeles/Long Beach Anaheim Urban Area improving from a 2017 Baseline value of 45.7 hours to 45.2 hours in 2021, while PHED in the Riverside/San Bernardino Urban Area increased from 16.2 hours to 16.6 hours. Although travel conditions in the Riverside/San Bernardino Urban Area had seemingly returned to pre-pandemic patterns by 2021, the table clearly illustrates that traffic in the Los Angeles/Long Beach/Anaheim Urban Area, which produced nearly 46 hours of excessive delay per capita in 2017, continues to experience significantly higher levels of traffic congestion than the Riverside/San Bernardino Urban Area, where annual per capita delay amounted to a comparatively tolerable 16.2 hours.

For the second federal performance reporting cycle (2022-2025), eight additional Urban Areas in the SCAG Region were added to the PHED reporting requirement due to the change in the population threshold. Because of the pandemic-related disruption in travel patterns experienced in 2020 and 2021, resulting in anomalously low PHED values recorded for the base year (2021), Caltrans and SCAG agreed to establish four-year targets of zero percent for each of the ten applicable Urban Areas in the region, with the expectation that regional travel will return to pre-pandemic patterns. With this understanding, even a zero percent change in observed PHED from 2021 to 2025 should be considered an aspirational target.

TABLE 28 provides the observed PHED performance results for the years 2017 through 2021 for both applicable Urban Areas in the SCAG Region as reported by the NPMRDS. The impact of the pandemic may clearly be seen in 2020, with the PHED value of 18.9 hours reported for Los Angeles/Long Beach/Anaheim

representing a decrease of more than 50 percent from the previous year (2019). Similarly, the 8.3 hours observed in the Riverside/San Bernardino Urban Area in 2020 was a 42 percent reduction from 2019. As indicated previously, PHED values began to reveal a return to normalcy by 2021, particularly in Riverside/San Bernardino, where observed PHED nearly doubled from 8.3 hours to 16.1 hours. The return to normalcy was more muted for Los Angeles/Long Beach/Anaheim, where PHED increased from 18.9 hours in 2020 to (a still below normal) 32.7 hours in 2021.

Table 28. Peak Hour Excessive Delay (PHED) Performance

Urban Area	2017	2018	2019	2020	2021	2017-21 Change
Los Angeles/Long Beach/Anaheim	45.7	45.1	38.3	18.9	32.7	-28.4%
Riverside/San Bernardino	16.2	13.6	14.3	8.3	16.1	+2.4%

Source: National Performance Management Research Data Set (NPMRDS)

The table shows that per capita excessive delay declined steadily in the Los Angeles/Long Beach/Anaheim Urban Area since 2017, dropping from 45.7 hours to only 32.7 hours of delay per capita over that four-year period. However, the exceedingly low value recorded for 2020 (18.9 hours) and, to a lesser extent, 2021 (32.7 hours), must be considered within the context of reduced travel demand resulting from the COVID-19 pandemic. However, the more moderate annual decreases in annual hours of excessive delay per capita experienced in 2018 (45.1) and 2019 (38.3) may be more reliable indicators of an emerging positive trend toward less congested conditions in the Los Angeles/Long Beach/Anaheim Urban Area.

PHED performance to be reported over the next several years will provide a better standard for assessing actual trends in travel delay occurring in the Los Angeles/Long Beach/Anaheim Urban Area, as the travel impacts of the pandemic resolve. However, the significant decrease in delay observed over the initial four-year federal reporting period achieved the one percent four-year performance target established for this Urban Area.

For the Riverside/San Bernardino Urban Area, annual per capita hours of peak hour excessive delay remained relatively stable over the initial four-year federal performance reporting period, dropping from 16.2 hours in 2017 to 16.1 hours in 2021. Again, the anomalously low value of 8.3 hours reported in 2020 must be considered within the context of pandemic related travel demand impacts experienced during that year. Considering the full four-year reporting period, the modest reduction in peak hour excessive delay from 16.2 hours to 16.1 hours for the Riverside/San Bernardino Urban Area meets the four-year target.

As with the Los Angeles/Long Beach/Anaheim Urban Area, ongoing trends in travel delay experienced in the Riverside/San Bernardino Urban Area will be better understood over the coming years as the impacts of the pandemic on travel behavior in the SCAG Region resolve.

Non-SOV Mode Share

The third CMAQ program metric is designed to provide information on improvements in traffic congestion through monitoring the percentage of commuters using a mode of travel other than driving alone in a motor vehicle (non-single occupancy vehicle travel). A higher non-SOV mode share is desirable in highly

congested urban areas since that would indicate less congested roadways and reduced criteria pollutant emissions due to fewer motor vehicles on the roadways.

Like the PHED measure described previously, for the initial federal performance reporting period, the non-SOV mode share metric applied only to the two Urban Areas in the SCAG Region with 2010 populations exceeding one million: Los Angeles/Long Beach/Anaheim, and Riverside/San Bernardino. According to the U.S. Census, the Los Angeles/Long Beach/Anaheim Urban Area had a population of 12.2 million in 2010, while the Riverside/San Bernardino Urban Area had a 2010 population of about 1.9 million.

TABLE 29 features the four-year non-SOV mode share performance targets cooperatively established by Caltrans and SCAG for the two applicable Urban Areas in the SCAG Region for the initial (2018-2021) federal performance period and the newly established targets for all ten applicable Urban Areas in the SCAG Region for the second reporting period (2021-2025). For the initial reporting period, moderate targets of a one-half percent increase in non-SOV mode share were established both Urban Areas after two-years, and a one percent increase target was set after four years.

Table 29. Non-SOV Mode Share Targets

Urban Area	2017 Baseline	4-Year Target (2021)		2021 Baseline	4-Year Target (2025)	
		Value	Change		Value	Change
Los Angeles/Long Beach/Anaheim	25.6%	26.6%	+0.5%	36.7%	36.7%	0.0%
Riverside/San Bernardino	22.7%	23.7%	+0.5%	25.2%	25.2%	0.0%
Mission Viejo/Lake Forest/San Clemente	N/A	N/A	N/A	38.6%	38.6%	0.0%
Temecula/Murrieta/Menifee	N/A	N/A	N/A	33.1%	33.1%	0.0%
Oxnard/San Buenaventura	N/A	N/A	N/A	28.6%	28.6%	0.0%
Indio/Palm Desert/Palm Springs	N/A	N/A	N/A	25.2%	25.2%	0.0%
Lancaster/Palmdale	N/A	N/A	N/A	23.7%	23.7%	0.0%
Victorville/Hesperia/Apple Valley	N/A	N/A	N/A	27.6%	27.6%	0.0%
Santa Clarita	N/A	N/A	N/A	32.7%	32.7%	0.0%
Thousand Oaks	N/A	N/A	N/A	35.9%	35.9%	0.0%

Due to the disruptive impact of the COVID-19 pandemic on travel behavior experienced during 2020-2021, Caltrans and SCAG opted to use a conservative approach toward setting non-SOV mode share targets for the second four-year federal performance reporting period. For this reason, the four-year targets were set for a zero percent change from the 2021 baseline share for all ten applicable Urban Areas in the SCAG Region, with the expectation that travel behavior and mode choice will normalize toward patterns observed before the pandemic. Once again, it must be emphasized that even a zero percent change in non-SOV mode share from 2021 to 2025 should be considered an aspirational target.

TABLE 30 provides non-SOV performance results for the initial federal reporting period. The U.S. Census American Community Survey (ACS) reported that 25.6 percent of commuters in the Los Angeles/Long Beach/Anaheim Urban Area used a travel mode other than driving alone in the base year (2017), while the reported non-SOV mode share was slightly lower in the Riverside/San Bernardino Urban Area, at 22.7 percent.

Table 30. Non-SOV Mode Share Performance

Urban Area	2017	2018	2019	2020	2021	2017-21 Change
Los Angeles/Long Beach/Anaheim	25.6%	24.8%	24.9%	25.3%	26.9%	+1.3%
Riverside/San Bernardino	22.7%	20.9%	19.6%	21.1%	21.7%	-1.0%

Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates

As revealed in the table, non-SOV mode share decreased in both applicable Urban Areas in the SCAG Region between 2017 and 2019. However, by 2021, the non-SOV shares increased to 26.9 percent for the Los Angeles/Long Beach/Anaheim area, and to 21.7 percent in the Riverside/San Bernardino area, for a 1.3 percent increase and a 1.0 percent decrease, respectively, over the initial federal reporting period.

7.3 TRANSIT SYSTEM PERFORMANCE MEASURES

The federal transportation performance management program also includes two sets of measures relative to the regional transit system performance, including transit asset management and transit system safety.

7.3.1 TRANSIT ASSET MANAGEMENT

In October 2016, the Federal Transit Administration (FTA) issued the TAM Final Rule (49 CFR §625 et seq.) to implement the asset management provisions of MAP-21. The Final Rule mandated the development of a National TAM System, defined 'State of Good Repair' (SGR), and required transit providers to develop TAM plans. The targets presented in this section were produced collaboratively with regional transit agencies and the six County Transportation Commissions (CTCs) in the SCAG Region based on agency TAM plans and local targets. In developing the targets, SCAG reviewed and considered the TAM plans of the various regional transit operators (including identified performance goals, objectives, measures, and targets), thereby incorporating them into the metropolitan planning process.

For purposes of federal transportation performance reporting, transit asset management refers to monitoring and reporting on the condition of four groups of transit system assets:

- **Equipment:** Percentage of transit non-revenue service vehicles (by asset class) that have met or exceeded useful life benchmark (ULB).
- **Rolling Stock:** Percentage of transit revenue vehicles (by asset class) that have met or exceeded the ULB.

- **Infrastructure:** Percentage of transit system track segments (by mode) that have performance restrictions.
- **Facilities:** Percentage of transit system facilities (by group) that are rated less than 3.0 on Transit Economic Requirements Model (TERM) Scale.

TABLE 31 presents the current TAM performance targets for the SCAG Region. The targets reflect the desire to maintain baseline (2019) conditions through the Connect SoCal horizon period (2050). The targets are aspirational as it is unlikely the region will meet all the TAM targets unless substantial additional funding is identified, or cuts are made in other areas (such as operations). SCAG will continue to work with FTA, the region’s transit operators, and the CTCs to seek opportunities to improve the transit asset monitoring data collection and analytical processes and will continue to engage with regional partners and other stakeholders in discussions to address transit state of good repair and the need for additional funding.

Further information regarding the TAM Final Rule and the associated performance targets is included in the Transit section of the Connect SoCal 2024 Mobility Technical Report.

Table 31. SCAG Region Transit Asset Management (TAM) Targets

Agency	Rolling Stock	Equipment	Facilities	Infrastructure
Imperial County	0.0%	N/A	N/A	N/A
Los Angeles County	17.4%	35.5%	1.5%	2.1%
Orange County	12.7%	18.4%	0.0%	N/A
Riverside County	5.3%	19.8%	8.7%	N/A
San Bernardino County	6.2%	19.7%	10.3%	N/A
Ventura County	12.2%	21.3%	0.0%	N/A
Metrolink (SCRRA)	0.4%	50.5%	20.0%	1.8%
SCAG Region	14.9%	34.1%	2.8%	1.9%

7.3.2 TRANSIT SYSTEM SAFETY

In July 2018, the Federal Transit Authority (FTA) published the Public Transportation Agency Safety Plan Final Rule (49 CFR Section 673.15) regulating how Chapter 53 grantees would have to implement federally mandated safety standards. The Final Rule specifically requires transit agencies employing federal funds to develop a safety plan and annually self-certify compliance with that plan. Each transit agency must make its safety performance targets available to MPOs to assist in the planning process and coordinate to the maximum extent practicable with the MPO in the selection of regional safety targets.

The National Public Transportation Safety Plan identifies the following four performance measures that must be included in the transit agency safety plans and for which targets must be set:

- **Fatalities:** Total annual number and rate of transit system fatalities.

- **Injuries:** Total annual number and rate of transit system injuries.
- **Safety Events:** Total annual number and rate of transit system safety events.
- **System Reliability:** Mean distance between major transit system mechanical failures

The transit system safety targets are organized by mode, including fixed route bus service, demand response, and rail. The following three tables present the 2022 Transit System Safety performance targets for the SCAG Region. TABLE 32 features the county and regional safety targets for fixed route bus service, while TABLE 33 shows the demand response safety targets by county and for the SCAG Region. TABLE 34 presents the rail transit safety targets for Los Angeles County. Rail transit safety targets have not been established for the other five SCAG Region counties.

For each of the tables, the fatalities, injuries, and safety event rates are calculated based on the number of incidents per 100 thousand vehicle revenue miles. The System Reliability values represent the average number of miles between transit system mechanical failure incidents.

Table 32. Transit System Safety Targets: Fixed Route Bus

County	Fatalities	Fatality Rate	Injuries	Injuries Rate	Safety Events	Safety Events Rate	System Reliability
Imperial	0	0	14	0	28	0.24	102,868
Los Angeles	0	0	510	0.6	493	0.34	10,843
Orange	0	0	84	0.6	136	1.02	14,912
Riverside	0	0	22	0.2	31	0.23	16,255
San Bernardino	0	0	28	0.1	28	0.1	17,070
Ventura	0	0	6	0.2	17	0.17	24,045
SCAG Region	0	0	663	0.5	733	0.37	12,868

Table 33. Transit System Safety Targets: Demand Response

County	Fatalities	Fatality Rate	Injuries	Injury Rate	Safety Events	Safety Events Rate	System Reliability
Imperial	0	0.0	7	0.0	10	0.20	36,595
Los Angeles	0	0.0	28	0.1	57	0.22	48,920
Orange	0	0.0	0	0.0	0	0.00	14,000
Riverside	0	0.0	7	0.1	9	0.19	16,205
San Bernardino	0	0.0	5	0.1	5	0.09	62,837
Ventura	0	0.0	5	0.3	9	0.23	41,899
SCAG Region	0	0.0	52	0.1	89	0.16	43,066

Table 34. Transit System Safety Targets: Rail

County	Fatalities	Fatality Rate	Injuries	Injury Rate	Safety Events	Safety Events Rate	System Reliability
Los Angeles	0	0.0	92	0.5	33	0.16	50,624
SCAG Region	0	0.0	92	0.5	33	0.16	50,624

7.4 FEDERAL TRANSPORTATION PERFORMANCE REPORTING

The federal transportation performance management program was established as a means for implementing a standardized national performance-based approach to guide investment of federal transportation funding to correlate with a specific set of national transportation performance goals. The federal transportation performance management program requires the incorporation of performance measures and targets into the transportation planning processes at both the statewide and regional (MPO) levels.

While the specific performance measures were established through various federal rulemakings, performance targets applicable to each of the measures are set by the State Department of Transportation (Caltrans) at the statewide level, and by the MPO (SCAG) at the regional level. In addition, MPOs are required to provide information on the federal performance management program, and the applicable regional targets, through each update of its Regional Transportation Plan (Connect SoCal) and Federal Transportation Improvement Program (FTIP).

7.4.1 SIGNIFICANT PROGRESS REPORTING

The PM 2 and PM 3 federal performance targets are reported and updated every four years. At the conclusion of each four-year reporting period, Caltrans is required to submit a report to the Federal Highway Administration (FHWA) detailing how the state has performed toward achieving the targets set for each of the federal measures and, specifically, whether it has achieved 'significant progress' toward the defined performance goals. In the context of federal performance reporting, 'significant progress' is achieved if the outcome for a particular measure shows improvement over the baseline.

The FHWA 'significant progress' determination only applies to the statewide targets, not to regional targets. However, Caltrans incorporates the regional performance data provided by SCAG and other MPOs into its statewide report. If it is determined that the state failed to make significant progress toward its performance targets, Caltrans is required to draft a supplemental report to FHWA explaining why the statewide targets were not met and what strategies are being implemented to support achievement of the targets over the subsequent federal reporting period. SCAG coordinates with Caltrans throughout the statewide target-setting and federal performance reporting processes.

The initial four-year federal transportation performance management reporting cycle began in 2018 and concluded at the end of 2021. The second reporting period started in 2022 and will continue through 2025. Several changes were made to the federal performance management program for the second four-year reporting cycle, including the change in the Urban Area population threshold from one million to 200,000 for reporting of two of the PM 3 CMAQ performance measures (peak hour excessive delay and non-SOV mode share). The updated population threshold adds eight additional Urban Areas in the SCAG Region to

the associated PM 3 target-setting and performance reporting requirements. The full list of applicable Urban Areas in the SCAG Region is provided in TABLE 26.

7.4.2 GHG EMISSIONS REDUCTION MEASURE

A new performance measure was proposed for inclusion in the PM 3 program that will require the monitoring and reporting of surface transportation-related greenhouse gas (GHG) emission reductions. GHG emissions contribute to climate change, which presents significant environmental and economic impacts in Southern California and around the world.

The transportation sector represents the largest source of GHG emissions in the U.S., with on-road transportation activities accounting for 29 percent of total emissions. Passenger vehicles and heavy-duty trucks make up more than 80 percent of that total. According to the U.S. EPA, GHG emissions produced by the transportation sector have increased by about 19 percent since 1990 due to increased travel demand. While expanded travel demand has increased motor vehicle related carbon dioxide emissions since 1990, improvements in average new vehicle fuel economy since 2005 have slowed the rate of increase.

Transportation infrastructure is increasingly at risk from the consequences of climate change, including increased intensity and frequency of precipitation, extreme heat, wildfires, and sea level rise. These climate-related impacts will ultimately increase the costs associated with the maintenance, improvement, and replacement of infrastructure, particularly assets that are approaching or beyond their design life.

7.4.3 GHG MEASURE TARGET-SETTING

The final FHWA rulemaking establishing the new federal GHG performance measure was published in December 2023. The rulemaking requires Caltrans to establish two- and four-year statewide targets for reducing tailpipe CO₂ emissions on the NHS, while SCAG will establish four-year regional targets. State DOTs and MPOs are provided the flexibility to set targets that work for their respective climate change policies and priorities, provided they are in accord with the national goals for achieving a 50-52 percent reduction in net economy-wide emissions (relative to 2005) by 2030, and for net-zero emissions by 2050.

Since the current four-year federal performance reporting cycle is already in progress, the initial targets for the new GHG measure will be set for the year 2026. Once the current federal performance reporting cycle ends in December 2025, updated statewide and regional targets in support of the new GHG emissions reduction metric will be established in congruence with the other PM 3 performance measures.

While SCAG already monitors regional GHG emission reductions in accordance with state requirements for meeting the 2035 regional GHG reduction target set by CARB, as described in the Plan Assessment Measures section of this report, and illustrated in Table 13, SCAG is supportive of the new national GHG measure as it will provide a standard national approach to monitor and address a critical issue that extends beyond state boundaries.





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