CONNECT SOCAL 2024

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

Mobility

TECHNICAL REPORT

ADOPTED APRIL 4, 2024

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Mobility

TECHNICAL REPORT

1. MOBILITY OVERVIEW

1.1 INTRODUCTION

Over the past decade, rapid developments in technology as well as impacts from the COVID-19 pandemic and subsequent responses have accelerated changes to the way we travel. What's becoming clear is that we – Southern Californians – are not who we once were. Our travel habits and preferences are evolving, and our mobility landscape is being reshaped. Services that were previously novel are no longer. Many in our region feel perfectly comfortable requesting a Lyft or an Uber; using an app for more efficient driving directions or to evaluate the wait time for a train or bus; grabbing an e-bike or e-scooter to complete a short trip; or plugging in our electric vehicle to charge while we sleep. Technology has also enabled some of us to move less, to remain at home more, to work or conduct appointments remotely, and to have goods delivered to our doorsteps.

Transportation and its corresponding technologies connect us to places, allowing us to move between home and important destinations like work, school, or the grocery store. Our community's land use pattern determines the distribution of these destinations which, when combined with available transportation options, either supports or negatively impacts our ability to meet our needs. Historically, patterns such as racial segregation, gentrification, and displacement have limited access and mobility for communities of color. These historic inequities have present day impacts, which surface in a variety of ways, including increased exposure to air pollution, noise, and traffic collisions. Ensuring mobility and accessibility is important, especially in the region's Priority Equity Communities, because reaching employment and educational opportunities is foundational for maintaining the social and economic interactions required to meet basic needs. For people across the region to thrive, a healthy mobility ecosystem needs to exist, one where various modes of transportation work in tandem to meet the needs of a community.

Addressing mobility needs becomes even more challenging in the face of climate change impacts such as extreme heat, more frequent and intense wildfires, poor air quality, sea-level rise, and flooding. These conditions can negatively impact transportation infrastructure and people trying to move about the region. For example, virtually every community in the region is impacted by extreme heat, which has significantly increased in terms of the number of days and magnitude in recent years. Extreme heat impacts all transportation modes. It can cause road surfaces to soften and buckle, leading to pavement damage and road closures. Extreme heat can also cause rail tracks to buckle and induce slower transit/rail speeds.[1] It can also have a significant impact on people who rely on bicycling and walking as modes of transportation. Their excessive sweating, increased heart rates, and difficulty breathing in hot conditions can decrease overall physical performance and make it far more difficult and riskier to complete their trips. While the pace and implications of climate change are dynamic, the region needs to plan for a future mobility ecosystem that is more resilient.

This Mobility Technical Report addresses the modes that comprise a thriving mobility ecosystem, including walking, bicycling, using micromobility devices (e.g., e-scooters), riding transit/rail, and driving. This report also discusses pressing intersectional issues touched upon above—technology, equity, and climate change. Furthermore, it is intended to serve as a 20-plus year guide for future decision-making by establishing a mobility vision with goals, policies, and strategies, and metrics for evaluating our progress.

The Overview chapter focuses on overarching and intersectional issues across all transportation modes. Subsequent chapters are modal specific, though still addressing intersectional issues (e.g., first/last mile

access) and focus on addressing Regional Transportation Plan (RTP) requirements, including identifying a network to service the transportation needs of the region and discussing intermodal and connectivity issues, transit/rail, highways, pedestrian, and bicyclist needs. The chapters flow in the following non-prioritized order: Transit/Rail, Active Transportation, and Streets and Highways, and each includes a discussion on our existing conditions, challenges and opportunities, and key strategies. Each chapter will cautiously attempt to forecast the future.

Though our experience with COVID-19 exposed the limits of what we can predict, it reinforced that the constant we can prepare for is change. This Mobility Technical Report focuses on planning for a more resilient mobility future, one where we are better able to mitigate or adapt to change and one where everyone has safe, affordable, reliable, and sustainable transportation options to access the opportunities and resources necessary to thrive, regardless of their race, gender, sexual orientation, ability, age, or income.

1.2 WHO ARE WE?

Our region is comprised of 191 cities and six counties within 38,000 square miles and is home to roughly 19 million people, roughly half the entire state's population. About half the region's population, 10 million residents, live in Los Angeles County. Orange County, with a population of 3.2 million, has the region's second highest population. The Inland Empire counties of Riverside (2.4 million) and San Bernardino (2.2 million) contain about 25 percent of the region's population. The counties of Ventura (845,000) and Imperial (180,000) are the least populated. By 2050, the region is expected to gain nearly two million more people. The greatest growth (as a percentage) will be inland, with about a million people added to Riverside (606,000) and San Bernardino (448,000) Counties, followed by Imperial County (29,000), Orange County (248,000), and Los Angeles County (747,000), with the smallest gains in Ventura County (3,000). This increasing population translates to more demands on our transportation system for which we need to better prepare. For more information on demographic changes, please refer to the Demographics and Growth Forecast Technical Report.

1.3 HOW DO WE GET AROUND?

Every day when we pick up our car keys or grab our bus pass as we exit our homes enroute to school, work, or on an errand, the act can feel routine, reflexive even, but how we arrive at these decisions is complex. Some of our considerations may include:

- Can we afford to own a car and pay for insurance, gas, or electric charging, and at times, parking?
- Do we live near a frequent and reliable transit/rail line?
- Can we afford the transit/rail fare?
- Do we feel safe walking or biking to a nearby transit/rail station?
- Can we afford to own or rent a bike?
- Are we physically able to walk or bike where we need to go?
- Do we feel safe walking, biking, or rolling to our destination?
- Is there secure bike parking?
- Is our home near separated bikeways or continuous sidewalks?
- How many places are we going?
- Will we need to transport kids or groceries?

- Which mode is fastest? Most reliable? Most affordable? Feels safest? Easiest to figure out?

Some of these considerations are individual, for example, our ability to afford a particular mode, while others are due to our environments, the options available to us in the neighborhoods we find ourselves living in. However, it is widely understood that the options we consider are heavily influenced by past transportation and land use decisions. These decisions determine access to opportunities and have far-reaching effects on equity and social justice. As noted earlier, transportation links people to places, allowing us to move between our home and other places, like work or school. Our neighborhood's land use pattern determines the distribution of these activities and destinations which, when combined with transportation options, impacts our ability to meet daily needs. Throughout history, communities of color have faced limitations in accessing essential services and experiencing overall mobility due to patterns like racial segregation, gentrification, and displacement.

Figure 1-1. Travel Mode Choices to Key Destinations

Source: SCAG, 2023

This history helps explain why the transportation network that meets you as you exit your home varies considerably across the region, from county to county, local jurisdiction to local jurisdiction, and neighborhood to neighborhood. At a high level, we know that most of our trips are handled via auto (nearly 90 percent) and the rest are made via biking, walking, or rolling (about 10 percent) and via transit/rail (3.6 percent). In the future, we anticipate that more of us will bike, walk, or roll (13.7 percent) and take transit/rail (5.3 percent). Currently, for those who have access to vehicles, driving can often feel like the easiest of options. As SCAG's report with UCLA on Falling Transit Ridership: California and Southern California[2] succinctly put it, so long as driving in the SCAG region is the easiest way to get around, people will drive more (often at a considerable cost burden) and ride transit/rail less.

Though our current propensity to drive is strong, we also know that there are a variety of transportation options across the region. If you drive, you are met by freeways, highways, and arterials system that has approximately 73,000 lane miles that can take you all over the region, to see snow in Big Bear, feel the sun in Joshua Tree, or hear waves crashing at Laguna Beach. If you are hopping on a bus to see these sights, your journey may be more time intensive and require careful coordination. You will be met by a transit/rail network that includes 33,485 miles of bus routes, including local bus, express and bus rapid transit (BRT), Amtrak intercity and long-distance services, and Metrolink commuter rail service. If you are biking to your destination, you will cover far less ground, but you will be met by roughly 5,000 miles of bikeways, including nearly 900 miles of Class I bikeways (bicycle paths), about 3,000 miles of Class II bikeways (a striped lane for one-way bicycle travel), approximately 1,200 miles of Class III bikeways (signs or pavement markings, but no separation), and almost 20 miles of Class IV bikeways (separated cycle tracks). And though we do not have a regional inventory of pedestrian facilities across the region, we know that the network is also vast, but contains significant gaps that can make a journey harder, including missing sidewalks and curb ramps, sidewalks in disrepair, a lack of shade, and excessive distances between safe crossing points.

Considered at a more local level, we know our travel options are not all the same and, as noted earlier, depend on individual and environmental factors. For example, if you live in a rural community of Imperial County, transit/rail options may be in short supply, so you may depend on driving more, or if you live in an urban area of Los Angeles County, parking may come at a premium and you may have more transit/rail options that make more sense. Or, if you live in a beach community in Orange County, biking may be possible for short trips, while if you live in Riverside or San Bernardino Counties, you may depend on Metrolink to take you to work, but you find yourself driving for other trips. And if you find yourself in Ventura County, you may feel that driving makes the most sense due to distances between destinations. Please see Tables 1-1 through 1-3 to view the travel mode distribution and trip length for the region as well as each county.

Table 1-1. Mode Share by County: 2050 (Baseline vs. Plan)

County	Trip Type	SOV		HOV		Transit		Walk		Bike	
		Baseline	Plan	Baseline	Plan	Baseline	Plan	Baseline	Plan	Baseline	Plan
Imperial	Work	63.8%	61.7%	24.9%	23.1%	0.2%	0.2%	8.6%	10.1%	2.4%	4.8%
	All	32.7%	31.5%	50.5%	47.3%	1.0%	1.0%	14.4%	17.1%	1.5%	3.1%
Los Angeles	Work	61.9%	57.4%	24.1%	21.3%	7.7%	11.6%	4.1%	4.8%	2.1%	4.8%
	All	34.9%	32.1%	49.3%	45.9%	4.5%	6.4%	9.4%	11.3%	1.8%	4.3%
Orange	Work	70.4%	66.8%	23.7%	22.5%	1.2%	3.7%	2.8%	3.4%	1.9%	3.7%
	All	40.4%	38.6%	48.6%	47.3%	1.3%	2.1%	7.9%	8.8%	1.8%	3.2%
Riverside	Work	71.2%	67.9%	24.0%	22.5%	0.7%	3.8%	2.9%	3.6%	1.1%	2.3%
	All	37.9%	36.3%	52.4%	51.1%	1.1%	1.9%	7.7%	8.9%	0.9%	1.8%
San Bernardino	Work	71.5%	67.9%	23.4%	21.7%	1.2%	3.9%	2.6%	3.5%	1.3%	3.0%
	All	39.4%	37.4%	50.6%	48.9%	1.4%	2.2%	7.5%	8.9%	1.1%	2.5%
Ventura	Work	68.6%	66.1%	22.1%	21.4%	0.8%	3.3%	5.1%	5.4%	3.5%	3.8%
	All	39.2%	38.1%	47.2%	46.5%	1.0%	1.8%	10.0%	10.8%	2.6%	2.8%
SCAG Region	Work	65.9%	61.9%	23.9%	21.7%	4.6%	7.9%	3.6%	4.3%	1.9%	4.1%
	All	37.0%	34.7%	49.7%	47.3%	2.9%	4.3%	8.8%	10.2%	1.6%	3.5%

Source: SCAG, 2024

Table 1-2. Average Commute Distance (Miles) by Mode, SCAG Region

Mode	Base Year (2019)	Connect SoCal (2050)
Auto	17.5	17.0
Transit	15.2	18.4
Walk	1.6	1.6
Bike	2.7	3.2

Source: SCAG, 2023

Table 1-3. Average Trip Distance (Miles) by Trip Type, SCAG Region

Trip Type	Base Year (2019)	Connect SoCal (2050)
Work Trips	16.6	15.9
Non-Work Trips	6.1	6.1

Source: SCAG, 2023

To better understand the transportation patterns and needs in the region's underserved and under-resourced communities, in 2020, SCAG conducted a Mobility Innovations and Pricing (MIP) Study, which was focused on exploring the potential equity implications of road pricing and other transportation policies in the region. Through this Study, 594 Transportation Equity Zones (TEZs) were identified that represent places with the greatest intersection of socioeconomic, environmental, and transportation burdens. Most TEZs were located within urbanized areas and in high-density areas near sources of pollution such as freeways, freight distribution points, and major arterials. The TEZ travel pattern analysis was focused on TEZ resident commutes and found that commuting consisted of largely local, short distance trips. Most of the largest commute flows from TEZs to major employment destinations originated from within approximately 10 miles of the employment destination. In lower density areas, such as the Corona industrial/commercial district in Riverside County and the Simi Valley industrial/commercial district in Ventura County, trip distances were somewhat longer. However, in general, there was limited intercounty travel from TEZs to the key destinations.

The Study also found that autos were the dominant mode (64 percent of commute trips), but less so than for most people across the region. Carpooling was an important commute mode for TEZ residents, and particularly for those in San Bernardino, Riverside, Orange, and Ventura Counties. In general, places with limited transit/rail access, such as the Corona industrial/commercial district in Riverside County, had higher rates of carpool commuting by TEZ residents. The Study found that throughout the region, TEZ residents were much more likely than all residents to commute using non-auto modes such as transit/rail. In some counties, TEZ residents were four or five times more likely than all residents to commute via transit/rail. Los Angeles County has the highest percentage of TEZ residents using transit to commute, at 13 percent. It is important to note that rail was used much less frequently by TEZ residents for commute trips than bus. For more details, please review the full Study.[3]

Regardless of where you live in the region, complicating matters further, sometimes you may depend on more than one mode to reach your destination. For example, you might drive, walk, or bike to reach your transit/rail stop, or when you drive to a local hub of shops and restaurants, you might park and then walk the rest of the way to an eatery or shop. At times you may identify as a driver, while at other times as a pedestrian or bicyclist, and with each comes a different perspective. Consider if you have grown exasperated

when making a right-hand turn and finding there is a pedestrian obstructing your path or consider times when you have been the pedestrian crossing a street and worried a driver might not notice you.

1.4 WHAT'S CHANGED?

1.4.1 COVID-19 PANDEMIC RECOVERY

Since Connect SoCal 2020 was adopted, the nation and region have continued to recover from the COVID-19 pandemic. During the early stages of the pandemic, California implemented multiple measures to mitigate the spread of the virus. These measures included stay-at-home orders, business closures, and restrictions on movement. Many people transitioned to remote work. As a result, there was a significant impact on vehicle miles traveled (VMT). However, this was followed by a substantial recovery in vehicle travel as restrictions eased and economic and social activities resumed. People started returning to workplaces, businesses reopened, and travel gradually picked up, leading to an eventual return to the pre-pandemic levels of VMT.[4] Along with VMT, the region is also experiencing issues with traffic congestion. Since the 2020 Plan was adopted, congestion has increased in all six counties across the region, returning to pre-pandemic levels. There are a variety of reasons for the region's congestion including low unemployment and our dispersed land use patterns (please see the Congestion Management Technical Report for more information).

While VMT and congestion have returned to pre-pandemic levels, transit/rail ridership has rebounded unevenly. Overall, the region's bus ridership levels are currently 21 percent below what they were pre-pandemic. For Metro, bus ridership has recovered more than rail ridership. For example, when comparing October 2019 to October 2023, bus ridership was down 20 percent and rail ridership was down 24 percent. The issue with rail ridership recovery extends to Metrolink whose ridership is currently 48 percent lower than it was pre-pandemic (October 2019 compared to October 2023). These transit/rail ridership declines have resulted in reduced farebox recovery and impacts to operations budgets, and there is widespread concern that transit/rail operators are fast approaching a fiscal cliff. Many transit/rail operators remain uncertain of what the longer-term future normal may look like, particularly if remote working remains a norm for discretionary riders who tend to take rail.

In part, due to its ability to adapt to changing travel needs, active transportation (i.e., bicycling, walking, rolling, etc.) experienced positive impacts from the COVID-19 pandemic. Initially, staying closer to home showed many people what their communities could be like with less traffic, noise, congestion, and pollution. Bicycling and walking were regarded as reliable and resilient options because they enabled physical distancing and carried a low risk of contracting or spreading COVID-19.[5] The increase in bicycling was reflected in the higher demand for bicycles and sales figures. According to the NPD Group, sales of bicycles between April 2020 and April 2021 were up by 57 percent in the United States.[6] Numerous communities reconsidered how public space was allocated and several prioritized opening up streets to bicyclists and pedestrians to make it easier to physically distance from others while traveling to essential businesses and work and engaging in recreation.[7] That is not to say that COVID-19 did not have negative impacts. At the start of the pandemic, most dockless shared micromobility providers withdrew from the public space resulting in a nearly 64 percent decrease in micromobility usage in 2020.[8] However, by the end of 2021 that number had increased to only 27 percent compared to 2019 numbers. During this same period, electric bicycle or e-bike ownership dramatically increased. Estimates for e-bike sales in 2019 were 250,000 nationally, approximately 450,000 in 2020, and nearly 790,000 in 2021. Industry experts shared that it would be reasonable to assume that sales will exceed one million in 2022 and continue to climb in future years.[9]

As noted above, the stay-at-home orders issued in March 2020 in response to COVID-19 increased remote working rates abruptly and dramatically. Prior to the pandemic's start, most workers spent the bulk of their time working outside of their homes, but once the pandemic was well underway, at least half of all employees were working remotely. According to UCLA's research, across the U.S., remote work peaked at 62 percent in May 2020, but declined to 37 percent by the end of that same year.[10] In a series of surveys conducted in partnership with UC Davis, SCAG found that as of summer 2021, about 40 percent of respondents expected to continue working from home at least one day a week. The majority of these workers had previously commuted to their jobs full-time. Survey results also demonstrated inequities in work-from-home across income groups, as lower-income workers were less likely to work remotely both during the pandemic and during pandemic recovery. Within Southern California, the share of jobs that can be performed at home are relatively high (36.7 percent) compared to the national estimate of 36.4 percent of U.S. jobs.[11] SCAG estimates that currently 19 percent of people are engaging in remote work compared to six percent prior to the pandemic. For the purposes of this Plan, SCAG is assuming roughly 22-25 percent of workdays will be conducted at home through 2050.

More people engaging in a balance of remote and in-person work has altered travel behavior in significant ways and created some challenges. Some literature suggests that while flexible work schedules and telecommuting may reduce (or, in the case of satellite offices, reroute) single occupancy vehicle (SOV) commute trips, they likely increase SOV trips for other purposes, such as errands and trips for lunch while an employee is working from home (although not necessarily during peak congestion periods). This is known as the rebound effect. It is also contended that telecommuting may encourage people to live farther from their workplaces than they would otherwise.[12] Remote work also poses significant challenges for transit/rail. Many of the region's transit/rail systems downtowns and other major activity centers, and with a chunk of workers no longer commuting, a variety of issues arise (e.g., farebox recovery, sustaining services, etc.). There is now a need to reconsider, adapt, and expand transit/rail, shared mobility, and short trip options to address these changing travel needs.

Relying on remote work and school (e-learning) as primary ways to physically distance exposed the region's digital divide, and that is why in February 2021, SCAG's Regional Council adopted the Broadband Access Resolution (Resolution No. 21-629-2) and resolved to bridge the digital divide in underserved and unserved communities. The digital divide is a critical issue, as technological advancements have been essential to the growth of the SCAG region over the past three decades. The internet, computers, and smartphones have provided unprecedented access to information, and have helped transform our relationship to transportation. Although many residents have benefited from these advancements, a significant portion of the population remains unconnected. The pandemic highlighted the stark disadvantages faced by unconnected individuals as California implemented measures to mitigate the spread of the virus and digital activities became a necessity for participating in daily life. Those who lacked access to healthcare, food services, remote work, and e-learning experienced severe hardships. Currently, across the region, 10 percent of residents lack broadband. More specifically, 13 percent of Black people, 12 percent of Hispanic/Latino people, 11 percent of Native Americans, 20 percent of adults aged 65 and older, and 70 percent of those without broadband are concentrated in low-income households .[13] As we recover from the pandemic, faster broadband speeds and better devices will become increasingly essential, and the disparities between those who have access and those who do not will continue to widen. While broadband access may seem to be an issue that primarily affects individual quality of life, it is crucial infrastructure that supports technological advancements in the mobility ecosystem.

1.4.2 TECHNOLOGY

Even with the challenges arising from the COVID-19 pandemic, transportation-specific technology has played a significant role in reshaping the mobility ecosystem and reshaping the way we travel. In the past decade or so, the proliferation of smartphone applications (apps) has transformed the way that we access transportation. Apps like Google Maps, Waze, and Transit provide real-time navigation, route planning, and public transportation information, making it easier for us to navigate the region. We use these apps to access ridesharing, bike sharing, scooter sharing, and car sharing programs so that we can acquire easy access to convenient and flexible transportation options. Still, other technological changes are afoot that will likely transform the transportation landscape.

Figure 1-2. Electric Vehicle Charging Infrastructure

Source: Unsplash- Michael Fousert, Published on April 8, 2021

With respect to driving, the adoption of passenger electric vehicles (EVs) has gained momentum in recent years (see Table 1-4). By the end of 2022, the region boasted a population of EVs totaling 524,892. Only a decade prior, in 2012, the region had a fraction of the current population of EVs. EVs across the region totaled 8,193: Imperial County (4); Los Angeles County (4,734); Orange County (2,175); Riverside County (445); San Bernardino County (344); and Ventura County (491).[14] Advances in battery technology, increased availability of charging infrastructure, and supportive government policies have accelerated this shift toward EVs. Through the National Electric Vehicle Infrastructure (NEVI) Formula Program, established by the Infrastructure Investment and Jobs Act (2021), California is receiving $384 million in dedicated federal funding over five years to strategically deploy publicly available EV charging infrastructure and establish an interconnected network of EV chargers along key corridors across the state.[15] This will allow California to at least double the number of fast-charging sites along these corridors. Importantly, the program is expected to benefit underserved communities by requiring 50 percent of stations be installed in disadvantaged and

low-income communities and 40 percent in Justice40 communities,[16] many of which overlap. Currently the region has 36,473 chargers (see Table 1-5).[17] Another important recent development is the California Air Resources Board 2022 approval of the Advanced Clean Cars II rule[18] that sets the state on a path to rapidly grow the zero-emission car, pickup truck, and SUV market. The rule establishes a roadmap so that by 2035, 100 percent of new cars and light trucks sold in the state will be zero-emission vehicles, including plug-in hybrid electric vehicles.

Table 1-4. Total Number of Electric Vehicles by County (2012 vs. 2022)

County	2012	2022
Imperial	4	770
Los Angeles	4,734	282,343
Orange	2,175	134,291
Riverside	445	47,681
San Bernardino	344	36,094
Ventura	491	23,713
SCAG Region	8,193	524,892

Source: California Energy Commission, 2023

Table 1-5. Total Number of Electric Vehicle Chargers by County (2022)

County	2022
Imperial	**49**
Los Angeles	**26,866**
Orange	**5,382**
Riverside	**1,634**
San Bernardino	**1,668**
Ventura	**854**
SCAG Region	**36,453**

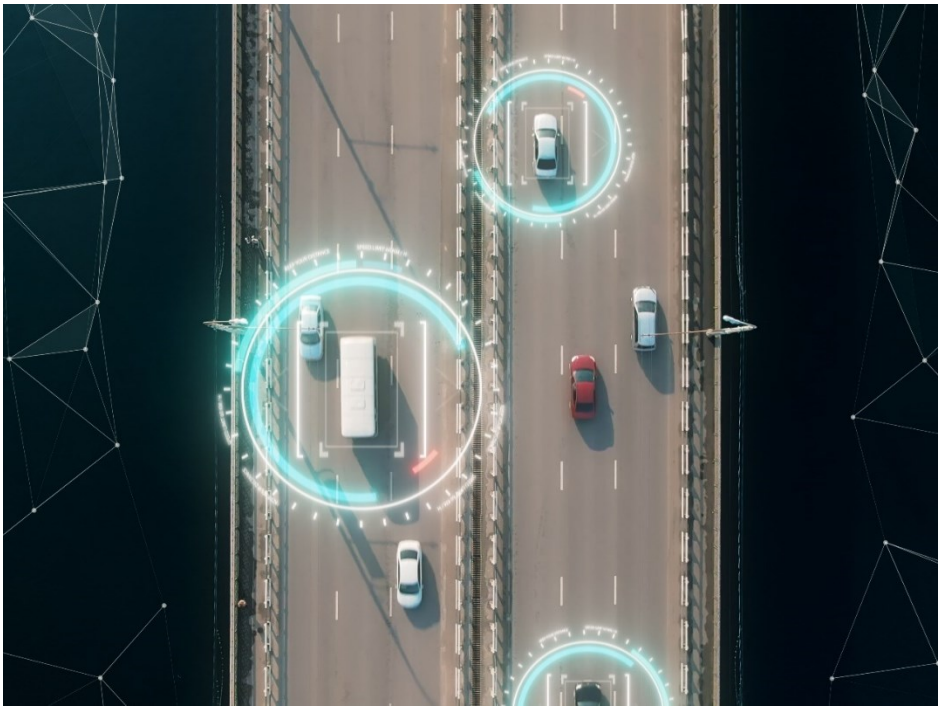
Source: California Energy Commission, 2023

Throughout the state, the number of EVs is anticipated to grow to 12.5 million by 2035, but to get there, a lot of work remains. Currently, EVs tend to be purchased and owned by mostly white and Asian, college-educated, and high-income residents in affluent coastal areas of Los Angeles and Orange Counties.[19] The high vehicle costs[20] and lack of supportive infrastructure for renters and public charging stations make it harder for most to make the transition, thereby hindering an equitable climate transition. A study conducted by the UCLA Luskin Center found that existing funding programs can only serve a limited number of households and are inadequate to support California's clean vehicle adoption goals and broader equitable transition priorities.[21] Expanding California's public and in-home charging networks, additional or increasing rebates for low- and middle-income residents,[22] and increasing the pool of used electric cars will help in improving EV affordability and developing confidence that charging is readily available, and these vehicles are worth purchasing.

Simultaneously with the increased adoption of electric vehicles (EVs), various companies in California, such as General Motors' self-driving unit (Cruise) and Alphabet Inc.'s (Waymo), are actively developing and testing automated vehicles. For example, Waymo has tested its vehicles by driving more than 20 million miles on public roads and tens of billions of miles in simulation.[23] Cruise and Waymo have been permitted to use autonomous vehicles for passenger service (i.e., ride hailing). The way that these vehicles work is that a passenger requests a ride via an app and a driverless vehicle shows up. The passenger enters the vehicle and initiates the ride and using the phone's Bluetooth, the vehicle carries out the trip. These companies envision that these autonomous vehicles will be used to transport people to the airport, entertainment venues, and work. In 2023, Waymo began officially testing driverless rides in Los Angeles. The expectation is that these vehicles will eventually become widespread, and they will support improved road safety, transportation efficiency, and accessibility for people who cannot drive due to factors such as age or disability. However, the future for autonomous vehicles is uncertain, with development and testing still in the early stages. Those who are optimistic predict that autonomous vehicles will be viable as early as the mid-2020s, while others forecast further into the 2030s and 2040s.[24]

The widespread adoption of autonomous vehicles faces several limitations and barriers that need to be addressed to ensure their integration into the mobility ecosystem. These challenges include securing sufficient consumer demand, assurances of data security, the development of regulatory frameworks, the update of liability laws, and more technological development, including efforts to make the vehicles more affordable.[25] Another concern is that these vehicles will lead to increased VMT. Research suggests that there would be a significant increase in travel demand for an average household (between two to 47 percent), especially for higher income households. Automated vehicles are expected to have higher fuel economy and lowered costs of travel, especially with respect to the time cost of travel, resulting in a rebound effect.[26]

Figure 1-3. Autonomous Vehicle Technology



Source: Shutterstock- FlashMovie

EVs and automated vehicles may also come into play with respect to Mobility as a Service (MaaS), which emphasizes that the future of travel will be shaped by technology and the ability of residents to easily choose from and use a variety of travel options. Since Connect SoCal was adopted in 2020, SCAG completed the MaaS Feasibility White Paper, to study the key building blocks for successfully implementing a MaaS system in the SCAG region. MaaS integrates transportation services into a single mobility platform that provides competitive alternatives over private vehicles, to promote universal basic mobility, encourage mode shift, and foster sustainable travel choices. Existing MaaS infrastructure in the region includes physical, technological, and social infrastructure. Physical infrastructure, such as mobility hubs, for multimodal trip planning are being planned or deployed at a small scale and need to be strategically expanded.

Mobility hubs are where a range of transportation options connect and interact with each other. They often provide an integrated suite of mobility services and serve as the nucleus of the physical infrastructure in a MaaS system. The hubs are essential for a safe and convenient transfer between transportation modes and enhance the overall traveler experience by supplying dynamic, real-time travel information as well as location-based information. The largest infrastructure barrier for MaaS remains the delivery of high-quality transit/rail service, a challenge that is more fully described in the Transit/Rail chapter. Since the 2020 Plan was adopted, Los Angeles County developed the I-710 North Mobility Hubs Plan and the Orange County Transportation Authority developed the Orange County Mobility Hubs Study, which, together, identify 35 future mobility hubs. In addition, the City of Los Angeles, Riverside County, and Imperial County are developing mobility hubs. As a part of developing Connect SoCal 2024, SCAG identified a set of mobility hubs across the region that will be further described in the Transit/Rail Chapter.

As mobility technologies continue to accelerate, SCAG understands that local agencies and leaders across the region will increasingly face the challenge of making informed decisions regarding emerging technologies. The lack of adequate information regarding the impacts of new technologies on communities may pose significant challenges. To assist in this decision-making process, SCAG developed a set of Guiding Principles for Emerging Technology to support staff and local leaders as they evaluate emerging mobility technologies. Please see Appendix 1 to review these principles.

1.4.3 CENTERING EQUITY

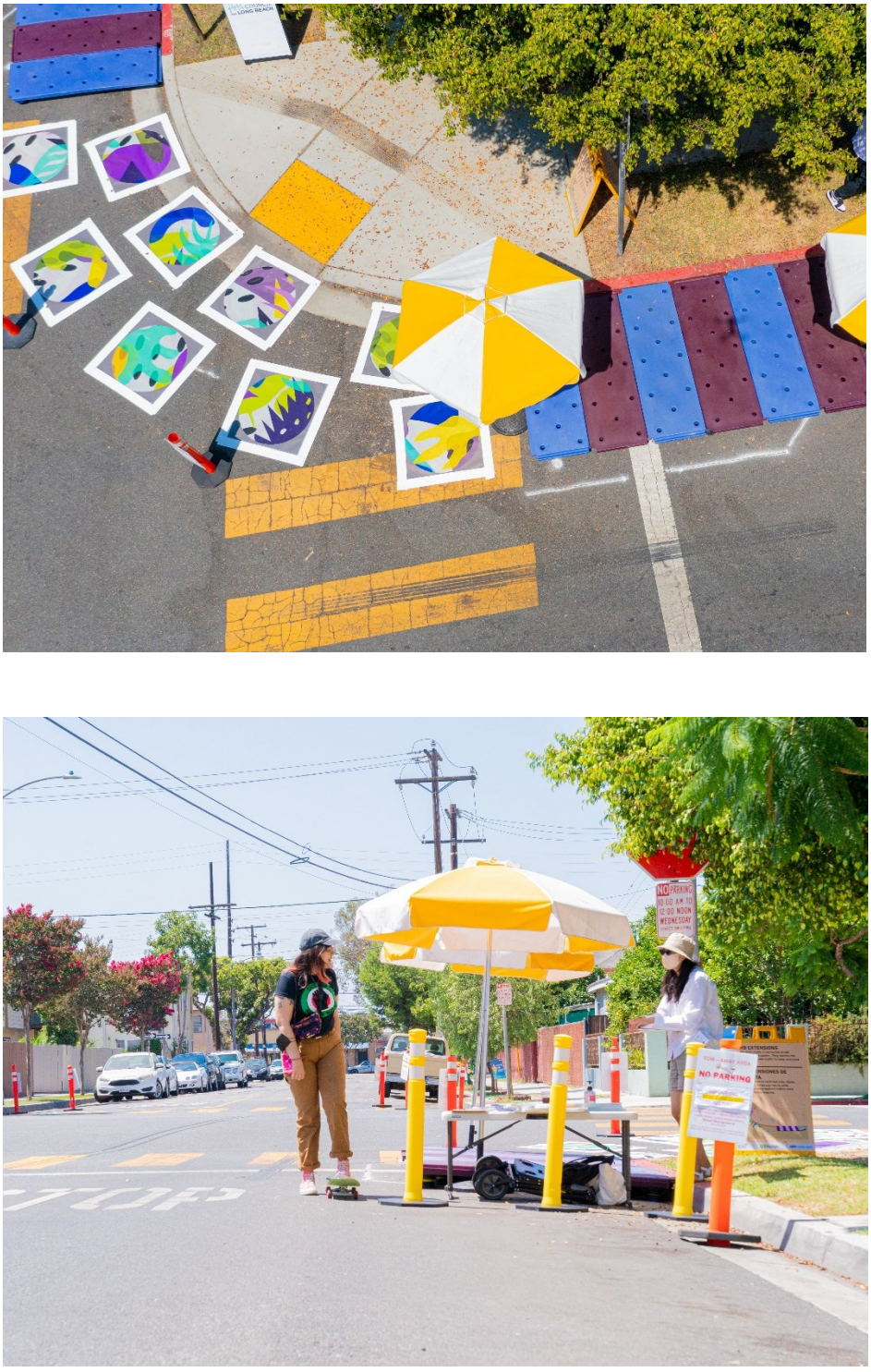
Prior to the final adoption of Connect SoCal, in July 2020, SCAG's Regional Council made a commitment to advancing justice, equity, diversity, and inclusion throughout the region. For the region to become healthy, livable, sustainable, and economically resilient, SCAG recognized that it would need to dramatically improve outcomes for low-income families and people of color. To that end, SCAG's core function, its planning work, must directly address the long-standing systemic and institutional barriers that have fostered inequities in health, wealth, and opportunities. SCAG adopted its Racial Early Action Plan in May 2021 to help facilitate the consistent integration of equity into its planning work. The Racial Equity Early Action Plan included a series of activities for SCAG to advance racial equity in the region. In 2022 and 2023, equity's integration into Connect SoCal was prioritized through the convening of the Racial Equity and Regional Planning Subcommittee. The Subcommittee recommended that Connect SoCal 2024 function as a vehicle to promote racial equity, to address the historic impacts of systemic racism and coordinate and implement equity-centered activities across the region. Throughout each chapter in the Mobility Technical Report, a concerted effort has been made to consider equity.

One piece of important work SCAG led was the Mobility Innovations and Pricing Study, which was highlighted earlier when discussing travel patterns across the region. This Study was important for a variety of reasons including this analysis, but also because it defined transportation equity. As the Study noted, in

transportation planning, the concept of equity generally relates to providing benefits and reducing burdens according to need, rather than equally and without respect to need. However, contextualizing equity within a transportation system is complex because how well the transportation system works for different people is inextricably linked to external factors (e.g., land use patterns, income, systemic social inequities, etc.). Pursuing more just transportation outcomes requires decision-makers and agencies to acknowledge that race, gender identity, age, ability, income, education, language, immigration status, sexual orientation, and other social factors shape how individuals and communities experience our transportation system and use it to access opportunities. Building from this understanding, the Study focused on the potential equity implications of road pricing and other innovative transportation policies on the region. The initiative combined stakeholder engagement, technical analyses, and communications strategies to elevate equity considerations as a key touchstone in planning for road pricing—most critically leading with the concerns of underrepresented communities through dialogue with community stakeholder organizations. In addition to identifying transportation burdens and priority investments through a community-led engagement process, the Study analyzed the travel needs of underrepresented communities. The project served as a foundational step towards understanding the equity implications of these strategies and increasing community participation in the policymaking process on these issues.

Another example of SCAG's transportation equity-related work can be found through the *Go Human* Program. Through this program, SCAG staff provides traffic safety resources to local jurisdictions and community organizations, including co-branded safety advertisements and the Kit of Parts Lending Library, which creates temporary demonstrations of street treatments. Additionally, in three funding rounds since 2020, the *Go Human* Mini-Grant program awarded more than $845,000 to 85 projects developed and led by community-based organizations, engaging more than 400,000 on traffic safety. This program aims to build street-level community resilience and increase the safety of people most harmed by traffic injuries and fatalities, including without limitation Black, Indigenous and People of Color; people with disabilities; and frontline workers, particularly those walking and biking. Through the strategies outlined at the conclusion of the Mobility Technical Report, we have identified opportunities to advance equity through strategies and actions that SCAG as well as its partners may take on in the coming years to address and rectify the effects of racially discriminatory policies in the SCAG region.

Figure 1-4. *Go Human* Curb Extension Demonstration



Source: SCAG, 2022

Figure 1-5. *Go Human* Bike Rodeo Event

Source: SCAG, 2022

1.4.4 RESILIENCE

Similar to equity, resilience has become an increasingly significant consideration in transportation planning efforts. Resilience refers to the capacity of the region's built, social, economic, and natural systems to anticipate and effectively respond to changing conditions, acute shocks, and chronic stressors. Recognizing the importance of resilience, in January 2021, SCAG's Regional Council adopted the Climate Change Action Resolution (Resolution No. 21-628-1) and resolved to develop a Regional Resilience Framework to "help the region plan and prepare for a changing climate, as well as potential near- and long-term disruptions to Southern California." By the year 2050, the region is projected to face numerous challenges and pressures due to climate change, including heightened risks of intense wildfires, droughts, extreme heat, rising sea levels, and seismic events. These conditions will have detrimental effects on the region's transportation system and the people who depend on it.[27]

The impacts of climate change on transportation infrastructure will be multifaceted. For instance, rising sea levels will pose a threat to coastal railways and bridges, while severe storms can trigger mudslides and highway flooding. Additionally, heatwaves will contribute to the deformation and rutting of roads. Such severe weather conditions can also reduce the lifespan of infrastructure assets, disrupt operations more frequently, and necessitate the development of new infrastructure. These changes may require adjustments in the design, construction, location, and maintenance of transportation infrastructure.[28] It is likely that some existing transportation infrastructure will need to be modified or relocated in order to remain functional, and the planning, construction, and maintenance processes will need to increasingly consider the consequences of climate change to ensure the long-term viability of the infrastructure.[29] It is important to note the potential human impacts, particularly for those who are dependent on traveling via their feet or bikes. To better anticipate a wide range of potential futures and strengthen the resilience and preparedness of the region, the Mobility Technical Report modal chapters explore key shocks and stressors to consider when planning for resilience.

Figure 1-6. Climate Change Impacts on Transportation

Source: Unsplash- Wade Austin Ellis, Published on November 9, 2018

Source: Unsplash- Marcus Kauffman, Published on October 10, 2017

1.5 WHY DO WE PLAN?

Connect SoCal 2024 represents the vision for Southern California's future, including policies, strategies, and projects for advancing the region's mobility, economy, and sustainability through 2050. The Plan details how the region will address its transportation and land use challenges and identifies opportunities to achieve regional emissions standards and greenhouse gas reduction targets. The Plan also strives to achieve broader regional objectives, such as improving mobility and roadway safety and supporting the region's vital goods movement industries. Connect SoCal is an important planning document for the region, allowing public agencies who implement transportation projects to do so in a coordinated manner, while qualifying for federal and state funding. The Plan includes robust financial analysis that considers operations and maintenance costs to ensure our existing transportation system's reliability, longevity, resilience, and cost effectiveness. Furthermore, development of a Regional Transportation Plan and a Sustainable Communities Strategy are required by federal and state legislation.

The role of the Mobility Technical Report is to provide an in-depth discussion of current conditions and future developments related to active transportation, transit/rail, and streets and highways. Beyond meeting the statutory requirements of Connect SoCal, this report is meant to serve as guidance for local and county agencies to outline the existing conditions and needs of the region related to mobility. It provides stakeholders with an understanding of the opportunities and challenges the region will face over the next 20-plus years in implementing the projects proposed. This report also provides stakeholders with critical data, examples of best practices, and a common framework for discussing the complex relationships between the built environment and our daily travel options. Ultimately, it is meant to help establish regional priorities and function as the basis for coordinated action.

1.5.1 PLANNING AND POLICY CONTEXTS

As noted above, Connect SoCal is required to meet federal and state requirements related to land use, transportation, air quality, and greenhouse gas emissions. Appendix 2 details the federal and state statutes, adopted legislation, guidelines, initiatives, and plans that SCAG reviewed in developing the Mobility Technical Report. Some of the key plans and policy contexts that were consulted are highlighted below.

- California Transportation Plan (CTP): CTP creates a vision that articulates strategic goals, policies, and recommendations to eliminate transportation disparities and improve multimodal mobility and accessibility while reducing greenhouse gas and climate change impacts.
- Interregional Transportation Strategic Plan (ITSP): ITSP implements the interregional portion of the CTP. The ITSP proposes a range of strategies, including the promotion of alternative modes of transportation such as transit, walking and biking, the deployment of advanced technologies to improve system efficiency and safety and the incorporation of climate resilience into transportation planning and design.
- Climate Action Plan for Transportation Infrastructure (CAPTI): CAPTI includes a detailed analysis of the State's transportation infrastructure and its vulnerability to the impacts of climate change, such as sea-level rise, flooding, and extreme weather events. The plan identifies strategies for reducing greenhouse gas emissions from the transportation sector, including promoting alternative modes of transportation such as transit, walking, and biking, increasing the use of electric and other low-emission vehicles and promoting sustainable development patterns that reduce vehicle travel. It also emphasizes the importance of integrating climate resilience into transportation infrastructure design, including measures such as improving drainage systems, using permeable pavements, and elevating critical infrastructure to protect against flooding and sea-level rise.
- California Department of Transportation (Caltrans) Smart Mobility Framework (SMF): SMF is a comprehensive statewide approach to advancing smart mobility and modernizing infrastructure. It aims to improve transportation safety, efficiency and sustainability through innovative technologies and data-driven strategies. Its framework identifies several key objectives such as the integration of connected and autonomous vehicles, the expansion of electric vehicle infrastructure and the promotion of shared mobility options. The framework also emphasizes the importance of data sharing and collaboration among stakeholders to develop and implement effective transportation solutions.
- Caltrans Active Transportation (CAT) Plans: CAT Plans build on the 2017 California State Bicycle and Pedestrian Plan, Toward an Active California, to evaluate bicycle and pedestrian needs on and across the State Transportation Network and prioritize improvements to develop and support an integrated bicycle and pedestrian network. Caltrans has developed one CAT plan for each district in the SCAG region (Districts 7, 8, 11, and 12).
- 2028 Olympic and Paralympic Games Plans: SCAG considered plans and forecasted projects to support the 2028 Olympic and Paralympic Games, which will be hosted in Los Angeles. The mobility vision and mission for LA28, the organization responsible for delivering the Games, is focused on providing a seamless “car-free” transport system for all attendees, utilizing a robust public transit system and providing for people to walk or roll and use other mobility means other than driving, to travel throughout the duration of the Games. Though still in the early planning stages, SCAG is coordinating with key leaders and stakeholders to align the LA28 Transportation Strategy with regional priorities. SCAG understands the Games and related activities will shape mobility in Los

Angeles County and other parts of the region. For example, there are plans for "legacy" projects that would improve transit speed and reliability, bike access, pedestrian crosswalks, street infrastructure, and amenities such as wayfinding to create more seamless connections. These projects and improvements will provide long-term mobility solutions to the region's residents well beyond the duration of the 2028 Games.

1.5.2 VISION AND GOALS

Connect SoCal's vision is to create a healthy, prosperous, and connected region for a more resilient and equitable future. Connect SoCal's overarching vision is meant to encapsulate an image of what the region can become by 2050. The purpose of the vision is to bring together the key themes of the Plan goals and the policy direction set by recent actions of SCAG's Regional Council regarding equity and resilience. The vision underscores the core purpose and responsibility of the long-range Plan in supporting balanced growth of the region's natural and built environments to meet the needs of people in the years to come. Supporting this vision are intersecting goals focusing on advancing our Mobility, Communities, Environment, and Economy. The goals detailed below provide the foundation for the Plan's policies and strategies.

- Mobility: Build and maintain an integrated multimodal transportation network.
  - Support investments that are well-maintained and operated, coordinated, resilient and result in improved safety, improved air quality and minimized greenhouse gas emissions.
  - Ensure that reliable, accessible, affordable, and appealing travel options are readily available, while striving to enhance equity in the offerings in high-need communities.
  - Support planning for people of all ages, abilities, and backgrounds.

- Communities: Develop, connect, and sustain communities that are livable and thriving.
  - Create human-centered communities in urban, suburban, and rural settings to increase mobility options and reduce travel distances.
  - Produce and preserve diverse housing types in an effort to improve affordability, accessibility, and opportunities for all households.

- 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 stresses 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 the region's resources.

- Economy: Support a sustainable, efficient, and productive regional economic environment that provides opportunities for all residents.
  - Improve access to jobs and educational resources.
  - 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.

1.6 HOW DO WE PLAN, AND WHO ARE WE PLANNING FOR?

Planning for such a large and diverse region requires substantial input from across Southern California. The people who live, work, and play here have varying, and sometimes conflicting, needs and priorities. Their

voices must be heard if we are to develop planning policies that truly meet the needs of the region. While many of the land use plans and transportation projects that feed into SCAG's work products undergo their own robust local public participation process, it is important that Connect SoCal 2024 also allows for an intentional public outreach and engagement process.

POLICY LEADERSHIP: A significant effort was made to conduct meaningful outreach and engagement throughout Connect SoCal 2024's development, to SCAG's policy committees as well as to other critical stakeholders. Throughout late 2022 and early 2023, SCAG staff convened the Next Generation Infrastructure Subcommittee, which was comprised of a dozen policymakers from across the region. The Subcommittee provided guidance on the priorities and strategies for Connect SoCal 2024, reflecting the rapidly evolving developments specific to the future of mobility and associated implications for public policy. Feedback from the Subcommittee was grouped into the following four broad recommendations that are addressed in the subsequent chapters of this technical report.

- **Maintain a people-centric transportation investment strategy**: Ensure that deployment of new technologies support people's needs and address larger shared goals like advancing equitable access and reducing traffic fatalities and series injuries. Prioritize use of our public rights-of-way for all roadway users, especially focusing on the needs of non-single occupant vehicle users.
- **Continue to invest in system preservation and efficiency investments**: Fix-it-first remains a key strategy for Connect SoCal, especially recognizing greater needs associated with the transition to zero emission vehicles and ensuring system resilience. Within this context, operational improvements and targeted strategic highway capacity expansion are warranted when coupled with complementary efforts to offset any potential increases in vehicle miles traveled and especially single-occupant vehicle travel.
- **Expand and enhance mobility choices**: Focus on understanding and meeting the needs of existing transit riders, which will also attract new riders. Increase choices beyond driving by enhancing and supporting services across all modes of travel including transit, active transportation, micromobility, and automobiles. Reconsider the role of the automobile in our daily lives and how mobility options can increase reliable accessibility.
- **Re-envision how we plan, fund, and manage the transportation system**: Plan and manage the transportation system more like an investor, including asserting a role in the management of the transportation digital realm. Appropriately pricing the transportation system ensures that the system functions for all users (even during peak demand periods), generates reliable revenue, and established resources for addressing equity concerns.

STAKEHOLDER COLLABORATION AND CONSULTATION: Having a grasp of where the region is at as it implements projects and plans for future projects is critical in shaping the Plan for the region. SCAG staff made an effort to better understand existing conditions, challenges and opportunities, and potential strategies and actions that could be taken to create a healthier mobility ecosystem. A significant effort was made to conduct meaningful outreach and engagement to stakeholders through SCAG's Regional Transit Technical Advisory Committee, which is comprised of dozens of transit/rail operators, and the Safe and Active Streets Working Group, which is comprised of transportation safety and active transportation practitioners from throughout the SCAG region. Over the course of 2022, SCAG met with jurisdictions across the region to discuss and secure local datasets and maps to help inform the Plan's development (also referred to as the Local Data Exchange (LDX) effort). SCAG also worked with the County Transportation Commissions (CTCs) to further understand the region's priorities. In the fall of 2022, SCAG staff solicited planned transportation projects from the CTCs. These projects largely originated from local sales tax

commitments and county plans and formed the basis for the future transportation network for this Plan. All this information helped support the Plan's financial assumptions and forecasts. More targeted modal outreach and engagement is described in the chapters that follow.

PUBLIC PARTICIPATION: Throughout the spring of 2023, SCAG staff conducted outreach and engagement across the region to share information regarding the Plan and to seek feedback on priorities. The purpose of these events was to gather input on the myriad of challenges each community faces to establish planning priorities for the next 20 plus years. Through a series of in-person and virtual workshops, valuable insights were gathered from stakeholders regarding concerns and priorities.

- **Transit/Rail**: Stakeholders demonstrated interest and overall support for transit/rail investment, particularly in clean transit technologies such as zero-emission bus fleets. They also expressed a strong desire for free or reduced transit fares, specifically targeting low-income individuals, while expressing support for more fast, frequent, reliable, accessible, and affordable transit/rail options that meet the evolving needs of communities. Stakeholders also expressed interest in microtransit and Bus Rapid Transit (BRT) solutions and called for increased funding to meet growing needs. Additionally, transit/rail safety on vehicles and at stations emerged as a significant concern, with stakeholders emphasizing the need for enhanced safety measures.
- **Active Transportation**: Stakeholders expressed strong support for active transportation, emphasizing the need for more comfortable routes and more destinations that can be easily reached by active transportation modes. They also advocated for increased investment in First/Last Mile and Safe Routes to School initiatives. Safety concerns regarding poor pedestrian and bicycling infrastructure were raised, as well as the need for effective regulations for e-bikes and micromobility options. Furthermore, stakeholders demonstrated a keen interest in transportation-related climate mitigation efforts, prioritizing the enhancement of pedestrian and bicycle networks, improved amenities and shade provision near transit/rail stops and stations, and the reduction of the urban heat island effect through the enhancement of the urban tree canopy.
- **Streets and Highways**: Stakeholders highlighted numerous challenges related to streets and freeways, encompassing traffic congestion, lengthy commute times, traffic safety concerns, air pollution, insufficient connections between travel modes, the need for reconfiguring built-out communities, and reducing car dependence, particularly among low-income households. In response to these challenges, stakeholders expressed support for various strategies. These include implementing congestion pricing mechanisms to alleviate traffic congestion, ensuring the preservation and resilience of the transportation system, and enhancing street quality and safety across the region. Stakeholders also advocated for more Complete Streets, emphasizing the importance of multimodal options, improved connections to transit, infrastructure development for zero-emission vehicles, and street safety improvements such as curb ramps, pedestrian islands, and enhanced lighting.

1.7 HOW WILL WE KNOW IF WE ARE MOVING IN THE RIGHT DIRECTION?

Connect SoCal 2024's performance measures evaluate the performance of investments and strategies that will be implemented at the local, regional, and/or state levels. SCAG has engaged in some level of performance measurement since 1998. Over the years, additional measures have been included, due to new requirements from the state (e.g., SB 375) and federal government (e.g., MAP-21 national transportation performance goals and measures). Still, the Plan's performance is largely evaluated using a combination of modeling tools. The modeling results provide the basis for interpreting the anticipated outcomes of the

Plan's investments and strategies. The Plan's performance measures are detailed in Appendix 3. They are intended to help us respond to some key questions, including:

- Will our region become more connected and accessible?
- Will we grow in ways that encourage livability?
- Will people and our environments become healthier?
- Will our economy function well for all?

To demonstrate the effectiveness of Connect SoCal toward achieving our regional vision and goals, SCAG conducted a 'Plan' vs 'No Plan' (or 'Baseline') analysis, which compares how the region would perform with and without implementation of the Plan. Implementation of the Plan would result in a regional transportation system that provides improved travel conditions and better air quality, while also ensuring an equitable distribution of benefits among communities across the region. With the implementation of the Plan, trips to work, schools and other key destinations would be faster and more efficient. Connect SoCal also improves the integration of multiple transportation modes, leading to an increase in carpooling, demand for transit/rail, and use of active transportation (bicycle and pedestrian) modes for work trips and for other trips made throughout the day.

Analysis conducted by SCAG found that, in comparison to the 2050 Baseline, Connect SoCal will:

- Increase the combined percentage of work trips made by carpooling, active transportation, and transit/rail by 4 percent, with a commensurate reduction in the number of commuters driving alone by single-occupancy vehicle.
- Reduce vehicle miles traveled (VMT) per capita by 6.3 percent as a result of more efficient land use strategies, improved regional transit/rail service, and the implementation of transportation demand management (TDM) strategies, including user pricing.
- Increase annual transit/rail boardings per capita by 64.2 percent.
- Increase transit/rail use for work trips by 3.3 percent, as a result of improved transit/rail service, more transit-oriented, mixed-use development, and implementation of TDM strategies, including user pricing.
- Reduce person delay per capita by 23.8 percent.

More details on the Connect SoCal 2024 performance analysis and its results may be found in the Performance Monitoring Technical Report.

Following the Plan's adoption, on-going monitoring of the Plan's performance helps ensure that the region is making progress towards achieving the established regional goals, and in some cases (e.g., transportation safety), interim targets allow for more near-term performance evaluation. Performance monitoring is key to understanding which investments and strategies are proving successful in meeting specific regional goals and which ones may require modification or reconsideration. Though we understand that progress towards achieving regional goals is made primarily through implementation at the local level, we also know that there are strategies we can implement as a region to realize our vision and achieve our goals. These strategies are detailed in the subsequent chapters and in a more simplified format in Appendix 4.

1.8 WHAT POLICIES WILL GUIDE US?

For Connect SoCal 2024, SCAG developed a set of broad regional planning policies for integrated land use and transportation planning that identify the path towards realizing the vision of Connect SoCal. The policies are meant to guide decision making for both SCAG and partner agencies as we work towards a

sustainable, equitable, and resilient future for the region. They are also intended to be used as a resource by CTCs or local jurisdictions to refer to specific policies to demonstrate alignment with the Plan in seeking resources from state or federal programs. The Mobility policies are broken up into eight categories that are provided below, along with intersecting policies from the Communities, Environment, and Economy categories.

SYSTEM PRESERVATION AND RESILIENCE

- Prioritize repair, maintenance, and preservation of the SCAG region's existing transportation assets, following a "Fix-It-First" principle.
- Promote transportation investments that advance progress toward the achievement of asset management targets, including the condition of the National Highway System pavement and bridges and transit assets (rolling stock, equipment, facilities, and infrastructure).

COMPLETE STREETS

- Pursue the development of Complete Streets that comprise a safe multi-modal network with flexible use of public rights-of-way for people of all ages and abilities using a variety of modes (e.g., people walking, biking, rolling, driving, taking transit).
- Ensure the implementation of Complete Streets that are sensitive to urban, suburban, or rural contexts and improve transportation safety for all, but especially vulnerable road users (e.g., people, especially older adults, and children, walking and biking).
- Facilitate the implementation of Complete Streets and curb space management strategies that accommodate and optimize new technologies and micromobility devices, first/last mile connections to transit, and last mile delivery.
- Support implementation of Complete Streets improvements in Priority Equity Communities, and particularly with respect to Transportation Equity Zones, to enhance mobility, safety, and access to opportunities.

TRANSIT AND MULTIMODAL INTEGRATION

- Encourage and support the implementation of projects, both physical and digital, that facilitate multimodal connectivity, prioritize transit and shared mobility, and result in improved mobility, accessibility, and safety.
- Support connections across the public, private and nonprofit sectors to develop transportation projects and programs that result in improved connectivity.
- Encourage residential and employment development in areas surrounding existing and planned transit/rail stations.
- Support the implementation of transportation projects in Priority Equity Communities, particularly with respect to Transportation Equity Zones, as a way to enhance mobility, safety, and access to opportunities.

- Create a resilient transportation system by preparing for emergencies and the impacts of climate change.

TRANSPORTATION SYSTEM MANAGEMENT

- Pursue efficient use of the transportation system using a set of operational improvement strategies that maintain the performance of the existing transportation system instead of adding roadway capacity, where possible.
- Prioritize transportation investments that increase travel time reliability, including build-out of the regional express lanes network.

TRANSPORTATION DEMAND MANAGEMENT

- Encourage the development of transportation projects that provide convenient, cost-effective, and safe alternatives to single-occupancy vehicle travel (e.g., trips made by foot, on bikes, via transit, etc.).
- Encourage jurisdictions and TDM practitioners to develop and expand local plans and policies to promote alternatives to single occupancy vehicle travel for residents, workers, and visitors.
- Encourage municipalities to update existing (legacy) TDM ordinances by incorporating new travel modes and new technology, and by incorporating employment and residential sites that fall of certain populations, for example employers who have less than 250 employees (below the 250 or more employees threshold identified in AQMD's Rule 2202).

TECHNOLOGY INTEGRATION

- Support the implementation of technology designed to provide equal access to mobility, employment, economic opportunity, education, health, and other quality-of-life opportunities for all residents within the SCAG region.
- Advocate for data sharing between the public and private sectors to effectively evaluate the services' benefits and impacts on communities while protecting data security and privacy.
- Advocate for technology that is adaptive and responsive to ensure it remains up to date and meets the evolving needs of users and stakeholders.
- Promote technology that has the capacity to facilitate economic growth, improve workforce development opportunities, and enhance safety and security.
- Proactively monitor and plan for the development, deployment, and commercialization of new technology as it relates to integration with transportation infrastructure.

SAFETY

- 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 so that impacts to transit employees and the public are minimized and those experiencing issues (e.g., unhoused persons) are supported.
- Support the use of transportation safety and system security data in investment decision-making, including consideration of new highway and transit/rail investments that would address safety and security needs.

FUNDING THE SYSTEM/USER PRICING

- Promote stability and sustainability for core state and federal transportation funding sources.
- Establish a user fee-based system that better reflects the true cost of transportation, provides firewall protection for new and existing transportation funds, and represents equitable distribution of costs and benefits.
- Pursue funding tools that promote access to opportunity and support economic development through innovative mobility programs.
- Promote national and state programs that include return-to-source guarantees while maintaining the flexibility to reward regions that continue to commit substantial local resources.
- Leverage locally available funding with innovative financing tools to attract private capital and accelerate project delivery.
- Promote local funding strategies that maximize the value of public assets while improving mobility, sustainability, and resilience.

The Communities policies that apply to mobility are included below.

PRIORITY DEVELOPMENT AREAS

- Promote the growth of origins and destinations, with a focus on future housing and population growth, in areas with existing and planned urban infrastructure that includes transit and utilities.
- Promote the growth of origins and destinations, in areas with a proclivity toward multimodal options like transit and active transportation, to reduce single occupant vehicle dependency and vehicle miles traveled.
- Seek to realize scale economies or a critical mass of jobs and destinations in areas across the region that can support non-SOV options and shorter trip distances, combined trips and reduced vehicle miles traveled.

15 MINUTE COMMUNITIES

- Promote 15-minute communities as places with a mix of complementary land uses and accessible mobility options that align with and support the diversity of places (or communities) across the region. These are communities where residents can either access their most basic, day-to-day needs

within a 15-minute walk, bike ride or roll from their home or as places that result in fewer and shorter trips because of the proximity of complementary land uses.

- Support communities across the region to realize 15-minute communities through incremental changes that improve equity, quality of life, public health, mobility, sustainability, resilience, and economic vitality.
- Encourage efforts that elevate innovative approaches to increasing access to neighborhood destinations and amenities through an array of people-centered mobility options.

The Environment policies that apply to mobility are included below.

CLEAN TRANSPORTATION

- Accelerate the deployment of a zero-emission transportation system and use near-zero-emission technology to offer short-term benefits where zero-emissions solutions are not yet feasible or commercially viable.
- Promote equitable use of and access to clean transportation technologies so that all may benefit from them.
- Consider the full environmental life-cycle of clean transportation technologies, including upstream production and end of life as an important part of meeting SCAG's objectives in economic development and recovery, resilience planning and achievement of equity.
- Maintain a technology-neutral approach in the study of, advancement of, and investment in clean transportation technology.

The Economy policies that apply to mobility are included below.

UNIVERSAL BASIC MOBILITY

- Encourage partnerships and policies to broaden safe and efficient access to a range of mobility services that improve connections to jobs, education, and basic services.
- Promote increased payment credentials for disadvantaged community members and the transition of cash users to digital payment technologies to address payment barriers.

TOURISM

- Consult and collaborate with state, county and local agencies within the region that are charged with promoting tourism and transportation.
- Encourage the reduced use of cars by visitors to the region by working with state, county and local agencies (e.g., park services, transportation agencies) to highlight and increase access to alternative options, including transit, passenger rail and active transportation.

Though we understand that progress towards achieving regional goals is made primarily through implementation at the local level, we also know that there are strategies we can implement as a region to realize our vision and achieve our goals. As noted earlier, these strategies are detailed in Appendix 4 and are intended to align with the above policies.

1.9 WHAT COULD MAKE MOVING ACROSS THE REGION EASIER?

There are a multitude of ways that traveling throughout the region could become easier. A handful are highlighted below that connect all the modes – walking, bicycling, using micromobility devices, riding transit/rail, or driving. Our goal is to improve multimodal integration. The Mobility Technical Report's subsequent chapters will focus on more specific strategies.

1.9.1 COMPLETE STREETS

Complete Streets that are planned, designed, built, operated, and maintained to support safety, comfort, and mobility for *all* road users, not just the speed of cars and the flow of traffic. If you have ever considered walking or biking to your destination, but hesitated because of concerns for your safety, a Complete Street could help you make the decision more easily. These streets provide for people of all ages and abilities. Complete Streets can vary considerably based on community context and needs, and types of mobility devices. Some streets may be prioritized for walking, others for taking transit, and some for a combination of a variety of modes and uses. It is a layered approach. These streets may include a variety of elements, such as sidewalks, bicycle lanes or paths, dedicated bus lanes, transit stops, crossing opportunities, median islands, accessible pedestrian signals, commercial delivery zones, curb extensions, landscape treatments, cool pavements, and other urban heat mitigation aspects. The goal is for these streets to comprise a safe multimodal network with facilities that support all types of uses. Recognizing the importance of creating a safe multimodal network, SCAG's Regional Council adopted a Complete Streets Policy in 2023. All the subsequent modal chapters will address the importance of Complete Streets.

Figure 1-7. Complete Streets

Source: Freepik- macrovector

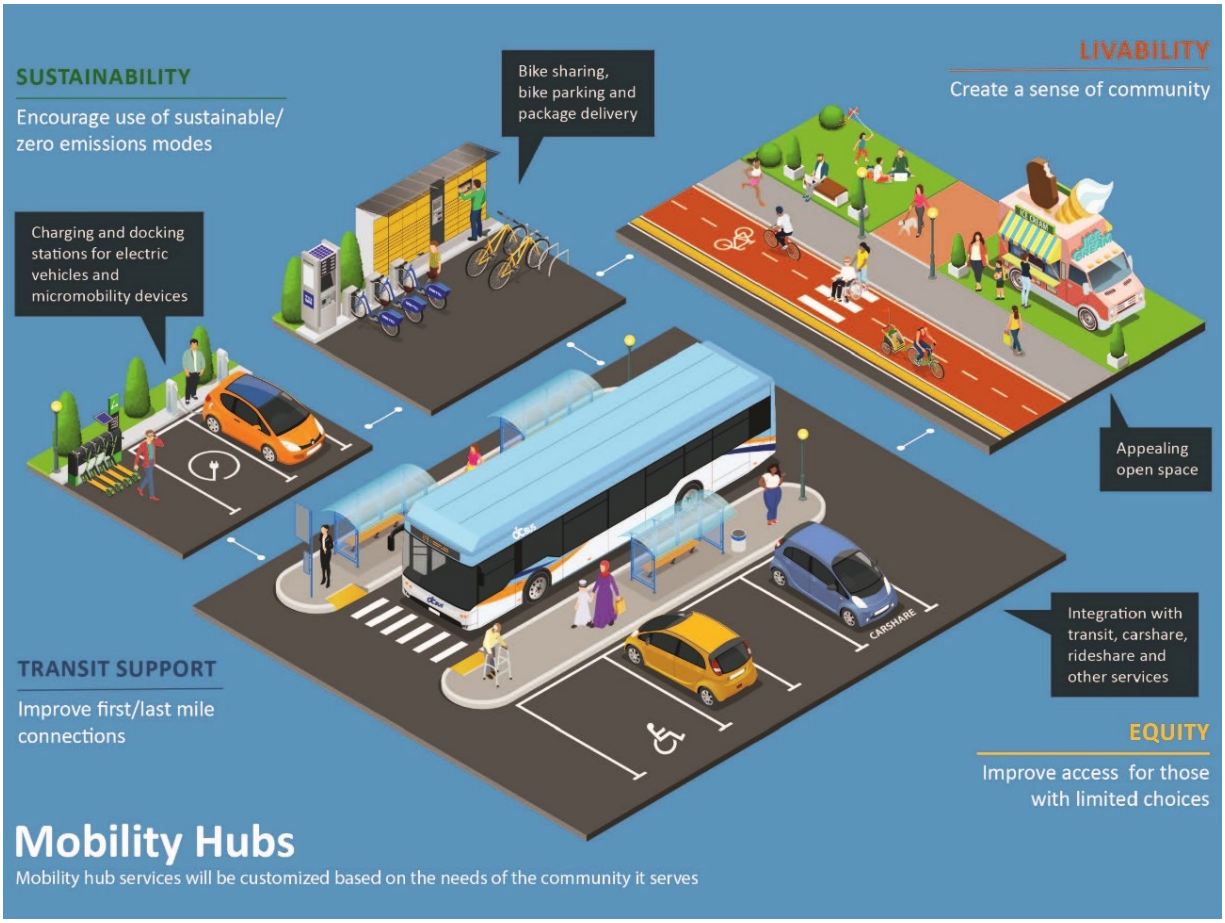
1.9.2 FIRST/LAST MILE CONNECTIONS

Complete Streets involve ensuring that there are first/last mile connections for you at the beginning and end of your journeys. The first mile refers to the distance traveled from your starting point to a transit/rail stop, while the last mile refers to the distance traveled from the transit/rail stop to the final destination. These short distances are often challenging to cover efficiently, leading to decreased transit/rail ridership and limited access to transit/rail, especially in suburban or low-density communities. First/last mile planning involves providing better access to transit/rail for multiple transportation modes (e.g., biking, walking, etc.), rather than focusing on one specific mode, such as car parking, and introducing new incentives and travel options to access transit. First/last mile planning aims to improve accessibility and encourage transit/rail usage by implementing various strategies and infrastructure enhancements. Since Connect SoCal 2020 was adopted, SCAG has partnered with local jurisdictions to develop plans to improve first/last mile connections across the region (e.g., Omnitrans' Bus Stop Safety Improvement Plan, Montebello First/Last Mile Plan, etc.). The Transit/Rail and Active Transportation chapters will each touch on the importance of supporting first/last mile connections.

1.9.3 MOBILITY HUBS

First/last mile connections may sometimes lead to a mobility hub. Though many of us have more ways to get around our communities than ever before—from bike share to scooters, car share to ride hailing, the benefits of this expanding menu of options can only be realized if they are integrated into a coherent network of efficient transportation options that lets us get where we need to go using whatever mode makes the most sense for us on a particular trip. Mobility hubs are places where we can seamlessly connect with multiple modes of transportation in a safe, comfortable, and accessible environment. Mobility hubs include a range of transportation options (but typically at least two) that connect and interact with each other (e.g., transit/rail, car share, bike share, etc.). They are the infrastructure foundation for multimodal trip planning and promoting mode shift and are considered essential for a safe and convenient transfer between transportation modes. Mobility hubs provide equity benefits when planned and implemented efficiently, as they help to provide many travel options, especially for those underserved by transit/rail, and with limited mobility options. The concept of mobility hubs has been developing in the SCAG region over the last decade. The development of mobility hubs varies by county within the SCAG region, as well as the naming convention and definitions of the mobility hubs. As noted earlier, as a part of developing Connect SoCal 2024, SCAG identified a set of mobility hubs across the region that will be further detailed in the Transit/Rail Chapter.

Figure 1-8. Mobility Hubs



Source: Orange County Transportation Authority (OCTA), Published on September 20, 2021

1.9.4 SAFETY

Transportation safety forms the foundation of a healthy mobility ecosystem. Safety is often a consideration when considering our travel options, particularly if you are planning to walk or bike. Unfortunately, each year an average of 1,600 people are killed and 140,000 injured, 7,000 of which are serious injuries, due to traffic collisions in the SCAG region. These collisions are happening to people who drive, and disproportionately to people who walk and bike. Low-income and communities of color are also negatively impacted; a significant portion of SCAG's High Injury [30][OBJ] 69.5 percent, exists in Priority Equity Communities. Collisions are happening in every community in our region, from El Centro in Imperial County to Malibu in Los Angeles County. And while there are many reasons that collisions are occurring, including driving, or bicycling under the influence of alcohol or drugs, unsafe speed is a top contributing factor of collisions, accounting for about 18 percent of fatalities in the region.

Regardless of whether you are driving, walking, bicycling, rolling, or riding transit/rail, you should have access to a safe multimodal network and that can come from local efforts to develop Vision Zero, Zero Deaths, and Safe System approaches to eliminate all traffic fatalities and serious injuries. These system approaches are based on the understanding that even one traffic-related fatality is unacceptable. At the center of the Safe System is people – that people are fragile and will at times make mistakes that can lead to collisions. With that understanding, the road system needs to provide layers of protection in the form of safe infrastructure, roads, vehicles, speeds, and people (safe road users) around the fallible and vulnerable human to prevent fatalities and serious injuries. Understanding the importance of advancing safety, SCAG's Regional Council has repeatedly affirmed its commitment to achieving Zero Deaths through the adoption of the region's annual safety targets. SCAG has also continued to support local efforts to advance transportation safety through partnerships on planning projects (e.g., El Monte Vision Zero Action Plan, Duarte Safe Routes to School Plan, Safe Mobility Santa Ana Plan, etc.), active transportation projects (e.g., Quick Builds), and through our *Go Human* Program. A heavier focus on transportation safety will be covered in the Active Transportation chapter.

1.9.5 SYSTEM PRESERVATION

Like transportation safety, system preservation is foundational for a healthy mobility ecosystem. With limited resources available to construct new roadways or fund major roadway rehabilitation projects, the condition of our regional transportation infrastructure, including highway pavement, has deteriorated over the years. The maintenance of our existing infrastructure has therefore become increasingly important. By monitoring the condition of our regional transit/rail facilities and roadways and highways over time, we are better able to allocate resources to facilities that are most in need. To comply with federal requirements, every four years SCAG establishes targets for pavement and bridge condition and transit assets, with the goal of ensuring a state of good repair.

Providing a well-maintained transportation system is critical for a variety of reasons. A reliable transportation system is vital for public mobility and accessibility. It allows people to access employment opportunities, educational institutions, healthcare facilities, and other essential services. Moreover, an efficient transportation system reduces travel time, congestion, and associated environmental impacts, such as air pollution and greenhouse gas emissions. Additionally, preserving transportation infrastructure helps ensure public safety by minimizing the risk of issues caused by deteriorating roads, bridges, or transit/rail systems. Finally, maintaining and improving the transportation system also contributes to the resilience and preparedness of communities in the face of natural disasters and emergencies. It is critical that we implement strategies to ensure our transportation system can withstand changing conditions and shocks,

while continuing to provide critical services, and that is why Connect SoCal 2024 includes strategies to ensure the safety and reliability of our transportation network. All the subsequent modal chapters will address the importance of system preservation.

1.9.6 UNIVERSAL BASIC MOBILITY

As noted in the earlier section regarding how we get around, our travel options are dependent on a variety of factors, some that are individual and others that are environmental. For many, travel options are heavily influenced by past transportation and land use decisions. Universal Basic Mobility (UBM) is an evolving concept, but generally recognizes that transportation plays a vital role in providing access to employment, education, healthcare, and other essential services, and that everyone deserves access to safe, affordable, reliable, and sustainable transportation options. By guaranteeing UBM, the goal is to address transportation inequities. UBM can be achieved through various means, such as providing affordable public transportation options, implementing subsidies or vouchers for transportation services, promoting shared mobility solutions, investing in infrastructure to enhance connectivity, and leveraging emerging technologies for an efficient transportation system.[31] [32]

UBM strategies build on work done by SCAG through our Mobility Innovations and Pricing project in identifying TEZs throughout the region, focusing on underserved neighborhoods throughout that face barriers to travel. SCAG envisions UBM whereby qualified residents could receive subsidies for transit/rail and other mobility options on prepaid cards or monthly subscriptions for these services, ultimately increasing equitable transportation. At its core, UBM would bring together a mix of partnerships and policies to support safe and efficient access to a range of mobility services. UBM can also help disadvantaged community members gain payment credentials by waiving annual fees on debit cards, and transition cash users to digital payment users. In this way, UBM can help address payment barriers that technologies can impose upon disadvantaged communities while also making possible broader access to shared mobility options beyond traditional fixed route transit. Several cities across the nation are already piloting UBM programs. For example, Los Angeles is currently implementing LADOT's South Los Angeles UBM Pilot Program, which includes fare payment subsidies and integrates fare payment across existing and new transportation options.[33]

These multimodal integration strategies are meant to function as a foundation for the more specific modal strategies that will be discussed in the subsequent chapters.

As mentioned at the outset, this Mobility Technical Report addresses the modes that comprise a thriving mobility ecosystem, including active transportation, riding transit/rail, and driving. It also discusses pressing intersectional issues and is meant to serve as a 20-plus year guide for future decision-making by establishing a mobility vision with goals, policies and strategies, and metrics for evaluating our progress. The chapters that follow lay out how we can collectively plan for a more resilient mobility future, one where we are better able to mitigate or adapt to change and one where everyone has safe, affordable, reliable, and sustainable transportation options to access the opportunities and resources necessary to thrive.

APPENDICES

1. Guiding Principles for Emerging Technology
2. Mobility Planning and Policy Context Table
3. Connect SoCal 2024 – Mobility Performance Measures Table
4. Connect SoCal 2024 – Mobility Strategies
5. High Quality Transit Corridors Methodology
6. Coordinated Human Services Transportation Plans and Regional Transit/Rail-related Plans
7. Regional Complete Streets Policy
8. Regional Bikeway Network
9. Regional Greenway Network
10. Active Transportation Plans – Regional Assessment
11. Comprehensive Multimodal Corridor Plans

1.10 ENDNOTES

[1] Office of Environmental Health Hazard Assessment (OEHHA). (2022). *Indicators of Climate Change in California*. (4th ed.). California Environmental Protection Agency, OEHHA. https://oehha.ca.gov/media/downloads/climate-change/document/2022caindicatorsreport.pdf
[2] Manville, M., Taylor, B. D, & Blumenberg, E. (2018). *Falling Transit Ridership: California and Southern California.* UCLA: Institute of Transportation Studies. https://escholarship.org/uc/item/0455c754
[3] SCAG. (2021, March). Mobility Innovations and Pricing. https://scag.ca.gov/sites/main/files/file-attachments/scag-mobility-innovations-and-pricing-report-final.pdf?1648504727
[4] Transportation Injury Mapping System (TIMS). Provisional weekly police-reported injury crashes on state highways in California. Data last updated, June 7, 2023. https://tims.berkeley.edu/covid19.php
Please note that an account and login credentials are required to view the VMT data comparison.
[5] Francke, A. (2022). Cycling during and after the COVID-19 pandemic. *Advances in Transport Policy and Planning, 10,* 265–290. https://doi.org/10.1016/bs.atpp.2022.04.011
[6] Sorenson, D. (2021, September 23). *The Cycling Market Pedals Ahead in 2021*. NPD Group. https://www.npd.com/news/blog/2021/the-cycling-market-pedals-ahead-in-2021
[7] National Association of City Transportation Officials (NACTO). (2021). *Streets for Pandemic Response & Recovery.* https://nacto.org/wp-content/uploads/2020/09/Streets_for_Pandemic_Response_Recovery_Full_20-09-24.pdf
[8] NACTO. (2022). *2020-2021 Shared Micromobility in the U.S.* https://nacto.org/wp-content/uploads/2022/12/2020-2021_shared_micro_snapshot_Dec7_2022.pdf
[9] Boudway, I. (2022, January 21). *America's Best-Selling Electric Vehicles Ride on Two Wheels.* Bloomberg. https://www.bloomberg.com/news/articles/2022-01-21/u-s-e-bike-sales-outpaced-electric-cars-in-2021
[10] Speroni, S., Taylor, B. D, & Garrett, M. (2023). The Future of Working Away from Work. *UCLA: Institute of Transportation Studies.* http://dx.doi.org/10.17610/T6H60S Retrieved from https://escholarship.org/uc/item/52z8w5pb
[11] Dingel, J.I., & Neiman, B. (2020). How many jobs can be done from home*? Journal of Public Economics, 189,* 104235. https://doi.org/10.1016/j.jpubeco.2020.104235.
[12] Speroni, S., Taylor, B. D, & Garrett, M. (2023). The Future of Working Away from Work. *UCLA: Institute of Transportation Studies.* http://dx.doi.org/10.17610/T6H60S
[13] U.S. Census Bureau, 2016-2020 ACS 5-year Estimates
[14] California Energy Commission. (2023). Light-Duty Vehicle Population in California. Data last updated, December 31, 2022. https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/light-duty-vehicle
[15] California Energy Commission. (2023). California's National Electric Vehicle Infrastructure (NEVI) Funding Program Map. Data last updated, March 27, 2023. https://www.energy.ca.gov/programs-and-topics/programs/national-electric-vehicle-infrastructure-program-nevi/californias
[16] *Justice40: A Whole-of-Government Initiative*. (n.d.). The White House. https://www.whitehouse.gov/environmentaljustice/justice40/
[17] California Energy Commission. (2023). Electric Vehicle Chargers in California. Data last updated, January 3, 2023. https://tableau.cnra.ca.gov/t/CNRA_CEC_PUBLIC/views/DMVDataPortal/ZEVInfrastructure?%3Adisplay_count=n&%3Aembed=y&%3AisGuestRedirectFromVizportal=y&%3Aorigin=viz_share_link&%3AshowAppBanner=false&%3AshowVizHome=n

[18] *Advanced Clean Cars II Regulations: All New Passenger Vehicles Sold in California to be Zero Emissions by 2035.* (n.d.). California Air Resources Board. https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii
[19] Lopez, N., & Yee, E. (2023, April 12). *Who buys electric cars in California — and who doesn't?*. CalMatters. https://calmatters.org/environment/2023/03/california-electric-cars-demographics/
[20] *New-Vehicle Transaction Prices Trend Downward February 2023.* (2023, March 8). Kelley Blue Book. https://b2b.kbb.com/news/view/vehicle-transaction-prices-february-2023/#:~:text=The%20average%20price%20paid%20for%20a%20new%20EV%20decreased%20by,well%20above%20the%20industry%20average
[21] *Beyond Incentives – Lessons from a community outreach campaign supporting electric vehicle purchase update.* (May 2023) UCLA Luskin Center for Innovation. https://innovation.luskin.ucla.edu/wp-content/uploads/2023/06/Beyond-Incentives.pdf
[22] *Incentive Search.* (n.d.). California Air Resources Board: Drive Clean. https://driveclean.ca.gov/search-incentives#:~:text=The%20Clean%20Vehicle%20Rebate%20Project,electric%20and%20fuel%20cell%20vehicles

[23] CNET (2020). Waymo Driverless Cars Have Driven 20 Million Miles On Public Roads. https://www.cnet.com/tech/tech-industry/waymo-driverless-cars-have-driven-20-million-miles-on-public-roads/
[24] Litman, Todd (2023, June 21). Autonomous Vehicle Implementation Predictions. https://www.vtpi.org/avip.pdf
[25] Mosquet, X., et al. (2015) Revolution in the Driver's Seat: The Road to Autonomous Vehicles.
[26] Taiebat, M., et al. (2019) "Forecasting the Impact of Connected and Automated Vehicles on Energy Use: A Microeconomic Study of Induced Travel and Energy Rebound." Applied Energy 247: 297-308.
[27] SCAG. (n.d.). Projected Changes in Climate in the SCAG Region. https://scag.ca.gov/sites/main/files/file-attachments/1_projectedchangesclimatescagregion.pdf?1603746680
[28] United States Department of Transportation. Office of the Secretary of Transportation. Office of the Deputy Assistant Secretary for Climate Policy. (2021). *Climate Action Plan: Revitalizing Efforts to Bolster Adaptation & Increase Resilience.* https://rosap.ntl.bts.gov/view/dot/66379
[29] Roh, E., & Ehlers, R. (2022). *Climate Change Impacts Across California Transportation.* Legislative Analyst's Office (LAO). https://lao.ca.gov/reports/2022/4576/Climate-Change-Impacts-Transportation-040522.pdf
[30] To provide greater detail on where fatalities and serious injuries are occurring, SCAG created a regional High Injury Network (HIN). The HIN identifies roadways throughout the region where high concentrations of collisions are occurring. https://transportation-safety-scag.hub.arcgis.com/pages/high-injury-network
[31] Bliss, L. (2021, November 11). Like Basic Income, But for Transportation. *Bloomberg.* https://www.bloomberg.com/news/articles/2021-11-11/u-s-cities-test-effects-of-universal-basic-mobility
[32] Kaner, D. (2022, June 30). Oakland's Universal Basic Mobility Pilot Is Eliminating Transportation Barriers. *Planning Magazine.* https://www.planning.org/planning/2022/spring/oaklands-universal-basic-mobility-pilot-is-eliminating-transportation-barriers/
[33] *LADOT Launches Universal Basic Mobility Pilot.* (2022, April 26). City of Los Angeles Department of Transportation (LADOT). https://ladot.lacity.org/dotnews/ladot-launches-universal-basic-mobility-pilot

2. TRANSIT/RAIL

2.1 INTRODUCTION

When people consider traveling about Southern California, they often think of the automobile. And they aren't wrong. The majority of people here drive a great deal, on average 8,600 miles per capita each year. However, along with 73,000 miles of streets and freeways, the six-county SCAG region boasts an extensive transit/rail network that includes 33,485 miles of transit routes, including local bus, express and bus rapid transit (BRT), Amtrak intercity and long-distance services, and Metrolink commuter rail service. While the transit/rail options in Southern California are abundant, the quality and availability of service varies depending on the area of the region in which you find yourself (e.g., numerous options in urban Los Angeles County vs. fewer options in rural Imperial County) and the time of day you are traveling (e.g., less service on weekends or during off-peak hours). Some rides may be quick and direct, while others may involve multiple transfers or longer travel times, and depending on the route, traffic congestion can be quite impactful.

Despite these challenges, the region's transit/rail options play an important role in the mobility ecosystem, providing access and connectivity for the region's residents and visitors. Transit/rail options are critical for a variety of reasons, but especially for their intersection with the region's economic, equity, and climate change goals. Specifically, investing in transit/rail is significant for the regional economy since it not only provides access to employment and educational opportunities, but it can also catalyze real estate development (e.g., Transit-Oriented Development) and invigorate local economies. Transit/rail also functions as a lifeline service for many essential workers and individuals who depend on it as their only means of transportation because it provides an affordable option for accessing key destinations throughout the region. With respect to climate change, the transportation sector is the largest contributor to California's greenhouse gas emissions, a leading cause of climate change. Transit/rail ridership growth supports reducing this contribution. A single travel lane of private vehicle traffic on an urban street may move 600 to 1,600 people per hour versus a dedicated bus lane, which may move up to 8,000 passengers per hour versus an on-street transitway (bus or rail) that may serve up to 25,000 people per hour per travel direction.[1] Both California and SCAG's goals for combating climate change are predicated on many people using transit/rail more and driving less. Transit/rail's recovery in the coming years will help determine our success in addressing the climate crisis.

This Plan envisions a future in which transit/rail functions as the backbone of the regional mobility ecosystem, enabling seamless and efficient travel without needing to own an automobile. The availability of frequent, reliable, and convenient transit/rail service is vital for advancing both the statewide and regional vision of fostering more livable and equitable communities. The provision of enhanced transit/rail service also supports the larger regional goal of creating a healthy, prosperous, and connected region to ensure a more resilient and equitable future. However, the future of transit/rail is at a crossroads. The increasing demand for sustainable transportation options, advancements in technology, changes in urban environments, and the ongoing impact of societal responses to the COVID-19 pandemic will shape its future. This Transit/Rail chapter outlines how we can plan for this future, including a discussion on our existing conditions, challenges and opportunities, and key strategies.

2.2 WHAT IS TRANSIT/RAIL?

Before diving in too deeply, let's first establish some common understandings by defining the terms. The term "public transportation" (also "transit" or "mass transportation") is defined in 49 U.S. Code Section 5302, as publicly accessible, ongoing shared transportation services that are available to the general public or specific groups based on age, disability, or low income. This excludes: Amtrak intercity passenger rail, intercity bus service, charter bus service, school bus service, sightseeing service, courtesy shuttle service for specific establishments, or shuttle services within terminals or facilities.

Commuter rail passenger transportation is defined in 49 U.S.C Section 24102 as short-haul rail passenger transportation in metropolitan and suburban areas usually having reduced fare, multiple-ride, and commuter tickets and morning and evening peak period operations. For reporting purposes, commuter rail service is defined by the National Transit Database (NTD) as an electric or diesel propelled railway for urban passenger train service consisting of local travel which operates between a central city and outlying areas. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas (UZAs), or between urbanized areas and outlying areas. Commuter rail is generally characterized by multi-trip tickets, specific station-to-station fares, railroad employment practices, relatively long distance between stops, and only 1-2 stations in the central business district. Intercity passenger rail service is defined in 49 U.S.C. Section 24102 as rail passenger transportation, except commuter rail passenger transportation. The Passenger Rail Investment and Improvement Act (PRIIA) of 2005 further clarifies that intercity passenger rail service means transportation services with the primary purpose of passenger transportation between towns, cities, and metropolitan areas by rail, including high speed rail. The Federal Code of Regulations (49 CFR 238.5), identifies three tiers of passenger rail operations, as follows:

- Tier I means operating at speeds not exceeding 125 mph;
- Tier II means operating at speeds exceeding 125 mph but not exceeding 160 mph; and
- Tier III means operating in a shared right-of-way at speeds not exceeding 125 mph and in an exclusive right-of-way without grade crossings at speeds exceeding 125 mph but not exceeding 220 mph.

In comparison, the American Public Transportation Association (APTA)[2] definition is a bit broader and more useful for our purposes here where we will be discussing transit and rail together. APTA defines public transportation as including buses, light rail, subways, commuter trains, streetcars and trolleys, cable cars, van pool services, ferries and water taxis, paratransit services for older adults and people with disabilities, and monorails and tramways. For Connect SoCal and this chapter, we will use a shorthand of transit/rail when referring to both and will refer to them separately when accounting for specific issues associated with each. We will also largely be referring to publicly provided transit/rail and will be specific if referring to a privately provided service.

2.3 WHAT ARE THE DIFFERENT TYPES OF TRANSIT/RAIL?

Besides the distinction between transit and rail, there are also different types of services within each category. The American Public Transit Association's (APTA) and the National Transit Database (NTD) define the following types of service. The predominant modes of transit/rail services in the region include:

FIXED-ROUTE LOCAL BUS – Refers to traditional bus transit service operated in a defined service area with a scheduled fixed route and stops spaced from at a minimum almost every block to a maximum of a quarter mile. This is a common form of transit among operators in the region. Several transit agencies including numerous individual cities operate this service. Examples include the Orange County Transportation Authority (OCTA) Local and the Glendale Beeline.

Figure 2-1. Fixed-Route Local Bus

Source: Orange County Transportation Authority

COMMUTER/EXPRESS BUS – Refers to a service that primarily connects suburban and exurban areas with a central city or employment center. It is characterized by motorcoach service, also known as "over-the-road" (OTR) buses with multiple stops in outlying areas and limited stops in the central city primarily running on freeways and highways. Examples in the region include Los Angeles Department of Transportation's (LADOT) and City of Santa Clarita Transit's Commuter Express services.

Figure 2-2. Commuter/Express Bus

Source: City of Santa Clarita

BUS RAPID TRANSIT (BRT) – Refers to fixed-route bus services where at least 50 percent of the service is operated on a fixed guideway. These systems also typically have dedicated passenger stations with ticket vending machines, elevated platforms and enhanced stations, off-board fare collection busways, dedicated bus lanes, traffic signal priority or preemption, short headways (i.e., the amount of time between transit vehicle arrivals at a stop), and separate branding of the high-quality service. This is a lower-cost alternative to light rail. Examples in the region include the Los Angeles Metropolitan Transportation Authority's (LA Metro's) Orange (G) Line and Omnitrans' sbX Green Line.

Figure 2-3. Bus Rapid Transit (BRT)

Source: Courtesy of Los Angeles Metro

COMMUNITY CIRCULATORS – Refers to local fixed-route transit services that typically serve residents within a particular city or community for various trip purposes. They typically use small, size buses. An example in the region includes Omnitrans' ONT Connect.

Figure 2-4. Community Circulator

Source: Omnitrans

PARATRANSIT – Refers to transit service (also called demand response or dial-a-ride) characterized by the use of passenger automobiles, vans or small buses ("cutaways") which typically serve older adults and persons with disabilities who cannot otherwise use the regular transit service for their trip purpose. The vehicles do not operate over a fixed route or on a fixed schedule. Access Services in Los Angeles County is the largest demand response provider in the region.

Figure 2-5. Paratransit

Source: Access Services

MICROTRANSIT – Refers to a new form of on-demand service that typically offers highly flexible routing and scheduling with shared trips using small van/shuttle style vehicles in a defined service area. Examples include Metro Micro, Riverside Transit Authority's (RTA) GoMicro, and OCTA's OC Flex.

Figure 2-6. Microtransit

Source: Riverside Transit Agency

COMMUTER RAIL – Refers to rail service (also called metropolitan rail, regional rail, or suburban rail) consisting of local or short to medium distance travel operating between a central city and adjacent suburbs. Most service is provided on routes of current or former freight railroads. The Southern California Regional Rail Authority's (SCRRA) Metrolink is the commuter rail service in the region.

Figure 2-7. Commuter Rail

Source: Metrolink

HEAVY RAIL – Refers to rail service (often referred to as the metro or subway) operating on an electric railway with the capacity for a heavy volume of traffic. It is characterized by high speed and rapid acceleration passenger rail cars operating singly or in multi-car trains on fixed rails; separate rights-of-way from which all other vehicular and foot traffic are excluded; sophisticated signaling; and high platform loading. Metro's Red and Purple line subways (A and B lines) are examples of heavy rail operating in the SCAG region.

Figure 2-8. Heavy Rail

Source: Courtesy of Los Angeles Metro

LIGHT RAIL – Refers to transit service (sometimes referred to as a streetcar, tramway, or trolley) operating passenger rail cars singly or in short, usually two or three car segments on fixed rails in right-of-way that is often separated from other traffic for part or much of the way. Light rail vehicles are typically driven electrically with power being drawn from an overhead electric line via a trolley or a pantograph, or a third, electrified rail. Metro and SCRRA operate light rail service in the region, and OCTA plans to open a streetcar in 2025.

Figure. 2-9 Light Rail

Source: Courtesy of Los Angeles Metro

2.4 WHO PROVIDES THE REGION'S TRANSIT/RAIL SERVICES?

The SCAG region has a complex transit/rail network that includes over 100 transit operators with 33,485 miles of bus routes, including local bus, express, and bus rapid transit (BRT); 109 miles of local heavy and light rail, serving 108 stations; Amtrak intercity and long-distance services; and Metrolink commuter rail service, which operates on seven lines with 66 stations in five of six counties on a 546 mile network and includes a portion of northern San Diego County.

Transit/rail operators generally provide a mix of fixed route local services, commuter express bus, BRT and demand response services, and they often operate in vastly different contexts. For example, Los Angeles Metro, the largest transit operator in the region, operates local bus services, heavy rail, and light rail across the county, where more than 10 million people in the region live. About a fourth of California's residents live, learn, work, and play within Los Angeles Metro's 1,400 plus square miles service area, which largely consists of urban and suburban communities. In contrast, Riverside Transit serves a much smaller segment of the population, roughly 2.45 million people, but covers significantly more ground, 2,500 square miles. And though the contexts differ, each is doing its utmost to provide fast, frequent, reliable, and accessible service.

There are two main passenger rail operators in the region, the Southern California Regional Rail Authority (SCRRA) or Metrolink, and Amtrak. Metrolink operates the region's commuter rail system on seven lines operating in five of our region's six counties along 546 miles of track. Metrolink operates 108 daily trains, 48 Saturday trains, and 42 Sunday trains on its seven lines. On-time performance (OTP) has generally ranged from 80 percent to 93 percent over the years. Metrolink runs on a combination of County Transportation Commission-owned track and freight-owned track. While operating on freight-owned track, its operations are dispatched by the freight railroads, and thus do not always receive priority for train movements, thereby affecting its OTP.

Amtrak operates intercity rail via its Pacific Surfliner, which serves a 351-mile-long corridor connecting San Luis Obispo, Los Angeles, and San Diego. It moves nearly 10 percent of Amtrak's total national ridership. Currently, there are 10 daily round trips between Los Angeles Union Station and San Diego's Santa Fe Depot, four round trips between Los Angeles and Santa Barbara and Goleta, and two daily round trips serving San Luis Obispo. Pre-pandemic, there were 13, five and two round trips between these destinations, respectively. The Pacific Surfliner train service is augmented by Amtrak Thruway buses providing an important extension for the Pacific Surfliner rail corridor. The Pacific Surfliner Thruway routes offer service from: Los Angeles to Bakersfield; Los Angeles to Santa Barbara; Santa Barbara-San Luis Obispo-San Francisco/Oakland; Santa Barbara to San Jose; Fullerton to Indio via Palm Springs. The Pacific Surfliner has always maintained a good farebox recovery, being as high as 78 percent prior to the pandemic. On-time performance (OTP) has ranged between 78 percent to 88 percent the last decade or so, but a challenge is the fact that Amtrak does not own the track it operates on—the Los Angeles – San Diego – San Luis Obispo Rail Corridor (LOSSAN Corridor) is owned by the two freight railroads and County Transportation Commissions (CTCs). On the freight-owned track, freight dispatching gives priority to freight trains impacting OTP. Amtrak also offers long distance services including:

- The Amtrak Coast Starlight, which operates between Los Angeles Union Station and Seattle, Washington via Santa Barbara, Oakland and Portland, Oregon. It provides one round trip per day. It is Amtrak's second most popular long distance train service. Planning is underway to bring back the "Coast Daylight," which would run from Los Angeles directly into San Francisco's new Transbay Terminal via the San Francisco Peninsula. One planning scenario would extend a Pacific Surfliner

train northward. The Coast Rail Coordinating Council (CRCC) and San Luis Obispo Council of Governments (SLOCOG) are leading this effort.

- The Southwest Chief, which operates between Los Angeles and Chicago, provides the only rail service in California from Los Angeles east to Victorville, Barstow and Needles, and then spans the country with major stops in Flagstaff, Albuquerque, Kansas City, and Chicago. Due to the grades encountered traversing the Cajon Pass, the Southwest Chief takes about three and a half hours to travel between downtown L.A. and Victorville. It operates one round trip daily.
- The Sunset Limited, which operates just three days a week in each direction connecting Los Angeles, Tucson, San Antonio, and New Orleans. It is the only rail service serving Palm Springs and the Coachella Valley from Los Angeles albeit with a departure and arrival time in the middle of the night. In San Antonio, part of the trainset continues north to Chicago as The Texas Eagle, via Little Rock and St. Louis.

2.4.1 TRANSIT/RAIL SERVICES BY COUNTY

IMPERIAL COUNTY

Transit service in Imperial County is operated by Imperial Valley Transit (IVT) for the Imperial County Transportation Commission (ICTC). IVT currently operates fixed route and demand response services and recently launched an on-demand microtransit service. IVT provides service in the El Centro-Calexico UZA,[3] covering about 425 square miles and providing a mix of small urban and rural transit services in the county.

LOS ANGELES COUNTY

Los Angeles County offers the largest share of transit/rail services in the region and is one the most robust transit/rail markets in the nation. The Los Angeles-Long Beach-Anaheim UZA, composed primarily of Los Angeles and Orange Counties, is the second largest UZA in the nation in population, and in Fiscal Year 2020-21 provided the second largest share of transit trips (263 million) and the third largest share of passenger miles travelled according to the National Transit Database (NTD). The Los Angeles County Metropolitan Transportation Authority (Metro) is the leading transit/rail provider in the county as well as in the SCAG region and is typically among the top five providers of transit/rail trips nationwide. Metro operates multiple transit/rail modes including light rail, heavy rail, BRT, and fixed route bus services. Metro also operates an on-demand microtransit service, offering trips within several zones in Los Angeles County. In cities or subregions where there are local operators, Metro often operates trunk routes and serves long distance markets. Metro also funds Metrolink service in Los Angeles County. Metro is also a designated transit district per Chapter 4, Article 1, Section 99213 of the California Public Utilities Code.

Besides Metro, the county has several municipal operators and local and specialized providers. The Municipal Operators, (Munis) are designated as eligible recipients of federal formula funds via Chapter 4, Article 1, Section 99207.5 of the California Public Utilities Code and consists of 13 transit properties and two joint powers operators. They operate mainly fixed route local trips, with service areas typically within and around their respective jurisdictions. Their services are overlaid with Metro services to support longer distance trips. Service areas vary per operator from relatively small (e.g., Beach Cities and Culver City Transit) to very large (e.g., Long Beach Transit and Foothill Transit). Specialized and local operators in Los Angeles County provide local circulator and demand-response services throughout the county. As noted earlier, Access Services is the largest provider of ADA paratransit trips in the county and provides some or all

complementary ADA paratransit service for Metro and various municipal bus operators. Metro's Local Transportation Systems Subcommittee (LTSS) of the Technical Advisory Committee represent the local operators in the county offering a mix demand-response and/or circular services within jurisdictional boundaries.

ORANGE COUNTY

The Orange County Transportation Authority (OCTA) is a designated transit district per Chapter 4, Article 1, Section 99213 of the California Public Utilities Code, and operates the second largest fixed–route bus transit fleet in the region. OCTA also operates ADA paratransit service and funds Metrolink commuter rail service. OCTA operates the City of Irvine iShuttle, which is funded cooperatively between the City and OCTA. OCTA currently provides a pilot on-demand microtransit service (OC Flex) within parts of the Cities of Aliso Viejo, Laguna Niguel, and Mission Viejo. The City of Laguna Beach and the Anaheim Transportation Network (ATN) operate local circulator services. Several cities in Orange County operate seasonal shuttles utilizing some funding from OCTA.

RIVERSIDE COUNTY

In Riverside County, Riverside Transit Agency (RTA) and SunLine Transit primarily operate fixed route bus service. RTA's service area is the western half of Riverside County and Sunline's service area is the Coachella Valley. RCTC funds the County's participation in regional commuter rail service via Metrolink and the Cities of Riverside and Corona respectively operate demand response and local circulator service. RTA recently launched an on-demand microtransit service providing shared rides in the Hemet-San Jacinto areas. Rural transit service in southwestern Riverside County is provided by the Reservation Transportation Authority, a collaborative of 18 federally recognized tribal groups. The Cities of Banning and Beaumont also provide service through the Pass Transit service brand, and Desert Roadrunner service is provided in the City of Blythe and unincorporated eastern Riverside County by the Palo Verde Valley Transit Agency.

SAN BERNARDINO COUNTY

San Bernardino County is served by Omnitrans and Victor Valley Transit Authority (VVTA). Omnitrans provides service in southern San Bernardino County while VVTA provides fixed route service in the Victorville-Hesperia UZA. The San Bernardino County Transportation Authority (SBCTA) funds the County's participation in Metrolink. Mountain Transit, Morongo Basin Transit Authority (MBTA), Needles Area Transit and VVTA also provide rural fixed route transit in the San Bernardino County.

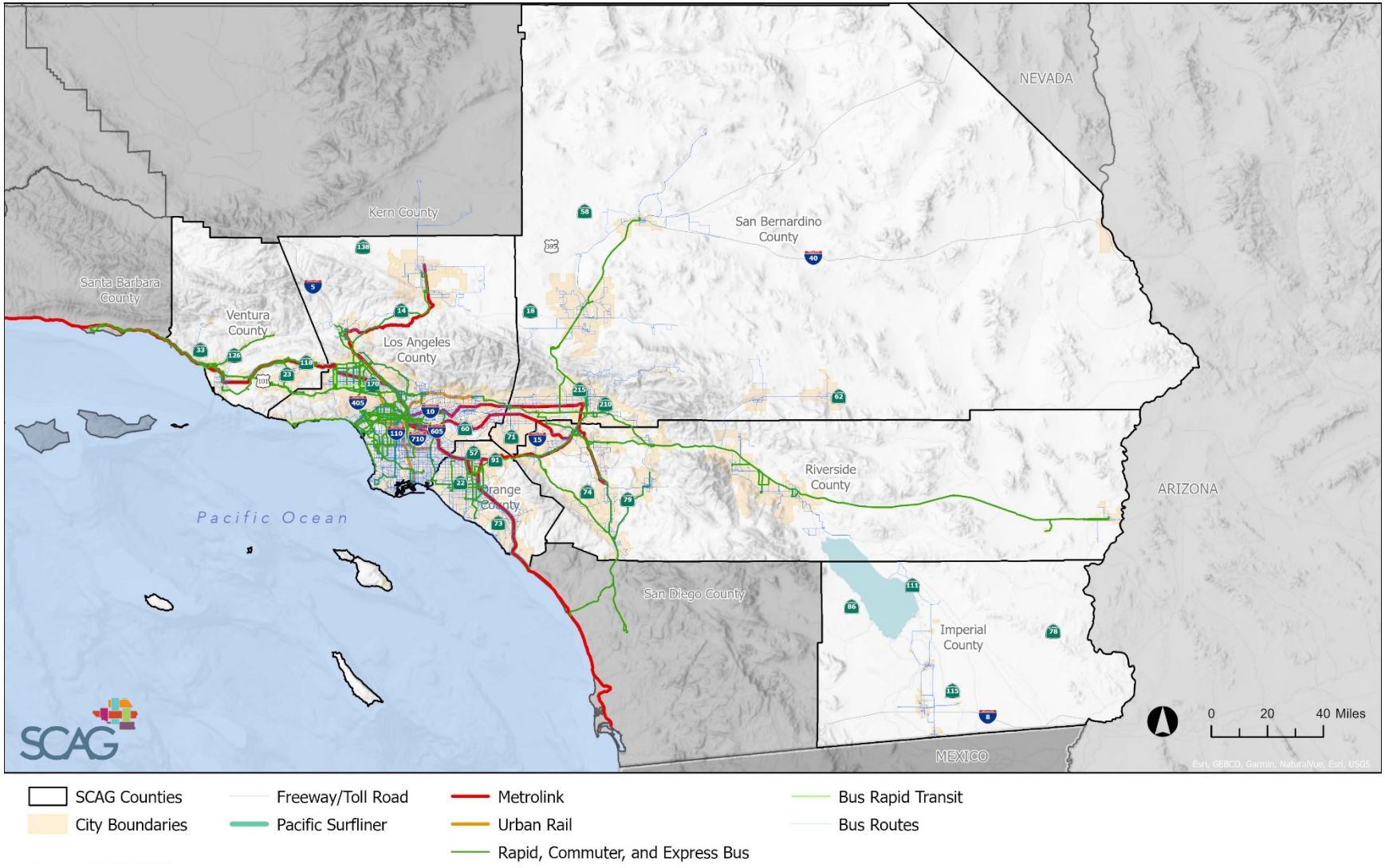
VENTURA COUNTY

Gold Coast Transit District (GCTD) is the largest operator of fixed route bus service in Ventura County, with its service area on the western end of the county extending to the City of Ojai. GCTD also operates ADA paratransit service in the Cities of Ojai, Oxnard, Port Hueneme, Ventura, and unincorporated areas of Ventura County between these cities. GCTD is a designated transit district pursuant to Chapter 4, Article 1, Section 99213 of the California Public Utilities Code.

Simi Valley Transit, Thousand Oaks Transit, Moorpark City Transit, and Camarillo Area Transit operate local fixed route, demand response and ADA paratransit services within their respective jurisdictions. Simi Valley

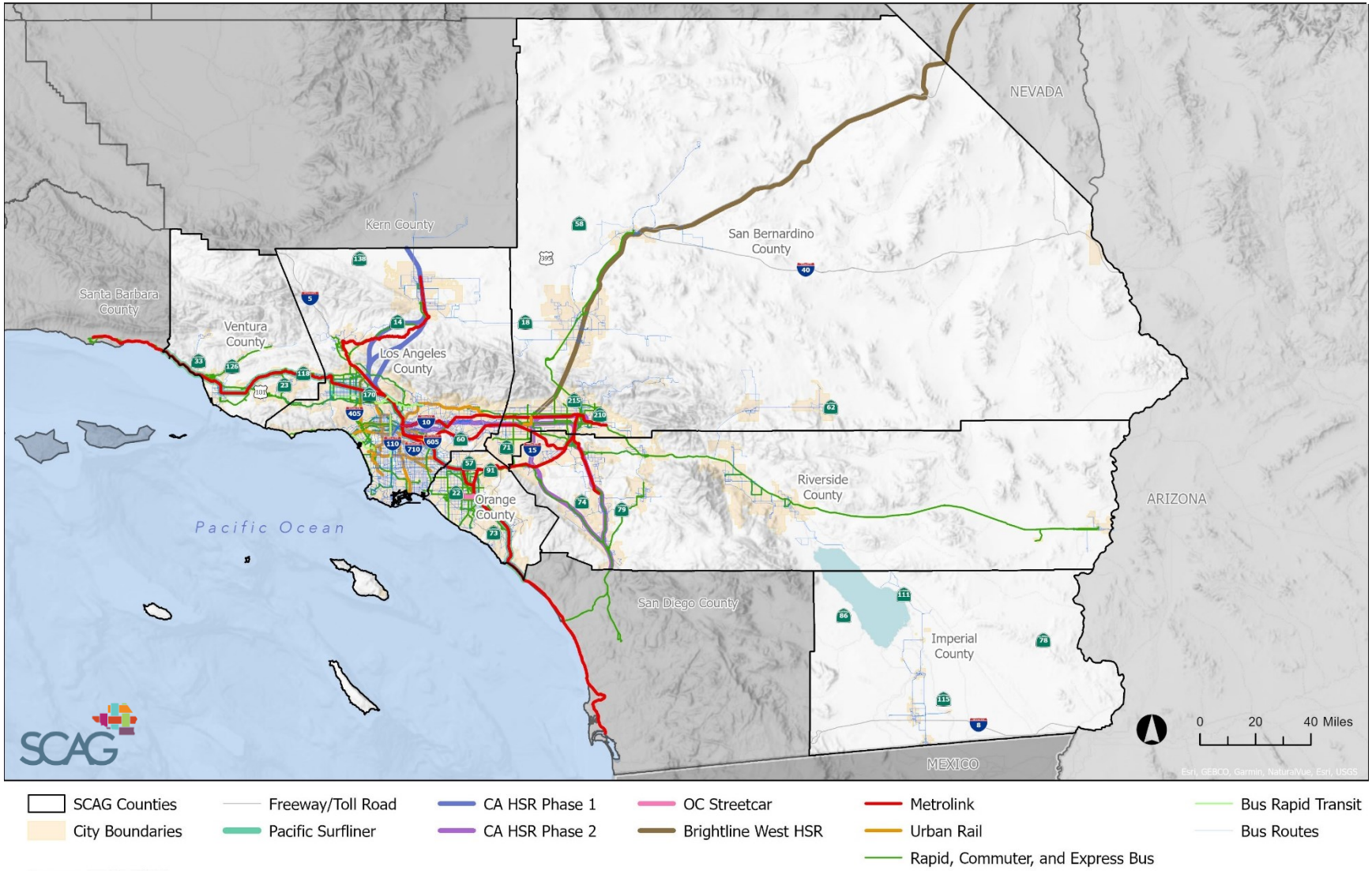
Transit provides a commuter connection with the Los Angeles Metro on one of their routes. The Ventura County Transportation Commission (VCTC) provides intercity bus services throughout the county. VCTC funds Ventura County's participation in Metrolink. The Ojai Trolley provides rural transit service in and around the City of Ojai and Valley Express provides local fixed route and demand response services within the Cities of Fillmore, Santa Paula and Piru. GCTD currently operates a pilot microtransit on-demand rideshare/carpool service – GO Now, for residents travelling anywhere within the South Oxnard Zone, which also provides connections to fixed routes, commuter buses, and rail services.

Map 2-1. Existing Transit Network (2019)



Source: SCAG (2023)

Map 2-2. Planned Transit Network (2050)

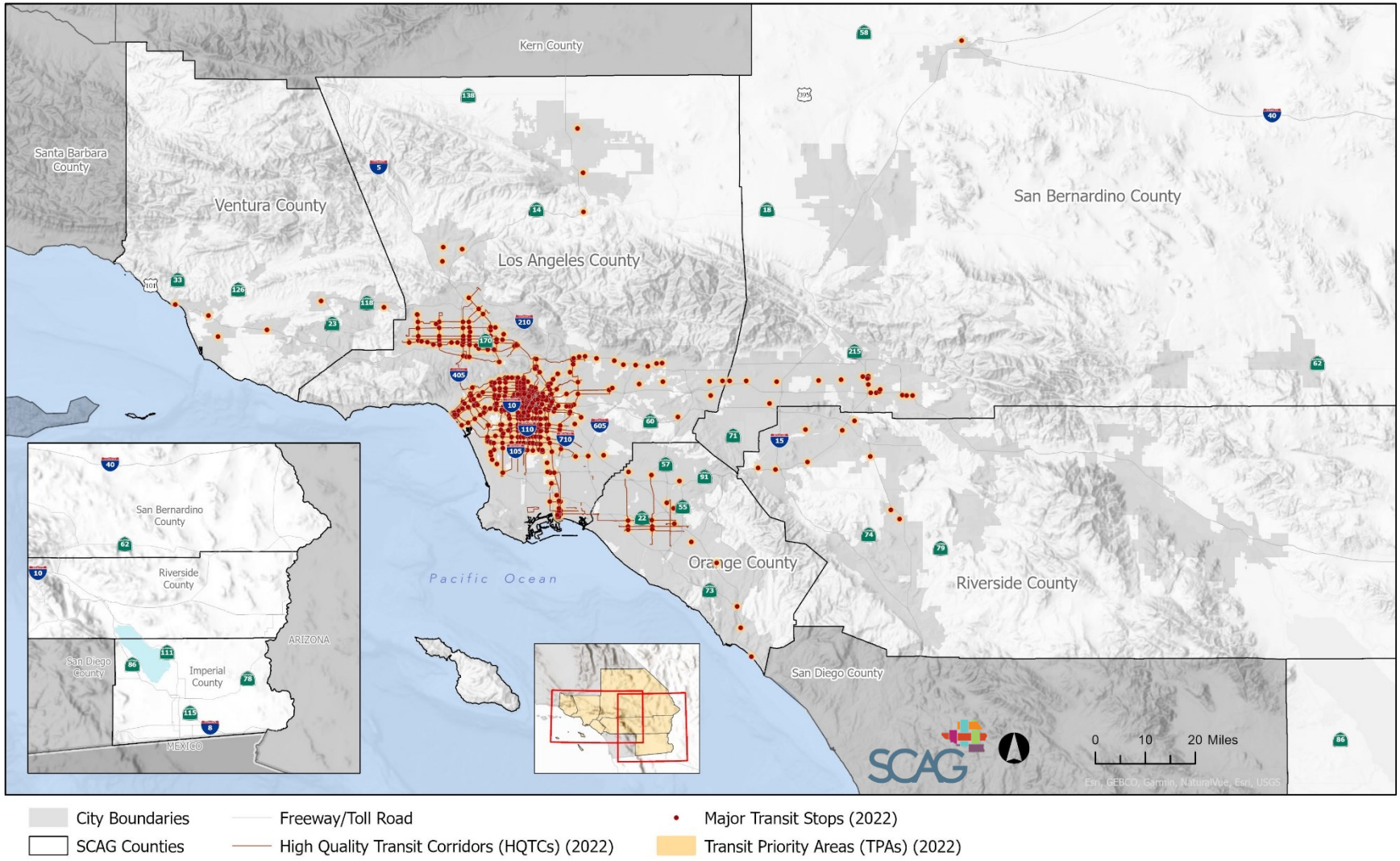


Source: SCAG (2023)

HIGH QUALITY TRANSIT CORRIDORS AND MAJOR TRANSIT STOPS

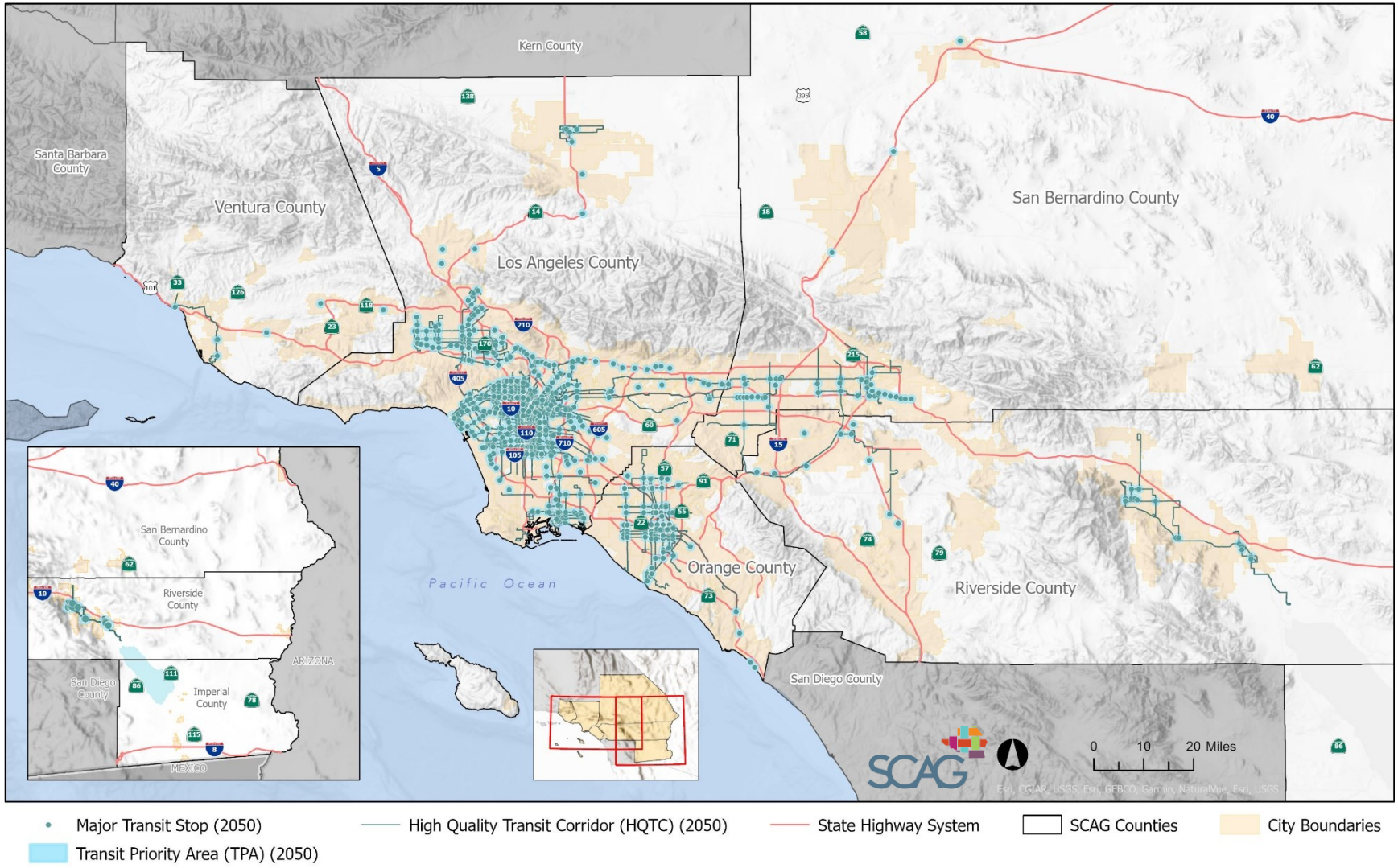
Throughout the region there are High Quality Transit Corridors (HQTCs), and major transit stops. These are areas where the region intends to focus its growth. Generally, an HQTC is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. A major transit stop is a transit stop that is a rail or bus rapid transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. Adopted state legislation (e.g., SB 375, SB 743) provides incentives for focusing new development along these corridors or stops. For example, Transit-Oriented Development (TOD) projects may be exempt from or subject to a limited review of the California Environmental Quality Act (CEQA), provided they are consistent with Connect SoCal. More information on HQTCs and major transit stops is included in Appendix 5.

Map 2-3. High Quality Transit Corridors (2022)



Source: SCAG (2023)

Map 2-4. Planned High Quality Transit Corridors (2050)

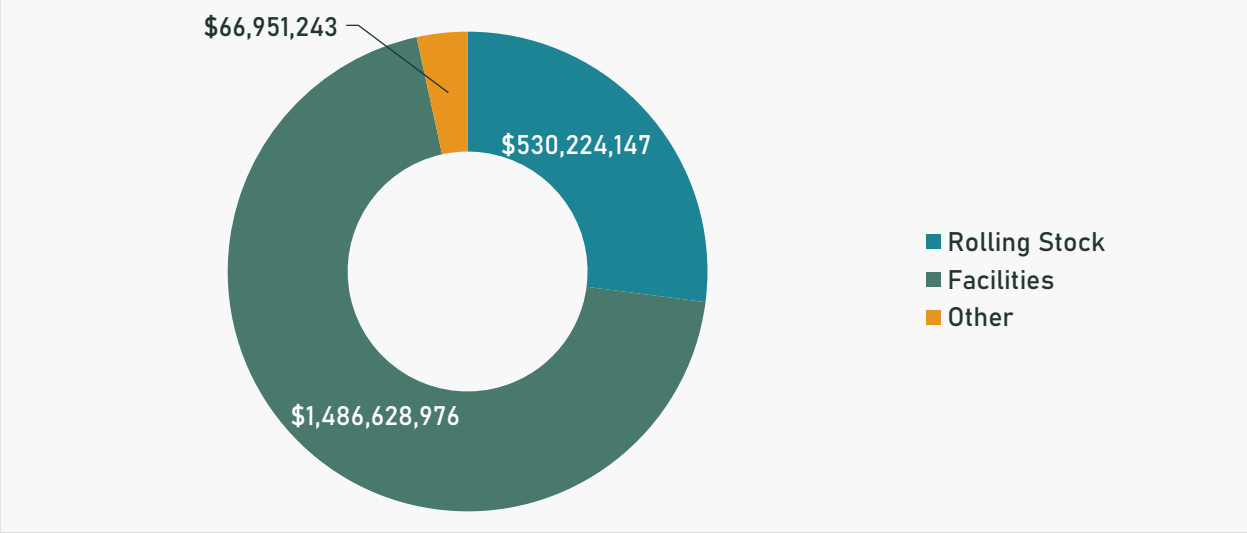


Source: SCAG (2023)

2.5 WHAT DOES IT TAKE TO SUPPORT THIS NETWORK?

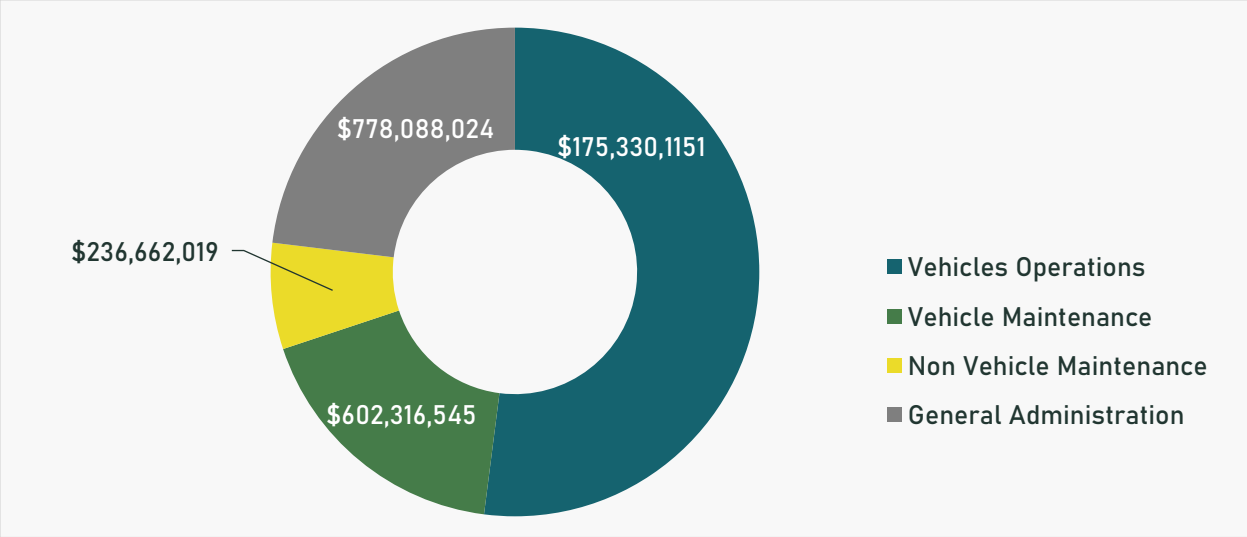
Since 2019, the region's transit/rail operators have spent more than $16 billion on transit/rail operations and capital expenditures. Even with the COVID-19 pandemic, expenditures have continued to rise. In 2019, operators spent a total of $5.3 billion on transit/rail operations and capital, about $3.4 billion of this total on operations and maintenance and the remaining $1.9 billion on capital expenses. Figure 2-10 shows the transit/rail capital expenses by proportions spent on rolling stock (vehicles) and facilities, with costs of facilities alone three times more than vehicles. The transit/rail operating expenses proportions show a greater share towards vehicle operations ($1.7 billion), $602 million for transit/rail vehicle maintenance, $778 million for general administration (second highest share), and $236 million for non-vehicle maintenance in 2019 (Figure 2-11).

Figure 2-10. Transit/Rail Capital Expenditures



Source: National Transit Database (2019). Note: Numbers may not sum to total due to rounding.

Figure 2-11. Transit/Rail Operating Expenditures

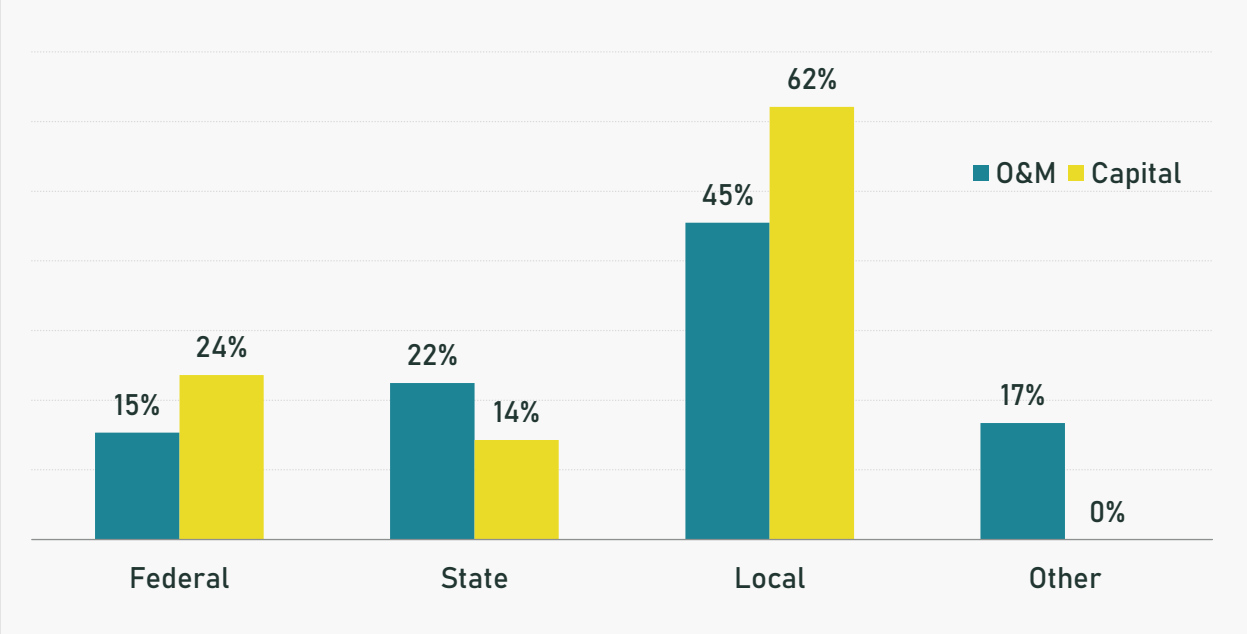


Source: National Transit Database (2019). Note: Numbers may not sum to total due to rounding.

Like previous years, in Fiscal Year 2018-19, local funds constituted 62 percent of all transit/rail capital funds in the region. The federal share for capital funds has continued to decline over the years. With the COVID-19 pandemic relief funding provided to transit/rail operators, federal funds increased slightly for transit/rail capital surpassing local funds. The region is unique in terms of its ability to fund significant amounts of capital projects due to the local sales taxes. Five out of the six counties in the SCAG region have passed local sales taxes to support transportation projects including transit/rail.

In Fiscal Year 2018-19, operations and maintenance (O&M) for transit/rail was funded primarily by fare revenues and other locally generated funds (46 percent). Only 38 percent of the revenues came from state and federal sources. State revenues for transit/rail O&M have continued to increase, reflecting the state's commitment to the operations budget (Figure 2-12). For instance, the state recently released draft guidelines to distribute $4 billion in General Fund through the Transit and Intercity Rail Capital Program (TIRCP), which authorizes regional transportation planning agencies (RTPAs) to provide funding with flexibility for transit operations or capital improvements.

Figure 2-12. Transit/Rail Funding Sources



Source: National Transit Database (2019). Note: Numbers may not sum to total due to rounding.

2.6 HOW MANY PEOPLE ARE SERVED BY TRANSIT/RAIL?

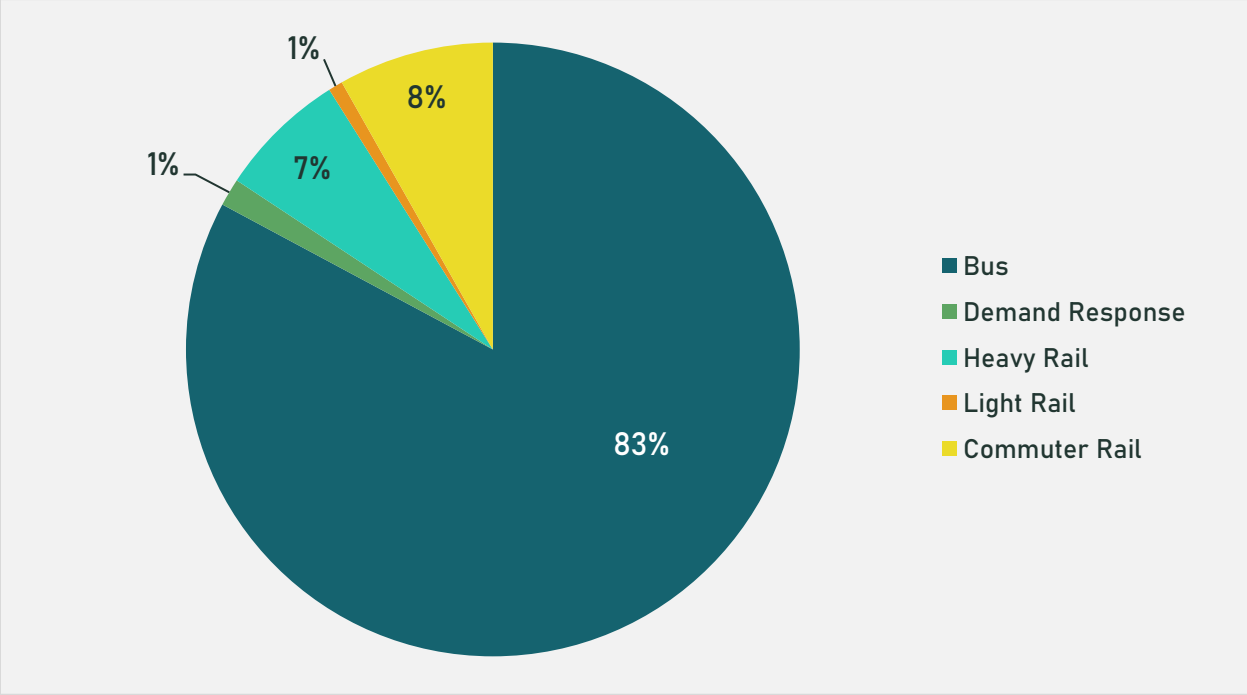
Although transit/rail ridership has improved over the past several years, it is still significantly less than it was prior to the COVID-19 pandemic and its past ridership peak around 2007, prior to the Great Recession. Prior to the pandemic, there were 600 million annual transit/rail boardings.[4] Overall, the region's bus ridership levels are currently 21 percent below what they were pre-pandemic. For Los Angeles Metro, bus ridership recovered more than rail ridership. For example, when comparing October 2019 to October 2023, bus ridership was down 20 percent and rail ridership was down 24 percent. The issue with rail ridership recovery extends to Metrolink whose ridership is currently 48 percent lower than it was pre-pandemic (October 2023 compared to October 2019). Pre-pandemic, and before the general national and regional decline in

transit/rail ridership, Metrolink was carrying about 45,000 boardings per day. It is now carrying about 20,000 boardings per day. Prior to the pandemic, Pacific Surfliner ridership had grown steadily over the years to nearly three million annual passengers. Ridership is slowly coming back and was about half that figure for Fiscal Year 2021-22. Though some transit/rail operators are optimistic that higher gas prices and worsening traffic congestion may motivate more ridership, driver shortages present an immediate challenge, and many remain uncertain of what the longer-term future normal may look like, particularly if remote working remains a norm for discretionary riders who tend to take rail.

Quick facts based on the latest year of National Transit Database (NTD), in Fiscal Year 2020-21:

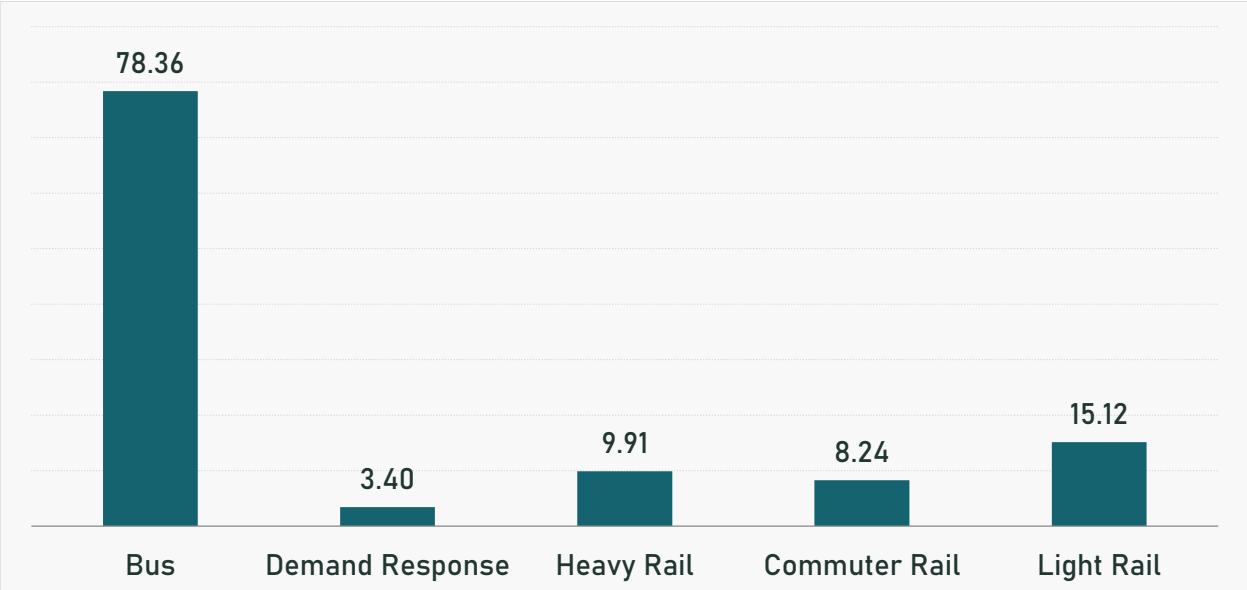
- Fixed route bus service continues to lead in the overall transit/rail boardings. 83 percent of the total boardings in the region were taken using local bus, rapid bus, and commuter bus. Commuter rail (Metrolink) accounted for eight percent of the transit/rail trips. Eight percent of boardings were taken on Metro rail, including seven percent on heavy rail and one percent on light rail (Figure 2-13).
- Despite the decline in overall ridership, the region's transit/rail operators provided over 200 million revenue miles of service annually across all modes and more than 15 million revenue hours of service.
- Overall, transit/rail riders traveled more than one billion passenger miles (Figure 2-14) (or about 4.12 miles per passenger), a 63 percent decrease from the more than three billion passenger miles in 2019.
- Transit/rail operators collected $82 million in fare revenues for all modes (62 percent was in bus fare revenues).

Figure 2-13. Transit/Rail Mode Share



Source: National Transit Database (2021)

Figure 2-14. Transit/Rail Passenger Mile Travelled (PMT) by Mode (In Billions)



Source: National Transit Database (2021)

2.7 WHO IS RIDING TRANSIT/RAIL?

There are known long-term racial inequities in public transit/rail. Based on the Plan's Equity Analysis, we know that within the region, Black commuters use transit/rail more, representing 6.8 percent, compared to the overall regional transit/rail mode share of 3.2 percent and when compared to only 1.9 percent of white commuters. Black and Native American commuters generally spend the most time on their commutes, regardless of mode, but particularly on transit/rail commute, where Black commuters spend 55.9 minutes and Native American Commuters spend 71.4 minutes compared to the regional average of 51 minutes. As reported in the Equity Analysis, we also know that nine percent of households of color in the region do not have access to a vehicle, and Black households are more than twice (14 percent) as likely not to own a vehicle compared to white households (six percent).[5] This information is consistent with recent research that has found that those who are still riding transit/rail are more likely low-income, people of color, and have few or no household vehicles.[6]

To better understand the transportation patterns and needs in the region's underserved and under-resourced communities, in 2020, SCAG conducted a Mobility Innovations and Pricing (MIP) Study, which was focused on exploring the potential equity implications of road pricing and other transportation policies in the region. Through this Study, 594 Transportation Equity Zones (TEZs) were identified that represent places with the greatest intersection of socioeconomic, environmental, and transportation burdens. Most TEZs were located within urbanized areas and in high-density areas near sources of pollution such as freeways, freight distribution points, and major arterials. The TEZ travel pattern analysis was focused on TEZ resident commutes. The Study found that throughout the region, TEZ residents were much more likely than all residents to commute using non-auto modes such as transit/rail. In some counties, TEZ residents were four or five times more likely than all residents to commute via transit/rail. Los Angeles County had the highest percentage of TEZ residents using transit to commute, at 13 percent. It is important to note that rail

was used much less frequently by TEZ residents for commute trips than bus. For more details, please review the full Study.[7]

2.8 WHAT'S A TYPICAL TRANSIT/RAIL TRIP?

First, it is important to acknowledge that taking transit/rail requires a certain level of knowledge and skill – understanding fares and payment methods, schedules, and availability for connections to other transit/rail or other modes (e.g., bike share). In recent years, the proliferation of mobility apps has helped facilitate rides for some, and these are important for supporting current and future riders and encouraging more transit/rail trips across the region, which is much needed considering that currently only 3.2 percent of work trips and 2.4 percent of all trips are made via transit/rail in the region. And though the amount of ground covered on transit/rail commute trips is comparable to auto commute trips (15.4 miles to 17.5, respectively), the time dedicated to transit/rail commutes is considerable, clocking in at 73.1 minutes compared to 27.6 minutes for an auto commute trip. This is why it is critical that transit/rail riders be prepared with the most current information for their trips. With that said, in many instances, especially during peak periods and for work trips into employment centers, taking transit/rail can be more efficient than driving. For example, taking Metrolink from San Bernardino to downtown Los Angeles is typically faster than driving on an average weekday; or taking the Silver Line from the South Bay to downtown Los Angeles would also most likely be faster. These transit/rail trips would also be less expensive on a per mile basis, and arguably less stressful (e.g., no search for parking). Another notable example is the future California High-Speed Rail connection between Palmdale and the Los Angeles Basin. Commuters living in the Antelope Valley have notoriously long and arduous commutes, but with introduction of high-speed rail service between the Valley and downtown Los Angeles, the commute time will be just 14 minutes to Burbank and about the same from Burbank to downtown Los Angeles.

Once prepared with information, a rider typically exits their home or wherever they happen to be originating their trip. They may drive, walk, bike, or roll to the nearest transit/rail stop, or the one that is going to provide the most fast, frequent, and/or reliable service. We typically refer to this segment of the trip as the first/last mile. That is, how riders travel to/from their transit/rail stop. If conditions are not optimal (e.g., a person feels unsafe, route is indirect, etc.), people may not consider taking transit/rail. That is why planning, designing, building, operating, and maintaining Complete Streets is critical. Complete Streets are designed to support the safety, comfort, and mobility for all road users. They provide for people of all ages and abilities, regardless of whether they are driving, walking, bicycling, rolling, or riding transit/rail. A lack of Complete Streets can make taking transit/rail more challenging, particularly for those who need to walk, bike, or roll to and from transit/rail stops. Incomplete streets, such as those lacking sidewalks or protected bike lanes, can create safety hazards for pedestrians and bicyclists, making it difficult or unsafe to access transit stops. In addition to safety concerns, incomplete streets can also lead to longer travel times, as people may need to take longer routes to reach their destination or to access transit/rail stops. This can be particularly burdensome for people who rely on transit/rail for their daily commute, as longer travel times can impact their ability to get to work or other important destinations on time.

Transit/rail trips may necessitate transfers between services or connections to other modes to bridge any gaps. In Los Angeles County, a typical transit/rail trip may involve taking a bike or scooter to a Metrolink commuter rail station or Los Angeles Metro station, then boarding the subway to go to school or work in downtown Los Angeles. On the other hand, in rural, agricultural Imperial County, a more typical transit trip would involve walking to a bus stop and taking a local fixed route bus to a destination. These examples demonstrate just how easy it is for people to use multiple modes for one trip; people are not only transit/rail riders, but pedestrians, bicyclists, and drivers.

Figure 2-15. Transit/Rail Trip from Home to School

Source: SCAG, 2023

Figure 2-16. Transit/Rail Trip from Home to Office

Source: SCAG, 2023

2.9 WHY DO PEOPLE TAKE TRANSIT/RAIL?

People take transit/rail for a variety of reasons, including cost-effectiveness, convenience, environmental concerns, mobility, and health benefits as detailed below:

- COST-EFFECTIVENESS: Transit/rail is often a more cost-effective option than driving. According to a report by the American Public Transportation Association (APTA), the average household can save over $9,000 annually by taking public transit instead of driving.[8]
- CONVENIENCE: Transit/rail can provide a convenient alternative to driving, particularly in urban areas where parking and traffic congestion can be challenging and time-consuming. A study by the National Bureau of Economic Research found that households located near high-quality public transit are more likely to be car-free or own fewer cars, suggesting that transit can provide a viable alternative to driving.[9]
- ENVIRONMENTAL CONCERNS: As previously described, transit/rail produces fewer greenhouse gas and other air pollution emissions than driving, making it an attractive option for individuals concerned about the environment. According to the U.S. Department of Transportation, on average public transit produces 95 percent less carbon monoxide, 92 percent fewer volatile organic compounds, and 45 percent less carbon dioxide per passenger mile than driving alone.[10]

- MOBILITY: Transit/rail can provide increased mobility for individuals who do not have access to a car, including low-income individuals, youth, and older adults. Transit-dependent populations are more likely to be low-income, elderly, or disabled and depend on transit to access essential services.[11]
- HEALTH: Taking transit/rail can also be beneficial for personal health, as individuals who take transit/rail are more likely to walk to and from transit/rail stops or stations, increasing physical activity levels. A study by the American Journal of Public Health found that transit users are twice as likely to meet the recommended daily amount of physical activity than non-transit users.[12]

2.10 WHY IS PROVIDING TRANSIT/RAIL IMPORTANT?

Planning and providing for transit/rail is critical for several reasons, including reducing traffic congestion, improving air quality, increasing access to jobs and education (i.e., supporting the region's economy), and promoting equity and social inclusion. Efficient transit/rail enables workers to reach job centers, which supports reduced unemployment rates and an upskilled workforce. Transit/rail can improve the connectedness across economic hubs in the region.[13] Moreover, well-connected transit/rail hubs can contribute to improved property values and real estate growth (e.g., consider Transit-Oriented Development). Furthermore, the construction and maintenance of these systems generate employment across a variety of sectors, further supporting economic growth and invigorating local economies.[14]

Providing transit/rail is also important because it is a lifeline service. During the most severe period of the COVID-19 pandemic, LA Metro carried at least 310,000 lifeline trips each day, and though Metrolink ridership dropped by 90 percent in March 2020, the 10 percent remaining were mainly essential workers. Recent statewide research found that those who continued to ride public transit/rail during the early periods of the pandemic were disproportionately poorer, women, and essential workers and less likely white or Asian.[15] SCAG's past research has found that frequent transit use in the region is concentrated among low-income, foreign-born households with no access to automobiles.[16] Supporting transit/rail helps to advance the region's equity goals. As noted in SCAG's most recent Racial Equity Baseline Conditions Report, accessibility to various destinations, specifically employment opportunities, is foundational for maintaining the social and economic interactions required to meet basic needs.[17]

Transit/rail is a more sustainable mode that will help the region meet its climate change and congestion reduction goals. According to a recent report from the National Academies of Sciences, Engineering, and Medicine, public transit in the United States saves six billion gallons of gasoline annually, reducing traffic congestion and its associated costs, such as increased air pollution.[18] Transit/rail also plays a crucial role in improving air quality and combatting climate change. According to the California Air Resources Board (CARB), transportation is responsible for about 37 percent of the state's greenhouse gas (GHG) emissions, and passenger vehicles account for about 26 percent of those emissions.[19] The state has set ambitious goals to reduce transportation emissions, including a goal of having five million zero-emission vehicles on the road by 2030. For its part, SCAG is aiming to reduce GHG emissions 19 percent below 2005 levels by 2035. By providing alternatives to driving, such as transit/rail, the region can reduce GHG emissions and improve air quality.

2.11 HOW DOES LAND USE COME INTO PLAY?

As mentioned at the beginning of the Mobility Technical report, every day when we exit our homes, we are met with varying community conditions. Some of us encounter streets that are conducive to walking with continuous sidewalks or low stress bikeways that make reaching a nearby transit/rail stop easy, while some of us encounter a whole host of issues like missing sidewalks and curb ramps that make traveling via transit/rail a struggle. The reasons we take transit/rail can be just as easily influenced by land use as by transportation infrastructure. A neighborhood's land use pattern determines the distribution of activities and destinations which, when combined with transportation options, impacts the ability to meet daily needs like going to the grocery store or school. Approaches to planning for transportation along with land use can help support growth in transit/rail ridership. Examples of these integrated planning approaches include:

- **15-Minute Communities**: These are communities where you can access all your most basic, day-to-day needs within a 15-minute walk or bike ride of your home. These communities can exist in a variety of contexts- urban, suburban, and rural. These communities can effectively support changing travel patterns, particularly for people working remotely and making more short trips. Current examples can be found near transit/rail stations in local jurisdictions such as Claremont, Fullerton, Montclair, and Pasadena.
- **Transit-Oriented Development (TOD)**: TOD creates dense, walkable, and mixed-use spaces near transit/rail that support vibrant, sustainable, and equitable communities. TOD projects include a mix of commercial, residential, office, and entertainment land uses. TOD overlaps with the 15-minute communities' concept. Current examples can be found near transit/rail stations in local jurisdictions such as Pasadena, Riverside, Santa Ana, Simi Valley, and Tustin.
- **Transit Priority Areas (TPAs)**: TPAs are within one half mile of existing or planned major transit/rail stops. A major transit stop is defined as a site containing an existing or planned rail or bus rapid transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. TPAs are where TOD and 15-minute communities can be realized – where people can live, work, and play in higher density, compact communities with ready access to a multitude of safe and convenient transportation alternatives.
- **Livable Corridors**: These corridors previously included single-story underperforming retail and have since been zoned for higher density housing and employment centers. These corridors frequently intersect with High Quality Transit Areas (HQTAs). Examples of Livable Corridors across the region include Mission Trail/Palomar Street in Lake Elsinore, Wildomar, and Temecula. CA-111 in the Coachella Valley, and Main Street in Santa Ana.
- **Priority Development Areas (PDAs)**: These are places within the SCAG region where future growth can be located in order to help the region reach mobility or environmental goals. Generally, this means that people in these areas have access to multiple modes of transportation or that trip origins and destinations are closer together, allowing for shorter trips.

For more details on these concepts in practice as well as the intersection of land use with transportation, please see the Land Use and Communities Technical Report.

2.12 WHAT GUIDES US IN PLANNING FOR TRANSIT/RAIL?

Long-range planning for transit/rail requires consideration of state and federal requirements and planning documents, including:

FEDERAL

- Metropolitan Planning Final Rule
- Passenger Rail Investment and Improvement Act (PRIIA, 2008)
- Transit Asset Management (TAM) Final Rule (2016)
- Public Transportation Agency Safety Plan (PTASP) Final Rule (2018)

STATE

- Senate Bill 375 – Sustainable Communities and Climate Protection Act (2008)
- Senate Bill 743 – Environmental Quality (2013)
- California Air Resources Board (CARB) Innovative Clean Transit Final Rule (2018)
- California Transportation Plan 2050 (CTP, 2021)
- Climate Action Plan for Transportation Infrastructure (CAPTI, 2021)
- California Intercity Bus Study (2022)
- California State Rail Plan (2023)

REGIONAL

- Coordinated Human Services Transportation Plans
- Imperial County Transportation Commission Draft Long Range Transportation Plan (LRTP, 2023)
- Los Angeles County Metropolitan Transportation Authority (Metro) NextGen Bus Plan (2020)
- Metro Long Range Transportation Plan (2020)
- Orange County Transportation Authority Long Range Transportation Plan (LRTP, 2023)
- San Bernardino Countywide Transportation Plan: Interim Update (2021)
- Ventura County Comprehensive Transportation Plan (CTP, 2023)
- Ventura County Draft Transit Integration and Efficiency Study (2023)

In developing the transit targets, SCAG reviewed and considered the transit operators' TAM plans (including identified goals, objectives, performance measures and targets). SCAG also reviewed and considered the Zero Emission Bus (ZEB) rollout plans developed by transit agencies (as required by CARB) that were available during the target setting process. SCAG also reviewed and considered transit agency safety plans (including safety management systems, goals, safety performance measures and targets). TAM, ZEB, and PTASP plans that were considered are listed in Appendix 6.

With respect to Coordinated Human Services Transportation Plans, Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU) required metropolitan regions to produce a Coordinated Human Services Transportation Plan. Congress intended the Coordinated Plan to begin communication between the transportation industry and human service providers about the special mobility needs of particular target populations, especially low-income workers and the elderly and disabled communities. Under MAP–21, the Section 5310 Program is the only program that still has this Coordinated Plan requirement. However, recipients with unobligated Job Access and Reverse Commute (JARC) Program and New Freedom funds must continue to certify that projects are included in a Coordinated Plan. The Federal Transit Administration (FTA) provides guidance via FTA Circular 9070.1G that, "Projects may be

identified as strategies, activities and/or specific projects addressing an identified service gap or transportation coordination objective articulated and prioritized within the plan." In the SCAG region, the County Transportation Commissions (CTCs) are responsible for producing Coordinated Plans at the county level. The CTCs incorporate those strategies and recommendations, as appropriate, into the metropolitan transportation planning and programming process through their role in developing countywide project submittals to SCAG for the development of the long-range plan, Connect SoCal, and Federal Transportation Improvement Program (FTIP). In this manner, the CTCs and SCAG ensure consistency between the Coordinated Plan process and the metropolitan planning process. Appendix 6 provides additional detail on the region's Coordinate Human Services Plans.

Appendix 2 provides additional details on federal, state, and regional requirements and planning documents consulted in preparation of this Plan.

2.13 WHAT PROGRESS HAS BEEN MADE SINCE 2020?

Since SCAG's Regional Council adopted Connect SoCal 2020, SCAG has supported efforts to improve transit/rail across the region through a variety of planning research and studies, many of which have been highlighted at past SCAG Transportation Committee meetings. The key recommendations from the research and studies are instrumental in informing and guiding local jurisdictions on projects to focus on to improve the transit/rail network. They have and continue to guide policy discussions for the region and provide the foundation for the transit/rail approach for Connect SoCal 2024. The research and studies include:

- Americans with Disabilities Act (ADA) Paratransit Demand Forecast Study: In 2020, SCAG published the Paratransit Demand Forecast Study to assist SCAG and transit operators with developing long term forecasts of demand for ADA paratransit services.
- Curb Space Management Study: In 2022, building on the Last-Mile Freight Delivery Study, which was focused on solutions to the logistical challenges and community impacts of increasing demand for commercial and home deliveries, SCAG completed the Curb Space Management Study, which took a comprehensive and multimodal review of some of the most congested and complicated curb space locations within the region. A key objective of the work was to promote a balanced transportation system by better understanding first/last mile trips and connections between transit and active transportation (multimodal connections).
- Mobility as a Service (MaaS) Feasibility White Paper: In 2022, SCAG completed the MaaS Feasibility White Paper, to study the key building blocks for successfully implementing a MaaS system in the SCAG region, which would integrate transportation services into a single mobility platform to provide competitive alternatives over private vehicles, promote universal basic mobility,[20] encourage mode shift, and foster sustainable travel choices.
- SwissCal Conference: In 2022, as a companion effort to the MaaS study, 20 representatives from SCAG, including 16 members of the SCAG Regional Council, participated in the SwissCal Conference on the Swiss Public Transportation Ecosystem. The goal of the virtual conference, which connected senior leaders and professionals from across California with senior Swiss transit experts, was to learn about Swiss best practices associated with transit coordination that could be applied in Southern California. The conference resulted in the identification of actions to advance in the near term, such as fare integration and ticketing and schedule coordination.

- **Regional Dedicated Transit Lanes Study**: In 2023, SCAG completed this Study, which plans for a regional network of dedicated bus lanes and other transit priority treatments to support enhanced transit services, improve mobility, accessibility and sustainability, and support implementation of Connect SoCal.
- **Integrated Freight and Passenger Rail Study**: In 2022, SCAG, working in partnership with Metrolink and other rail stakeholders, completed a study that combined both future freight and passenger train volumes out to the year 2050 to determine additional rail infrastructure needed over and above currently planned improvements.
- **Metrolink Transit-Oriented Development (TOD) Study**: From 2022 through April 2024, SCAG, working in partnership with Metrolink, analyzed a subset of Metrolink stations areas in an effort to identify and recommend stations with the greatest potential for TOD.
- **First/Last Mile Plans**: Through SCAG's Sustainable Communities Program, SCAG offers technical support to local jurisdictions for planning, including First/Last Mile Plans. In 2020, SCAG partnered with Omnitrans to develop the Bus Stop Safety Improvement Plan, and more recently, SCAG is partnering with the City of Montebello to develop a First/Last Mile Master Plan. These plans include project concepts that can be repackaged into grant applications so that the plans may be implemented expeditiously.

Beyond SCAG's efforts to support more planning research and studies, transit/rail agencies across the region have been implementing new transit/rail projects and exploring microtransit and Transit Network Company (TNC) pilots. Connect SoCal 2020 included a large investment in transit and rail capital improvement projects and new services. Many of the projects included in the Plan as well as innovative pilot projects have recently been implemented and/or opened for passenger service. Examples include:

- **Redlands Rail Arrow Service in San Bernardino County**: In October 2022, Metrolink's Arrow service, a new nine-mile corridor, opened between downtown San Bernardino and the University of Redlands. The service includes four new stations. Metrolink commuter rail also runs one roundtrip along this corridor as an extension of its San Bernardino Line to the downtown Redlands station.
- **Riverside Transit Authority's (RTA) GoMicro:** In late 2022, RTA launched a new microtransit service, GoMicro, in the Hemet-San Jacinto area. The minibuses seat up to 12 passengers, operate every day, and serve nearly 300 stops. The shared service allows customers to book their trips in real-time on a mobile device by using the GoMicro app. The wait time is a maximum of 60 minutes from time of reservation to time of pickup.
- **Metro Micro:** In February 2020, the Metro Board approved awarding a $29-million contract to private ridesharing company RideCo Inc. to partner with Metro to operate Metro Micro, a three-year pilot project. Metro Micro is designed to replace short, solo trips by offering a flexible, on-demand service operated by Metro employees in vehicles that hold up to 10 passengers.
- **LA Metro NextGen Bus Plan**: The NextGen Bus Plan was approved in 2020 and is currently being implemented. The plan was developed to implement a new competitive bus system in Los Angeles County that is fast, frequent, reliable and accessible. The proposed improvements will: double the number of frequent Metro bus lines; provide more than 80 percent of current bus riders with 10 minute or better frequency; improve and expand midday, evening and weekend service, creating an all-day, seven-days-a-week service; ensure a quarter mile walk to a bus stop for 99 percent of current riders; and create a more comfortable and safer waiting environment.

- **Crenshaw "K Line" light rail line in Los Angeles County**: In October 2022, Metro opened the K line, which connects to the Metro E Line (Expo) that travels between East Los Angeles and Santa Monica. In 2024, the K Line will also connect to the new Los Angeles International Airport (LAX)/Metro Transit Center Station, the new Aviation/Century Station and the Metro C Line (Green).
- **LA Metro Regional Connector:** In June 2023, Metro opened a rail line that provides riders a seamless journey from Azusa to Long Beach and from East Los Angeles to Santa Monica, through the downtown Los Angeles core. The project includes three new underground stations and extends from the L Line (Gold) in Little Tokyo and Arts District communities to the A (Blue) and E (Expo) Lines at 7th Street/Metro Center Station.
- **Metrolink's Southern California Optimized Rail Expansion (SCORE) Program**: Metrolink's SCORE program is currently being implemented. It includes new grade crossings, station and signal improvements as well as track additions that will allow much greater bi-directional train frequency and accelerate progress towards its zero-emissions future. Examples of projects include the Simi Valley Double Track, Chatsworth Station improvements, El Monte Siding Extension Project, and Rancho Cucamonga Siding Extension Project. In addition, the state of California will deliver high speed rail service from San Francisco to Los Angeles/Anaheim in the future and Brightline West will operate high speed rail service between Las Vegas, the Victor Valley and Rancho Cucamonga by the end of the decade.
- **Metrolink Partnership with Uber:** Metrolink has partnered with Uber to provide their commuters with rides to their destinations when service disruptions occur and when Metrolink is unable to secure alternate transportation from a local public transit provider.

Figure 2-17. Metro Regional Connector

Source: Courtesy of Los Angeles Metro

Figure 2-18. Metro K Line

Source: Courtesy of Los Angeles Metro

Many transit/rail operators have also purchased clean fuel technology buses or locomotives. In addition, many additional capital improvement projects and new transit and rail services are moving closer to implementation, such as the already referenced OC Streetcar in Orange County and the LA Metro Gold Line extension to Pomona.

2.14 WHAT ARE THE CHALLENGES?

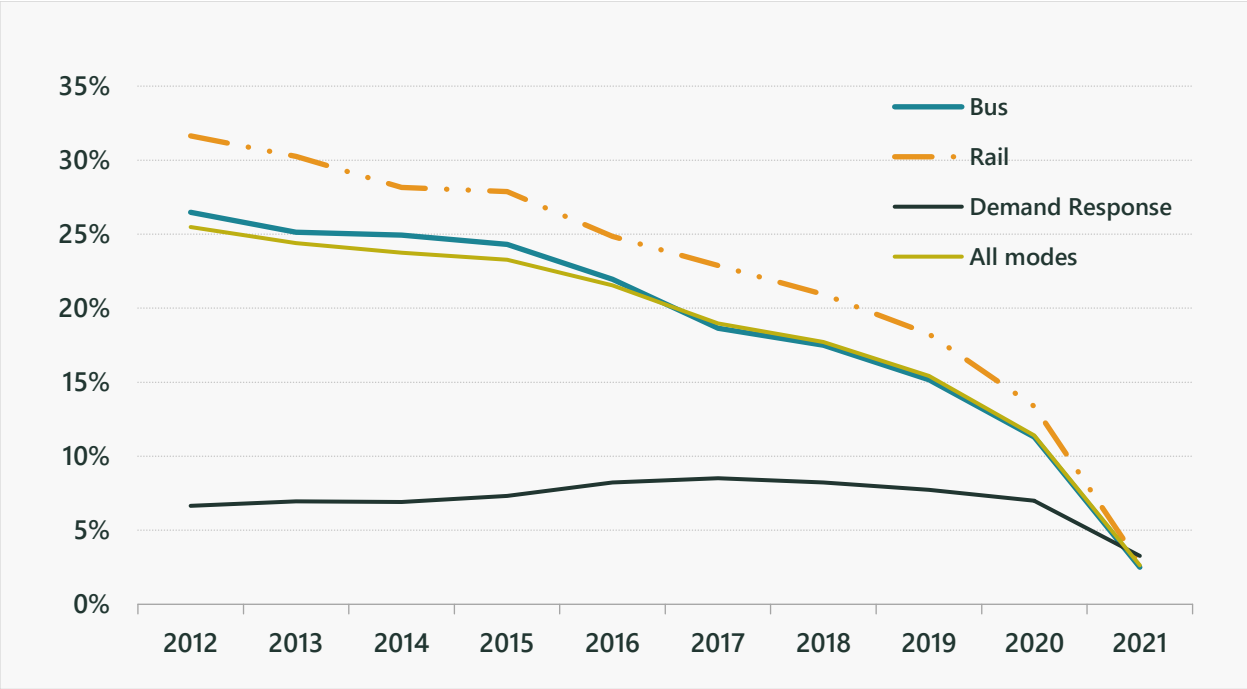
Several challenges exist for transit/rail, many of which were exacerbated by the COVID-19 pandemic and some that are enduring issues. The following section provides an overview of the more significant issues facing the region, while a later section on strategies discusses approaches for tackling these issues.

2.14.1 FUNDING

Over the course of the past three decades, Southern California invested heavily in transit/rail options. Though capital funding has become more readily available for transit/rail in recent years, funding for operations and maintenance (O&M) has not generally increased, and when you consider that these transit/rail investments have not been matched by increases in transit/rail ridership, even prior to the COVID-19 pandemic, the financial picture becomes complicated. Transit/rail agencies depend, at least in part, on revenues from fares to operate. At the beginning of the pandemic, most transit/rail agencies stopped collecting fares as a precaution for operator safety, and though agencies have largely resumed fare collection, some transit/rail agencies like LA Metro, OCTA, and Metrolink implemented low- or free-fare programs for students and persons with limited income to address equity concerns and to motivate more ridership. Historically, farebox recovery ranged between 15 percent to 20 percent for transit and roughly 40 percent to 60 percent for passenger rail. Prior to the pandemic, in 2019, transit/rail farebox recovery declined to 15 percent and 18 percent, respectively. Matters worsened in 2020, when farebox recovery plummeted to three percent (Figure 2-19).

Declines in transit ridership and fare revenues threaten the viability and availability of services in the interim and long term. Three federal pandemic relief bills provided critical support to keep transit/rail afloat early on, but these funds are running out, and there is growing concern that transit/rail operators are approaching a fiscal cliff when federal pandemic operational support will be fully expended and unrenewed and financial shortfalls will hit.[21] [22] Transit/rail agencies are currently working with the State to identify a path forward so that they can avoid substantial fare hikes or cuts in service.[23] These changes would not only disproportionately impact low-income people who depend on transit/rail to get around, but also commuters on their way to work and other regular riders. More expensive fares and less consistent service also might keep ridership perpetually low. Essentially, it could lead to an unfortunate cycle of service cuts leading to lower ridership leading to more service cuts. Transit/rail agencies may also consider altering the course for transit/rail expansions, which could impact efforts to attract and retain ridership.

Figure 2-19. Transit/Rail Farebox Recovery



Source: National Transit Database (2021)

2.14.2 SAFETY AND SECURITY

Unhoused persons on transit/rail have been a persistent issue predating the COVID-19 pandemic. Persons without housing often seek shelter in public spaces, particularly at locations with 24-hour transit/rail service, and frequently utilize buses or trains for overnight stays. During the peak of the pandemic, especially in urban areas, the period of free or discounted fares, and in many cases, the suspension of fare checking, along with shelter closures, led to a rise in unhoused persons on transit/rail. Fewer people were riding transit/rail (an issue that persists) and social norms eroded and more concerning behaviors (e.g., openly using drugs) became more common.[24] There are few comprehensive studies and analyses that accurately assess the extent of unhoused persons on transit/rail systems, except for reports from transit/rail agencies highlighting an increase in unhoused individuals utilizing their services. However, a recent UCLA study[25] surveyed participating U.S. and Canadian transit/rail agencies and found that transit/rail operators were encountering approximately 100 unhoused individuals on their systems daily. Specific to our region, a pandemic count of unhoused persons on both buses and trains in October 2020 found that buses were the most-used shelter for unhoused LA Metro riders, with more than 1,000 people experiencing homelessness on them during the early evening. This count was nearly double the number of unhoused persons found on rail and Bus Rapid Transit (BRT) platforms.[26]

The situation raises several concerns for both transit/rail agencies and riders. Some returning riders are apprehensive about their safety and security as they resume using transit/rail services. Buses or trains occupied by unhoused persons may face lingering cleanliness issues, and there have been reports of threats, assault, and crime incidents that deter ridership.[27] From the transit/rail agency's perspective, addressing homelessness on systems poses a complex challenge, particularly amidst numerous other pressing issues

and limited funding. Transit/rail operators often lack specific training in addressing these issues. The largest transit/rail agency in the region, LA Metro, referred to the situation as a "humanitarian crisis" that not only impacts ridership but also affects frontline workers.[28] According to LA Metro's 2022 customer survey, addressing this issue fell within the top five aspects customers want Metro to address. To address safety and security concerns, LA Metro recently implemented a pilot Transit Ambassador Program, which consists of a field-based team trained to play a rider-facing and welcoming role and help connect unhoused riders to resources and/or assistance. LA Metro also recently adopted a $9 billion budget for Fiscal Year 2023-24, which includes $280 million for public safety initiatives and investments. They are planning to explore whether they can assess properties where there could be supports for the unhoused near transit/rail stations. Across the region, transit/rail agencies will need to develop comprehensive strategies that address homelessness on their systems, considering factors such as safety, cleanliness, and the welfare of both riders and unhoused persons. However, finding sustainable solutions within the context of limited resources will remain an ongoing challenge.

Figure 2-20. Metro Ambassador

Source: Courtesy of Los Angeles Metro

REMOTE/TELEWORK/HYBRID WORK

As noted in the prior Mobility Overview chapter, the COVID-19 pandemic reshaped the work landscape for many as organizations were forced to quickly adapt and find ways to reduce in-person exposures. The "mass social experiment" in remote work supplied roughly half of paid workhours from home between April and

December 2020, as compared to six percent before the pandemic.[29] This shift in working arrangements has persisted more than three years later, with about a third of all days being worked from home. Recent research suggests that the pandemic permanently increased work from home to an equivalent of almost 40 years of pre-pandemic growth. It also finds that 12 percent of full-time employees are fully remote, 60 percent are full-time on-site, and 28 percent are in a hybrid arrangement.[30] Across the region, SCAG estimates that currently 19 percent of people are engaging in remote work compared to six percent prior to the pandemic. For the purposes of this Plan, SCAG is assuming roughly 22-25 percent of workdays will be conducted at home through 2050.

It is important to note that the opportunity to work from home is not available to everyone and is most prevalent at higher income levels and within the technology, finance, and professional and business service sectors. With that said, the growth of remote work and flexible work arrangements has reduced the need for daily commuting and, consequently, decreased transit/rail ridership, particularly on systems that depended on commuters such as Metrolink and Metro Rail, to some extent.[31] More people engaging in a balance of remote and in-person work has altered travel behavior in significant ways and created some challenges. Some literature suggests that while flexible work schedules and telecommuting may reduce (or, in the case of satellite offices, reroute) single-occupancy vehicle (SOV) commute trips, these practices may actually increase SOV trips for other trip purposes, such as errands and trips for lunch while an employee is working from home (although not necessarily during peak congestion periods). This is known as the rebound effect. It is also contended that telecommuting may encourage people to live farther from their workplaces than they would otherwise.[32]

Remote work also poses significant challenges for transit/rail. Many of the region's transit/rail systems are designed to serve downtowns and other major activity centers, and with a chunk of workers no longer commuting, a variety of issues arise (e.g., farebox recovery, sustaining services, etc.). There is now a need to reconsider, adapt, and expand transit/rail, shared mobility, and short trip offerings to address these changing travel needs. This may mean focusing on flexible transit/rail options in addition to fixed rail options and focusing more on supporting short trips with alternative modes (e.g., biking, walking, etc.) that already support bridging the first/last mile of a transit/rail trip. This may also mean providing more opportunities for people to seamlessly connect with multiple modes of transportation at mobility hubs located across the region in a variety of community contexts- urban, suburban, and rural. These options are more fully described in the later section that includes first/last mile and shared mobility strategies.

2.14.3 CLIMATE CHANGE

Climate change affects the region with extreme heat, more frequent and intense wildfires, poor air quality, sea-level rise, and flooding. These conditions negatively impact public health, economic vitality, and transportation infrastructure. Extreme weather conditions such as heavy rains cause flooding and mudslides and affect transit/rail especially in areas where there is insufficient protection from the elements via transit/rail shelters. Heavy rains can flood tunnels and underground rail stops affecting riders' ability to access critical services, resources, and needs. Low-income communities who greatly rely on transit/rail and people with disabilities and mobility issues are vulnerable to these conditions and disruptions. In 2021, there were reports on the way in which Hurricane Ida impacted transit/rail riders, with water levels up to waist level as they entered and exited subway stations.[33] While our region does not have the same topographical vulnerabilities to flooding as the East Coast, heavy rains in 2022-23 resulted in a LOSSAN San Clemente service shutdown for several months to stabilize the rail bed, which had slipped towards the ocean. A good chunk of the region's rail system, especially the LOSSAN Corridor, runs along the coast on sandstone bluffs that could be significantly affected by erosion from heavy rains as well as sea level rise.

Virtually every community in the SCAG region is impacted by extreme heat. Los Angeles and many other cities in the region are becoming hotter than they used to be, with more than double high temperatures and worse predicted for up to 100 days annually.[34] Extreme heat is potentially deadly and can result in more hospitalizations, especially for people with certain health conditions. A recent UCLA study found that within Los Angeles County, only 26 percent of the 10,527 LA Metro bus stops examined currently have shelters, and many of them are located in areas that frequently experience extreme heat, with average summer temperatures exceeding 97 degrees.[35] This means that many people taking transit are subject to the impacts of extreme heat. Also, according to the study, due to the sun's orientation changes throughout the day, it is challenging for bus shelters, a noted heat adaptation strategy, to provide protection from the sun during daylight hours.[36] Considering that the wait for transit/rail is often preceded by walking or biking to the stop, people taking transit/rail are considerably impacted by rising temperatures. Extreme heat reinforces the inequities for those who do not have access to air-conditioned vehicles, have longer commute times, and are dependent on transit/rail to access their daily needs. Extreme heat can also have significant impacts on infrastructure. For example, it can cause rail buckling and result in slower transit/rail speeds as well as issues with air conditioning units on passenger rail cars. Furthermore, power lines can melt, leading to disruptions in service and potentially causing train derailments.[37]

In situations where extreme weather conditions render transit/rail services unavailable, individuals often resort to alternative modes of transportation, such as driving. However, this shift towards private vehicles can have detrimental effects on sustainability efforts and air quality goals.[38] Increased reliance on driving contributes to higher greenhouse gas emissions, congestion, and poor air quality, undermining efforts to promote sustainable transportation options.[39] While the pace and implications of climate change are dynamic, the region's transit/rail service networks and infrastructure require investment to become more resilient to the impacts of climate change.

Recognizing the potential for significant impacts to transit/rail, SCAG developed resources[40] for providers of public transportation in the region to respond to expected challenges climate change. This work was intended to assist transit/rail providers with incorporating climate change adaptation into their existing processes. The resulting toolbox of resources can be used to identify critical assets and routes; integrate climate considerations into local and regional planning processes; and implement adaptation practices to improve transit/rail system resilience while complying with state and federal regulations. These resources were developed to assist transit agencies in completing these activities with limited resources. More recently, the Federal Highway Administration released a handbook[41] explaining how to develop a baseline understanding of a transportation networks' exposure and vulnerability to extreme weather and climate change. The handbook supports agencies as they consider how to integrate resilience into asset management, particularly to natural hazards, and addressing damage and deterioration to assets.

2.14.4 BUILT ENVIRONMENT AND SUBSIDIZATION OF DRIVING

As SCAG's report with UCLA on Falling Transit Ridership: California and Southern California[42] succinctly put it, as long as driving in the SCAG region is the easiest way to get around, people will drive more and ride transit/rail less. The complexity and inconvenience associated with taking transit/rail further discourage individuals from choosing it. Factors such as limited-service frequency, lack of accessibility, and unreliable schedules can make transit/rail less appealing to potential riders. As a result, people are more likely to opt for driving, even though it may come with a significant financial burden. To address this situation and promote a shift towards transit/rail usage, efforts must be made to improve the quality of transit/rail service. This includes increasing service frequency, enhancing accessibility through better infrastructure and connectivity, and ensuring reliable and predictable schedules. By making transit/rail a more attractive

option, people may be encouraged to choose public transportation over driving. With that said, transit/rail ridership recovery is contingent on more than the actions of transit/rail operators, but on the larger transportation and land use environment. The current built environment primarily caters to private vehicle movement, which creates a preference for driving and makes it the easiest transportation option for many individuals. One of the key factors contributing to the dominance of private vehicles is the subsidization of driving. Roads are often unpriced, meaning that drivers do not directly bear the costs of road infrastructure and maintenance. Similarly, parking is often unpriced or underpriced, providing an incentive for individuals to choose driving over other modes of transportation. This subsidy, combined with the convenience and ease of driving when one already has access to a vehicle, makes it a more attractive option compared to transit/rail. To address these issues, some regions and cities have begun implementing approaches to more appropriately price roadways (e.g., congestion pricing) as well as parking, and adjust high minimum parking requirements for developments. Congestion pricing is described more fully in the Congestion Management Technical Report. Additionally, focusing growth in areas that already have high-frequency transit/rail service can further support the utilization of these modes. By strategically planning and designing communities where transit/rail is easily accessible, people will have better alternatives to driving and may be more inclined to use public transportation. This work is described later in the Transit-Oriented Development strategy.

2.14.5 AGENCY COORDINATION

The SCAG region is unlike most others in that it is home to numerous transit/rail providers (100 plus) and considering the size of the region and the large number of operators, it is not surprising that coordination is an ongoing challenge. Coordination across transit/rail agencies is important for several reasons. Coordination ensures a seamless travel experience for passengers. When transit/rail agencies align their schedules, routes, and services, it becomes easier for riders to transfer between different modes of transportation. This reduces wait times, eliminates confusion, and makes the overall transit/rail journey more convenient and efficient. Coordination also fosters better connectivity between various transit/rail services.

By collaborating and integrating their operations, transit/rail agencies can create a network that allows passengers to travel across jurisdictions using a single ticket or fare system. This integrated approach expands the reach of transit/rail, making it more accessible and attractive to a larger number of people. Coordinated efforts help optimize the allocation of resources. By sharing information, data, and resources, transit/rail agencies can avoid duplication of services and maximize the utilization of existing infrastructure and vehicles. This results in cost savings and more efficient use of funding. Coordination also enables transit/rail agencies to improve efficiency and reliability. By coordinating schedules, agencies can minimize gaps and overlaps in service, reducing wait times and ensuring that transit/rail services are available when and where they are needed. This reliability encourages more people to use public transportation as a dependable mode of travel. Finally, coordinated efforts facilitate strategic planning and investment in transit/rail infrastructure. When agencies work together, they can collectively identify gaps in service, assess future transportation needs, and prioritize investment in areas that require improved transit access. This coordinated approach leads to more effective and targeted use of resources for expanding and improving transit services.

Currently, the six County Transportation Commissions (CTCs) in the SCAG region facilitate coordination across operators, but beyond this high-level coordination, transit/rail agencies generally operate independently. One issue with the current structure is that transit/rail operators have multiple fare structures, prices, products, payment options, discount categories, and customer experience goals. The fare coordination issues can discourage riders from using/exploring the different systems and create confusion.

It is already difficult to navigate traveling on different systems within just one county, but also confusing to navigate each fare system. It is challenging to determine which systems offer transfers and for how long, and how much they cost. Where cooperative fare agreements do exist, there are sometimes barriers in terms of affordability and flexibility. The agreements are also not directly tied to short- and long-term investments and service plans. Intercounty trips are generally difficult with the restriction of transfer policies, and many of the transfer policies between transit operators are limited to day passes. Examples where fare coordination is occurring include the Rail2Rail pass, which allows Amtrak Pacific Surfliner Monthly Pass holders to ride any Metrolink train and Metrolink Pass holders to ride any Pacific Surfliner train within the station pairs on their pass at no additional charge. Agreements like this could be expanded once the California High Speed Rail project is built. California's State Rail Plan is centered in part on a "pulse schedule" that aligns regional and inter-regional services statewide with California High Speed Rail. This would present ample opportunities for better fare and scheduling coordination and integration. Other notable fare policy efforts include Metrolink, Omnitrans, and OCTA's e-ticketing programs, which continue to grow as a percentage of ticket sales. Also, through LA Metro's EZ Pass program, Metrolink has maintained agreements with 32 connecting local transit operators in Southern California for many years to allow passengers with Metrolink tickets to transfer for free to and from connecting local transit/rail services. These cooperative fare agreements are important and play a role in promoting transit/rail equity. By implementing cooperative fare agreements, transit/rail access becomes more equitable, ensuring that all individuals, regardless of their location or income level, can enjoy the benefits of a well-connected and affordable transit/rail system.

2.14.6 EQUITY

Several equity issues are associated with transit/rail, particularly when it comes to accessibility, affordability, and service quality.

- According to the NTD, agencies in the SCAG region cover about 3,189 UZA square miles. Together, the urbanized areas serve about 16 million people. However, gaps still exist in where services are provided and in the types of services provided. As documented in the Equity Analysis Technical Report, SCAG found that across the region, within a 30-minute drive, Native Americans had the lowest accessibility to employment compared to other racial and ethnic groups, with 8.7 percent of employment opportunities within reach. Within a 45-minute transit commute, only 1.1 percent of employment was accessible for Native Americans, with access for people of all other race/ethnicities also below 2.3 percent. Access to shopping, jobs, schools and healthcare within 15-minute transit was near zero for all populations. The Plan is expected to improve transit access for the entire region, though those improvements are greater at the regional level compared to within Priority Equity Communities.
- Transit/rail service quality can vary across different neighborhoods and communities. Some areas may experience inadequate or unreliable service, longer wait times, overcrowding, or limited hours of operation. These disparities can lead to inconvenience, longer travel times, and reduced mobility options, particularly for individuals who depend heavily on transit/rail as their primary mode of transportation.
- Affordability is another significant equity concern in transit/rail. Fares and ticket prices can pose a financial burden, especially for low-income individuals and families. High transit costs relative to income can limit access to public transportation, forcing individuals to seek alternative, often less efficient or more expensive modes of transportation. Affordability issues can disproportionately affect marginalized communities and exacerbate existing social and economic inequalities.

- The current payment structure in the region offers limited options for the unbanked and underbanked population and/or those without credit/debit card payment abilities. The Metro 2022 customer survey mentioned above points to this problem vividly. Unbanked riders are likely to constitute the largest share of cash fare payment customers. In California, 25 percent of residents are underbanked or unbanked and are unable to participate in the fast-paced digital economy but the issues the underbanked face cannot be overlooked. The underbanked (which make up about 20 percent of the state's population) share distrust for banks due to increasing fees, especially for those falling below the minimum account balance. The challenge to converting cash-only, underbanked and unbanked riders to digital payments so they can equitably access transit/rail services may be overcome with open-loop payment technology, which can facilitate benefits eligibility determination. The state, through the California Integrated Travel Program (Cal-ITP), is leading efforts to address this issue.
- The digital divide is an equity issue in transit/rail, particularly with the increasing use of technology for fare payment, trip planning, and real-time information. Limited access to smartphones and internet connectivity, along with a lack of digital literacy can create barriers for individuals who rely on transit/rail services. This can hinder their ability to access important information, make connections, and utilize digital tools that enhance the transit/rail experience. Affordability is cited as one of the top issues with respect to the digital divide. According to the California State Transportation Agency (CalSTA), one in four or 10 million people in California are not fully banked due to costs associated with opening or maintaining a bank account. Not having a bank account means that they cannot take advantage of digital payment systems. A customer survey conducted by LA Metro in 2022 found that 21 percent of their passengers do not have smartphones and 27 percent are still using cash for fare payments. That represents a significant portion of their customers and suggests there are widespread impacts when more communications and tools are offered digitally.
- Safety and security issues on transit/rail systems can disproportionately impact certain communities. Perceptions or realities of crime, harassment, or inadequate safety measures can discourage individuals, particularly women,[43] elderly individuals, and marginalized populations, from using public transportation. Ensuring a safe and secure transit/rail environment is crucial for promoting equity and ensuring the well-being of all passengers.

Addressing these equity issues requires targeted interventions, such as improving transit/rail infrastructure in underserved areas, implementing fare policies that prioritize affordability, enhancing service quality and reliability, bridging the digital divide, and prioritizing safety and security measures. Equity-centered approaches in transit/rail planning and policymaking are essential to create a more equitable and accessible transportation system for all. Approaches for addressing these challenges are detailed in a later section on strategies.

2.14.7 AIRPORT CONNECTIVITY

The region is served primarily by LAX, Ontario International Airport (ONT), Hollywood Burbank Airport (BUR), John Wayne Airport (SNA), and Long Beach Airport (LGB). Only BUR is directly connected to rail with two rail stations served by Amtrak and Metrolink. LAX, ONT, and Palmdale Regional Airport (PMD) are very close to rail lines, roughly 2.5 to 3.5 miles, but fall short of a rail connection. Los Angeles World Airports (LAWA) is currently constructing an automated people mover which will connect all terminals to a new station under construction on the K Line at 96th Street scheduled to open in 2024. LAWA currently operates the FlyAway bus service from Los Angeles Union Station and Van Nuys airport. LGB and SNA airports are

farther from rail. Given these conditions, transit/rail's mode share to airports in our region is extremely low. At LAX and BUR, the transit mode share is approximately one percent to two percent, with even lower shares at ONT, SNA, and LGB. Transportation network companies (TNCs) such as Lyft and Uber, shared-ride vans, long-distance shuttles, taxis, and limousines provide approximately 33 percent of passenger trips to and from LAX, which demonstrates the potential for transit/rail to increase its share.

2.14.8 RAIL CAPACITY CONSTRAINTS

Passenger rail in the region is characterized by significant capacity constraints. These capacity constraints serve as significant barriers to growing rail ridership. Most notable of these constraints is the physical infrastructure of the track. 70 percent of the track right-of-way that Metrolink operates on is one-track operation. This limits the volume of trainsets that may be placed into service and makes certain train trip schedules longer when a train moving in one direction has to pull off onto a siding to allow another train to pass. In addition to the one-track operating environment, several of Metrolink's lines are owned by the freight companies, Burlington Northern Santa Fe Railway (BNSF) and Union Pacific Railroad (UP). The Ventura County Line is owned by UP west of Moorpark, the 91/PVL Line is owned by BNSF between downtown Los Angeles and Riverside, and the Riverside Line is owned by UP. SCRRA operates service on these lines through shared-use agreements. The shared use agreement on the Riverside Line is the most constrained corridor allowing just six round trips per day. Furthermore, the Link Union Station (LINK US) project also demonstrates another capacity constraint in the region. Constructing the run-through tracks will allow for increased efficiencies and service that would significantly decrease travel time, air pollution and greenhouse gas emissions. The LINK US project, together with the Metrolink SCORE project (described in more detail later) will greatly reduce capacity constraints in the passenger rail infrastructure in the region and provide more frequent and reliable service.

2.15 WHO SHAPED OUR APPROACH TO THIS PLAN?

Having a grasp of where the region is at as it implements projects and plans for future projects is critical in shaping the Plan for the region. A significant effort is made to conduct meaningful outreach and engagement throughout Connect SoCal 2024's development, to SCAG's Transportation Committee as well as to other critical stakeholders, such as its Regional Transit Technical Advisory Committee, which is comprised of dozens of transit/rail operators. As part of the planning process, SCAG staff made an effort to better understand transit/rail existing conditions, challenges and opportunities, and potential strategies and actions that could be taken to advance transit/rail.

Significant outreach began in summer 2021, when SCAG staff met with transit/rail operators to discuss their plans for restoring pre-pandemic service levels and potential service level growth. In the fall of 2022 SCAG staff solicited planned transit/rail projects from the County Transportation Commissions (CTCs). These transit/rail projects largely originated from local sales tax commitments and county plans and formed the basis for the future transit/rail network for this Plan. SCAG staff also sought input on planned High Quality Transit Corridors, where buses arrive every 15 minutes or less during peak commute periods. SCAG staff also conducted outreach to transit/rail operators regarding transit safety and asset management targets in accordance with federal requirements. This information helped support the Plan's financial assumptions and forecasts.

Also occurring in the fall of 2022, SCAG staff began convening the Next Generation Infrastructure Subcommittee, which was comprised of a dozen policymakers from across the region. The Subcommittee

was intended to provide guidance on the priorities and strategies for Connect SoCal 2024, reflecting the rapidly evolving developments specific to the future of mobility and associated implications for public policy. The Subcommittee's November 16, 2022, meeting was focused on exploring how the region could ensure transit/rail recovery and included perspectives from Culver City, Metrolink, Via, and the Shared Use Mobility Center. Overall, feedback from members of the Subcommittee can be grouped into four broad recommendations:

- Maintain a people-centric transportation investment strategy: Ensure that deployment of new technologies support people's needs and address larger shared goals like advancing equitable access and reducing traffic fatalities and series injuries. Prioritize use of our public rights-of-way for all roadway users, especially focusing on the needs of non-single occupant vehicle users.
- Continue to invest in system preservation and efficiency investments: Fix-it-first remains a key strategy for Connect SoCal, especially recognizing greater needs associated with the transition to zero emission vehicles and ensuring system resilience. Within this context, operational improvements and targeted strategic highway capacity expansion are warranted when coupled with complementary efforts to offset any potential increases in vehicle miles traveled and especially single-occupant vehicle travel.
- Expand and enhance mobility choices: Focus on understanding and meeting the needs of existing transit riders, which will also attract new riders. Increase choices beyond driving by enhancing and supporting services across all modes of travel including transit, active transportation, micromobility, and automobiles. Reconsider the role of the automobile in our daily lives and how mobility options can increase reliable accessibility.
- Re-envision how we plan, fund, and manage the transportation system: Plan and manage the transportation system more like an investor, including asserting a role in the management of the transportation digital realm. Appropriately pricing the transportation system ensures that the system functions for all users (even during peak demand periods), generates reliable revenue, and established resources for addressing equity concerns.

In spring 2023, SCAG conducted Connect SoCal 2024 outreach and engagement across the region to share information about the Plan and to seek feedback on priorities. The purpose of these events was to gather input regarding challenges each community faces to establish planning priorities for the next 20 plus years. Through a series of in-person and virtual workshops, valuable insights were gathered from stakeholders regarding transit/rail-related concerns and priorities in the region. Transit/rail safety on vehicles and at stops/stations emerged as a significant concern, with stakeholders emphasizing the need for enhanced safety measures. They also expressed a need for free or reduced transit/rail fares, especially for low-income residents. Stakeholders generally expressed support for more frequent, reliable, accessible, and affordable transit/rail, including Bus Rapid Transit (BRT) solutions. They also shared interest in on-demand transit solutions like microtransit and called for increased funding to meet the evolving mobility needs of communities. Stakeholders also communicated interest and overall support for transit/rail investments, particularly in clean technologies such as zero-emission bus fleets.

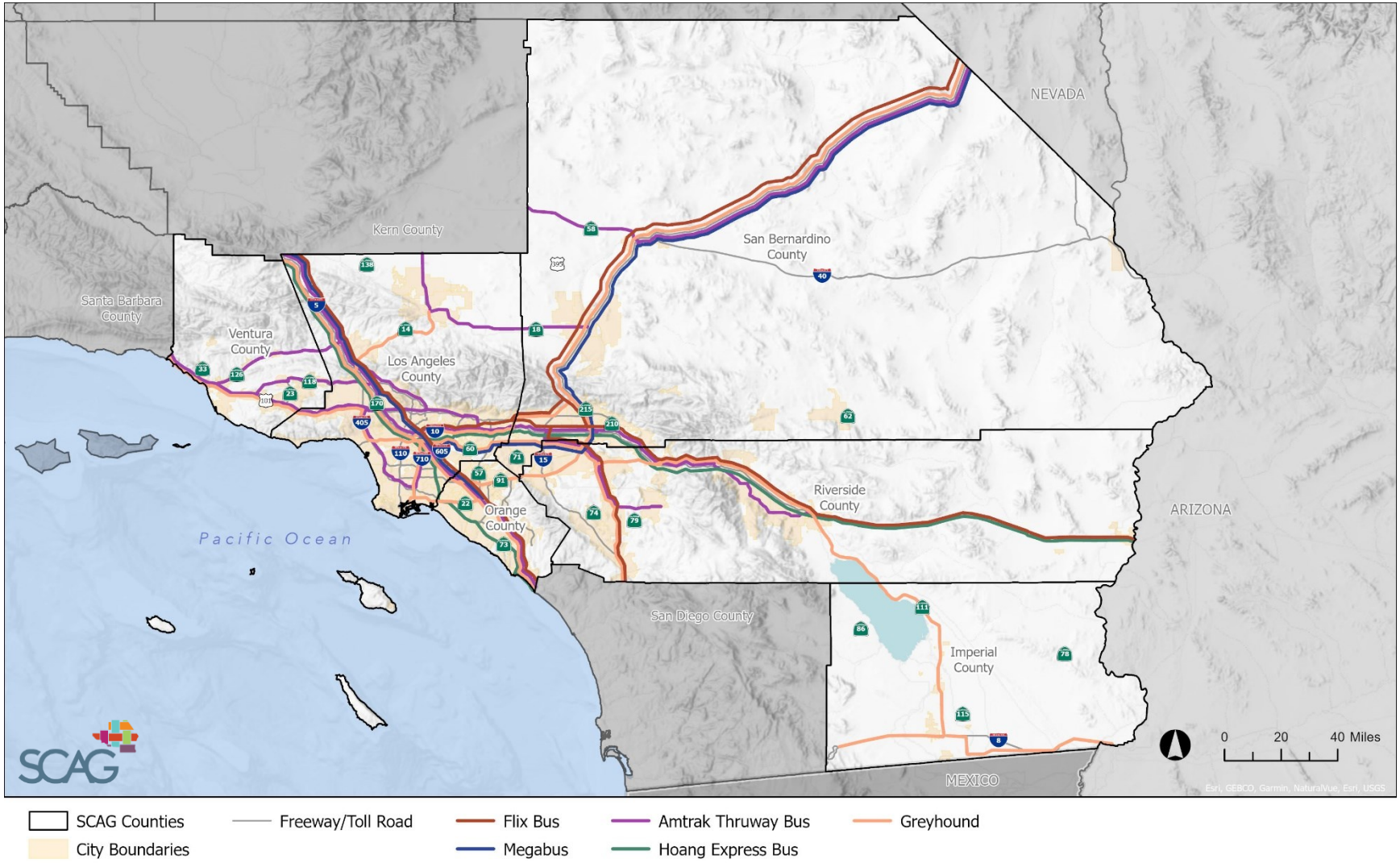
As part of this spring 2023 outreach, SCAG also administered an online survey on SCAG's website and social media pages. The survey included three questions related to transit/rail and one question related to transportation equity.[44] Survey responses show residents would take public transit if they lived close to a bus stop or rail station and prefer to use transit to commute to work compared to other destinations. When asked what transportation-related improvements are most important to the stakeholders' communities, the

third most cited response was "more access to reliable, frequent and fast transit options." Similarly, "fast, frequent and reliable transit and transportation options" was ranked as the third-most significant transportation equity issue affecting the region. Stakeholders also stressed the importance of preparing for and being resilient to transit service disruptions.

Overall, the outreach and engagement efforts helped SCAG gain a better understanding of stakeholders' perspectives and priorities. Stakeholder feedback revealed a shared vision of transit/rail investment, affordability, accessibility, reliability, safety, and sustainability, while prioritizing the evolving needs of communities.

SCAG is required under the FAST Act regulations to include private providers of transportation in the metropolitan planning process. There are some significant gaps in service in our region between public and private transportation providers. Most notably, the eight-block gap where there is no connecting public transit service between the Los Angeles Greyhound Station, one of the busiest bus stations in the nation, and Los Angeles Union Station. Cooperation in planning efforts between the public and private providers may result in important benefits for the traveling public. Caltrans completed its latest California Intercity Bus Study in 2022 that identifies current and future intercity bus travel markets. The study is operator neutral but these current and future services would be provided by private operators. Also, Caltrans recently completed the 2023 California State Rail Plan which identifies express bus markets and services that provide extensions to current and future state rail networks.

Map 2-5. Private Intercity Bus Network



Source: SCAG (2023)

2.16 WHAT IS OUR PLAN FOR THE FUTURE?

As mentioned at the outset, the Plan envisions a future in which transit/rail functions as the backbone of the regional mobility ecosystem, enabling seamless and efficient travel without needing to own an automobile. Frequent, reliable, and convenient transit/rail is vital for advancing both the state and region's vision of more livable and equitable communities. This approach also supports the larger regional goal for fostering a healthy, prosperous, and connected region to ensure a more resilient and equitable future. The larger vision for Connect SoCal is meant to encapsulate an image of what the region can become by 2050. The vision underscores the core purpose and responsibility of the long-range plan in supporting balanced growth of the region's natural and built environments to meet the needs of people in the years to come. Supporting this vision are multiple goals, including one for mobility that is focused on building and maintaining a robust transportation network. More specifically, this means:

- Support investments that are well-maintained and operated, coordinated, resilient and result in improved safety, improved air quality and minimized greenhouse gas emissions.
- Ensure that reliable, accessible, affordable, and appealing travel options are readily available, while striving to enhance equity in the offerings in high-need communities.
- Support planning for people of all ages, abilities, and backgrounds.

Overall, the future of transit/rail is likely to be shaped by a combination of technological, social, and environmental developments. While the exact trajectory is difficult to predict, it is clear that there will be a continued need for efficient and sustainable transportation solutions in the years to come. Some potential trends that could shape the future of transit/rail include:

- Electric and autonomous vehicles: As technology continues to advance, we are likely to see an increasing number of electric and autonomous vehicles on the road. This could result in more roadway capacity constraints, resulting in inefficiencies that support transit/rail use.
- Mobility-as-a-Service (MaaS): MaaS platforms are digital services that provide users with access to multiple modes of transportation, such as bikes, cars, and public transit/rail, through a single app. This could make it easier for people to plan and pay for their trips and could lead to increased usage of transit/rail.
- Sustainable transportation options: With climate change becoming an increasingly pressing issue, there will likely continue to be greater emphasis on sustainable transportation options, such as zero-emission buses, bikeways, and pedestrian zones. The California Air Resources Board Innovative Clean Transit (ICT) regulation (Cal. Code Regs. Tit. 13 § 2023.1) will catalyze some of this change, as it requires all transit agencies to gradually transition to 100 percent zero emission bus (ZEB) fleets by 2040.
- Flexible and on-demand transit: Some transit/rail agencies are experimenting with on-demand transit services (e.g., Metro Micro, OCFlex), which allow users to request a ride on demand, rather than relying on fixed schedules. This could make transit more convenient and responsive to users' needs, particularly in suburban and rural environments where traditional fixed route transit may not be most efficient.
- Changes in urban planning: As cities continue to grow and evolve, there may be a greater emphasis on Transit-Oriented Development, which involves designing communities around mobility hubs. This could make it easier for people to access transit/rail and could lead to more sustainable and livable communities.

The Plan includes robust investment in multimodal projects. Specifically for transit/rail, the Plan includes $54.6 billion of transit capital projects and reflects $248.7 billion in transit operations and maintenance (O&M). It also includes passenger rail capital investments of $45 billion and $42.5 billion for O&M. Together, there is an investment of more than $390 billion of local, state, and federal funds. These investments will support transit/rail ridership recovery as well as reduced greenhouse gas emissions through more frequent, fast, safe, and reliable service. As with previous Plans, these investments include High Quality Transit Corridors identified in partnership with our regional transit agencies. Connect SoCal assumes additional regional strategic investment in transit service improvements on these corridors, contingent upon new revenue sources. These investments will further the Plan's vision of a mobility ecosystem where transit/rail functions as its backbone.

In the near term, SCAG's Regional Early Action Planning Grants (REAP 2.0) will fund a diverse set of transformative transit/rail planning and implementation projects that expand access, increase mobility options, bring jobs and housing closer together, and achieve a more sustainable growth pattern across the region. Examples of these projects include:

- Neighborhood Mobility Hub Pilot Projects in Disadvantaged Communities in the South Bay
- First Last Mile Revolution: Transforming Metro Connections to Housing
- North Hollywood Transit Center
- Mobility Wallets Pilot 2.0: Challenge and Low-Income
- Fullerton Park and Ride Transit-Oriented Development Site Design Concepts
- Orange County Mobility Hubs Pilot Concept of Operations
- Riverside Transit Agency GoMicro Microtransit Pilot Program Extension

The REAP 2.0 Regional Pilot Initiatives (RPI) Program will also target funding for demonstrating innovative, next generation technologies and models of regional significance. It will specifically fund projects with the potential to change transportation and housing paradigms towards building more sustainable communities. SCAG anticipates targeting funding towards mobility hubs, mobility wallets and Universal Basic Mobility (UBM). These REAP projects will help lay the foundation for a more robust multimodal ecosystem.

The following section highlights key future projects in each county. New transit/rail capital projects, coupled with improvements in active transportation and an improved jobs/housing balance will provide people an alternative to single occupant vehicle (SOV) travel and result in a more sustainable region with cleaner air and reduced greenhouse gas emissions.

2.16.1 REGIONAL PROJECTS

A huge investment in passenger rail is already underway. Metrolink is currently constructing multiple SCORE projects, which, with a full $10 plus billion buildout, will enable 30-minute bi-directional service on all of its seven lines. This transformation of Metrolink, from a primarily commuter-oriented service to one that also serves local travel over much of the day, will provide more options to address changes in travel behavior due to the COVID-19 pandemic and increasing rates of people working from home. The addition of more non-peak hour trips will align with changing travel patterns. Metrolink has seen significant changes in its travel patterns with less peak-hour passengers due to work-from-home and hybrid work schedules and at the same time surveying has shown an increase in non-work trips. LOSSAN is also investing in capital

improvement projects on the LOSSAN Corridor, which will result in 18 daily roundtrips between Los Angeles and San Diego, with a faster travel time.

The California High Speed Rail is currently under construction in the San Joaquin Valley and is forecast to complete the Phase 1 system between San Francisco, Los Angeles, and Anaheim by 2033. Not only will the service provide an alternative to flying between Southern and Northern California, helping to relieve constrained airport facilities as California's population grows, it will be a game changer for travel between the Los Angeles Basin and the Antelope Valley. What now takes up to two hours by car, will take approximately 25 minutes between Palmdale and downtown Los Angeles. Brightline West, a private provider of passenger rail service, will be implementing high speed rail between Las Vegas and Rancho Cucamonga where it will connect with the Metrolink system. From Rancho Cucamonga, the San Bernardino County Transportation Authority (SBCTA) tunnel project will provide a quick connection to Ontario International Airport. Rail connections to other regional airports will also be improved, notably, California High Speed Rail to Hollywood Burbank Airport, and LA Metro Rail to LAX (Table 2-1).

Table 2-1. Selected Transit Capital Projects

County	Project
Los Angeles	Airport Metro Connector
Los Angeles	North Hollywood to Pasadena Transit Corridor
Los Angeles	Los Angeles Streetcar
Los Angeles	East San Fernando Valley Transit Corridor
Los Angeles	Gold Line Eastside Extension to Whittier
Los Angeles	Gold Line Foothill Extension - Azusa to Pomona/Claremont
Los Angeles	Green Line Extension to Torrance
Los Angeles	LAX Automated People Mover
Los Angeles	North San Fernando Valley Transit Corridor
Los Angeles	Orange Line BRT Improvements
Los Angeles	Purple Line Westside Subway Extension to La Cienega/Century City/Westwood
Los Angeles	Sepulveda Pass Transit Corridor
Los Angeles	Vermont Transit Corridor
Los Angeles	West Santa Ana Branch Transit Corridor
Los Angeles	Green Line Extension to Norwalk/Santa Fe Springs Metrolink Station
Los Angeles	Red Line Extension to Hollywood Burbank Airport
Los Angeles	Metro K Line Northern Extension
Los Angeles	Inglewood Transit Connector
Los Angeles	Lincoln Blvd BRT
Orange	OC Streetcar
Riverside	Coachella Valley-San Gorgonio Pass Rail Corridor

County	Project
Riverside	Metrolink Extensions to San Jacinto/Hemet and Lake Elsinore/Temecula
Riverside	RTA RapidLink Service
San Bernardino	Redlands Passenger Rail ZEMU Service
San Bernardino	West Valley Connector Phase 1
San Bernardino	Gold Line Extension to Montclair
San Bernardino	Rancho Cucamonga Metrolink to Ontario International Airport Tunnel
Regional	Metrolink SCORE
Regional	LOSSAN Corridor Improvements
Regional	Brightline West
Regional	California High-Speed Rail
Regional	High Desert Rail Corridor Victor Valley to Antelope Valley

Source: SCAG

LOS ANGELES COUNTY

In terms of urban rail, LA Metro is investing over $100 billion to expand its heavy rail and light rail network. The projects are numerous, but include the Purple Line extension to Westwood, the Regional Connector, the East San Fernando Valley light rail, the Eastside light rail extension to Montebello and Whittier, the C (Green) Line extension to Torrance, the West Santa Ana Branch to Artesia, the Sepulveda Pass rail project, and others. Many of these will be completed in time for the 2028 Olympics, or shortly thereafter.

ORANGE COUNTY

OCTA is constructing the first modern streetcar in the region which will open in 2025 and provide service between Santa Ana and Garden Grove, connecting with Amtrak and Metrolink in Santa Ana. OCTA has also implemented its BRAVO limited stop bus service on several of its busiest corridors and is working on implementing transit signal priority.

RIVERSIDE COUNTY

RCTC is currently planning the Coachella Valley-San Gorgonio Pass Rail Corridor from downtown Los Angeles to the Coachella Valley via Fullerton. There is currently no workable rail service between Los Angeles and the Coachella Valley. Service most likely will be operated by Amtrak with at least two and up to five roundtrips per day.

SAN BERNARDINO COUNTY

SBCTA opened the Redlands Rail Arrow service, now operated by Metrolink, in 2022. In the near future, SBCTA will introduce its electrical multiple units (EMUs) on the Arrow service, using zero emission fuel cell propulsion. SBCTA is also planning for the Brightline West extension from the Victor Valley to the Rancho

Cucamonga Metrolink station through the Cajon Pass, where it will connect to the future tunnel to Ontario International Airport along with the West Valley Connector BRT to downtown Pomona.

2.17 HOW ARE WE GOING TO COLLECTIVELY ACHIEVE OUR VISION?

The opportunity to change the way people travel across the region is significant, particularly when considering technological advancements and the potential for greater partnership across sectors. The faster transit/rail agencies, cities, and municipal agencies act, including in partnership with private mobility providers, the better chance the region has to reverse years of falling transit/rail ridership and usher in a new era where transit/rail vehicles and the people who depend on them, are a priority. Key strategies to support the future we envision are detailed below.

2.17.1 SYSTEM PRESERVATION AND RESILIENCE

Transit/rail system preservation refers to a comprehensive approach to maintaining and extending the lifespan of transit/rail infrastructure, including assets such as tracks, stations, bridges, tunnels, signals, rolling stock, and other components. It typically involves proactive strategies and practices aimed at preventing deterioration, minimizing the need for costly repairs or replacements, and preserving the functionality and value of transit/rail assets over their entire lifecycle. Preservation efforts may include regular inspections, preventive maintenance, rehabilitation, and asset management strategies to optimize the use of available resources and ensure the long-term viability of the transit system. Preservation contributes to safety by identifying and rectifying potential hazards, minimizing the risk of incidents. Additionally, it enhances reliability and service quality, as regular maintenance and repairs prevent disruptions, breakdowns, and delays. Preserving transit/rail systems optimizes operational efficiency, reduces costs, and supports economic development by facilitating the efficient movement of people and goods.

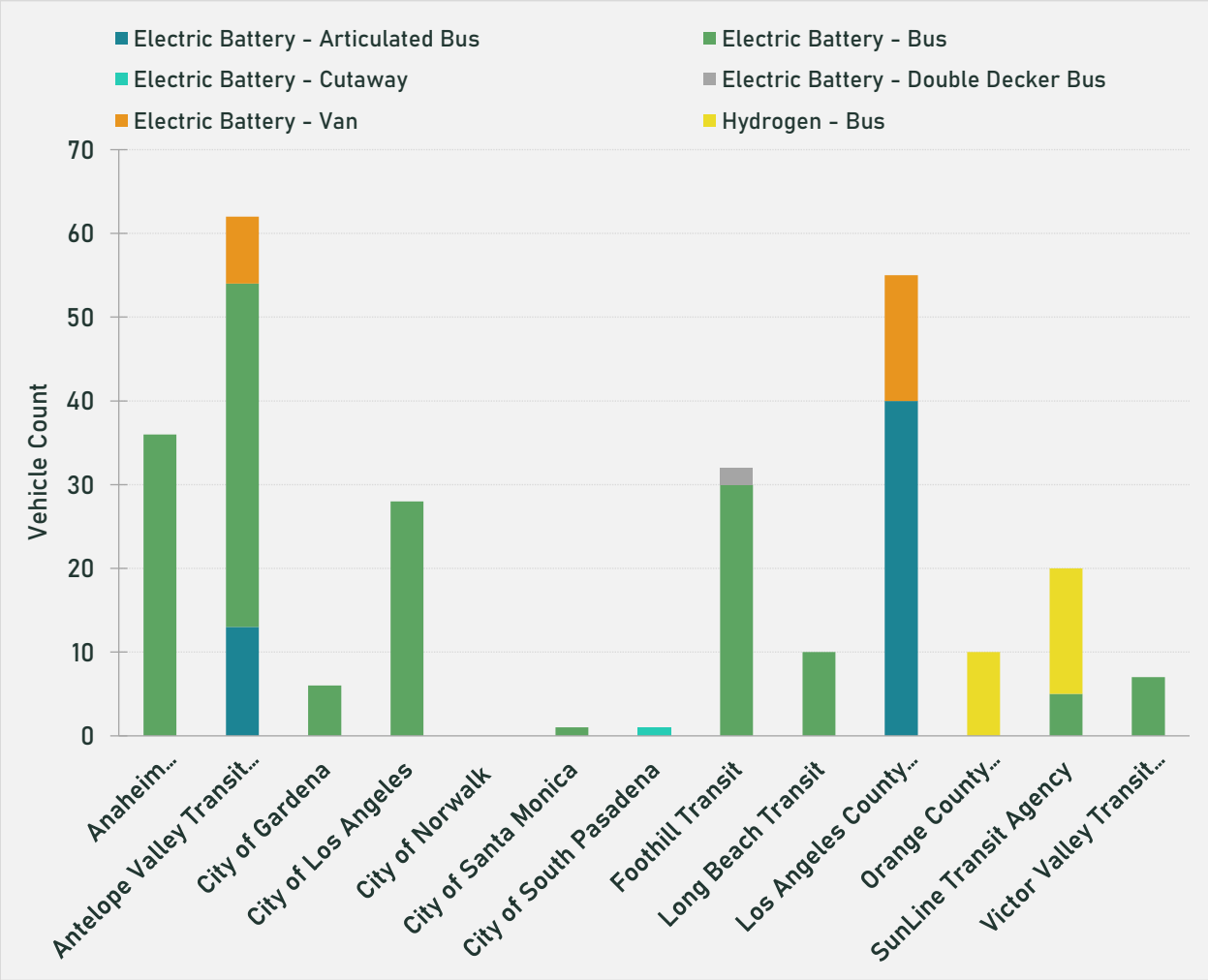
Transit/rail agencies employ preservation strategies to continuously work towards and maintain the state of good repair for their assets. State of good repair focuses on the condition and performance of transit/rail infrastructure and assets at a given point in time. It refers to the desired state or level of maintenance, where all components and systems are functioning as intended, meeting safety standards, and providing reliable service to passengers. Achieving a state of good repair involves identifying and addressing any deficiencies, damage, or wear and tear that may compromise the integrity or functionality of the transit/rail system. This may include repairs, replacements, upgrades, or refurbishments to bring infrastructure up to the desired standard. Achieving a state of good repair is critical for transit/rail agencies and aligned with federal priorities to establish Transit Asset Management targets (described in a subsequent section).

System preservation and maintaining a state of good repair also contribute to the overall resilience (i.e., overall stability) of the transit/rail network. With that said, resilience also means deploying clean technologies that have long term benefits of reducing environmental consequences, supporting long term climate goals, and addressing long term public health concerns. The clean technology landscape for transit/rail and in particular, buses, has evolved significantly over the past few years, experiencing rapid advancements and adoption rates across the globe. The primary clean technology solutions that have gained traction are battery electric buses (BEBs) and fuel cell electric buses (FCEBs). Both technologies are proven to significantly reduce greenhouse gas and criteria pollutant emissions compared to traditional diesel- and natural-gas powered buses, thereby playing a crucial role in decarbonizing transit. Among the two major zero emission transit bus technologies, battery electric buses have become more prevalent, thanks to continued advancements in battery technology that have led to improved energy density, lower

costs, and longer lifespans. On the other hand, fuel cell electric buses, powered by hydrogen, offer another clean alternative. While FCEBs are currently less widespread than BEBs, they provide a promising solution, particularly for long-range transit applications, due to their quick refueling times and longer-range capabilities, and proven lower costs compared to BEBs. According to the CALSTART's Zero Emission Technology Inventory,[45] there are currently more than 25 models of zero emission transit buses available in the North American market of which 23 are BEBs and two are FCEBs.

Currently zero emission buses make up the largest number of heavy-duty ZEVs in the SCAG region. When looking at the number of ZE transit vehicles by operator in the SCAG region, LA Metro and the Antelope Valley Transit Authority have the largest fleets, with the latter having the most ZE transit vehicles in the region. The Anaheim Transportation Network, City of Los Angeles, and Foothill Transit also have a considerable number of ZE transit vehicles, although to a lesser extent. Other operators in the region have a much smaller number of ZEBs or none at all (Figure 2-21).

Figure 2-21. Zero Emission Bus Count by Operator



Source: National Transit Database (2021)

As alluded to at the outset, transitioning buses in the region to zero-emission technology is not only a crucial strategy for reducing emissions but also a necessary measure with profound implications for public health. Diesel-powered buses emit pollutants, including particulate matter and nitrogen oxides, which contribute to air pollution and associated health issues such as respiratory diseases, heart disease, and premature death. A transition to zero-emission buses would, therefore, result in significant public health improvements, particularly in Priority Equity Communities. These communities are often disproportionately affected by the adverse health effects of air pollution due to their proximity to major transportation corridors and industrial areas. Hence, it is imperative for the region to take a proactive and strategic approach in accelerating the transition of their transit bus fleet to zero emissions. Even though the California Innovative Clean Transit (ICT) regulation has established mandates for transit agencies to make the shift to zero emissions, a complete transition to ZEB is not expected until 2040.

Establishing partnerships with industry stakeholders, such as bus manufacturers, charging infrastructure providers, utilities, and funding agencies, is crucial for the region. Collaborative efforts between these entities can play a pivotal role in streamlining the transition to clean technologies, lowering overall costs, and guaranteeing reliable service. As such, zero emission infrastructure and its availability will play a pivotal role in the transition to ZEB technology. For example, reliable and strategically placed charging and hydrogen fueling stations are critical to successful transition of transit buses in the SCAG region to zero emission technology. Implementing this infrastructure necessitates a robust power grid that can handle the increased energy demand. This is where close coordination with utilities becomes crucial. The transformation of the transit fleet to zero-emission technology will inevitably increase the demand for electricity, thus potentially challenging the local grid's capacity. Transit operators and other stakeholders need to work with utility providers to understand the timing and scale of this additional demand, and to identify any grid enhancements required to support this transition.

The transition to zero-emission bus technology is a significant undertaking, made particularly challenging by the higher upfront costs of these clean transit options and their respective infrastructure. This transition would not be possible without substantial support from local, state, and federal funding. To offset initial expenses such as bus procurement and charging infrastructure installation, regional partners will need to actively seek federal and state funding opportunities. Launching pilot projects can also provide hands-on experience and highlight potential challenges before a full-scale deployment is undertaken. Furthermore, equipping staff with necessary training on the operation and maintenance of zero-emission buses and related infrastructure is critical. This initiative will enhance internal capabilities and ensure that transit agencies are prepared to manage and optimize the performance of their zero-emission fleets effectively.

Adoption of zero-emission technologies in the rail sector is still in its early stages; however, these technologies are relatively mature and have been deployed elsewhere – particularly outside of North America, such as many European and Asian countries – but not yet in the SCAG region. Due to the predictable nature of passenger locomotive operations in terms of routes and schedules, there is a potential opportunity to employ battery-electric technology for shorter routes that allow for convenient charging. Alternatively, fuel cell technology offers more flexibility for passenger rail agencies, enabling them to operate longer routes with faster and less frequent refueling. Caltrans has identified hydrogen locomotives as the most suitable zero-emission (ZE) technology for Amtrak intercity operations[46] and has devised a strategy to transition its rail fleet to 100 percent ZE by 2035. As advancements in zero-emission switch

locomotives have shown promise, it is estimated that commercially available zero-emission passenger locomotives will be developed by 2030, building upon these technological successes.

Within the SCAG region, zero emission rail has not been fully realized, however several agencies have plans to implement these technologies over the coming decade. For example, Metrolink outlines in its Climate Action Plan that it plans to develop and implement the necessary steps to achieve widespread electrification across its rail fleet fully by 2028. This process will occur in stages, with the Antelope Valley Line expected to be fully electrified by 2025. For lines where electrification is not feasible in the short term the plan lays out a program to replace or retrofit older locomotives with more energy efficient models that meet the latest emissions standards.[47] In San Bernardino County, SBCTA has laid out plans to debut its hydrogen locomotives in 2024. The project will be funded by the California Transit and Intercity Rail Capital Program and is expected to begin testing in late 2023.[48]

Similar to bus transit, transitioning a passenger rail system to zero emissions requires a concerted effort and strategic actions at various levels. Pilot projects and partnerships with industry stakeholders, such as bus manufacturers, charging infrastructure providers, utilities, and funding agencies, are crucial for a successful transition.

Examples from across the region include:

- As noted above, the Antelope Valley Transit Authority (AVTA) has an impressive electric fleet. AVTA became the first all-electric transit agency in North America in 2022. AVTA recently placed their twentieth electric coach for their commuter routes into service, adding to their already existing fixed-route fleet of zero-emission buses.
- SunLine Transit in the Coachella Valley has been a national pioneer in hydrogen fuel cell buses. SunLine currently operates 16 hydrogen fuel cell buses and plans to have the entire fixed-route fleet converted entirely to zero-emissions buses by 2035, five years ahead of state regulation requirements. The paratransit fleet will be entirely zero-emissions buses by 2032.
- Foothill Transit welcomed 33 hydrogen fuel cell buses (HFCB) into its fleet in 2022, making it the first in Los Angeles County to own and operate HFCBs. To support these buses, Foothill Transit has a new Hydrogen Fueling Station with a 25,000-gallon tank in Pomona (currently, the largest hydrogen fuel tank used for transit in North America). Foothill Transit still owns and operates 19 Battery Electric buses and was the first transit agency in the nation to put a fast charge battery-electric bus into service in 2010.

Figure 2-22. SunLine Transit Hydrogen Fuel Cell Bus

Source: SunLine Transit

Figure 2-23. AVTA Artic Bend Battery Electric Bus

Source: Antelope Valley Transit Authority

2.17.2 COMPLETE STREETS

As briefly noted earlier, Complete Streets are streets that are planned, designed, built, operated, and maintained to support safety, comfort, and mobility for all road users instead of the speed of cars and the flow of traffic. These streets provide for people of all ages and abilities, regardless of mode. They may accommodate and optimize new technologies and micromobility devices, first/last mile connections to transit/rail, and curbside management strategies. Nearly half of all jurisdictions in the region have adopted a Complete Streets policy. SCAG adopted its own Complete Streets policy in March 2023 (see Appendix 7). Strategies for achieving Complete Streets for transit/rail include a focus on first/last mile connections as described below and integration of transit priority treatments along a network of corridors (described within the Multimodal Integration strategies section that follows).

Complete Streets involve ensuring that there are first/last mile connections for individuals at the beginning and end of their journeys. The first mile refers to the distance traveled by someone from their starting point to the transit/rail stop, while the last mile refers to the distance traveled from the transit/rail stop to the final destination. These short distances are often challenging to cover efficiently, leading to decreased transit/rail ridership and limited access to transit/rail, especially in suburban or low-density communities. First/last mile planning involves providing better access to transit/rail for multiple transportation modes (e.g., biking, walking, etc.), rather than focusing on one specific mode, such as car parking, and introducing new incentives and travel options to access transit. First/last mile planning aims to improve accessibility and encourage transit/rail usage by implementing various strategies and infrastructure enhancements. Common approaches include:

- Pedestrian Infrastructure: Developing safe and attractive walking paths, sidewalks, crosswalks, and footbridges to facilitate easy access to transit/rail stops.
- Bicycle Infrastructure: Establishing bike lanes, bike sharing programs, and secure bike parking facilities to encourage bicycling as a first/last mile mode of transport.
- Microtransit: As noted earlier, microtransit involves implementing on-demand, flexible transit services, such as shuttle buses, vans, or ridesharing, which can transport commuters to and from transit/rail stops.
- Station Design: Creating user-friendly transit/rail stops with clear signage, information displays, and amenities like seating, lighting, and shelter to enhance the overall experience and encourage usage.
- Transit-Oriented Development (TOD): As noted earlier, TOD involves promoting the construction of mixed-use developments near transit/rail stations, allowing commuters to conveniently access residential, commercial, and recreational areas without relying solely on private vehicles.
- Seamless Fare Integration: Introducing integrated fare systems that enable people to use a single ticket or card (including with an app) for multiple modes of transportation, including both transit/rail and first/last mile options (see later section on Mobility as a Service, MaaS).
- Partnerships: Collaborating with private companies, ridesharing services, and community organizations to offer innovative solutions and expand transportation options.
- Mobility Hubs: Places where people can seamlessly connect with multiple modes of transportation in a safe, comfortable, and accessible environment. Mobility hub locations typically include public transit/rail, active transportation, and shared mobility modes, reinforcing Complete Streets.

Examples from across the region include:

- SCAG is working with the City of Montebello and Montebello Bus Lines on a first/last mile plan that will identify and recommend active transportation infrastructure treatments and safety improvements citywide to make walking, biking, and rolling more feasible and safer along Montebello's streets and near bus stops.
- The Riverside County Transportation Commission is developing a Transit-Oriented Communities Strategic Plan. The Plan is focusing on the eight Metrolink stations that serve the Metrolink 91/Perris Valley Line and key corridors within a defined radius of each station. Transit-Oriented Communities (TOCs) are places designed to make it easier to use transit/rail, walk, cycle, and drive less. The benefits of TOCs include increased pedestrian and bicycle safety, facilitating first and last mile connections; promoting housing development and employment opportunities near transit centers; improving the quality of life for residents, and enhancing mobility.
- The Metrolink Station Planning and Connectivity Study, which examined connectivity barriers linked to getting to and from Metrolink stations and will develop strategies for addressing those barriers. Improving connectivity at Metrolink stations will help grow ridership, enhance all customers' experience and safety, and reduce dependency on single-occupant vehicles. The goals of the study were to develop strategies to improve the overall customer experience and create a more integrated system.

2.17.3 MULTIMODAL INTEGRATION

Multimodal integration refers to the seamless and efficient integration of different modes of transportation, such as cars, buses, trains, bicycles, and walking, to provide travelers with convenient and connected mobility options. It involves coordinating and integrating various transportation services and infrastructure to enable travelers to move smoothly across different modes of transport and complete their journeys efficiently. The goal of multimodal integration in transportation is to create a well-connected and sustainable transportation system that optimizes the use of available resources, reduces congestion, and enhances the overall travel experience for individuals. It recognizes that no single mode of transport can fulfill all travel needs and that combining multiple modes can offer greater flexibility, convenience, and efficiency. Multimodal integration involves several key aspects:

- Physical Integration: It involves the development of physical infrastructure that enables smooth transfers between different modes of transport. This can include integrated mobility hubs where different modes converge, ensuring easy access and seamless transitions.
- Fare Integration: As noted earlier, fare integration involves the integration of ticketing and fare systems across different modes of transport. This allows passengers to use a single ticket or payment method for their entire journey, irrespective of the mode of transport or system used.
- Information Integration: It involves providing real-time information about different transportation options, schedules, routes, and disruptions to travelers. This can be achieved through Mobility as a Service, or more specifically, digital platforms, mobile applications, and signage, helping travelers make informed decisions and plan their journeys more effectively.
- Policy and Planning Integration: It involves coordinating transportation policies and planning efforts across different modes of transport and jurisdictions. This can include integrating transportation

planning with land use planning (e.g., Transit-Oriented Development), prioritizing infrastructure investments, and promoting policies that support seamless connectivity between modes.

The benefits of multimodal integration in transportation include enhanced accessibility, reduced travel times, improved efficiency, increased sustainability, and better overall user experience. It promotes a shift towards more sustainable transportation choices and reduces reliance on private cars, leading to reduced traffic congestion and environmental impact. By integrating and optimizing the different components of the transportation system, multimodal integration aims to create a more connected and efficient mobility ecosystem. Strategies for achieving multimodal integration are detailed below.

2.17.4 MOBILITY HUBS

Today we have more ways to get around our cities than ever before—from bike share to scooters, carshare to ridehailing, but the many benefits of this expanding menu of options can only be realized if they are integrated into a coherent network of efficient transportation options that lets people get where they need to go using whatever mode makes the most sense for them on a particular trip. Mobility hubs address this issue by concentrating a variety of transportation options in one location. They support seamless travel connections between different modes such as transit/rail, active transportation, ridesharing, and ridehailing, and they are often supported by park-and-ride facilities, electric vehicle charging infrastructure, and wayfinding amenities.

Mobility hubs are important because they support safe and convenient transfers between transportation modes; they provide first/last mile connections to transit/rail; they offer travel options, especially for those with limited mobility options; and they promote mode shift, which results in reduced greenhouse gas emissions. Furthermore, mobility hubs are responsive to changing travel patterns, whether people are working from home or commuting to an office. Concentrated and convenient travel options at mobility hubs can support more sustainable short and long trips.

In developing this Plan, SCAG developed a regional mobility hubs strategy, which considered best practices from peer agencies as well as current local planning efforts. Examples from across the region were considered including:

- Mobility hubs in Los Angeles County include central mobility hubs like the Wilshire/Vermont Station and Willowbrook/Rosa Parks Station, which encompass amenities such as car share, bike share, bus shelters, and next bus information, or regional mobility hubs like Union Station and North Hollywood Station which offer amenities like secure bike parking, bus layover zones, and other infrastructure built into the station itself.
- San Bernardino County mobility hub examples include the Montclair Transit Center is where commuter service, fixed-route service, and Metrolink service connect with a park-and-ride facility, and the Fontana Transit Center, which is a major intermodal transit hub in the Omnitrans' service area. The facility is regarded as a key link between high-frequency east-west routes. In addition, Metrolink commuter rail stops at this location, providing transit users the opportunity to park-and-ride and transfer between bus and rail service.
- The Orange County Transportation Authority (OCTA) recently adopted the Orange County Mobility Hubs Strategy, which establishes principles and guidelines for mobility hub planning in Orange

County. The Strategy identifies areas of high potential for future mobility hubs network based on mode shift and vehicle miles traveled. It also provides a planning and implementation framework.

- The I-710 North Mobility Hubs Plan was also recently adopted and identifies future mobility hub locations in the area bounded by Los Angeles Union Station, the South Pasadena L (Gold) Line Station, the Los Angeles County Public Works headquarters in Alhambra, California State University, Los Angeles, and the surrounding neighborhoods.
- The Imperial County Transportation Commission (ICTC) collaborated with the San Diego Association of Governments to develop a Regional Mobility Hubs Implementation Strategy, which resulted in the selection of three mobility hub prototype sites in the Imperial Valley.

Figure 2-24. Mobility Hub (Union Station – at the corner of Cesar E. Chavez & Vignes)

Source: Alta Planning + Design (I-710 North Mobility Hubs Plan)

SCAG's mobility hubs strategy identifies mobility hubs across the region and establishes a recommended baseline for a mobility hubs network. The data-driven methodology for screening and prioritizing mobility hubs used a set of baseline network criteria to determine candidate mobility hub's locations. To divide the entire region into consistent land areas, counties were split into equally sized grid tiles with areas of a quarter mile by a quarter mile. The methodology established transit/rail stops as a baseline criterion, ensuring only locations containing at least one major stop were further evaluated. Other screening criteria

included park and ride locations, proximity to major institutions such as sport venues, universities, and overlap with Priority Equity Communities. The screening process resulted in the identification of more than 700 potential mobility hub locations, which provided the baseline for a potential regional network. These mobility hub locations were then categorized by typology. In developing typologies, SCAG considered land use densities, transportation characteristics, and future population and employment growth. A total of six typologies were developed including:

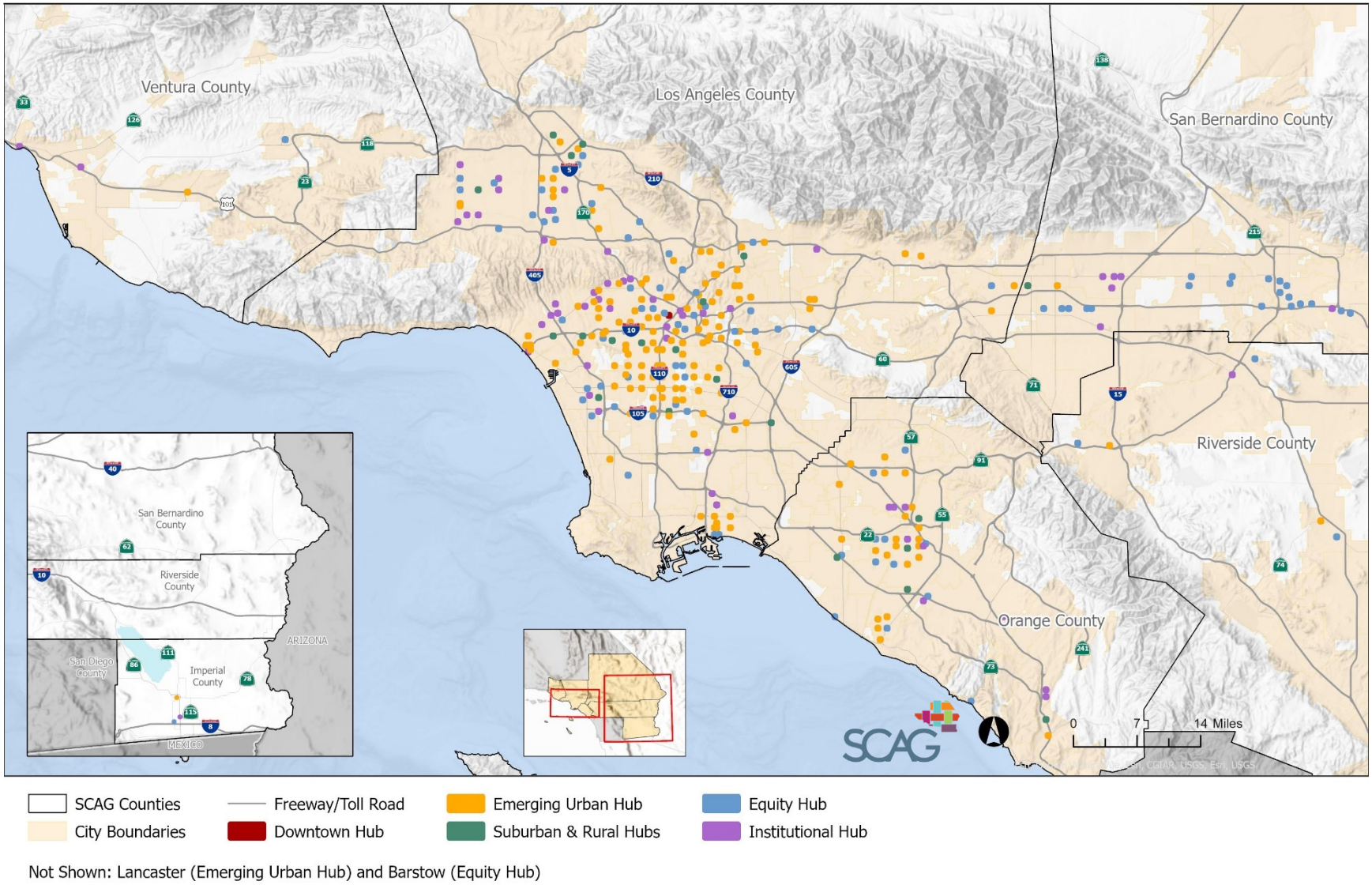
- Downtown Hub: A Downtown Hub is located in an area that has the highest employment and residential densities with a variety of high-capacity transportation and other mobility options that are easily accessible. They are located in walkable, bike friendly areas and serve as commercial and cultural activity centers. A local example is the Downtown Los Angeles Union Station.
- Urban Hub: An Urban Hub is located in an area that has moderate to high employment and residential densities. It contains a rich mix of high-capacity transit, frequent bus service, and access to bikeshare, car share, and other mobility options. The built environment is walkable and bike friendly. A local example is McArthur Park in Los Angeles.
- Emerging Urban Hub: An Emerging Urban Hub has low to moderate employment and residential densities with access to high-capacity transit and local bus service, as well as limited share mobility services. These are smaller communities with low to moderate economic activity. A local example is the Downtown Pomona Metrolink Station.
- Suburban and Rural Hub: A Suburban Hub is located in an area that has land uses with relatively low employment and residential densities, and medium population and/or employment numbers today or in the future. The community may be within driving distance to commuter rail, park-and-ride lots, local bus routes, and car share. A Rural Hub may have rideshare or vanpool coordination. A local example is the Park and Ride Lot at Junipero Serra and Rancho Viejo in San Juan Capistrano.
- Equity Hub: An Equity Hub may be located in moderate to high residential density area which is in a Priority Equity Community, and which might find elevated benefits from reliable transit/rail service, bus routes, or shared mobility. A local example is South Tippecanoe Avenue and East Davidson Street in Loma Linda.
- Institutional Hub: An Institutional Hub is a large trip generator including universities, hospitals, stadiums, airports, and employer campuses. These may be located in a variety of environments including areas with high-capacity transit/rail service and local bus routes. They tend to be removed from other high intensity uses and can be challenging to access. Local examples include the University of California, Angel Stadium in Anaheim.

The expansive list of screened mobility hubs was then subjected to prioritization based on the following weighted criteria:

- Transit Access and Connectivity: High ranking for candidate hub locations with the most mobility options and connections. All mobility hubs are located in high quality transit areas. Additional criteria to differentiate and prioritize the hubs included existing and planned bike routes, livable corridors, microtransit, electric vehicle charging stations and where data was available, bikeshare and transit/rail boardings/alightings by stop/station.
- Climate Action: High ranking for candidate hub locations near major trip generators and areas with high walking and bicycling network connectivity. This aspect of the prioritization focused on the potential for mode shift of trips, based on of trip generators such as airports, job centers, etc. Though as a whole mobility hubs are expected to result in mode shift and reductions in greenhouse gas emissions, these particular mobility hubs are anticipated to motivate more active transportation connections than others that motivate shifts to modes that still result in emissions (e.g., car share).
- Equitable Mobility: High ranking for candidate hub locations within Priority Equity Communities.

The prioritization process resulted in a halving of the prior list, to a total of 346 mobility hubs. Each of the mobility hub types has designated land uses based on definitions as well as transportation features. In addition to existing land use and transportation characteristics, each hub type includes a list of elements that are highly recommended, recommended, or not applicable (e.g., electric vehicle charging, bike share, etc.). It is important to note that design and access elements can vary significantly based on topography, property lines, and other local context factors.

Map 2-6. Mobility Hubs



Source: SCAG (2023)

2.17.5 MOBILITY AS A SERVICE (MAAS)

MaaS integrates transportation services into a single mobility platform that provides competitive alternatives over private vehicles, to promote universal basic mobility, encourage mode shift, and foster sustainable travel choices. It plays a critical role in providing trip planning and seamless fare payment options for easy access to transit/rail, first/last mile connections, and other travel options. Although it functions well where there's an existing integrated transportation network, it can help create the building blocks for integrated options to develop. MaaS is driven by data standardization and policies that support secured data sharing and interoperability by building on existing standards and principles including General Transit Feed Specification (GTFS), General Bikeshare Feed Specification (GBFS), mobility data specification and the mobility data interoperability principles. Effective data standardization can also support interoperability of transit/rail and other mobility services.

Figure 2-25. Mobility as a Service (MaaS)

Source: City Innovators by the Innovators Forum

Fare integration forms one of key components and facilitates travel through a common fare media, transfer policies, integrated policies that allow one fare to cover multiple modes for one trip (e.g., a free ride on the regional rail from the inter-city terminal and the use of a campus shuttle with paid parking). A complete fare integration and payment system can incorporate an open-loop payment, which can be modeled as a shared product system where services maintain their independence while users enjoy seamless trip planning. Open-loop payment systems involve standardized data sharing and service optimization among mobility providers. This can help optimize customer experience. From an equity standpoint, MaaS can help offer subsidies to transit/rail riders through existing and future programs. Los Angeles Metro's Low-Income is Easy (LIFE) program offers discounted weekly and monthly transit passes that can be shared by members of a family (1-6), with qualifying income. Through a MaaS model, a discount/subsidy layer could be added to a mobility account for disadvantaged and low-income families.

At the statewide level, the California Integrated Travel Project (Cal-ITP) is supporting the implementation of MaaS. Cal-ITP is an initiative of the California State Transportation Agency (CalSTA) and California Department of Transportation (Caltrans) to make riding public transportation simpler and more cost-effective for all. To do this, Cal-ITP aims to bring global standards for fare payment and real-time data to California transit agencies, along with seamless verification of eligibility for transit discounts. Cal-ITP is aiming to build and foster interoperable systems for payment and data sharing that give transit agencies control over their information and systems. Cal-ITP implementation is a key action identified in the state's Climate Action Plan (CAPTI) under Strategy S2, Support a Robust Economic Recovery by Revitalizing Transit, Supporting Zero Emission Vehicle Deployment, and Expanding Active Transportation Investments. Recently Cal-ITP is working with some transit agencies (several others considering) in the region to deploy open loop payments through the state's purchasing schedules for lowest rates on equipment and software.

Examples from across the region include:

- Anaheim Regional Transportation (ART), LADOT Commuter Express and Glendale Beeline are exploring open loop payment options or planning to utilize the state's purchasing schedules through Cal-ITP.
- Caltrans was recently awarded $7.7 million through the U.S. DOT FHWA Advanced Transportation Technology and Innovation (ATTAIN) program grant for the Southern California Mobility Wallet project to deploy open loop payment technology in Los Angeles County.

2.17.6 Dedicated Lanes/Transit Priority Treatments

As noted earlier, SCAG developed the Regional Transit Dedicated Lanes Study,[49] which identifies a regional network of dedicated bus lanes and other transit priority treatments. As the Study noted, the best transit service has reliability, speed, and convenience. Dedicated bus lanes address all these measures. They provide space for transit vehicles to operate separately from automobile traffic, improving reliability and reducing travel times. Other transit priority treatments, such as transit signal priority (TSP) and queue jump lanes, allow buses to bypass traffic. These treatments can reduce the transit travel time delay caused by traffic congestion and improve the reliability of transit schedules.

Examples from across the region include:

- Los Angeles County has several dedicated bus lanes and transit priority treatments, including:
    - LA Metro and LADOT have installed several miles of dedicated bus lanes throughout the city (e.g., peak hour bus lanes on Alvarado Street, 5th and 6th Streets, Aliso Street, Wilshire Boulevard). Peak hour bus lanes on Figueroa and Flower Streets include signal queue jumper.
    - LADOT has installed bus only lanes on North Spring Street.
- Culver City installed bus and bike mobility lanes on Culver and Washington Boulevards as part of MOVE Culver City project, which is an initiative to engage Culver City residents and businesses in the redesign of existing streets into mobility lanes on Culver and Washington Boulevard Downtown, Sepulveda Boulevard, and Jefferson Boulevard using the Quick-Build method. The goal is to prioritize moving people over cars in the design of a street, which benefits bus riders, bicyclists, and others.

- The City of Santa Monica has priority bus lanes on Lincoln Boulevard, part of Santa Monica Boulevard, and Broadway to 5th Street to Ocean Boulevard.

- As already mentioned, Omnitrans operates the sbX Greenline BRT in San Bernardino County, which includes TSP and segments of dedicated bus lanes in the City of San Bernardino.

- In San Bernardino County, the future West Valley Connector will have 3.5 miles of dedicated bus lanes on Holt Avenue in the City of Ontario. It will function as a 100 percent zero-emission Bus Rapid Transit (BRT) system, the first stage of the San Bernardino County zero-emission Bus Initiative and second BRT route in San Bernardino County. Phase I of the project is 19 miles and will upgrade a portion of existing Route 61, which runs along Holt Boulevard, adding approximately 3.5 miles as center running, dedicated bus-only lanes. There will be 21 stations in Phase I that will provide an improved transit connection to Ontario International Airport (ONT) and help build transit connectivity by linking ONT, two Metrolink lines (San Bernardino and Riverside) and multiple major activity centers along the route including Ontario Mills and Victoria Gardens.

- In Ventura County, Gold Coast Transit has installed right-turn only queue jump lanes for buses.

Figure 2-26. Bus-Only Lane on Venice Boulevard

Source: Courtesy of Los Angeles Metro

2.17.7 SHARED MOBILITY

Shared mobility is transportation services and resources that are shared among users, either concurrently or one after another. This includes public transit/rail; micromobility (bike sharing, scooter sharing); automobile-based modes (car sharing, rides on demand via Transportation Network Companies (TNCs) like Uber and Lyft); microtransit; and commute-based modes or ridesharing (carpooling and vanpooling). As noted earlier, the California State Legislature defines microtransit as "IT-enabled multi-passenger transportation services that serve passengers using dynamically generated routes and may expect passengers to make their way to and from common pick-up or drop-off points. Microtransit vehicles include, but are not limited to, large sport utility vehicles, vans, and shuttle buses."

Microtransit has emerged as a new form of technology-based public transit providing on-demand rideshare services, offering trips including first/last mile connections to transit/rail services and as an on-demand solution in areas underserved by fixed route services. Microtransit improves access to communities underserved by transit/rail, enhances fixed-route bus services and rail networks by increasing access and convenience, and has the potential to replace low-performing bus routes in low-density areas. The service can also be used to introduce a community to the use of public transit of all modes. With microtransit, a user can order a ride in real-time, through a smartphone app or desktop computer or via a landline and be picked up at the location of their choosing within an allocated travel zone and dropped off at another location of their choosing. In this way, microtransit mirrors the functionality of popular ride-hailing/ride-sharing services such as Uber and Lyft, with additional features for the public good including serving all customers in accordance with the Americans with Disabilities Act (ADA), whereas TNCs are exempt from compliance.

The COVID-19 pandemic resulted in service cuts and service reductions which affected millions of low-income transit/rail riders who were not able to work from home. For the purposes of ridership recovery and to address inequities, transit/rail agencies implemented microtransit services to promote accessibility for those who were underserved by traditional transit/rail networks. Microtransit continues to be deployed, though there are considerable challenges to deploying it effectively such as high operational costs, accurate demand prediction, and efficient route optimization. Finding a financially sustainable model while ensuring sufficient coverage and minimizing empty vehicle trips is a complex undertaking. Integration with existing transportation infrastructure and regulatory compliance further add to the challenges of implementing it.

Examples from across the region include:

- LA Metro's microtransit is branded Metro Micro and provides service in eight zones in Los Angeles County. In 2021, Metro Micro provided over 200,000 trips and the number has more than doubled in 2022 with over 500,000 trips.
- OCTA's OC Flex on-demand microtransit service provided about 16,725 trips in Fiscal Year 2020-21 and 23,043 trips in Fiscal Year 2021-22. Several additional deployments are underway in the region including one recently launched by the Riverside Transit Agency in late 2022.
- Several cities partner with Circuit, an on-demand app-based microtransit company to provide services in communities and Downtown core in the region – Santa Monica, Venice, and Marina Del Rey, Leimert Park, Culver City, Huntington Beach, Long Beach and Palm Desert.

2.17.8 TRANSIT-ORIENTED DEVELOPMENT (TOD)

As noted earlier, TOD focuses on creating compact, mixed-use communities centered around public transit/rail. It aims to promote sustainable and efficient development by integrating land use, transportation, and economic strategies. Mixed land use: TOD encourages a mix of residential, commercial, and institutional uses within a compact area. This helps create a diverse and vibrant community where people have easy access to various amenities.

- Higher density: TOD promotes higher population densities compared to traditional suburban development. By concentrating development around transit/rail nodes, more people can live and work in a smaller area, reducing the need for long commutes and supporting the viability of transit/rail.
- Pedestrian-friendly design: TOD prioritizes pedestrian access and creates safe and attractive walking environments. Streetscapes are designed to be inviting for pedestrians, with wider sidewalks, tree-lined streets, and pedestrian-oriented amenities.
- Transit/rail connectivity: The design of TOD includes well-designed, convenient, and accessible public transportation infrastructure. This may include dedicated bus lanes, bike sharing facilities, park-and-ride options, and seamless integration with different transit/rail modes.
- Reduced parking: TOD aims to minimize the need for excessive parking spaces by encouraging the use of public transportation and other sustainable modes of travel. Instead, emphasis is placed on creating walkable communities where residents have easy access to amenities.

The benefits of Transit-Oriented Development include reduced traffic congestion, improved air quality, increased mobility options, enhanced social interaction, and more efficient land use. TOD can also contribute to economic vitality by attracting investment, fostering job creation, and increasing property values in well-planned transit/rail-oriented areas. Across the region, there are a variety of examples of TOD. As noted earlier, current examples can be found near transit/rail stations in local jurisdictions such as Pasadena, Riverside, Santa Ana, Simi Valley, and Tustin. In terms of future plans for TOD, Metrolink is partnering with SCAG on a TOD study that is conducting a systemwide analysis of all Metrolink's 60 plus stations to determine which have the greatest potential for near-term TOD. The study will perform a detailed land use analysis of a final nine station areas to recommend strategies to spur development and is anticipated to be completed in 2024.

2.18 HOW WILL SCAG SUPPORT THE REGION?

We understand that progress towards achieving regional goals will be made primarily through implementation at the local level. We also know that there are strategies SCAG can support to help the region realize Connect SoCal 2024's vision. These SCAG-specific strategies are reflected in Appendix 4 and will be backed by the following near-term actions:

POLICY AND PLANNING

- Perform analytical studies to move forward the key strategies described. Additional planning efforts with respect to transportation demand management (TDM), intelligent transportation systems (ITS), active transportation, and pricing will also support and complement the advancement of Connect SoCal transit/rail strategies.

- Support transit/rail legislation: As documented in SCAG's legislative platform, SCAG supports legislation that advances regional transportation interests, including transit/rail. SCAG was recently appointed as a member on the Transit Transformation Task Force led by the California State Transportation Agency (CalSTA), established as part of SB125 to address transit recovery. The Task Force is responsible for developing recommendations to grow transit ridership, improve the transit experience and address long-term operational needs. Through the Task Force's resulting recommendations report, SCAG anticipates continuing to support legislation to improve transit in the state and the region.

DATA COLLECTION AND ANALYSIS

- Establish transit safety and transit asset management targets and maintain a transit asset management platform (TransAM) to support this work. As described below, as a Metropolitan Planning Organizations (MPO), SCAG is federally required to establish targets for in coordination with transit agencies and the state.
- Analyze, interpret, and share regional data via platforms such as TransAM, the Regional Data Platform, and Story Maps. Through platforms, monitor implementation progress across the region.
- Conduct transit/rail modeling to help the region understand the impacts of potential and planned projects, to support informed policy decision-making.

SUPPORTING LOCAL EFFORTS

- To the extent that SCAG is able, provide transit/rail planning technical assistance to support the development of plans, projects, or programs that implement the key strategies described in this chapter.
- Convene transit operators and local agencies on at least a quarterly basis to achieve better coordination and uplift best practices via the Regional Transit Technical Advisory Committee.
- Program local projects into the Federal Transportation Improvement Program (FTIP). Entering projects into the FTIP is a key step in the project development pipeline, particularly for projects using federal funds, requiring federal approvals or that are regionally significant.
- Assist in the distribution and administration of key Federal Transit Administration (FTA) formula funds. In particular, SCAG will continue to serve as the designated recipient for large UZAs for FTA 5307, 5337, and 5339 funds, as well as assisting with the pass–through of competitive 5312 and 5339 grants.

2.19 HOW WILL WE KNOW HOW WE ARE DOING?

Connect SoCal 2024's performance measures evaluate the performance of the previously referenced investments and strategies that will be implemented at the local, regional, and/or state levels. The Plan's performance is largely evaluated using a combination of modeling tools. The modeling results provide the basis for interpreting the anticipated outcomes of the Plan's investments and strategies. As noted in the Mobility Technical Report Overview, the Plan's performance measures are detailed in Appendix 3. Among the performance measures, those that correspond to transit/rail include trip distance, mode share, average travel time, travel time by mode, and major destination accessibility. These performance measures are

intended to help us understand how our future might appear – whether our region will become more connected and accessible and grow in ways that encourage livability.

To demonstrate the effectiveness of Connect SoCal 2024 toward achieving our regional vision and goals, SCAG conducted a 'Plan' vs 'No Plan' (or 'Baseline') analysis, which compares how the region would perform with and without implementation of the Plan. It is important to understand these terms:

- The region's 'Base Year' represents existing conditions as of 2019 – that is, the regional transportation system as it was operating on the ground and in service in 2019. The year 2019 was selected as the base year to avoid the COVID-19 pandemic irregularities that impacted travel behavior in 2020.
- 'Baseline' represents the future regional transportation system that will result from the continuation of current programs including projects currently under construction or undergoing right-of-way acquisition; those programs and projects programmed and committed to in the 2023 Federal Transportation Improvement Program (FTIP); and projects that have already received environmental clearance.
- 'Plan' represents future conditions in 2050 in which the investments and strategies detailed in Connect SoCal are fully implemented and benefits are realized.
- Note: Performance of the existing system was conducted using the most recent National Transit Database (NTD) data for the Base Year using Fiscal Year 2018-19 data.

Based on this analysis, SCAG found that in comparison to the 2050 Baseline, Connect SoCal 2024 will:

- Increase transit/rail use for work trips by 3.3 percent, as a result of improved transit/rail service, more transit-oriented, mixed-use development, and implementation of TDM strategies, including user pricing.
- Reduce vehicle miles traveled (VMT) per capita by 6.3 percent and person delay per capita by 23.8 percent (for all facility types) because of more efficient land use strategies and improved regional transit/rail service.
- Reduce average work trip distance for all modes by 1.7 percent.
- Increase transit boardings per capita by 64.2 percent.

Following the Plan's adoption, on-going monitoring of the Plan's performance helps ensure that the region is making progress towards achieving the established regional goals, and in some cases (e.g., transportation safety), interim targets allow for more near-term performance evaluation. Performance monitoring is key to understanding which investments and strategies are proving successful in meeting specific regional goals and which ones may require modification or reconsideration. In the long term, SCAG staff plan to monitor performance utilizing the following measures: average travel time, commute mode share, transit fatalities, transit system reliability and equipment condition, and transit boardings. More details on the Connect SoCal performance analysis and its results may be found in the Performance Monitoring Technical Report.

SCAG staff will also monitor transit performance as a part of the federally required target setting for transit safety and transit asset management (TAM). While transit/rail are among the safest surface transportation modes in the United States, federal transportation legislation includes specific mandates to strengthen the safety and resilience of transit systems. These efforts are detailed below.

FEDERAL TRANSIT PERFORMANCE REQUIREMENTS

Moving Ahead for Progress in the 21st Century Act (MAP 21) defined performance-based planning requirements for metropolitan transportation planning, including federally required performance measures specifically for TAM and for transit safety. As a Metropolitan Planning Organization (MPO), SCAG has responsibilities for coordination, target setting, and progress reporting as part of Connect SoCal and the Federal Transportation Improvement Program (FTIP), under the Metropolitan Planning Final Rule (23 CFR 450). These statutes and regulations guide the operation and delivery of transit and rail, specify requirements for providers and affect how transit must be considered in the federally defined metropolitan planning processes.

SCAG has metropolitan planning agreements in place with the County Transportation Commissions (CTCs) and transit providers that were updated in 2018 to incorporate provisions for data sharing and the coordinated development of transit performance targets.

Transit Asset Management (TAM) Rule

In July 2016, the FTA published the TAM Final Rule,[50] which outlined how agencies can increase system reliability and performance through adoption of a TAM Plan. The rule requires operators to adopt a TAM Plan and update it at minimum every four years, inventory their assets, set performance targets, produce a list of prioritized investments, and report to the NTD annually. The rule also requires operators to coordinate with their respective MPOs (SCAG) to set regional TAM targets. TAM requirements apply to all recipients and sub–recipients of federal financial assistance under Federal Transit Act Chapter 53 (49 USC, Chapter 53) that own, operate, or manage capital assets used in providing public transportation. The TAM Final Rule (49 CFR 625) establishes a National TAM System to monitor and manage public transportation capital assets to enhance safety, reduce maintenance costs, increase reliability, and improve performance.

In January 2022, the FTA published an update in accordance with the Bipartisan Infrastructure Law that continues the TAM program with two minor updates. The law requires the consideration of TAM plan elements in two other FTA programs:[51]

- Fixed Guideway Capital Investment Grants (Section 5309): Added a requirement to determine whether a project sponsor has made progress toward meeting their TAM performance targets.
- State of Good Repair Grants (Section 5337): Adds a requirement to consider whether an applicant has identified rail vehicle replacements as a priority in the recipient's TAM program.

The plan must include nine elements, but these requirements differ based on the size of the transit agency. The rule separates transit providers into two tiers. Larger operators, also called Tier I providers (with 101 or more vehicles in peak revenue service or operating rail fixed– guideway service), must cover all nine elements and must develop and implement an individual TAM plan. Small agencies (those with 100 bus vehicles or less and do not operate any rail service), and all subrecipients under the 5311 Rural Area Formula Program, and American Indian Tribe operators are classified as Tier II agencies, are only responsible to cover 1-4 in their TAM plans. These groups must participate in a group TAM plan by the state of direct recipients.

1. Asset Inventory
2. Condition Assessment of Inventoried Assets
3. Description of a Decision Support Tool
4. Prioritized List of Investments

5. Transit Asset Management and State of Good Repair Policies
6. Implementation Strategy
7. List of Key Annual Activities
8. Identification of Resources
9. Evaluation Plan

Selection of TAM Targets

TAM is meant to help prioritize funding in a way that maintains transit/rail assets in a state of good repair (SGR) based on the conditions and performance of the assets. The Final Rule requires transit agencies to set TAM performance targets based on SGR performance targets. The measures are divided into asset classes to specify useful life benchmarks (i.e., the expected life cycle or the acceptable period of use in service for a capital asset) by asset type.

The region's first TAM targets were integrated into Connect SoCal 2020. Since then, progress on the targets has been reported in the FTIP. SCAG has developed TAM performance targets for inclusion in this Plan, Connect SoCal 2024. The targets were developed in collaboration with County Transportation Commissions (CTCs) and the transit agencies in the region and are based on agency TAM plans and targets and transit agencies reported asset data and conditions through the SCAG TAM database portal (TransAM). These targets were identified based on the four FTA categories of assets—equipment, rolling stock, infrastructure, and facilities—and performance measures for each class. Table 2-2 describes the asset categories and measures. All vehicles are measured with Useful Life Benchmarks, and facilities require a condition assessment and the use of the FTA Transit Economic Requirements Model (TERM) model or a similar tool. In the region, only Metro and Metrolink are rail operators currently expected to address the infrastructure category.

Table 2-2. Transit Asset Management Requirements

Category	Asset Inventory	Condition Assessment	Performance Targets	Measure
EQUIPMENT	All non–revenue service vehicles and equipment >$50K used in the provision of public transit, except 3rd–party equipment assets (construction, service vehicles, maintenance)	Only equipment with direct capital responsibility, no 3rd–party assets	Only non–revenue service vehicles	Age (ULB) % of vehicles that have met or exceeded their ULB
ROLLING STOCK	All revenue vehicles used in the provision of public transit (railcars, buses, ferries)	Only revenue vehicles with direct capital responsibility	Only revenue vehicles by vehicle class/mode	Age (ULB) % of revenue vehicles within a particular asset class that have met/exceeded their ULB
INFRASTRUCTURE	All infrastructure used in the provision of public transit (fixed guideway, signal systems, structures, power)	Only infrastructure with direct capital responsibility	Only non–revenue service vehicles	Performance (%) % of track segments with performance restrictions by class
FACILITIES	All facilities used in the provision of public transit (excluding bus structures) (support, parking, passenger facilities)	Only facilities with direct capital responsibility (excluding bus structures)	Maintenance and administrative facilities, passenger stations, and parking facilities with direct capital responsibility	Condition (TERM) % of facilities with a condition rating below 3.0 on the FTA TERM scale

Source: Federal Transit Administration

The TAM targets (Table 2-3) were determined using weighted three-year county averages and based on operator targets. This approach was developed in collaboration with the CTCs and transit operators through the Regional Transit Technical Advisory Committee (RTTAC) and is consistent with the methodology used for the transit targets that were adopted as part of Connect SoCal 2020. This represents a reasonable approach, particularly as local funding decisions for transit are made at the county level. The development of these targets included consideration of the CARB Innovative Clean Transit (ICT) regulation (Cal. Code Regs. Tit. 13 § 2023.1), which requires all transit agencies to transition to 100 percent zero emission bus (ZEB) fleets by 2040. These aspirational targets maintain the current 2022 conditions and assets in a state of good repair through the Plan's horizon year but will require significant additional funding. In addition to incorporating the costs for deploying zero emission vehicles as required by CARB, this backlog is captured as part of the Plan's funding needed for overall transit operations and maintenance and preservation for the region.

Table 2-3. Transit Asset Management Targets

County	Rolling Stock (% of revenue vehicles > ULB)	Equipment (% of non-revenue vehicles > ULB)	Facilities (% of facilities < TERM scale 3)	Infrastructure (% of track segments with restrictions)
Imperial	0.0%	n/a	n/a	n/a
Los Angeles	17.4%	35.5%	1.5%	2.1%
Orange	12.7%	18.4%	0.0%	n/a
Riverside	5.3%	19.8%	8.7%	n/a
San Bernardino	6.2%	19.7%	10.3%	n/a
Ventura	12.2%	21.3%	0.0%	n/a
Metrolink	0.4%	50.5%	20.0%	1.8%
SCAG Region	**14.9%**	**34.1%**	**2.8%**	**1.9%**

Source: SCAG

Public Transportation Agency Safety Plan Rule

Similar to the TAM rule, in July 2018, the FTA published the Public Transportation Agency Safety Plan (PTASP) Final Rule, which became effective on July 19, 2019. The PTASP Final Rule (49 C.F.R. Part 673) requires certain operators of public transportation systems that are recipients or sub recipients of federal financial assistance under 49 U.S.C Chapter 53 to develop safety plans that include the processes and procedures necessary for implementing Safety Management Systems (SMS). SMS components of a safety plan include Safety Management Policies, Safety Risk Management, Safety Assurance and Safety Promotion. Transit agencies are meant to consider the results of asset condition assessments while performing safety risk management and safety assurance activities. The rule provides exemptions for commuter rail agencies regulated by the Federal Railroad Administration (FRA), ferries, and recipients that only receive federal financial assistance under Section 5310, Section 5311, or both.

The PTASP is intended to improve public transportation safety by guiding transit agencies to proactively manage safety risks in their systems. The PTASP must include seven safety performance targets by modal types, and transit agencies must coordinate with their respective MPOs to the maximum extent practicable,

in the selection of regional performance targets. Each transit agency must annually certify via FTA's Certification and Assurances process that its safety plan meets the requirements of the Final Rule.

As part of the Bipartisan Infrastructure Law, on February 17, 2022, the FTA published changes in the process for developing PTASPs, including the need to create safety committees for operators in large, urbanized areas and a requirement for operators in small, urbanized areas to include a frontline employee representative in the development of PTASPs.

Per the PTASP Final Rule, an operator is required to set safety performance targets based on the safety performance measures established in the National Public Transportation Safety Plan (NSP) based on four main categories – fatalities, injuries, safety events and system reliability by mode (Table 2-4). The thresholds for "reportable" fatalities, injuries, and safety events are defined in the NTD Safety and Security Reporting Manual.

Table 2-4. Transit Safety Performance Measures

Category	Performance Measure
Fatalities	Total number of fatalities reported to National Transit Database (NTD) and rate of reportable fatalities per total vehicle revenue miles by mode.
Injuries	Total number of injuries reported to NTD and rate of reportable injuries per total vehicle revenue miles by mode.
Safety Events	Total number of safety events reported to NTD and rate of reportable injuries per total vehicle revenue miles by mode.
System Reliability	Mean miles between major mechanical failures by mode

Source: Federal Transit Administration

To fulfil the requirements of the final rule, SCAG developed initial transit safety targets which were adopted by the Regional Council in June 2021. For Connect SoCal 2024, SCAG developed updated transit safety performance targets (Tables 2-5 to 2-7) in partnership with the CTCs and transit agencies. Following the same methodology that was used for the initial safety targets adopted by the Regional Council, the updated set of transit safety targets will be based on county weighted averages and agency PTASPs.

Table 2-5. Transit Safety Targets – Fixed Route

County	Fatalities	Fatality Rate*	Injuries	Injuries Rate*	Safety Events	Safety Events Rate*	System Reliability**
Imperial	0	0	14.0	0.00	28.0	0.24	102,868
Los Angeles	0	0	510.0	0.60	493.0	0.34	10,843
Orange	0	0	84.0	0.60	136.0	1.02	14,912
Riverside	0	0	22.0	0.20	31.0	0.23	16,255
San Bernardino	0	0	28.0	0.10	28.0	0.10	17,070
Ventura	0	0	6.0	0.20	17.0	0.17	24,045
SCAG Region	**0**	**0**	**663.0**	**0.50**	**733.0**	**0.37**	**12,868**

**Per 100K Vehicle Revenue Miles*
***Mean miles between mechanical failure*
Source: SCAG

Table 2-6. Transit Safety Targets – Demand Response

County	Fatalities	Fatality Rate*	Injuries	Injuries Rate*	Safety Events	Safety Events Rate*	System Reliability**
Imperial	0	0	7.0	0.00	10.0	0.20	36,595
Los Angeles	0	0	28.0	0.10	57.0	0.22	48,920
Orange	0	0	0.0	0.00	0.0	0.00	14,000
Riverside	0	0	7.0	0.10	9.0	0.19	16,205
San Bernardino	0	0	5.0	0.10	5.0	0.09	62,837
Ventura	0	0	5.0	0.30	9.0	0.23	41,899
SCAG Region	**0**	**0**	**52.0**	**0.10**	**89.0**	**0.16**	**43,066**

**Per 100K Vehicle Revenue Miles*
***Mean miles between mechanical failure*
Source: SCAG

The TAM targets (Table 2-3) were determined using weighted three-year county averages and based on operator targets. This approach was developed in collaboration with the CTCs and transit operators through the Regional Transit Technical Advisory Committee (RTTAC) and is consistent with the methodology used for the transit targets that were adopted as part of Connect SoCal 2020. This represents a reasonable approach, particularly as local funding decisions for transit are made at the county level. The development of these targets included consideration of the CARB Innovative Clean Transit (ICT) regulation (Cal. Code Regs. Tit. 13 § 2023.1), which requires all transit agencies to transition to 100 percent zero emission bus (ZEB) fleets by 2040. These aspirational targets maintain the current 2022 conditions and assets in a state of good repair through the Plan's horizon year but will require significant additional funding. In addition to incorporating the costs for deploying zero emission vehicles as required by CARB, this backlog is captured as part of the Plan's funding needed for overall transit operations and maintenance and preservation for the region.

Table 2-3. Transit Asset Management Targets

County	Rolling Stock (% of revenue vehicles > ULB)	Equipment (% of non-revenue vehicles > ULB)	Facilities (% of facilities < TERM scale 3)	Infrastructure (% of track segments with restrictions)
Imperial	0.0%	n/a	n/a	n/a
Los Angeles	17.4%	35.5%	1.5%	2.1%
Orange	12.7%	18.4%	0.0%	n/a
Riverside	5.3%	19.8%	8.7%	n/a
San Bernardino	6.2%	19.7%	10.3%	n/a
Ventura	12.2%	21.3%	0.0%	n/a
Metrolink	0.4%	50.5%	20.0%	1.8%
SCAG Region	**14.9%**	**34.1%**	**2.8%**	**1.9%**

Source: SCAG

Public Transportation Agency Safety Plan Rule

Similar to the TAM rule, in July 2018, the FTA published the Public Transportation Agency Safety Plan (PTASP) Final Rule, which became effective on July 19, 2019. The PTASP Final Rule (49 C.F.R. Part 673) requires certain operators of public transportation systems that are recipients or sub recipients of federal financial assistance under 49 U.S.C Chapter 53 to develop safety plans that include the processes and procedures necessary for implementing Safety Management Systems (SMS). SMS components of a safety plan include Safety Management Policies, Safety Risk Management, Safety Assurance and Safety Promotion. Transit agencies are meant to consider the results of asset condition assessments while performing safety risk management and safety assurance activities. The rule provides exemptions for commuter rail agencies regulated by the Federal Railroad Administration (FRA), ferries, and recipients that only receive federal financial assistance under Section 5310, Section 5311, or both.

The PTASP is intended to improve public transportation safety by guiding transit agencies to proactively manage safety risks in their systems. The PTASP must include seven safety performance targets by modal types, and transit agencies must coordinate with their respective MPOs to the maximum extent practicable,

The safety targets represent the transit operators' commitment to support safety management and provide resources and training, integrate safety as a primary principle and responsibility for all staff, and to ensure data-driven compliance measures and realistic targets inform operations and safety standards. The 2050 safety targets (Tables 2-8 to 2-10) also reflect the aspirational goals towards zero fatalities for the plan period, an aspirational future target for injuries and safety events rates that is 50 percent less than the current targets and an incremental future target for system reliability that is based on a static two percent annual increase in mean miles between mechanical failures (two percent relative to current targets).

Table 2-8. 2050 Transit Safety Targets – Fixed Route

County	Fatality Rate*	Injuries Rate*	Safety Events Rate*	System Reliability**
Imperial	0	0.00	0.12	154,302
Los Angeles	0	0.29	0.17	16,264
Orange	0	0.29	0.51	21,132
Riverside	0	0.11	0.12	24,383
San Bernardino	0	0.05	0.05	25,606
Ventura	0	0.08	0.09	36,067
SCAG Region	**0**	**0.25**	**0.19**	**19,301**

**Per 100K Vehicle Revenue Miles; **Mean miles between mechanical failure*
Source: SCAG

Table 2-9. 2050 Transit Safety Targets – Demand Response

County	Fatality Rate*	Injuries Rate*	Safety Events Rate*	System Reliability**
Imperial	0	0	0.10	54,892
Los Angeles	0	0.06	0.11	73,381
Orange	0	0	0.00	21,000
Riverside	0	0.07	0.09	24,307
San Bernardino	0	0.04	0.04	94,256
Ventura	0	0.15	0.12	62,849
SCAG Region	**0**	**0.05**	**0.08**	**64,599**

**Per 100K Vehicle Revenue Miles; **Mean miles between mechanical failure*
Source: SCAG

Table 2-10. 2050 Transit Safety Targets – Rail

County	Fatality Rate*	Injuries Rate*	Safety Events Rate*	System Reliability**
Los Angeles	0	0.23	0.08	75,936

**Per 100K Vehicle Revenue Miles; **Mean miles between mechanical failure*
Source: SCAG

2.20 WHERE DO WE GO FROM HERE?

As this chapter has detailed, the future of transit/rail in the region holds both challenges and opportunities, and though it is difficulty to precisely forecast its trajectory, we do know that climate change impacts and technological advances will continue, and with them, movement toward more sustainable transportation options. Through our outreach and engagement on the Plan, we have heard that many people feel they have limited reliable travel options besides driving to everyday destinations. If we can invest in transit/rail to make it more frequent, reliable, convenient, and connected to other modes, we can provide a viable option for current and future riders, and help build a more healthy, accessible, and connected region that is prepared for a resilient and equitable future. To get there, we need partnership across agencies and sectors to implement the strategies described within this chapter. We will also need integration across modes and compelling solutions that lie outside the purview of transit agencies and partners, some of which will be discussed in the next chapter that focuses on Active Transportation.

APPENDICES

1. Guiding Principles for Emerging Technology
2. Mobility Planning and Policy Context Table
3. Connect SoCal 2024 – Mobility Performance Measures Table
4. Connect SoCal 2024 – Mobility Strategies
5. High Quality Transit Corridors Methodology
6. Coordinated Human Services Transportation Plans and Regional Transit/Rail-related Plans
7. Regional Complete Streets Policy
8. Regional Bikeway Network
9. Regional Greenway Network
10. Active Transportation Plans – Regional Assessment
11. Comprehensive Multimodal Corridor Plans

2.21 ENDNOTES

[1] National Association of City Transportation Officials (NACTO). (n.d.). *Transit Street Design Guide*. https://nacto.org/publication/transit-street-design-guide/introduction/why/designing-move-people/
[2] *Public Transportation Facts.* (n.d.). American Public Transportation Association (APTA). https://www.apta.com/news-publications/public-transportation-facts/
[3] An Urbanized Area is a statistical geographic entity designated by the Census Bureau, consisting of a central core and adjacent densely settled territory that together contain at least 50,000 people, generally with an overall population density of at least 1,000 people per square mile.
[4] Federal Transit Administration (FTA). (n.d.). National Transit Database. https://www.transit.dot.gov/ntd
[5] SCAG. (2022). *Racial Equity Baseline Conditions Report.* https://scag.ca.gov/sites/main/files/file-attachments/2022racialequitybaselineconditionsreport_final.pdf
[6] Paul, J., & Taylor, B.D. (2022). Pandemic transit: examining transit use changes and equity implications in Boston, Houston, and Los Angeles. *Transportation.* https://doi.org/10.1007/s11116-022-10345-1
[7] SCAG. (2022). *Mobility Innovations and Pricing.* https://scag.ca.gov/sites/main/files/file-attachments/scag-mobility-innovations-and-pricing-report-final.pdf?1648504727
[8] APTA. (2020). *Economic Impact of Public Transportation Investment 2020 Update.* https://www.apta.com/wp-content/uploads/APTA-econ-impact-transit-investment-2020-ES.pdf
[9] Glaeser, E.L., Kahn, M.E., & Rappaport, J. (2008). Why do the poor live in cities? The role of public transportation. *Journal of Urban Economics, 63*(1), 1-24. https://doi.org/10.1016/j.jue.2006.12.004
[10] U.S. Department of Transportation (U.S. DOT). (2015, August 24). *Public Transportation Trips Per Capita.* https://www.transportation.gov/mission/health/public-transportation-trips-capita
[11] Taylor, B.D., & Morris, E.A. (2015). Public transportation objectives and rider demographics: are transit's priorities poor public policy?. *Transportation 42*, 347–367. https://doi.org/10.1007/s11116-014-9547-0
[12] Besser, L.M., & Dannenberg, A.L. (2005). Walking to Public Transit: Steps to Help Meet Physical Activity Recommendations. *American Journal of Preventive Medicine, 29*(4), 273-280. https://doi.org/10.1016/j.amepre.2005.06.010
[13] Ramesh Pokharel, Luca Bertolini, Marco te Brömmelstroet. (2023). How does transportation facilitate regional economic development? A heuristic mapping of the literature. *Transportation Research Interdisciplinary Perspectives*, Volume 19. https://doi.org/10.1016/j.trip.2023.100817
[14] American Public Transportation Association. (2020). Economic Impact of Public Transportation Investment. https://www.apta.com/research-technical-resources/research-reports/economic-impact-of-public-transportation-investment/
[15] Wasserman, J. L., Gahbauer, J., Siddiq, F., King, H., Ding, H., & Taylor, B. D. (2023). Financing the Future: Examining the Fiscal Landscape of California Public Transit in the Wake of the Pandemic. *UCLA: Institute of Transportation Studies.* http://dx.doi.org/10.17610/T6CC9P
[16] Manville, M., Taylor, B. D., & Blumenberg, E. (2018). Falling Transit Ridership: California and Southern California. *UCLA: Institute of Transportation Studies.* https://escholarship.org/uc/item/0455c754
[17] SCAG. (2022). *Racial Equity Baseline Conditions Report.* https://scag.ca.gov/sites/main/files/file-attachments/2022racialequitybaselineconditionsreport_final.pdf
[18] National Academies of Sciences, Engineering, and Medicine. (2021). An Update on Public Transportation's Impacts on Greenhouse Gas Emissions. *The National Academies Press.* https://doi.org/10.17226/26103
[19] California Air Resources Board (CARB). (2022). *California Greenhouse Gas Emissions for 2000 to 2020*

Trends of Emissions and Other Indicators.
https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf
[20] Universal basic mobility is the concept that everyone should have a decent range of affordable transportation options, regardless of socioeconomic status or ability. See Shared-Use Mobility Center, https://sumcmic.org/universal-basic-mobility-and-mobility-wallets-pilots/.
[21] Blumgart, J. (2022, June 24). For Mass Transit Agencies, a Fiscal Cliff Looms. *Governing*. https://www.governing.com/now/for-mass-transit-agencies-a-fiscal-cliff-looms
[22] Blumgart, J. (2022, June 27). For Mass Transit Agencies, a Fiscal Cliff Looms (Part II). *Governing*. https://www.governing.com/now/for-mass-transit-agencies-a-fiscal-cliff-looms-part-ii
[23] Wasserman, J. L., Gahbauer, J., Siddiq, F., King, H., Ding, H., & Taylor, B. D. (2023). Financing the Future: Examining the Fiscal Landscape of California Public Transit in the Wake of the Pandemic. UCLA: Institute of Transportation Studies. http://dx.doi.org/10.17610/T6CC9P
[24] Uranga, R. (2022, April 1). With crime up and ridership down, Metro struggles to move homeless people off trains. *The Los Angeles Times*. https://www.latimes.com/california/story/2022-04-01/la-metro-struggles-to-move-homeless-people-off-trains
[25] Loukaitou-Sideris, A., Wasserman, J. L, Caro, R., & Ding, H. (2020). Homelessness in Transit Environments Volume I: Findings from a Survey of Public Transit Operators. UC Office of the President: University of California Institute of Transportation Studies. Retrieved from https://escholarship.org/uc/item/55d481p8
[26] Loukaitou-Sideris, A., Wasserman, J. L, Caro, R., & Ding, H. (2021). Homelessness in Transit Environments Volume II: Transit Agency Strategies and Responses. *UCLA: Institute of Transportation Studies*. Retrieved from https://escholarship.org/uc/item/87b0v8cr
[27] City News Service. (2022, January 19). Homeless Man Charged With Murder in Unprovoked Attack of Nurse at Bus Stop. *NBC Los Angeles*. https://www.nbclosangeles.com/news/local/nurse-attack-homeless-downtown-la-murder-charge/2799658/
[28] Scauzillo, S. (2023, January 26). Metro will keep removing homeless when trains get cleaned but will explore solutions. *Los Angeles Daily News*. https://www.dailynews.com/2023/01/26/metro-will-keep-removing-homeless-when-trains-get-cleaned-but-will-explore-solutions/
[29] Barrero, J.M., Bloom, N., & Davis, S.J. (2021). Why Working from Home Will Stick. (Working Paper No. 28731). *National Bureau of Economic Research*. http://www.nber.org/papers/w28731
[30] Barrero, J.M., Bloom, N., & Davis, S.J. (2021). Why Working from Home Will Stick. (Working Paper No. 28731). *National Bureau of Economic Research*. http://www.nber.org/papers/w28731
[31] APTA. (2021). *Transit Ridership Report, Fourth Quarter 2020*. https://www.apta.com/research-technical-resources/transit-statistics/ridership-report/ridership-report-archives/
[32] Speroni, S., Taylor, B. D, & Garrett, M. (2023). The Future of Working Away from Work. *UCLA: Institute of Transportation Studies*. http://dx.doi.org/10.17610/T6H60S
[33] Bauck, W. (2022, August 12). *Extreme Weather Is Only Getting Worse. Can Cities Protect Public Transit?* Next City. https://nextcity.org/urbanist-news/extreme-weather-is-only-getting-worse.-can-cities-protect-public-transit
[34] First Street Foundation. (2023). *The 6th National Risk Assessment: Hazardous Heat*. https://report.firststreet.org/heat
[35] Brozen, M., Engelhardt, C., & Lipman, E. (2023) Are LA bus riders protected from extreme heat? Analyzing bus shelter provision in Los Angeles County. *UCLA Lewis Center for Regional Policy Studies*. https://www.lewis.ucla.edu/publications/do-la-bus-riders-have-shelter-from-the-elements/
[36] Brozen, M., Engelhardt, C., & Lipman, E. (2023) Are LA bus riders protected from extreme heat? Analyzing bus shelter provision in Los Angeles County. *UCLA Lewis Center for Regional Policy Studies*. https://www.lewis.ucla.edu/publications/do-la-bus-riders-have-shelter-from-the-elements/

[37] Hamilton, J., & Bosman, J. (2021, August 17). Heat Cracks Rails and Melds Wires as a Heat Wave Hobbles Transit Systems. *The New York Times*. https://www.nytimes.com/2021/08/17/us/heat-wave-public-transportation.html
[38] Schiller, P.L., & Kenworthy, J. (2017). An Introduction to Sustainable Transportation: Policy, Planning and Implementation (2nd ed.). *Routledge*. https://doi.org/10.4324/9781315644486
[39] Victoria Transport Policy Institute. (2016). *Transportation Cost and Benefit Analysis. Techniques, Estimates and Implications*. https://www.vtpi.org/tca/
[40] Please visit the following SCAG website for access to transit/rail adaptation and resilience resources: https://scag.ca.gov/transit-adaptation-and-resilience-planning.
[41] Brenda Dix (ICF), Hannah Wagner (ICF), Amanda Vargo (ICF), Gordon Proctor (Gordon Proctor & Associates), Shobna Varma (StarIsis), Gina Filosa (Volpe). (2023). Addressing Resilience to Climate Change & Extreme Weather in Transportation Asset Management. https://www.fhwa.dot.gov/asset/pubs/hif23010.pdf
[42] Manville, Michael, Taylor, Brian D., Blumenberg, Evelyn (2018, January). Falling Transit Ridership: California and Southern California. https://scag.ca.gov/sites/main/files/file-attachments/its_scag_transit_ridership.pdf
[43] Los Angeles County Metropolitan Transportation Authority (Metro). (2019). *Understanding How Women Travel*. https://libraryarchives.metro.net/DB_Attachments/2019-0294/UnderstandingHowWomenTravel_FullReport_FINAL.pdf
[44] SCAG. (2023). Connect SoCal 2024 - Public Participation and Consultation Technical Report.
[45] CALSTART. (2022). *Drive to Zero's Zero-Emission Technology Inventory Data Explorer Version 1.0* [Data set]. https://globaldrivetozero.org/zeti-data-explorer/ https://globaldrivetozero.org/tools/zeti-data-explorer/
[46] Tamaoki, M. (2020, October 28). *Caltrans Intercity Passenger Rail: Our strategy towards zero emission (Draft).*Division of Rail and Mass Transportation (DRMT), Caltrans. https://ww2.arb.ca.gov/sites/default/files/2020-10/Day%201%20Ext%205%20Caltrans%2020201026.pdf).
[47] Metrolink. (2021). *Climate Action Plan*. https://metrolinktrains.com/globalassets/about/agency/sustainability/climate-action-plan.pdf
[48] San Bernardino County Transportation Authority (SBCTA). (2022). *Zero-Emission Rail Technology*. https://www.gosbcta.com/wp-content/uploads/2022/12/ZEMU-Technology-Fact-Sheet-ENG-120522.pdf
[49] SCAG. (2023). *Regional Dedicated Transit Lanes Study*. https://scag.ca.gov/post/regional-dedicated-transit-lanes-study-0
[50] FTA Transit Asset Management (TAM) Final Rule, 49 C.F.R. § 625 (2016). https://www.govinfo.gov/content/pkg/FR-2016-07-26/pdf/2016-16883.pdf
[51] FTA. (n.d.). *Bipartisan Infrastructure Law Fact Sheet: Transit Asset Management*. https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-01/Fact-Sheet-Transit-Asset-Management.pdf

3. ACTIVE TRANSPORTATION

3.1 INTRODUCTION

Across the SCAG region, the option to walk, bike, or roll to destinations can differ depending on where you live, work, or go to school; your physical ability to take advantage of these modes; and the amount of ground you need to cover (e.g., traveling more than a half-mile by foot or a few miles via bike). Though the automobile and miles of streets and highways often come to mind when envisioning travel across Southern California, the region boasts roughly 9,000 miles of bikeways. Currently, half of all short trips, defined as those under two miles, are made by walking or bicycling. In recent years, bike share and scooter share programs have continued to expand, and though we do not currently have a complete inventory of pedestrian facilities across the region, we know that this network is also vast. In the best of cases, when departing on a trip, you may find low stress, separated bikeways or continuous and well shaded sidewalks. However, in other cases you may encounter no designated bikeways in situations that feel high stress (e.g., those adjacent to high-speed vehicle traffic) or sidewalks that are discontinuous, lacking curb ramps, or entirely missing. These sorts of trips may feel uncomfortable, unsafe, or at times, impossible.

Figure 3-1. Active Transportation

Source: Robert So via Pexels

This Active Transportation chapter aims to address the region's varying conditions, with the goal of providing more people with viable active transportation options. Like transit/rail, active transportation is critical for a variety of reasons, but especially for its intersection with the region's equity and climate change goals. Active transportation is a relatively affordable mode of transportation, particularly for individuals with limited financial resources, allowing them to save on transportation costs and allocate limited funds elsewhere in their personal budgets. It also enables access to essential services for those who do not have access to private vehicles. Encouraging more use of active transportation instead of personal vehicles

supports improved public health as well as reductions in greenhouse gas emissions and air pollution and aligns with the region's larger goals in these areas.

The Plan envisions a future in which the region has an abundance of safe, accessible, and connected active transportation options that get people to the places they need and want to go, whether that is to the neighborhood grocery store, a nearby transit/rail stop or station, a local park or school, or even work across town. This future is aligned with the larger vision for the region: to create a healthy, accessible, and connected region for a more resilient and equitable future. This Active Transportation chapter outlines how we can plan for this future, including a discussion on our existing conditions, challenges and opportunities, and key strategies.

3.2 WHAT IS ACTIVE TRANSPORTATION?

Before diving further into the topic, it is important to establish some common definitions. The term "active transportation" (also "non-motorized transportation") refers to human powered transportation, primarily walking and bicycling, and low speed electronic assist devices, including wheelchairs, electric bicycles (e-bikes), electric scooters (e-scooters), skates, and skateboards. More specific definitions of various types of active transportation are included below, along with transportation planning concepts that often intersect and support it.

BICYCLIST – To align with the California State Bicycle and Pedestrian Plan,[1] for the purposes of this Plan, a "bicyclist" is defined as "any person riding a bicycle or tricycle, including Class I and II e-bikes, cargo bikes, recumbent bikes, bikes with trailers, handcycles, or other variations."

PEDESTRIAN – To align with the California State Bicycle and Pedestrian Plan, a "pedestrian" is defined as "any person walking, skateboarding, using a wheelchair or other mobility device, or any other form of human-powered transportation other than a bicycle." This definition also includes motorized wheelchair users, who are considered pedestrians. For the purposes of this Plan, this chapter will generically refer to active transportation trips as bicycle and pedestrian trips, since these represent most active transportation trips, and a growing body of data and research is available to support the analysis of the effects of these trips on the broader mobility ecosystem.

VULNERABLE ROAD USERS – Both bicyclists and pedestrians are commonly recognized as "vulnerable road users" due to their lack of protection compared to those inside vehicles. However, measures such as off-street trails and on-street separated bikeways can enhance their safety. This vulnerability is particularly pronounced for certain groups, such as children, older adults, and individuals with disabilities, who may need extra time and specific information to navigate and crossroads safely and securely.

MICROMOBILITY – While not yet universally defined, "micromobility" has been used to describe low-speed, manually or electrically powered transportation devices designed for short-distance travel and are particularly helpful for supporting connections to and from transit/rail. These devices often share infrastructure and exhibit similar trip characteristics to traditional active transportation modes. Examples of micromobility devices include bicycles, e-bikes, e-scooters, and other small, lightweight, wheeled conveyances.[2] These mobility devices have attracted new users and have the potential to greatly increase the number of people using active transportation. Similarly, "shared micromobility" refers to shared-use fleets of small, fully or partially human-powered vehicles such as bike sharing and scooter sharing. The National Association of City Transportation Officials (NACTO)[3] defines "bike sharing" as the shared use of a fleet of bicycles (manual or e-bikes) which provides users with on-demand access to bicycles at a variety of

pick-up and drop-off locations for one-way (point-to-point) or roundtrip travel. Bike sharing fleets are commonly deployed in a network within a metropolitan region, city, neighborhood, employment center, and/or university campus. Scooter sharing, as defined by NACTO, involves the shared use of a fleet of e-scooters, enabling individuals to access e-scooters from different locations for on-demand trips. Scooter sharing models can include a variety of motorized scooter types, with the service provider typically handling charging, maintenance, and potentially parking.

QUICK BUILD – The term Quick Build is a relatively new term that describes an interim capital improvement project using durable, low-cost, short-term materials that is often supportive of active transportation (e.g., bike lanes, crosswalks, etc.). Quick Builds fall into a category somewhere between demonstrations and small infrastructure projects. What differentiates Quick Builds from other infrastructure improvements is that they are expected to be evaluated for a period of time after the initial implementation and modified (or removed) as necessary. A significant value of the Quick Build model is that by using low-cost materials and continued evaluation after implementation, local agencies have the ability to test out a new piece of infrastructure prior to committing to the full capital improvement. The flexibility to remove the project, if necessary, often eases initial concerns of trying something new from community members or local elected officials. To support local jurisdictions with project implementation, the California Department of Transportation (Caltrans) has been developing Quick Build guidance.[4] Note: while the term Quick Builds is new, the concept is not. Local agencies have been completing safety improvements with low-cost materials for many years (e.g., the Cities of Santa Ana, Los Angeles, Long Beach, and Burbank implemented Quick Builds more than 10 years ago), and often these projects were pilot projects with extended evaluation periods.

Figure 3-2. Quick Builds

Source: National Association of City Transportation Officials

SAFE ROUTES (TO SCHOOL, PARKS, TRANSIT, OR FOR OLDER ADULTS) – There a variety of Safe Routes Programs that aim to improve the safety of walking, bicycling, and other forms of active transportation for students and community members. These programs typically focus on promoting and enabling safe routes to schools, but they can also extend to other areas within communities (e.g., parks, transit, places older adults consider destinations). The primary goal of Safe Routes Programs is to encourage and facilitate active transportation options while enhancing the safety and accessibility of routes used by people walking, biking, or rolling. These programs often involve a combination of infrastructure improvements, educational campaigns, and policy changes to create safer environments for using active transportation. Safe Routes Programs can have numerous benefits, including improved safety, reduced traffic congestion around schools, increased physical activity levels, improved air quality, and strengthened community connections. The SCAG region benefits from having robust Safe Routes efforts across most of the counties and numerous cities, with 49 percent having completed Safe Routes to School (SRTS) Plans and another five percent reporting that their SRTS Plans are in progress. To review a regional assessment of active transportation-related plans, please see Appendix 10. Examples of recently completed plans include Orange County Transportation Authority's (OCTA's) Safe Routes to School Action Plan,[5] and the Cities of La Puente,[6] Lynwood, and San Gabriel Safe Routes to School Plans. Support for those pursuing Safe Routes plans, projects, or programs can be found via Safe Routes Partnership.[7]

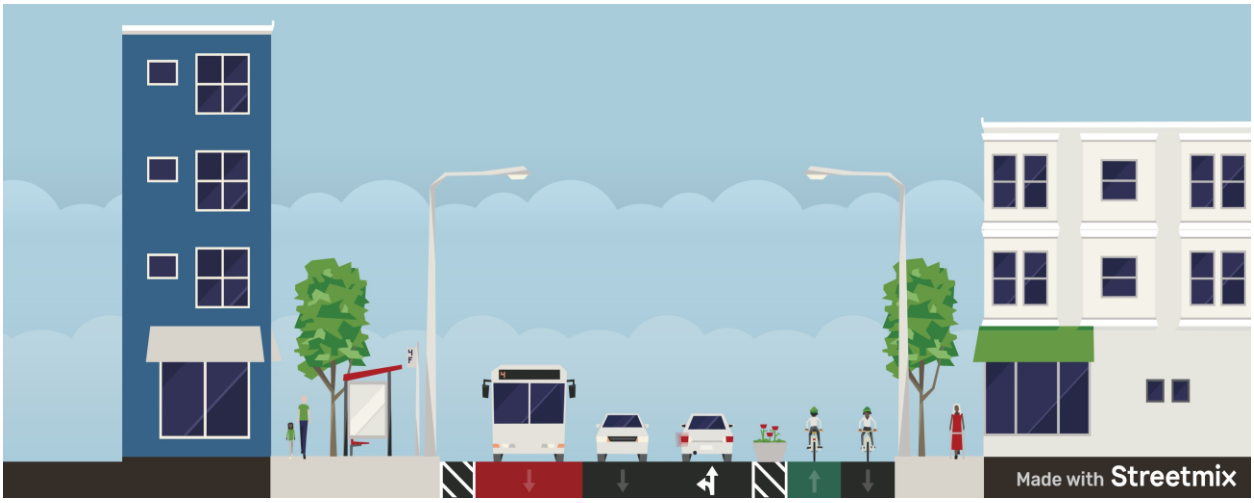
FIRST/LAST MILE – Integrating and connecting active transportation with other modes, such as transit/rail, and addressing gaps in the existing transportation network, are necessary for enhancing the convenience, safety, and reliability of travel across the region. The phrase "first mile/last mile" describes situations where travelers are trying to travel from their starting point to a transit/rail stop or station, and from the stop or station to their final destination. Since many transit/rail riders need to walk, bike, or roll to transit/rail stops or stations, making the first mile/last mile of transit/rail trips accessible to all modes, ages, and abilities, makes transit/rail available to a wider population. For example, the Los Angeles County Metropolitan Authority (LA Metro or Metro) has reported that more than 90 percent of its customers walk, bike, roll, or take transit (i.e., a bus) to Metro Rail/Bus Rapid Transit stations or stops.[8]

MOBILITY HUBS – Mobility hubs are places where people can seamlessly connect with multiple modes of transportation in a safe, comfortable, and accessible environment. Mobility hubs are locations where there are a range of transportation options (but typically at least two) that connect and interact with each other. They are intended to serve as the nucleus of the physical infrastructure in a Mobility as a Service (MaaS) system, and may include transit/rail, active transportation, and shared vehicles. They may also include electric vehicle charging stations. Mobility hubs are the infrastructure foundation for multimodal trip planning and promoting mode shift and are considered essential for a safe and convenient transfer between transportation modes. Since Connect SoCal 2020 was adopted, OCTA adopted the Orange County Mobility Hubs Strategy, which establishes principles and guidelines for mobility hub planning, and identifies areas of high potential for future mobility hubs network based on mode shift and vehicle miles traveled. In addition, the I-710 North Mobility Hubs Plan was also recently completed, which identifies future mobility hub locations in the area bounded by Los Angeles Union Station, the South Pasadena L (Gold) Line Station, the Los Angeles County Public Works headquarters in Alhambra, California State University, Los Angeles, and the surrounding neighborhoods.

COMPLETE STREETS – Complete Streets are streets that are planned, designed, built, operated, and maintained to support safety, comfort, and mobility for all road users instead of the speed of cars and the flow of traffic. These streets provide for people of all ages and abilities, regardless of whether they are driving, walking, bicycling, rolling, or riding transit, while also considering goods movement. Complete Streets approaches can vary considerably based on community context and needs and types of mobility

devices. Essentially, there is no universal, prescriptive design. Some streets may be prioritized for walking, others for taking transit, and some for a combination of a variety of modes and uses; it is a layered approach. These streets may include a variety of elements, such as sidewalks, bicycle lanes or paths, dedicated bus lanes, transit stops, safe crossing opportunities, median islands, accessible pedestrian signals, commercial delivery zones, curb extensions, landscape treatments, cool pavements, and other urban heat mitigation aspects. The goal is for these streets to comprise a safe multimodal network with facilities for all types of users. In addition, these streets contribute to advancing regional resilience by supporting more non-auto travel, thereby reducing greenhouse gas emissions impacts. Complete Streets also advance equity by providing more accessible and affordable travel options.

Figure 3-3. Complete Streets



Source: Streetmix

3.3 HOW DID THE COVID-19 PANDEMIC IMPACT ACTIVE TRANSPORTATION?

The COVID-19 pandemic had a significant impact on active transportation, including:

- **Surge in Active Transportation:** The pandemic positively impacted the use of active transportation. Initially, staying closer to home showed many people what their communities could be like with less traffic, noise, congestion, and pollution. Bicycling and walking were regarded as reliable and resilient options because they enabled physical distancing and carried a low risk of contracting or spreading COVID-19.[9]
- **Bicycle Sales:** Many individuals and families purchased bicycles, including e-bikes, as a means of transportation, exercise, and recreation. The demand for bicycles skyrocketed, leading to shortages in supply and increased prices. Estimates for e-bike sales in 2019 were 250,000 nationally, approximately 450,000 in 2020, and nearly 790,000 in 2021.[10] According to the National Bicycle Dealers Association, in 2022, e-bike sales increased by 33 percent.[11]
- **Expanded and New, Adaptive Types of Active Transportation Infrastructure:** Numerous communities reconsidered how public space was allocated and several prioritized opening up streets to bicyclists and pedestrians to make it easier to physically distance from others while traveling to essential businesses and work and engaging in recreation.[12] There were slow streets,

open streets, shared streets, pop-up bike lanes, widened sidewalks for pedestrians, and the introduction of traffic calming measures to improve safety and encourage active transportation. Many of these treatments are detailed in NACTO's Streets for Pandemic Response and Recovery report.[13]

- **Transportation Safety Issues:** Since 2019, the last pre-pandemic year, pedestrian fatalities have surged by 12.6 percent. A variety of factors are thought to have contributed to this rise, including changing commute patterns (e.g., traffic being spread more evenly throughout the day) and increases in risky driver behaviors, such as speeding, failure to wear seatbelts, and driving under the influence. All of these factors support the enduring need for the implementation of a Safe System approach.
- **Equity Considerations:** The pandemic highlighted existing equity issues related to active transportation. Priority Equity Communities, which often face limited access to safe walking and bicycling infrastructure, experience disparities in accessing active transportation options. Efforts were made to address these disparities by prioritizing equitable distribution of resources and infrastructure improvements in underserved areas.

It is important to note that while the pandemic initially led to increased active transportation use, the long-term sustainability of these changes will depend on various factors, including post-pandemic travel patterns, ongoing infrastructure investments, and individuals' preferences and behaviors.

3.4 WHERE ARE ACTIVE TRANSPORTATION FACILITIES?

Active transportation networks include sidewalks, walking paths, bikeways, regional trails, and other transportation infrastructure that can be used by people walking, bicycling, and rolling. These networks have not always been well documented, and efforts are underway throughout the region to develop a full accounting of the existing networks. It is important to consider that not all active transportation infrastructure is equal, so the classification of the type of bikeway, sidewalk width, the presence of curb ramps, or regular and adequate crossings, for example, is essential. For active modes in particular, a connected, low-stress network can make the difference in whether a person feels comfortable taking an active mode versus driving or taking transit/rail.

3.4.1 EXISTING PEDESTRIAN NETWORK

Walking is the most basic form of transportation, and it can be for utilitarian, commute, recreational or fitness purposes. At this point, no comprehensive inventory of pedestrian facilities exists for the SCAG region. However, in recent years larger agencies such as the Orange County Transportation Authority and the San Bernardino County Transportation Authority,[14] as well as local agencies, such as the City of El Monte,[15] have completed inventories of existing sidewalks and detailed sidewalk needs assessments to better inform planning efforts.

Though there is not a complete accounting of facilities, we do know that across the region, there are significant gaps in the pedestrian network, including missing sidewalks, sidewalks in poor repair, lack of shade, missing curb ramps that hinder accessibility, and excessive spacing between safe crossings that cause people walking to go far out of their way or put themselves in danger crossing midblock. Additionally, people walking in the region often encounter sidewalks blocked by utility poles, utility boxes, cars jutting out of driveways, trash bins, signs, or improperly parked micromobility devices. To address these issues, nearly half of the cities in the SCAG region have developed, or are in the process of developing, pedestrian

master plans that aim to improve the existing pedestrian networks and fill in gaps to get more people safely walking.

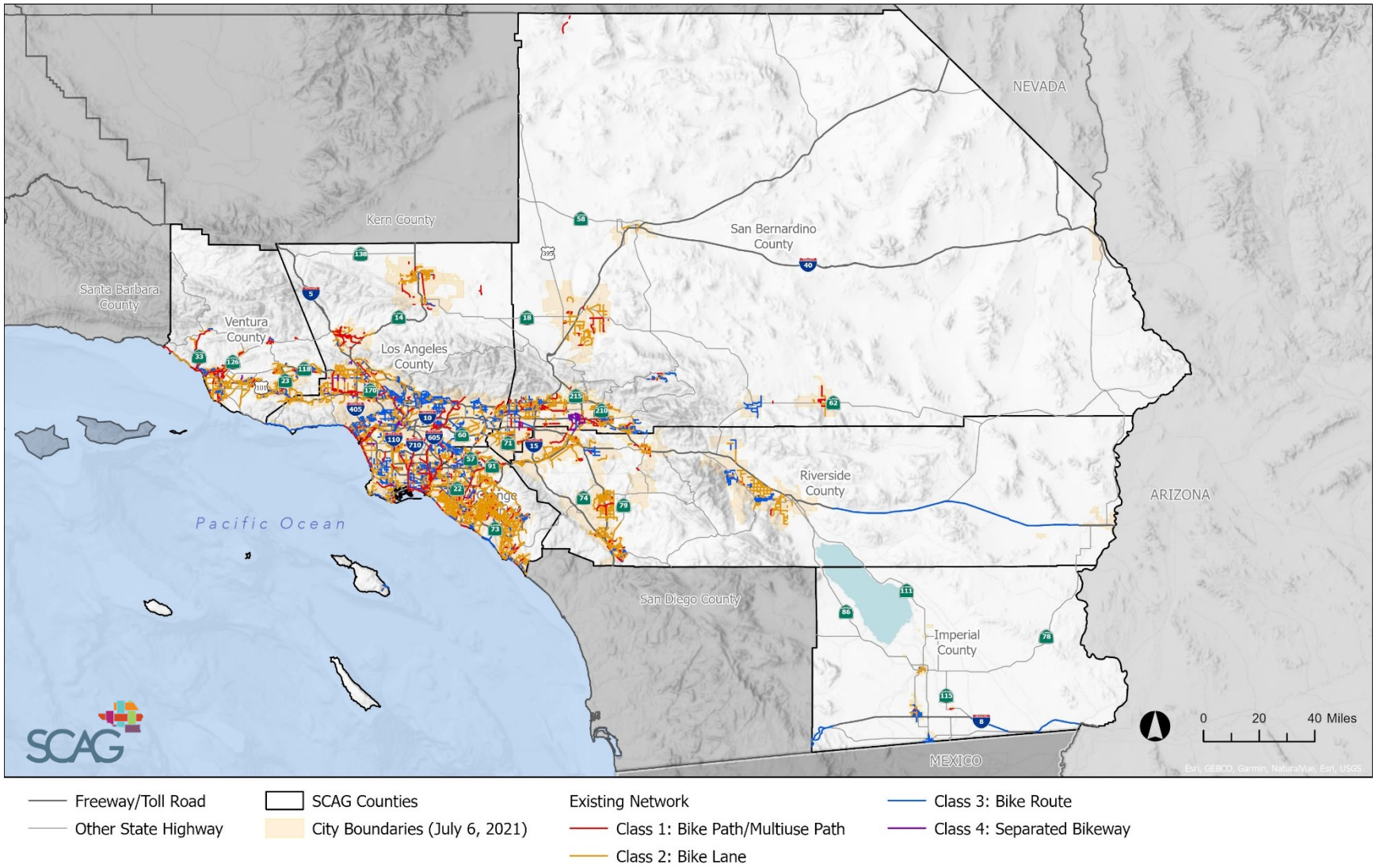
3.4.2 EXISTING BIKEWAY NETWORK

Bicycling can be entirely human-powered or electric. Like walking, bicycling is an affordable and environmentally friendly transportation mode, and it can be for utilitarian, commute, recreational or fitness purposes. The region is home to approximately 9,000 bikeway miles. Total bikeway mileage by county is detailed in Table 3-1. More than 1,000 additional miles of bikeways were added to the network since the last Plan was adopted.[16] Local jurisdictions and counties have developed series of bikeway routes to improve the connectivity of the overall existing bikeway network (Map 3-1). More information regarding existing and proposed bikeway networks for each county can be found in Section 3.14 and Appendix 8.

The Caltrans Highway Design Manual currently classifies bicycle lanes, bicycle paths, and routes by the following method (Figure 3-4):

- **Class I:** Also known as bicycle paths, shared-use paths or bicycle trails, a Class I bikeway provides a completely separated right-of-way designated for the exclusive use of bicyclists and/or pedestrians. Class I bikeways are typically associated with a level-of-traffic stress (LTS) 1. The SCAG Region includes nearly 900 miles of Class I bikeways.
- **Class II:** Often referred as a bicycle lane, a Class II bikeway provides a striped lane for one-way bicycle travel on a street or highway. Buffered bicycle lanes included greater striped separation from travel lanes than traditional bicycle lanes. Class II bikeways are typically associated with a level-of-traffic stress (LTS) 3. The SCAG Region includes about 3,000 miles of Class II bikeways.
- **Class III:** Also known as a bicycle route, a Class III bikeway provides for shared use with motor vehicle traffic or pedestrians (though the use of sidewalks as a Class III bikeway is strongly discouraged), designated by signs or pavement markings, but have no separated bicycle right-of-way or lane striping. Class III bikeways are typically associated with a level-of-traffic stress (LTS) 3. The SCAG Region has approximately 1,200 miles of Class III bikeways.
- **Class IV:** Also known as a cycle track, a Class IV bikeway provides a right-of-way designated exclusively for bicycle travel within a roadway and is protected from other vehicle traffic with devices, including, but not limited to, grade separation, flexible posts, inflexible physical barriers, or parked cars. Class IV bikeways are typically associated with a level-of-traffic stress (LTS) 2. The SCAG Region currently has almost 20 miles of Class IV bikeways.

Map 3-1. Overall Existing Bikeway Network



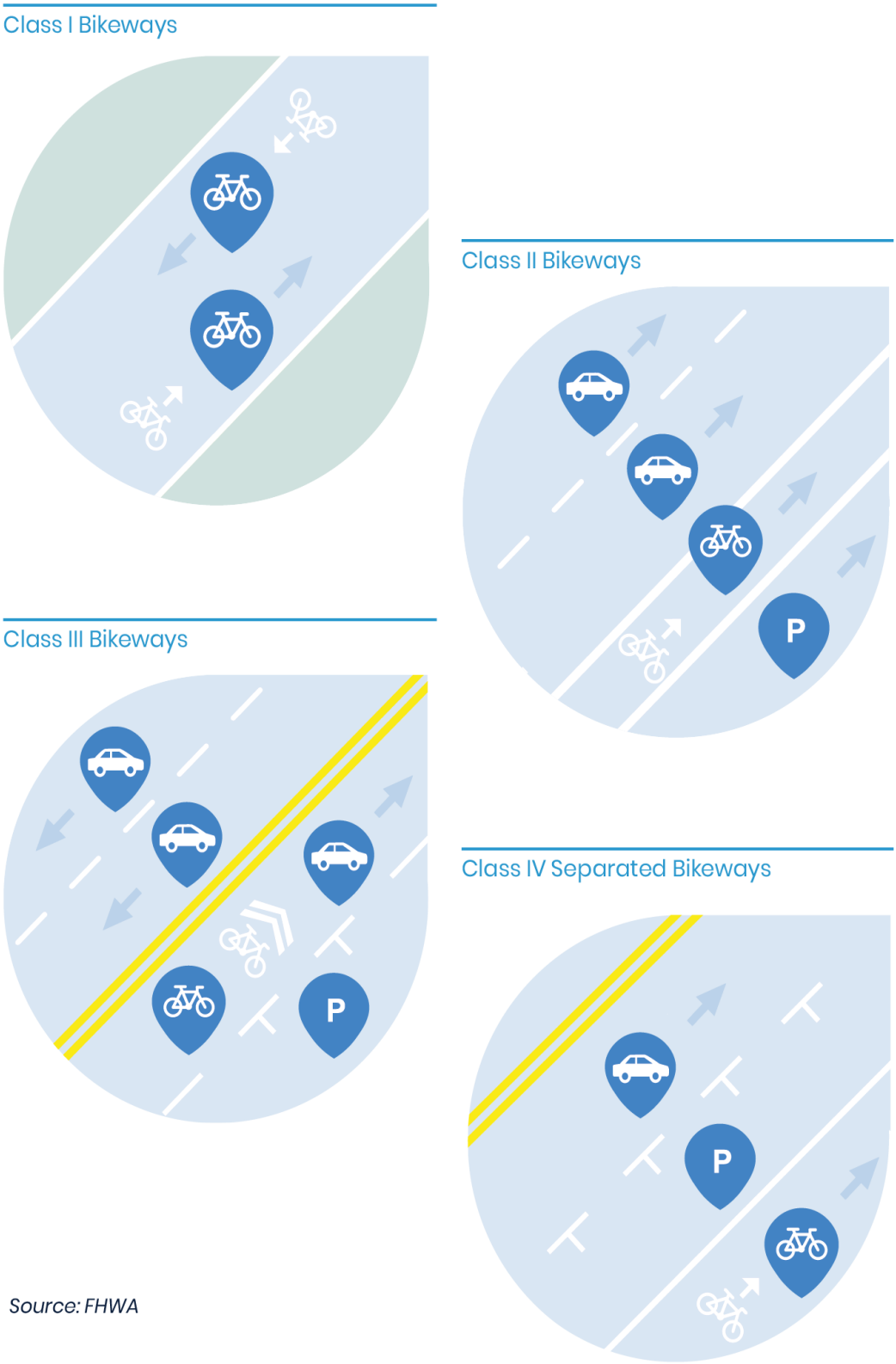
Source: SCAG (2023)

Table 3-1. Bikeway Mileage by County

	Class 1		Class 2		Class 3		Class 4		Class N/A	
County	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned
Imperial	617.75	105.83	1.33	76.65	13.39	486.74	77.91	44.15	-	-
Los Angeles	355.71	350.30	1257.74	1661.69	714.36	1792.80	40.10	367.30	4322.02	2517.82
Orange	267.90	211.33	794.59	405.55	115.37	138.97	5.68	32.99	807.62	1201.24
Riverside	58.27	439.61	454.68	1161.75	162.80	216.77	1.39	8.70	1870.06	720.37
San Bernardino	146.04	467.67	425.15	1236.69	149.67	503.90	25.75	30.62	2259.46	767.20
Ventura	89.36	31.22	416.48	51.59	97.48	22.37	2.55	-	221.14	721.82

Source: SCAG (2023)

Figure 3-4. Classifications: Caltrans Highway Design Manual



Source: Federal Highway Administration (FHWA)

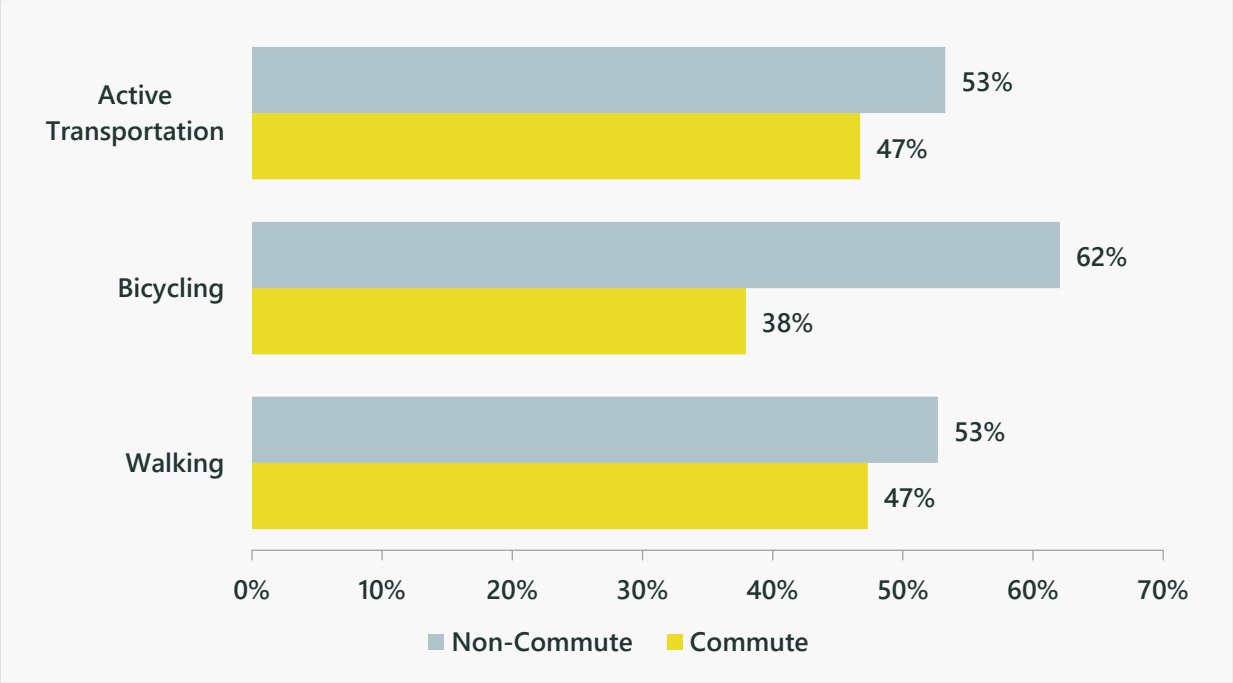
3.5 HOW IS ACTIVE TRANSPORTATION CHANGING IN THE REGION?

Walking, biking, and using micromobility devices are often considered localized activities as these trips tend to be shorter than the distance you would cover if driving or taking transit/rail. The state of active transportation networks and levels of walking, biking, and using micromobility devices vary considerably across the region.

3.5.1 COMMUTE TRENDS

Although current data on the number of people walking, bicycling, and using micromobility devices for all trips are difficult to obtain, the American Community Survey (ACS) tracks the number of people walking and bicycling to work in the SCAG region, which can be used to track general trends over time. Unfortunately, the data is often a bit dated (i.e., not provided in real time or soon thereafter). Also, it is important to note that this data may not provide a comprehensive understanding of the total number of trips being taken by bicycle or walking since work trips are generally longer trips and the ACS data do not reflect the complete travel patterns of active transportation users. Also, generally commute trips are a smaller share of active transportation, with non-commute outpacing commute for both walking and bicycling (Figure 3-5).

Figure 3-5. Active Transportation for Commute and Non-Commute Trips

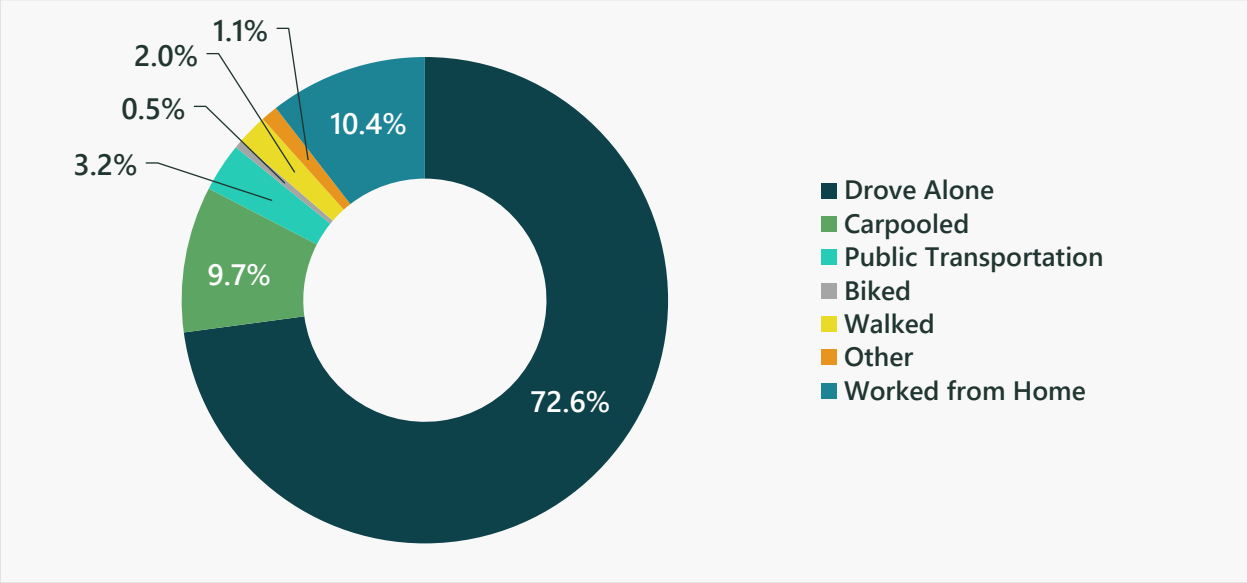


Source: National Household Travel Survey (2017)
Note: Numbers may not sum to total due to rounding

In the SCAG region, there are an estimated 8,722,201 workers aged 16 years and over, and nearly three-quarters of those workers drive alone to work (2021). Overall, two percent of commuters walk to work and half a percent bike to work (Figure 3-6). This reflects a drop from the prior year of analysis (2017) when the commute share for these modes was roughly three percent. While there was a drop across the region,

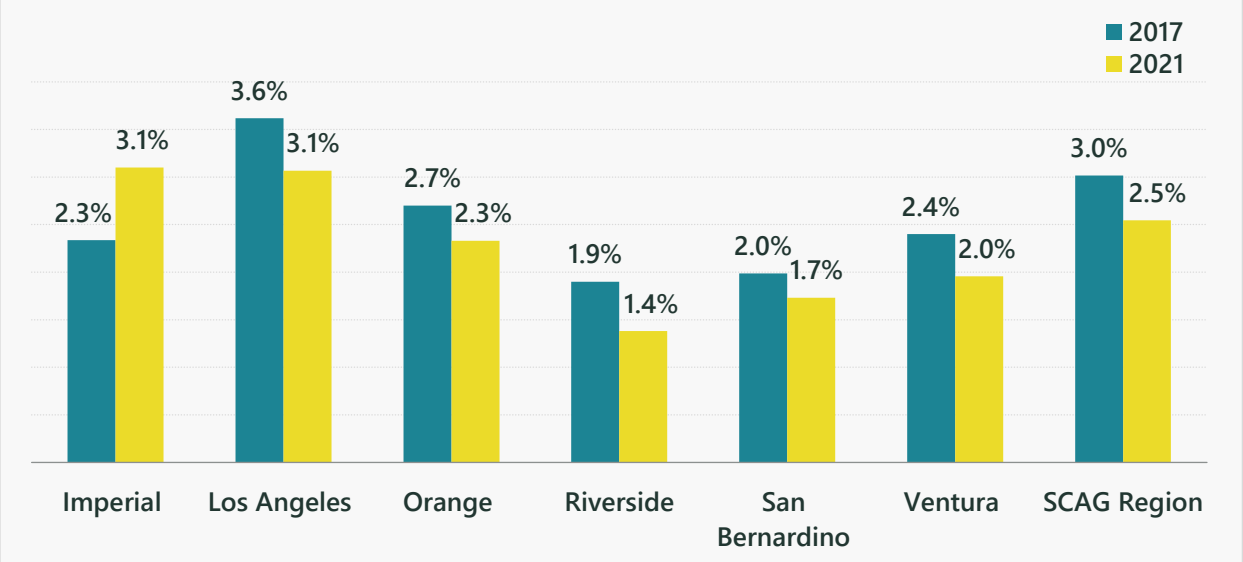
Imperial County experienced a marginal increase in its share of active transportation (walking and biking) commuters (Figure 3-7).

Figure 3-6. Commute Mode Share in SCAG Region (2021)



Source: U.S. Census Bureau American Community Survey, 2017-2021 Five-Year Estimates, Table B08301
Note: Numbers may not sum to total due to rounding

Figure 3-7. Active Transportation Commute Mode Share by County for 2017 and 2021

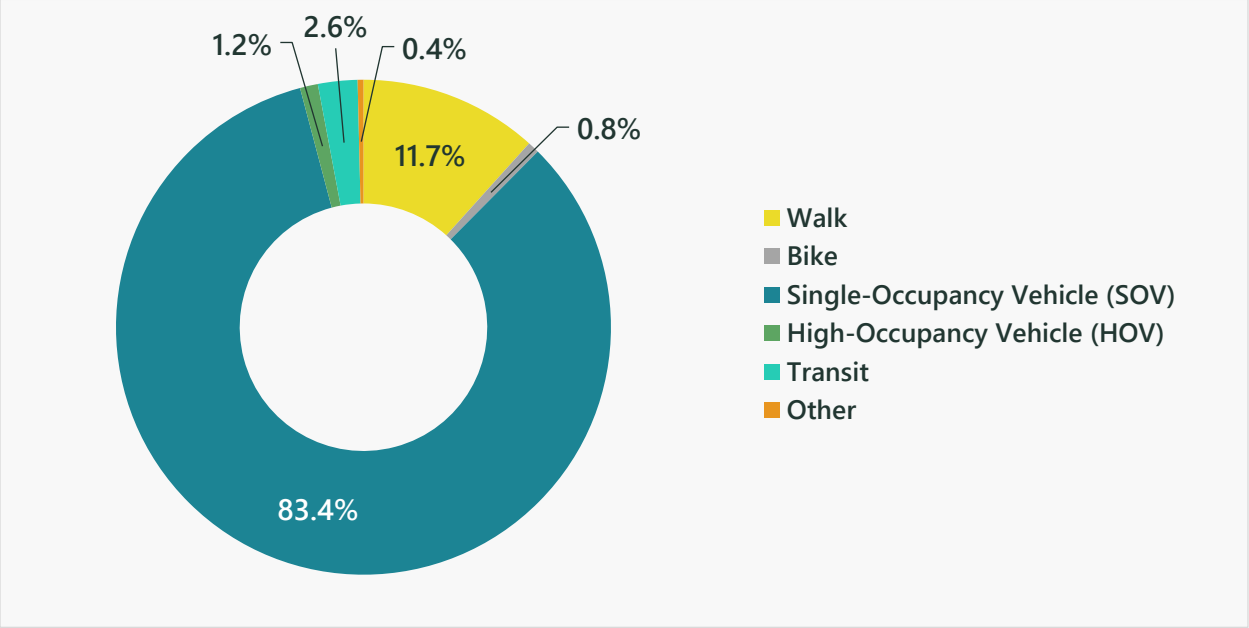


Source: U.S. Census Bureau American Community Survey, 2013-2017 and 2017-2021 Five-Year Estimates, Table B08301
Note: Numbers may not sum to total due to rounding

3.5.2 WALKING TRENDS

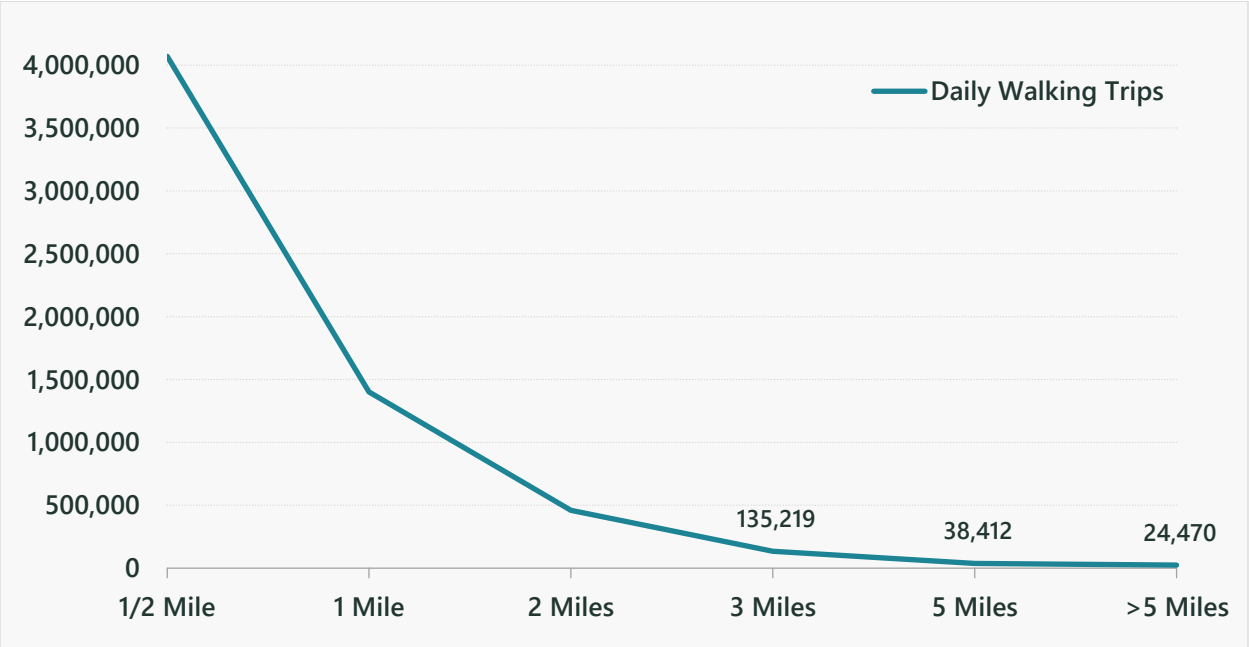
Walking is the most popular form of transportation for all trips within a half-mile distance, constituting approximately 61.5 percent of all such trips in the SCAG region. Additionally, walk trips comprise an average of 11.7 percent of all trips in the region (Figure 3-8). As for school-related travel, walking is the second most popular choice, with 12.9 percent of all trips to school completed on foot, compared to 79.3 percent driven. Notably, about 66.4 percent of walking trips are under half a mile, while 89.3 percent are less than one mile (Figure 3-9). The slower pace and localized nature of walking foster opportunities for neighbors to connect and build a sense of community.

Figure 3-8. Mode Split for All Trips



Source: National Household Travel Survey (2017)
Note: Numbers may not sum to total due to rounding

Figure 3-9. Total Number of Walking Trips, by Distance

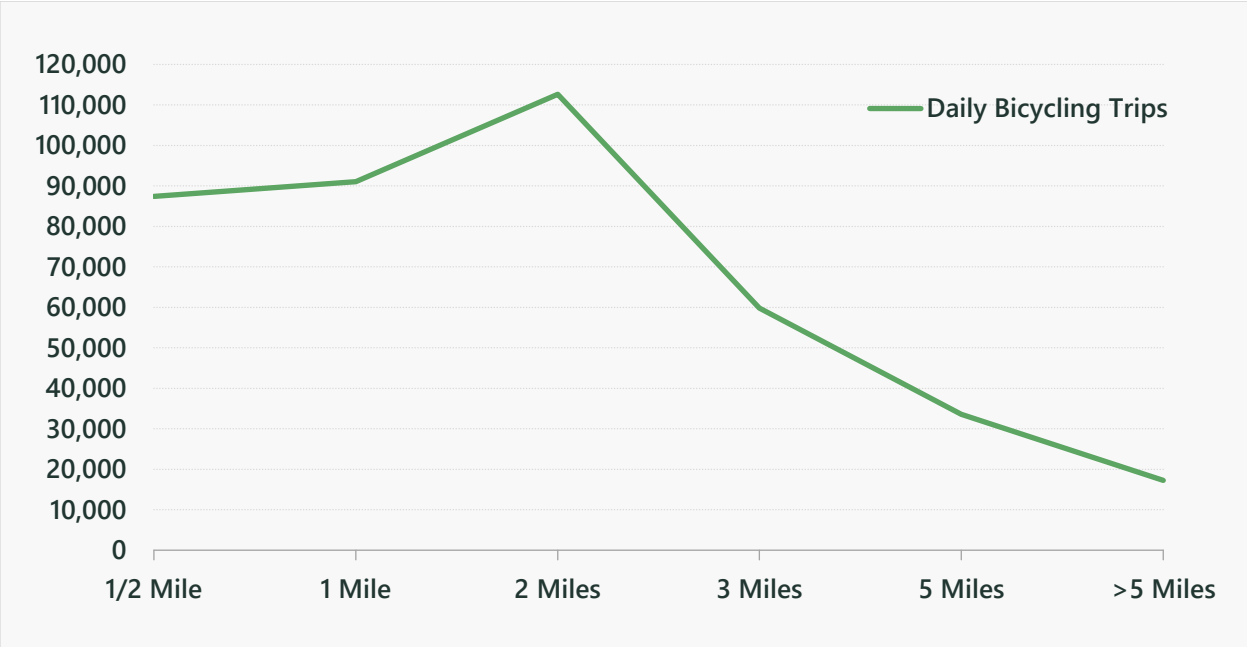


Source: National Household Travel Survey (2017)

3.5.3 BICYCLING TRENDS

Every day in the SCAG region, approximately 400,000 trips are taken by bicycle, covering an average distance of 2.1 miles (Figure 3-10). These bicycle trips account for 0.8 percent of all trips, and about 90 percent of them take 30 minutes or less. The majority of bicycle trips are less than one mile, indicating that bicyclists may be intentionally reducing their exposure to motor vehicle traffic. To increase the percentage of bicyclists beyond the core committed group, it is important to analyze the existing bicycle network's level of comfort. Researchers from the Mineta Transportation Institute[17] proposed a scheme for classifying road types by one of four levels of traffic stress (LTS) that corresponds to the needs of different types of bicyclists (Table 3-2). The level of stress is determined by the physical criteria of a roadway as well as traffic conditions and their contributions to the experience bicyclists have when riding.[18] Creating a continuous low-stress bicycle network by minimizing or eliminating these factors can help make bicycling more appealing to a broader segment of the population. While the LTS analysis focuses on bicycle travel, improvements for bicyclists generally result in improved conditions for pedestrians as well. This is particularly true for crossing conditions, as improvements are measured in terms of reduced exposure to motor vehicle travel speed and the number of travel lanes crossed.[19]

Figure 3-10. Number of Daily Bicycle Trips by Distance



Source: National Household Travel Survey (2017)

Table 3-2. Bicyclist Classification - Level of Traffic Stress

Level of Traffic Stress (LTS)	Description
LTS 1	The level that most children can tolerate and at which riders of all ages feel comfortable. Corresponds to riding in Class I Bikeway (bicycle path, shared-used path or bicycle trail) completely separated from motor vehicles.
LTS 2	Suitable to most adult bicyclists but demanding more attention than might be expected from children. Corresponds to riding in Class IV bikeway (physically separated bicycle lane) or a shared road with occasional motor vehicles.
LTS 3	Level comparable to riding in Class II Bikeways (non-physically separated bicycle lanes) or Class III bikeway (bicycle routes) with moderate or low speed.
LTS 4	Level corresponding to riding in mixed traffic at 35 mph or more or in bike lanes or shoulders next to traffic at highway speeds.

Source: Mekuria, Furth and Nixon. (2012). Low Stress Bicycling and Network Connectivity

3.5.4 MICROMOBILITY TRENDS

While securing micromobility (bike/scooter share data) for the region is a challenge, a recently published report by the North American Bikeshare and Scootershare Association, Shared Micromobility: State of the Industry Report,[20] provides helpful insights. In 2022, shared micromobility ridership across North America returned to pre-pandemic levels, with approximately 157 million trips taken in 401 cities. Systems have been expanding, with the highest number of shared micromobility vehicles deployed to date (289,000). In 2022, the number of e-bikes available through these systems increased by 71 percent from 2021, and the number of e-scooters increased by 28 percent. Despite the COVID-19 pandemic, bike share trips taken on e-bikes continued to increase over time, from seven million in 2019 to almost 31 million in 2022. About 65 percent of total shared micromobility trips taken in 2022 were made on e-bikes and e-scooters, and they accounted for well over half of the total devices deployed across North America. E-bikes were also ridden further than pedal bikes, with an average trip distance of 1.9 miles compared to 1.4 miles for pedal bikes. An estimated 37 percent of shared micromobility trips replaced car trips, and 64 percent of riders reported that they were using shared micromobility to connect to transit.

Figure 3-11. Bike Share

Source: Los Angeles Metro

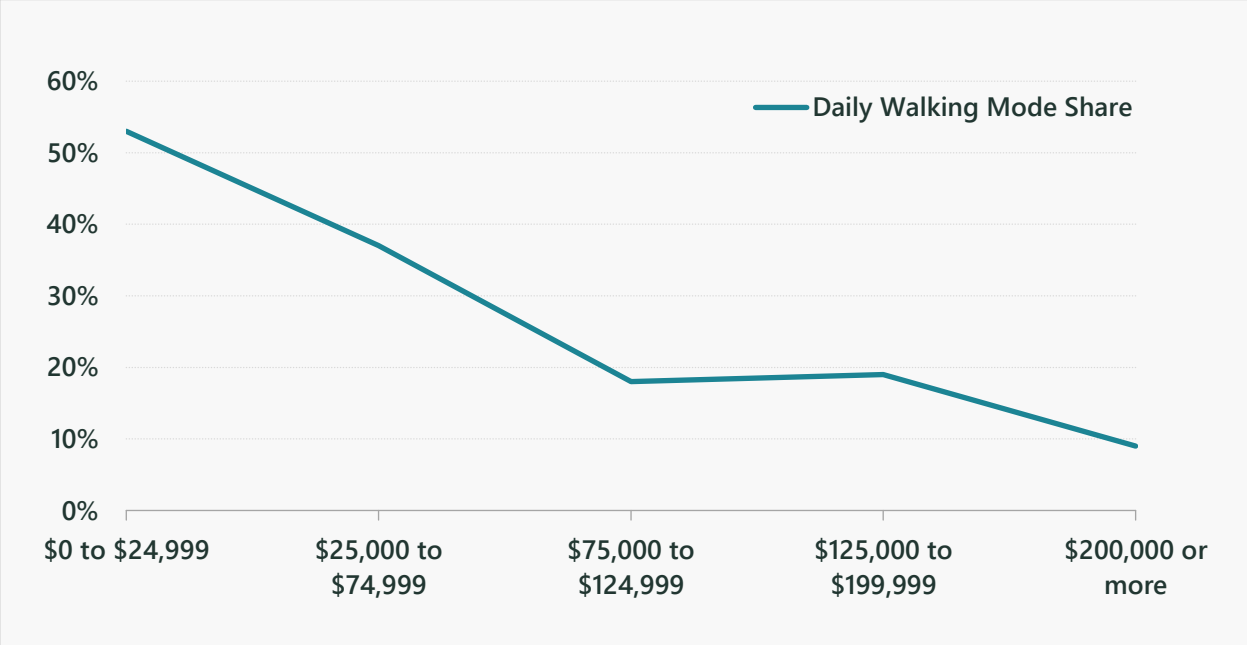
3.6 WHO IS USING ACTIVE TRANSPORTATION?

Walking, bicycling, and rolling are very accessible forms of transportation for people of a variety of ages, abilities, and socioeconomic backgrounds. Though driving is often considered the norm across the region, many factors can impact a person's ability to drive, such as age and physical ability. Obviously, children under the age of 16 are not able to transport themselves via vehicle on their own (at least at this time- automated vehicles may change this circumstance), and for some older adults, driving can become a less viable option due to physical changes (e.g., issues with eyesight or hearing).[21]

The likelihood that someone will walk, bike, or roll is also influenced by other demographic factors, including income, vehicle ownership, and race/ethnicity. For example, lower-income households exhibit higher rates of walking, which gradually decrease as income levels rise. With that said, there is a slight increase in walking observed in the second highest income bracket, as shown in Figure 3-12. Bicycle ridership rates also vary across income levels, highlighting diverse bicycling populations with distinct economic profiles. Households with very low incomes exhibit higher rates of bicycle ridership, which decline gradually as income levels rise,

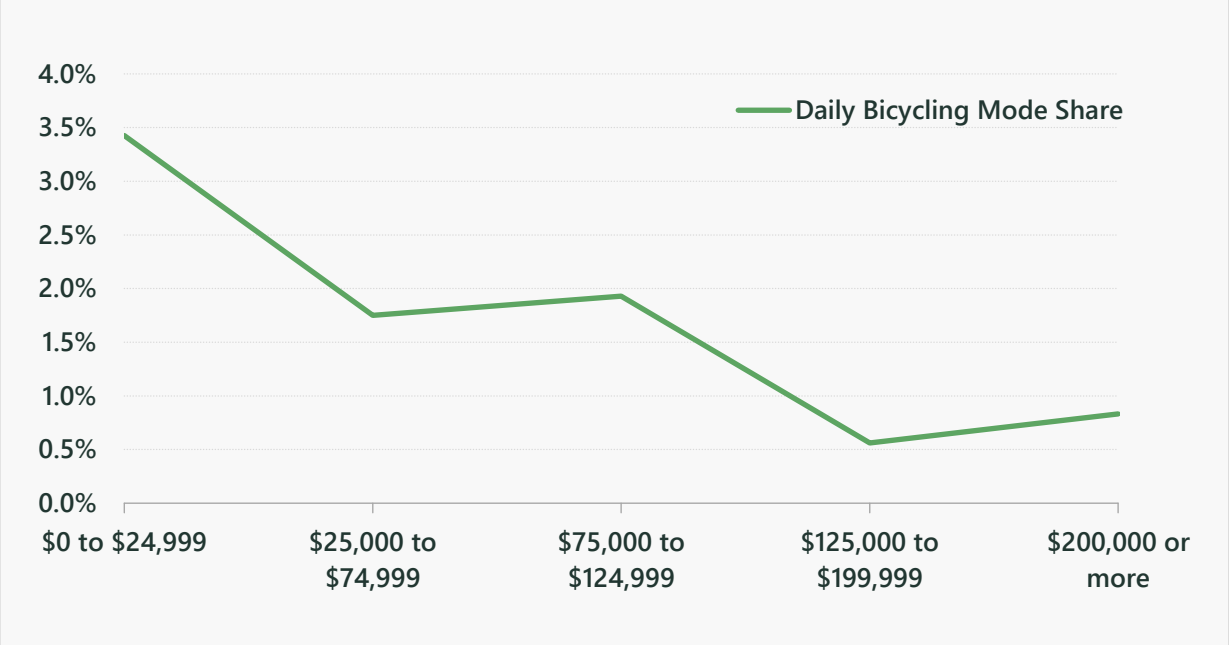
but interestingly, there is an uptick in bicycle ridership among households with middle and very high incomes. (Figure 3-13). The presence of vehicles in households also affects walking and bicycling rates. Among households with no vehicles, walking constitutes approximately 49 percent of trips, whereas households with one vehicle and two vehicles report 15 percent and 10 percent of walking trips, respectively (Figure 3-14). Additionally, households with no vehicles engage in bicycling for 3.5 percent of all trips, compared to 0.9 percent for households with one vehicle and 0.7 percent for those with two or more (Figure 3-15). Furthermore, walking and bicycling mode shares vary across different racial and ethnic groups within the region. Multiracial travelers report the highest walking mode share, accounting for 15 percent of all trips made on foot. Following closely are those who identify as an Other race, including American Indian/Alaskan Native and Native Hawaiian/Pacific Islander travelers, with 14 percent of trips made on foot, surpassing the overall average of 11.83 percent for all races/ethnicities. Similarly, multiracial travelers exhibit the highest bicycling mode share, constituting two percent of all trips made by bicycle, in contrast to the average of 0.77 percent for all races/ethnicities. Interestingly, Asian, Black/African American, White, and Other race travelers exhibit comparable bicycle mode shares, each at one percent (Figure 3-16).

Figure 3-12. Walking Trips as a Percentage of all Trips, by Income



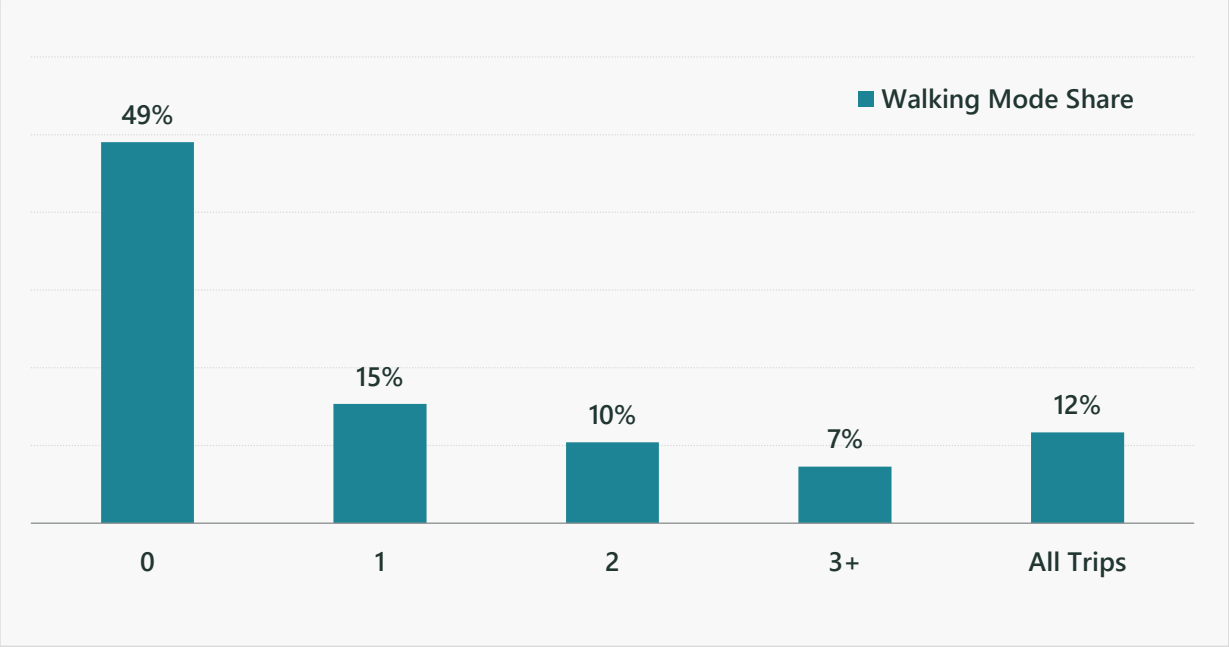
Source: National Household Travel Survey (2017)

Figure 3-13. Bicycling Trips as a Percentage of all Trips, by Income



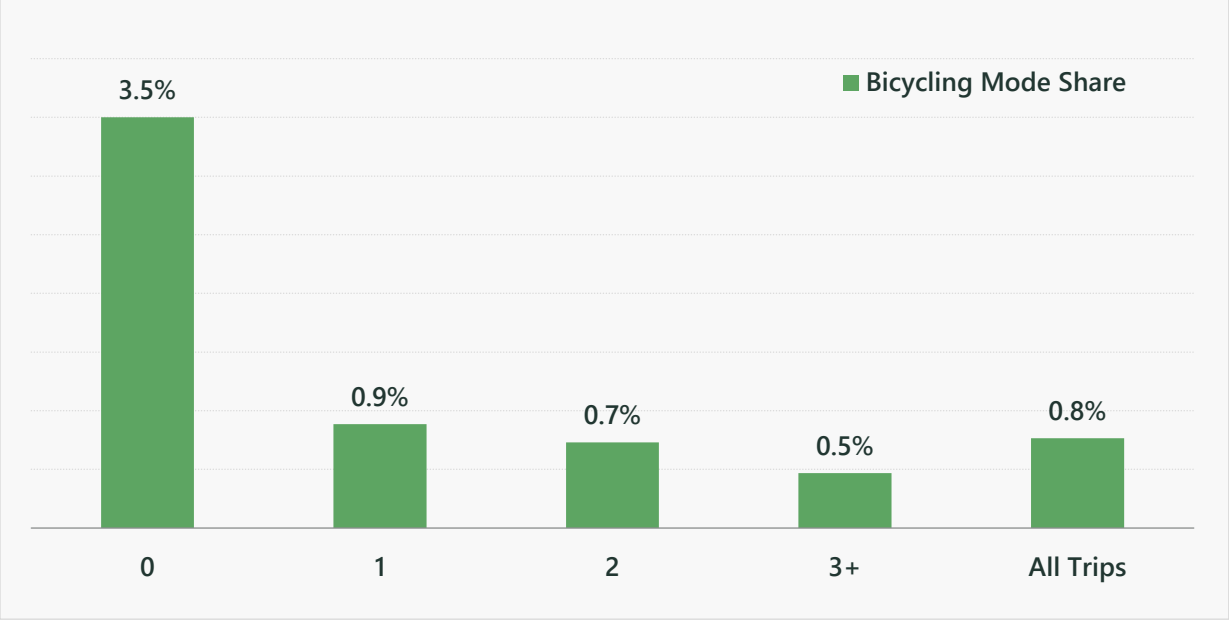
Source: National Household Travel Survey (2017)

Figure 3-14. Walking Trips as a Percentage of all Trips, by Household Vehicle Ownership



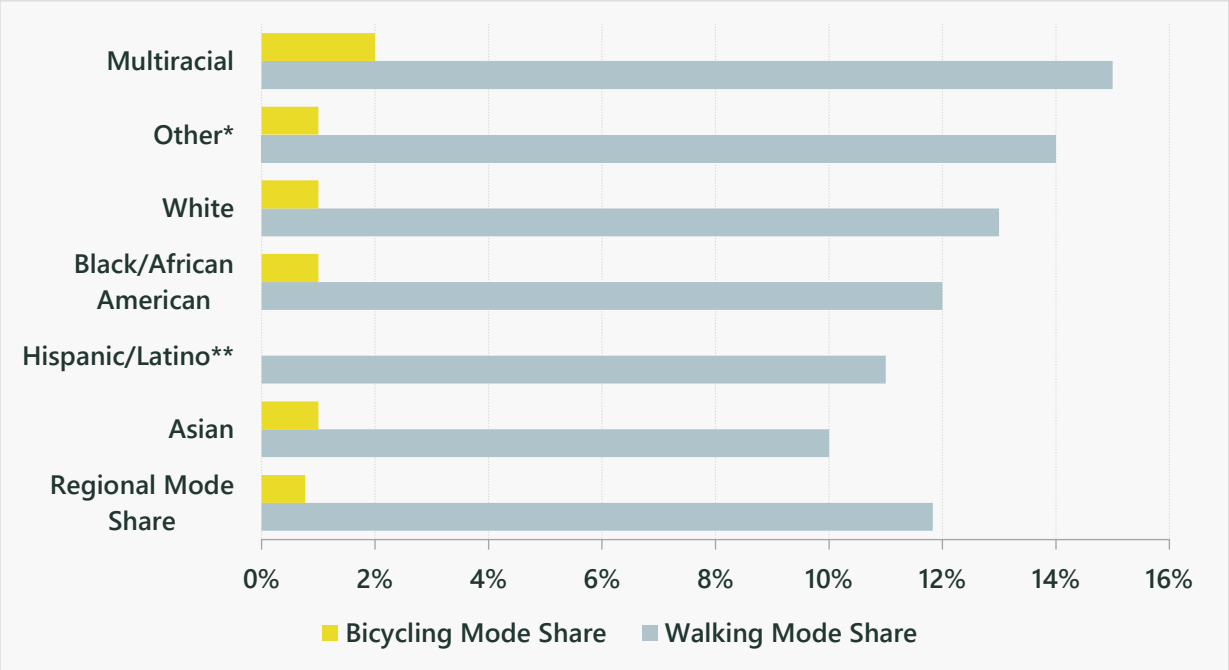
Source: National Household Travel Survey (2017)
Note: Numbers may not sum to total due to rounding

Figure 3-15. Bicycling Trips as a Percentage of all Trips, by Household Vehicle Ownership



Source: National Household Travel Survey (2017)
Note: Numbers may not sum to total due to rounding

Figure 3-16. Walking and Bicycling Mode Shares by Race/Ethnicity



*Source: National Household Travel Survey (2017). *Note: "Other" includes American Indian/Alaskan Native and Native Hawaiian/Pacific Islander due to small sample sizes. **According to the 2017 National Household Travel Survey, there is no recorded percentage of bicycle trips made by Hispanic/Latino travelers.*

3.7 WHY DO PEOPLE TRAVEL VIA ACTIVE TRANSPORTATION?

People travel via active transportation for a variety of reasons, including cost-effectiveness, convenience, environmental concerns, mobility, and health benefits as detailed below.

- **Cost-effectiveness:** Active transportation is often a more cost-effective option than driving or taking transit/rail. Walking and bicycling do not require expenditures on fuel, vehicle maintenance, parking fees, or transit/rail fares. Taking active transportation can lead to significant savings on transportation costs, especially for short trips.
- **Convenience:** Active transportation can offer convenience and accessibility, particularly for short trips within neighborhoods or urban areas. This is particularly important considering the recent growth in remote work and the ongoing need for remote workers to complete short trips during the workday. Walking or bicycling can often be faster than driving in congested traffic, especially during peak hours. In addition, active transportation provides direct access to destinations that may have limited or expensive parking facilities. As noted elsewhere, active transportation is only convenient if there are readily accessible and safe facilities to support a trip (e.g., bike lanes or sidewalks).
- **Environmental Concerns:** Active transportation is environmentally friendly and sustainable. By opting for walking or bicycling instead of using motorized vehicles, individuals contribute to reducing greenhouse gas emissions, air pollution, and noise pollution. Active transportation plays a role in combating climate change, preserving natural resources, and promoting cleaner and healthier communities.[22]
- **Mobility:** Active transportation can provide increased mobility for individuals who do not have access to a car, including low-income individuals, youth, and older adults. Across the region, roughly 7 percent of households do not have a vehicle, and this rate varies considerably depending on race/ethnicity as reflected in Table 3-3.
- **Health:** Active transportation provides an opportunity for regular physical activity. It helps individuals incorporate exercise into their daily routines, contributing to improved cardiovascular health, increased fitness levels, and overall well-being.[23] Active transportation promotes an active and healthy lifestyle, reducing the risk of chronic diseases associated with sedentary behaviors.[24]
- **Social Interaction and Community Connection:** Active transportation can foster social interaction and community connections. When people walk or bicycle, they are more likely to engage with others, whether it is greeting neighbors, meeting fellow pedestrians or bicyclists, or participating in community events. Active transportation helps create a sense of belonging, strengthens social bonds, and builds a more cohesive community fabric.

Table 3-3. Households Without a Vehicle by Race/Ethnicity

County	Hispanic	NH-White	NH-Black	NH-Asian PI	NH-Native Am	NH-Mixed/Other	All Race/Ethnicity
Imperial	6.8%	4.5%	15.7%	5.1%	11.3%	3.1%	6.6%
Los Angeles	8.2%	7.3%	16.2%	8.2%	15.0%	8.9%	8.6%
Orange	4.2%	4.2%	9.4%	5.6%	4.8%	3.8%	4.6%
Riverside	3.4%	3.9%	5.9%	3.9%	10.5%	6.3%	3.9%
San Bernardino	3.5%	4.8%	8.7%	4.5%	6.4%	6.1%	4.6%
Ventura	4.2%	4.1%	8.8%	3.3%	0.0%	3.2%	4.1%
SCAG Region	6.3%	5.7%	13.7%	7.0%	11.1%	7.1%	6.7%

Source: U.S. Census Bureau American Community Survey Five-Year Public Use Microdata (PUMS), 2017-2021

3.8 WHY IS ACTIVE TRANSPORTATION IMPORTANT?

Investment in active transportation infrastructure and policies to support active transportation are important components of Connect SoCal. Active transportation plays a vital role in supporting the region's efforts to create livable and sustainable communities. Whether people choose to travel by biking, walking, or using a micromobility device, active transportation has significant environmental benefits. Replacing driving trips with active transportation trips results in a measurable reduction in greenhouse gas emissions, air pollution, and contribution to climate change. Active transportation not only benefits the environment but also enhances quality of life. By actively promoting active transportation, communities can help mitigate the negative impacts of poor air quality by reducing the number of vehicles on the road and subsequently lowering emissions. This can contribute to improved air quality and create healthier environments for vulnerable individuals, fostering a better quality of life. It is important to note that areas disproportionately affected by poor environmental conditions, including air quality, are often located in Priority Equity Communities.

Equity is another crucial aspect supported by active transportation investments. By improving access to jobs and everyday necessities, active transportation initiatives promote equity by enhancing transportation options for underserved communities. They also contribute to reducing pedestrian and bicyclist-involved traffic collisions in areas where such incidents are disproportionately high.[25] Furthermore, active transportation investments can improve public health indicators in communities most impacted by chronic diseases linked to physical inactivity. By addressing these disparities, active transportation helps foster more equitable communities.

Finally, active transportation investments enhance mobility by improving connectivity between different modes of transportation, particularly with transit/rail. In many cases, people choose to drive instead of using transit/rail because stops or stations are not conveniently located near their starting points or final destinations. Active transportation options, such as walking, biking, or rolling, bridge this gap by providing first/last mile connectivity to transit/rail networks. Integrating active transportation with transit/rail systems in turn creates a more seamless travel experience, expands transportation choices, and improves overall mobility for individuals. Furthermore, these investments contribute to regional resilience.

Figure 3-17. First/Last Mile Connectivity to Transit

Source: Metrolink

3.9 HOW DOES LAND USE COME INTO PLAY?

Land use patterns play a key role in determining the number of trips taken via active transportation since these modes are exceedingly sensitive to trip length. Conventional suburban neighborhoods typically inhibit active transportation use since destinations are often too far to comfortably reach via walking, bicycling, or rolling. The lack of compact, walkable communities and the limited availability of amenities and services within close proximity can discourage people from choosing active transportation, as they may perceive it as time-consuming or inconvenient for longer journeys. A more connected configuration of streets, blocks, and land uses encourages the use of active transportation by reducing the distance between trip origins and destination and providing access to a variety of destinations. People living in higher density areas are more likely to travel by walking or biking as compared to those living in lower density areas (i.e., urban versus suburban versus rural areas).[26]According to the 2017 National Household Travel Survey, about 66.4 percent of trips less than a half mile in the SCAG region are walking trips, but walking rates decline rapidly beyond a half mile. The time to bicycle one mile is about eight minutes at a casual speed, and approximately 44.4 percent of all trips less than one mile in the SCAG region are bicycling trips. As the region continues to grow, adding an estimated two million new residents by 2050, the success of creating walkable and bikeable communities, both through land use and infrastructure, will determine how many trips will be made using active transportation modes. Planning for transportation and land use can help support growth in use of active transportation. Examples of these integrated planning approaches include:

- **15-Minute Communities:** These are communities where you can access all your most basic, day-to-day needs within a 15-minute walk or bike ride of your home. These communities can exist in a variety of contexts: urban, suburban, and rural. Complete Streets that support active transportation

trips form the foundation of these communities. It is important to note that these communities enable relatively quick and easy access to destinations, but 15 minutes may not reflect the actual travel time, particularly for people who have different abilities (e.g., if you tend to walk more slowly or use a wheelchair). Current examples of these types of communities can be found near transit/rail stops or stations in local jurisdictions such as Claremont, Fullerton, Montclair, and Pasadena.

- **Livable Corridors:** These corridors previously included single-story underperforming retail and have since been zoned for higher density housing and employment centers. These corridors often include opportunities for increased investment in Complete Streets. Examples of Livable Corridors across the region include Mission Trail/Palomar St in Lake Elsinore, Wildomar, and Temecula; CA-111 in the Coachella Valley; and Main Street in Santa Ana.
- **Priority Development Areas (PDAs):** These are places within the SCAG region where future growth can be located to help the region reach mobility or environmental goals. Generally, this means that people in these areas have access to multiple modes of transportation, including active transportation options, or that trip origins and destinations are closer together, allowing for shorter trips that can be made via walking, biking, or rolling.

For more details on these concepts in practice, as well as the intersection of land use with transportation, please see the Land Use and Communities Technical Report.

3.10 WHAT GUIDES US IN PLANNING FOR ACTIVE TRANSPORTATION?

Long-range planning for active transportation requires consideration of federal and state requirements and planning documents, including:

FEDERAL

- Bipartisan Infrastructure Law (Investment, Infrastructure, and Jobs Act, or IIJA, 2021)
- Fixing America's Surface Transportation (FAST) Act (2015)

STATE

- Assembly Bill 1358 - Complete Streets Act (2008)
- Senate Bill 375 - Sustainable Communities and Climate Protection Act (2008)
- California Coastal Trail (1976)
- California Interregional Transportation Strategic Plan (ITSP, 2021 with Addendum in 2022)
- California State Bicycle and Pedestrian Plan - Toward an Active California (2017)
- California Strategic Highway Safety Plan (SHSP, 2022)
- California Transportation Plan 2050 (CTP, 2021)
- Caltrans Active Transportation (CAT) Plans - Districts 7, 8, 11, and 12 (2022)
- Complete Streets Elements Toolbox (2018)
- Complete Streets Implementation Action Plan (DD-64-R2, 2014)
- General Plan Guidelines (2017)

Appendix 2 provides a more detailed explanation of these federal and state requirements and planning documents.

3.11 WHAT PROGRESS HAS BEEN MADE SINCE 2020?

Since SCAG's Regional Council adopted Connect SoCal 2020, SCAG has supported efforts to advance active transportation across the region. SCAG has developed a comprehensive regional active transportation strategy that includes support of local level efforts, policy and planning and data collection and analysis, including:

3.11.1 SUPPORTING LOCAL PLANNING EFFORTS

- **Active Transportation Program (ATP):** SCAG works closely with the California Transportation Commission and Caltrans as well as the County Transportation Commissions to ensure that jurisdictions from across the region benefit from California's ATP that is administered at the state and Metropolitan Planning Organization (MPO) levels of government. The statewide ATP grant program funds active transportation projects, programs, and plans. Each funding cycle, 60 percent of the funds are recommended by the California Transportation Commission and 40 percent are recommended by the MPOs. In 2021, the region secured more than $185 million. In 2023, due to a significant increase in available funds (four times the 2021 funds), the region secured more than $700 million. Despite the increase in available funds, the need for resources continues to dramatically exceed the funds available. Through the ATP, SCAG is also able to fund quick build projects, which use low-cost materials to implement improvements on an interim basis. These demonstration projects allow local jurisdictions to try something new before investing in permanent infrastructure and typically include an extended evaluation period.
- **Sustainable Communities Program (Active Transportation & Safety):** Through the Sustainable Communities Program, SCAG offers support to local jurisdictions for plans, including Active Transportation Plans, Transportation Safety Plans, and First/Last Mile Plans. Since 2020, SCAG has partnered with the City of Montebello, Omnitrans, and the Orange County Transportation Authority (OCTA) to develop First/Last Mile Plans to improve accessibility to transit/rail stops and stations. SCAG has also worked with the Cities of Avalon, Banning, Buena Park, Cathedral City, Costa Mesa, and Palm Springs, as well as the Soboba Tribe and the County of Los Angeles to develop Active Transportation Plans. Finally, SCAG has been working with the Cities of Duarte, La Puente, Lynwood, San Gabriel, and Santa Ana to develop Transportation Safety Plans. These plans include project concepts that can be repackaged into grant applications so that the plans may be implemented expeditiously.
- ***Go Human***: To support the creation of safer, more accessible infrastructure for walking and biking and to eliminate collisions resulting in serious injuries or fatalities, SCAG launched the *Go Human* campaign in 2015. *Go Human* is a community outreach and advertising campaign with the goals of reducing traffic collisions and encouraging people to walk and bike more in the SCAG region. *Go Human* is a collaboration between SCAG and the County Transportation Commissions and Public Health Departments in the region. The campaign provides advertising and educational resources to partners and implements temporary safety demonstration projects to showcase innovative transportation designs and help cities re-envision their streets. Other strategies have included distribution of mini grants to local partners to implement safety engagement activities and safety workshops and symposiums. In 2021, *Go Human* revamped and relaunched the *Go Human* Safety Pledge. Stakeholders, residents, businesses, and leaders are invited to take action to improve traffic safety in communities across the region.

Figure 3-18. Go Human Safety Campaign

Source: SCAG

3.11.2 POLICY AND PLANNING

- **Disadvantaged Communities Active Transportation Planning Initiative:** This SCAG-led effort developed seven different active transportation plans for communities across the region. The seven participating communities (Adelanto, Calipatria, Highland, Perris, Santa Fe Springs, Saticoy, and Stanton) offered diverse contexts critical to developing a customizable and useful toolkit by spanning both urban and rural settings, incorporated and unincorporated status, and all six counties within the SCAG region. The project developed a series of templates and a toolkit that will allow other local communities to develop low cost (or no cost) active transportation plans for their own communities.[27] SCAG expects those templates and toolkits to become available in the near future.
- **Partnership with the California Active Transportation Resource Center (ATRC):** Since the adoption of Connect SoCal 2020, SCAG has partnered with the ATRC on the expansion of the *Go Human* Kit of Parts so that it can function as a statewide resource. SCAG guided Caltrans on the management of the Kit of Parts and loaned the state one of its Kits of Parts for demonstrations statewide.
- **California's Strategic Highway Safety Plan's Bicycle and Pedestrian Challenge Area Teams:** SCAG serves on the Bicycle and Pedestrian Challenge Area Teams, where staff are helping shape Caltrans' efforts to improve the implementation of Quick Build projects, which are interim capital projects that often include active transportation components.
- **Mobility as a Service (MaaS) Feasibility White Paper:** In 2022, SCAG completed the MaaS Feasibility White Paper, to study the key building blocks for successfully implementing a MaaS system in the SCAG region, which would integrate transportation services, including bike share and other micromobility options, into a single mobility platform to provide competitive alternatives over private vehicles, promote universal basic mobility, encourage mode shift, and foster sustainable travel choices.
- **Curb Space Management Study:** In 2022, SCAG completed the Curb Space Management Study (CSMS), which took a comprehensive and multimodal review of some of the most congested and complicated curb space locations within the region. A key objective of the work was to promote a

balanced transportation system by better understanding first/last mile trips and connections between transit and active transportation (multimodal connections).

3.11.3 DATA COLLECTION AND ANALYSIS

- Active Transportation Database (ATDB): SCAG's ATDB was developed to collect and store bicycle, pedestrian, wheelchair, and scooter/skateboard volume counts from infrastructure and planning projects across Southern California. SCAG is currently collaborating with the ATRC from Caltrans and UC Berkeley Safe Transportation Research and Education Center (SafeTREC) to develop a consistent statewide count methodology and to expand and enhance the SCAG regional ATDB to include a userbase of the entire State of California. The statewide ATDB will be implemented and managed by Caltrans.
- Regional High Injury Network (HIN): To support the reduction of serious injuries and fatalities, SCAG developed a Regional High Injury Network (HIN) to help local jurisdictions focus improvements on where they are most needed. The regional HIN was recently updated to include additional years of data and is now available via the interactive Transportation Safety Resource Hub.[28]

3.11.4 MONITORING EFFORTS ACROSS THE REGION

Beyond SCAG's efforts to support more planning research and studies, jurisdictions across the region have continued to develop active transportation-related plans and projects. The following is a snapshot of efforts that are well underway or have been completed since Connect SoCal 2020 was adopted.

IMPERIAL COUNTY

PLANS

- **Imperial County Pedestrian Master Plan (Completed April 2021):** The Imperial County Pedestrian Master Plan, developed by the Imperial County Public Works Department and Caltrans, analyzes the six unincorporated communities[29] within the County and identifies needs and priorities that address issues such as safety and security, environmental issues, convenience, accessibility, and connectivity of pedestrian infrastructure. The proposed recommendations in the Plan are specifically tailored to each community and influenced by climate specific design strategies like Xeriscape design and green infrastructure to offset greenhouse gas (GHG) emissions and contribute to sustainable development. The Plan is meant to assist the County in creating a safe and enhanced walkable environment throughout these communities.
- **Imperial County Transportation Commission (ICTC) Regional Active Transportation Plan (Completed February 2022):** ICTC's Regional Active Transportation Plan thoroughly examines the cities, census-designated places, unincorporated communities, and Native American reservations within Imperial County and offers prioritized active transportation recommendations to provide guidance on which projects to pursue future design and funding opportunities.
- **Imperial County Safe Routes to School Project (Completed Fall 2022):** In 2022, Imperial County developed a Safe Routes to School (SRTS) Program, which focused on three elementary schools.[30] As part of this initiative, walk audits were conducted around each school to assess pedestrian behaviors and existing conditions and to make recommendations for educational interventions and/or infrastructure improvements. Utilizing the findings from the walk audits, Imperial County

Public Works Department staff were able to submit a grant application for sidewalk and flashing beacon installation near Heber Elementary School. Imperial County will continue to conduct SRTS outreach efforts and prioritize safety projects.

PROJECTS

- **Aten Bike Path Project (Completed July 2021):** This project is located on Aten Boulevard from Dogwood Road to Puerto Vallarta Avenue in the City of Imperial. The City installed an eight-foot-wide paved bike path, striping, and signage for approximately one mile and bike lanes and signage for another half mile. The project closes an active transportation gap between a dense residential neighborhood and Imperial Valley College.

Figure 3-19. Safe Routes to School

Source: Los Angeles Department of Transportation

LOS ANGELES COUNTY

PLANS

- **Metro Active Transportation Strategic Plan Update (Completed November 2023)**: LA Metro developed their 2023 Active Transportation Strategic Plan (ATSP) to further their mission of providing a world-class transportation system, focusing specifically on the regional active transportation network and first mile/last mile (FLM) connectivity to transit/rail. The 2023 ATSP includes proposals for FLM improvement areas, regional bikeways, and new pedestrian districts.[31] The first ATSP was adopted in 2016 and was prefaced by several Metro Board motions calling for the agency's proactive role in countywide active transportation. This update of the ATSP is an opportunity to advance Metro's and other agencies' policies related to climate, social equity and sustainability that have been adopted in the years since the 2016 ATSP.
- **Los Angeles County Bicycle Master Plan Update**: The Los Angeles County Public Works Department is in the process of updating the Los Angeles County Bicycle Master Plan (BMP). The current BMP was last updated in 2012 and established a vision for the future of biking in the County. The BMP will serve as a guide for the development of safe and accessible bikeways and paths within unincorporated Los Angeles County and along County flood control district channels. The BMP will propose new bikeways, revisit the feasibility of unconstructed bikeways from the 2012 BMP, incorporate new policies to share bikeway facilities with micromobility devices, and identify first mile/last mile bikeway and improvements to further connect to transit/rail. The BMP is anticipated to be finalized in early 2025.
- **City of Glendale Bicycle Transportation Plan Update**: The City of Glendale is working on an updated Bicycle Transportation Plan (BTP) to create a 20-year measurable blueprint for making biking safer, easier, and more attractive within the city while also identifying biking-related strategies that help support broader goals, such as economic development, public health, climate change, and equity. The updated BTP will be a roadmap for creating a safe, enjoyable, all-ages, all-abilities bicycle network that connects local destinations within the city as well as to the region, while also addressing bicycle parking, programming and education, and new technologies such as shared micromobility and e-bikes. The BTP is anticipated to be finalized in early 2024.

PROJECTS

- **Maine Avenue and Pacific Avenue Corridor Complete Streets Improvements (Completed August 2021)**: This project is located along Maine Avenue and Pacific Avenue in the City of Baldwin Park. The City installed high visibility crosswalks, pedestrian ramps, and curb extensions. The City also reconfigured the corridor by removing a travel lane in each direction to install a protected Class IV bikeway for the entire length of the corridor.
- **Del Amo Boulevard Separated Bike Lane (Completed April 2022)**: The City of Long Beach debuted its first concrete-separated bike lane along Del Amo Boulevard. Bicyclists can now ride the new half-mile connection between Atlantic and Orange Avenues. The new design improves upon the segment's previous bike lanes and creates more comfortable riding conditions by adding more space and separation from cars. In addition to improving access to destinations such as Barton Elementary School and Scherer Park, the new Del Amo Boulevard separated bike lanes strengthen the connectivity of Long Beach's overall bike network. Orange and Atlantic Avenues are two of the city's main north-south bike corridors, and the Del Amo Boulevard project ensures a quality connection that enhances these streets' utility. The City minimized costs and disruption to the area by including these bike lane improvements in existing repaving plans for Del Amo Boulevard.

Figure 3-20. Del Amo Boulevard Separated Bike Lane Project

Source: City of Long Beach

- **Costa Del Sol Way Separated Bike Lanes (Completed October 2022)**: The City of Long Beach added separated bike lanes along Costa Del Sol Way between Loynes Drive and Jack Nichol Park. The road segment is among the first in the city to use concrete separators between bike and vehicle traffic lanes, a design choice that can improve bicyclists' safety and confidence in riding. The project was coordinated with scheduled road maintenance on Costa Del Sol to minimize costs and disruption to neighbors.
- **Loynes Drive Bike Lanes (Completed February 2023)**: New bike lanes were installed on Loynes Drive in the City of Long Beach. This was part of a repaving and maintenance project that included repairing curbs, gutters, and sidewalks along Loynes Drive between Bellflower Boulevard and Pacific Coast Highway. These improvements connect Loynes Drive to the existing bike network along Bellflower Boulevard, providing a low-stress biking connection throughout southeast Long Beach all the way to Bixby Village Drive.
- **Venice Boulevard Safety and Mobility Project (Completed June 2023)**: The Los Angeles Department of Transportation (LADOT), in collaboration with Los Angeles County Metropolitan Transportation Authority (Metro), installed over four miles of safety and mobility improvements along Venice Boulevard between Inglewood Boulevard and National Boulevard in the City of Los Angeles. The project includes new crosswalks, signal upgrades, parking-protected bike lanes, and a 24-hour dedicated bus lane.[32] The project primarily addresses safety concerns on Venice Boulevard, which is part of the City of Los Angeles' High Injury Network.
- **Union Street Protected Bikeway (Completed September 2023)**: The City of Pasadena developed its first two-way protected bike lane on Union Street between Hill Avenue and Arroyo Parkway. The project is expected to increase safety, comfort, and access for all users to local businesses and

destinations along Union Street and throughout Pasadena. The project includes the construction of new traffic signals to help pedestrians and bicyclists cross the intersections of: Union Street and Mar Vista Avenue, Michigan Avenue, Chester Avenue, and Holliston Avenue, and Holliston Avenue and Colorado Boulevard and Green Street.

ORANGE COUNTY

PLANS

- **Orange County Safe Routes to School Action Plan (Completed March 2021):** In 2021, the Orange County Transportation Authority (OCTA) developed the Orange County Safe Routes to School (SRTS) Action Plan, which summarizes findings and recommendations pertaining to the need for SRTS support at schools and school districts in Orange County. Throughout the Plan's development, the project team assessed existing SRTS efforts already underway in the County and engaged with stakeholders to learn about opportunities and challenges for SRTS efforts countywide. Results of engagement and research showed that 70 percent of the County's schools fell into the top two tiers of the Plan's needs analysis, demonstrating the opportunity and need for more support for SRTS. A key aspect of the Action Plan was to evaluate the potential for a countywide program that would coordinate and reinforce SRTS efforts at local schools and districts. The team's analysis found that significant need exists and that a countywide program would effectively meet that need by complementing existing efforts (e.g., OC Active). By better understanding countywide conditions and needs, all schools and districts can advance through the next steps on the path to safer travel to school, regardless of need, context, available resources, or level of readiness.
- **County of Orange Active Transportation Plan (Completed May 2023):** The County of Orange developed an Active Transportation Plan (ATP) that establishes a vision and a roadmap for implementation of pedestrian and bicyclist facilities within the County's unincorporated communities and along County-owned flood control channels. By planning a safe and convenient active transportation network, the plan's goal is to connect more people with jobs, goods, services, and public transit networks without the use of a car, thereby improving public health, and reducing environmental impacts from vehicle miles traveled and greenhouse gas emissions.
- **Santa Ana Vision Zero Plan:** The City of Santa Ana is undergoing an update to its Safe Mobility Santa Ana (SMSA) Plan, now renamed the Santa Ana Vision Zero (SAVZ) Plan, to evaluate mobility priorities and identify innovative transportation solutions for a safer Santa Ana. The SAVZ Plan builds on the original SMSA Plan from 2016 to evaluate citywide traffic safety through a comprehensive analysis of traffic collisions. The SAVZ Plan will utilize the Federal Highway Safety Administration-sanctioned Safe System approach to improve safety across the network, using low-cost and highly effective countermeasures. The project team will provide forward-thinking recommendations that recognize the need to balance the many objectives of the local transportation system, including travel time reliability, safety, and meeting the mobility needs of a variety of roadway users. The SAVZ is anticipated to be finalized in 2024.
- **City of Buena Park Active Transportation Plan:** The City of Buena Park is currently developing its first citywide Active Transportation Plan (ATP), which includes a three-fold vision: to enhance bicycle and pedestrian safety through improved infrastructure, to bridge gaps within the city's transportation network by creating well-connected bicycle and pedestrian facilities, and to ensure better bicyclist and pedestrian access to transit/rail, jobs, schools, parks, and other essential services. The ATP will evaluate the City's existing bicycle and pedestrian infrastructure and incorporate feedback from community stakeholders to identify future improvement projects. Presently, the

Buena Park Active Transportation Network is comprised of isolated corridors primarily in the northern part of the city. Planning for a more comprehensive and equitable Active Transportation Network will enable community members to access local and regional destinations, including transit hubs, by walking and biking. The final ATP is anticipated to be released in early 2024.

PROJECTS

- **Civic Center Bicycle Boulevard Project (Completed January 2022)**: This project was identified in the Downtown Santa Ana Complete Streets Plan, which SCAG funded in 2014. The City of Santa Ana secured Active Transportation Program funding to implement a bicycle boulevard along the Civic Center corridor in Downtown Santa Ana between the Civic Center and the Metrolink Station. The City installed pedestrian crossing improvements at seven intersections including crosswalks, curb extensions, and curb ramps. Additionally, the City installed four roundabouts and bikeway markings with signage along the corridor to reduce vehicle speeds and volumes.

Figure 3-21. Santa Ana Civic Center Bicycle Boulevard Project

Source: City of Santa Ana

RIVERSIDE COUNTY

PLANS

- **City of Palm Springs Pedestrian Plan (Completed December 2021)**: The City of Palm Springs Pedestrian Plan serves as a roadmap for implementing pedestrian improvements within the public right-of-way in the City of Palm Springs. The Plan analyzes existing conditions by city council district[33] and presents 37 recommended pedestrian infrastructure projects spanning all the districts

within the city. Additionally, the Plan features a list of 15 priority projects, evaluated based on the Plan's selected themes and supplemented by feedback received from the community outreach and engagement process. To provide tangible examples of pedestrian strategies, the Plan includes project fact sheets for five select pedestrian projects from the project list, showcasing their potential application along corridors in Palm Springs.

PROJECTS

- **La Quinta Village Complete Streets Project (Completed 2021)**: The City of La Quinta completed the La Quinta Village Complete Streets Project, which makes roadways safer and more accessible to pedestrians and bicycles in the La Quinta Village center by constructing improvements for pedestrian, bicycle, golf cart, and automobile activity. These improvements included the reduction of four traffic lanes to two lanes, new designated bike and golf cart lanes, five roundabouts with high-visibility crosswalks installed at key intersections, curb extensions and midblock refuge medians, and lighting enhancements, among others.[34] By implementing the project and replacing existing intersections with roundabouts, the City reduced congestion and delay along the three roadways that serve the village center. Specifically, traffic-calming measures considerably reduced vehicle speeds and made merging from driveways onto travel lanes less complex and safer.
- **San Pablo Corridor Improvements (Completed September 2021)**: Following a SCAG funded 10-day demonstration event in 2016, the City of Palm Desert secured funding to install bicycle and pedestrian improvements along San Pablo Avenue. The improvements included a roadway reconfiguration reducing the vehicle lanes to add wider sidewalks, shade trees, street furniture, center median vehicle parking, three roundabouts, and a separated bikeway.

Figure 3-22. La Quinta Village Complete Streets Project

Source: City of La Quinta

SAN BERNARDINO COUNTY

PLANS

- **Active San Bernardino (Completed September 2020)**: San Bernardino County's Active Transportation Plan, *Active San Bernardino*, includes the creation of an open data portal that provides data and resources related to active transportation all in one central hub. The plan brings together biking, walking, and SRTS recommendations from previously completed county-wide plans.
- **City of San Bernardino Active Transportation Plan (Completed July 2022)**: The City of San Bernardino Active Transportation Plan analyzes existing conditions in the City that pertain to active transportation and offers policy and infrastructure recommendations to help San Bernardino advance its vision of a more walkable and bikeable future. The Plan builds upon ongoing efforts by the SBCTA to expand regional active transportation infrastructure and programming.

PROJECTS

- **Rialto Bike Share Program (Launched 2023)**: In 2023, the City of Rialto launched its first electric bike share program using funds from the Clean Mobility Options Voucher Pilot Program. The primary goal of the Rialto Bike Share Program is to provide low-income residents within Rialto with a safe, affordable, clean, on-demand travel option to access transit and important community destinations, while improving quality of life and reducing harmful pollution that contributes to climate change.

Figure 3-23. Rialto Bike Share Program

Source: City of Rialto

VENTURA COUNTY

PLANS

- **City of Oxnard Sustainable Transportation Plan (Completed June 2023)**: The City of Oxnard's Sustainable Transportation Plan (STP) has a primary objective of shifting Oxnard's transportation system from auto-oriented to people-oriented. The STP focuses on implementing sustainable transportation improvements in key locations across the City, ensuring a more sustainable future for all Oxnard residents, employees, and visitors. It features a comprehensive toolkit of sustainable streetscape elements, demonstrating their application in seven priority locations identified through the community engagement process, as well as their adaptability to all community contexts. Additionally, the STP presents a range of strategies aimed at promoting sustainable transportation and enhancing accessibility to multimodal transportation options throughout Oxnard. These strategies serve as broad ideas, open to exploration by various City departments for potential further implementation.
- **City of Ventura Active Transportation Plan**: The City of Ventura is developing a citywide Active Transportation Plan that will serve as a roadmap for priority projects and programs that support the City by making walking and bicycling attractive travel options for Ventura residents and visitors. The Plan will incorporate bicycle and pedestrian mobility, Safe Routes to School, and Complete Streets components to increase mobility options for all City residents, especially for disadvantaged communities. Additionally, the Plan outcomes will feed directly into the City's General Plan update, memorializing active transportation-driven concepts, goals, objectives, and policies as a blueprint for future generations. The ATP is anticipated to be finalized by early 2024.

PROJECTS

- **Conejo School Road and Willow Lane Sidewalk and Bike Lanes Project (Completed July 2022)**: This project is located in the City of Thousand Oaks along Conejo School Road and Willow Lane from Hampshire Road to Hillcrest Drive. The City addressed a one-and-a-half-mile gap in the sidewalk network and installed one-mile of bike lanes and signage.

Figure 3-24. Thousand Oaks Conejo/Willow Improvement Project

Source: City of Thousand Oaks

3.12 WHAT ARE THE CHALLENGES?

One of the most significant challenges for growing active transportation use in Southern California is the region's existing infrastructure and transportation culture, which has historically prioritized vehicular travel. Several factors contribute to this challenge, which are described below. Section 3.15 discusses approaches for tackling these issues.

3.12.1 TRANSPORTATION SAFETY

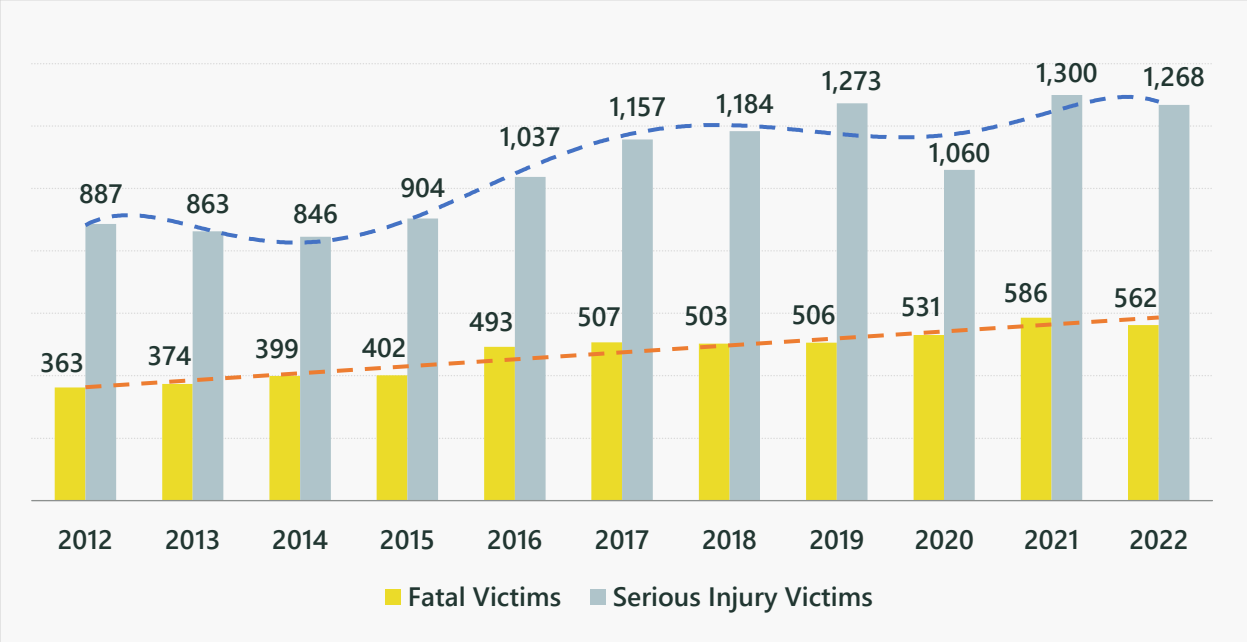
Southern California's transportation infrastructure has largely been designed to accommodate private vehicles, with wide roads, limited pedestrian and bicycling infrastructure, and sprawling suburban areas. This car-centric design creates barriers for active transportation, making it less safe and convenient for pedestrians and bicyclists to navigate the built environment.

Transportation safety is critical for active transportation because it directly impacts the well-being and confidence of people who are walking, biking, and rolling, as well as their willingness to choose active transportation. When active transportation feels safe, it becomes an attractive and viable option for people of all ages and abilities. Safety is the most significant challenge for active transportation. Unfortunately, transportation safety issues persist across the region and disproportionately impact people walking and bicycling compared to their mode share. More specifically, pedestrians represented roughly 32 percent of fatalities and 28 percent of serious injuries, while bicyclists represented roughly five percent of fatalities and nearly nine percent of serious injuries, though their respective mode share for all trips was 8.7 percent and 1.2 percent.

Overall, on average, approximately 1,600 people are killed and 7,000 are seriously injured on roadways throughout the region every year. While traffic collisions occur in communities all over 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. While local roads are typically low-speed streets with low traffic volumes in residential areas, they also include similar streets in commercial and industrial areas. Local roads also generally account for the largest percentage of all roadways in terms of mileage, and vehicles traveling on these roads have more opportunities to interact with oncoming traffic, cross-traffic, and vulnerable road users like pedestrians and bicyclists. All these factors may explain why so many collisions occur on these types of roadways. To examine where fatalities and serious injuries are occurring across the region, SCAG developed a regional High Injury Network (HIN). The HIN identifies roadways throughout the region where high concentrations of collisions occur. Through the HIN development, it became clear that transportation safety is an equity issue as approximately 70 percent of HIN roadway miles are within or adjacent to Priority Equity Communities (about 72 percent and about 80 percent for bicyclist and pedestrian HINs, respectively).

Safety is of particular concern for people using active transportation and do not have the protection provided by automobiles, which results in higher rates of fatalities. In recent years, trends for pedestrian and bicycle related collisions have been worsening. Figure 3-25 presents the number of pedestrian fatalities and serious injuries reported on roadways in the SCAG region between the years 2012 and 2022. The number of pedestrian fatalities remained relatively stable between 2012 and 2015, ranging between 363 and 402 over those four years. However, in 2016 the number of fatalities jumped to 493, representing an increase of nearly 23 percent over the previous year. Unfortunately, the pattern of rising pedestrian fatalities continued along that upward trajectory over the next five years, reaching a peak of 586 in 2021, an increase of about 46 percent since 2015. While this upward trend in pedestrian fatalities is concerning, 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 3-25. Pedestrian Fatalities & Serious Injuries: 2012-2022

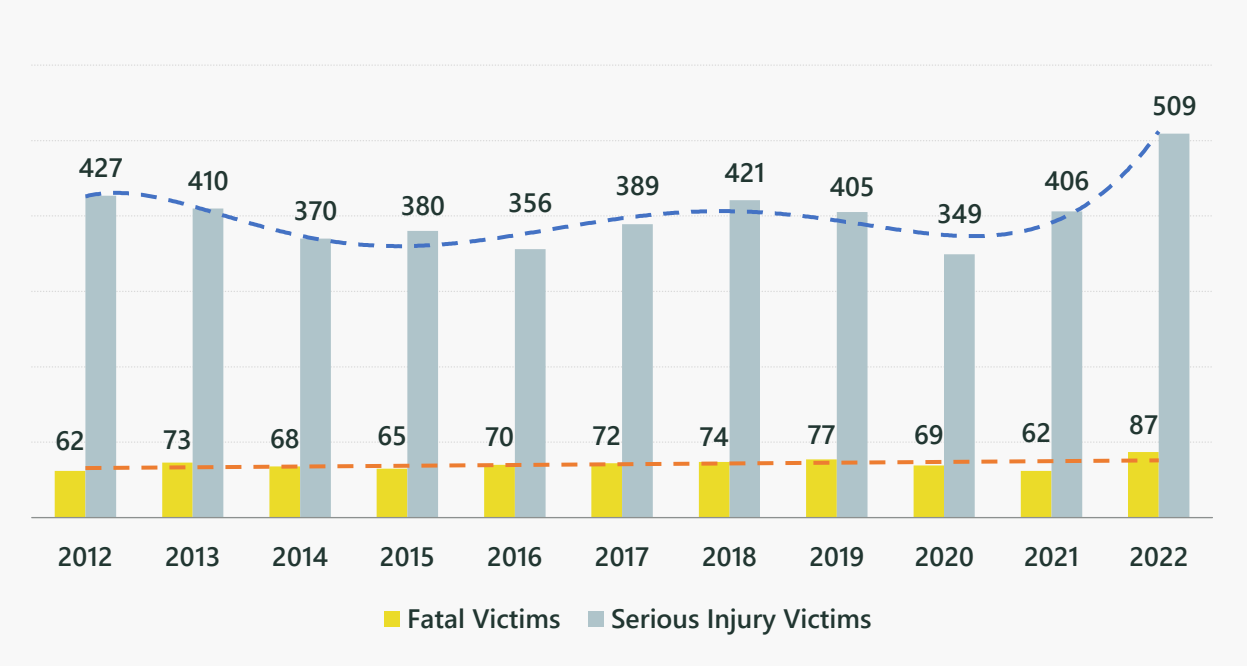


Source: Transportation Injury Mapping System, 2012-2022

The number of serious injuries experienced by pedestrians in the region has shown more annual volatility over the last ten years, with yearly totals declining from 887 to 846 between 2012 and 2014 before beginning a steady climb over the next five years, reaching a peak of 1,273 in 2019. However, following the 2019 peak, the annual number of reported pedestrian serious injuries dropped to 1,060 in 2020, a 17 percent decline from the previous year; this is likely due to COVID-19 pandemic-related travel impacts. In 2021, the number of reported pedestrian serious injuries jumped back up to 1,300, an increase of nearly 23 percent from 2020. Data for 2022 shows a slight annual decrease of 2.5 percent in the number of pedestrian serious injuries in the region, at 1,268. Although this may signal an emergent trend toward lower pedestrian serious injury rates, the concurrent upward trend in pedestrian fatalities indicates that pedestrian safety remains a major concern for the region.

Figure 3-26 shows the number of bicyclist fatalities and serious injuries in the SCAG region between the years 2012 and 2022. The number of bicyclist fatalities had remained relatively stable between 2012 and 2019, ranging between a high of 77 in 2019 and a low of 62 in both 2012 and 2021. However, bicyclist fatalities began increasing again with 87 fatalities reported in the region in 2022. The trend in bicycle-related serious injuries had been decreasing between 2012 and 2016, from a high of 427 in 2012, down to 356 in 2016, a reduction of nearly 17 percent. Over the next two years, the trend in bicycle-related serious injuries began moving upward again, reaching a peak of 421 in 2018, before beginning another downward trend, reaching a low of 349 in 2020. Unfortunately, there were 406 bicycle-related serious injuries observed in 2021, and 509 reported for 2022, which appears to indicate an alarming trend toward reduced bicycle safety performance in the region. The continued high rates of fatalities and serious injuries suggests that more needs to be done to improve safety conditions for bicyclists in the region.

Figure 3-26. Bicycle Fatalities & Serious Injuries: 2012-2022



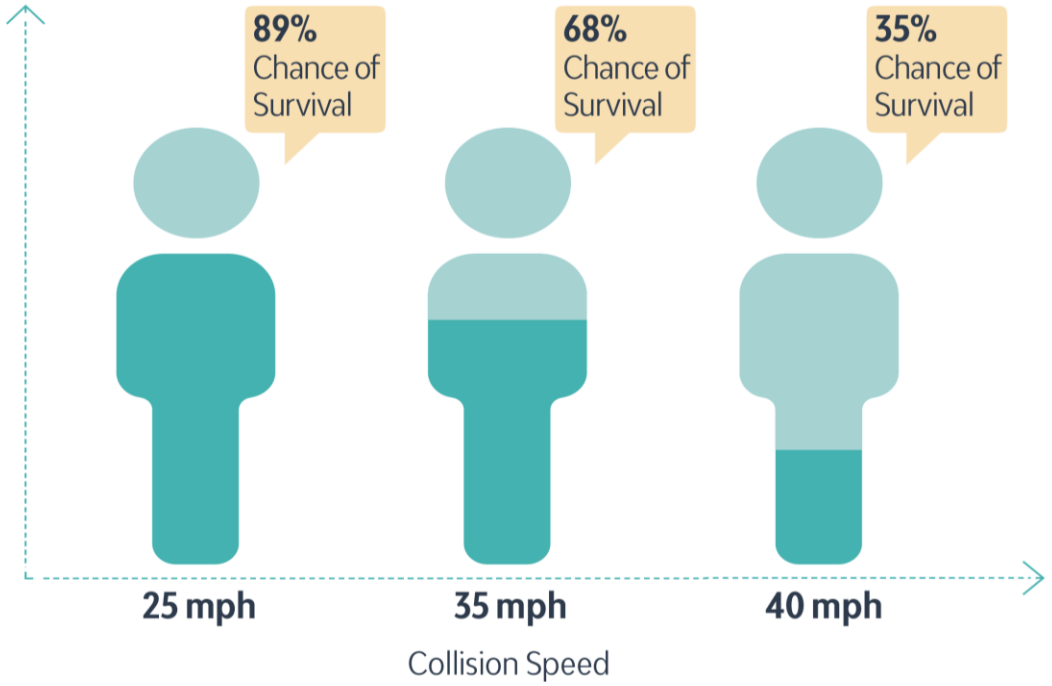
Source: Transportation Injury Mapping System, 2012-2022

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. Complete Streets improvements may support the reversal of this trend by creating safer streets that accommodate all travel modes, and reduction in speed limits would help manage the severity of impacts from higher speed collisions.

Across the region, pedestrian violations were the leading cause of fatalities, accounting for 20 percent of all traffic-related deaths in 2019. Again, it is important to bear in mind that people who are walking do not have the protections provided by automobiles, which results in higher rates of fatalities. Recognizing this vulnerability, the National Highway Traffic Safety Administration (NHTSA) is seeking to amend its New Car Assessment Program to provide safety information to consumers regarding the ability of vehicles to protect pedestrians in a collision.[35] This adjustment could incentivize automakers to produce vehicles with safeguards to prevent or minimize pedestrian fatalities and serious injuries. Relatedly, vehicle size is also a significant factor in collision outcomes and larger vehicles like pickup trucks and SUVs are more likely to result in vulnerable road user fatalities.[36]

This information on pedestrian fatalities also suggests a need for more Complete Streets to support pedestrians as most streets are prioritized for the automobile. Unsafe travel speeds account for another significant share of both roadway fatalities and serious injuries, at 17.1 percent and 16.4 percent, respectively. It is important to note that the survivability in a collision decreases significantly with increases in speed. For example, a car hitting a pedestrian at 40 miles per hour gives a pedestrian only a 35 percent chance of surviving if struck, while the same car going at 25 miles per hour would give the pedestrian an 89 percent chance of surviving (Figure 3-27). Figure 3-28 indicates the primary factors that have led to collision-related fatalities and serious injuries in the region.

Figure 3-27. Relationship Between Vehicle Speed, Collisions, and Fatalities



Source: SCAG (2023)

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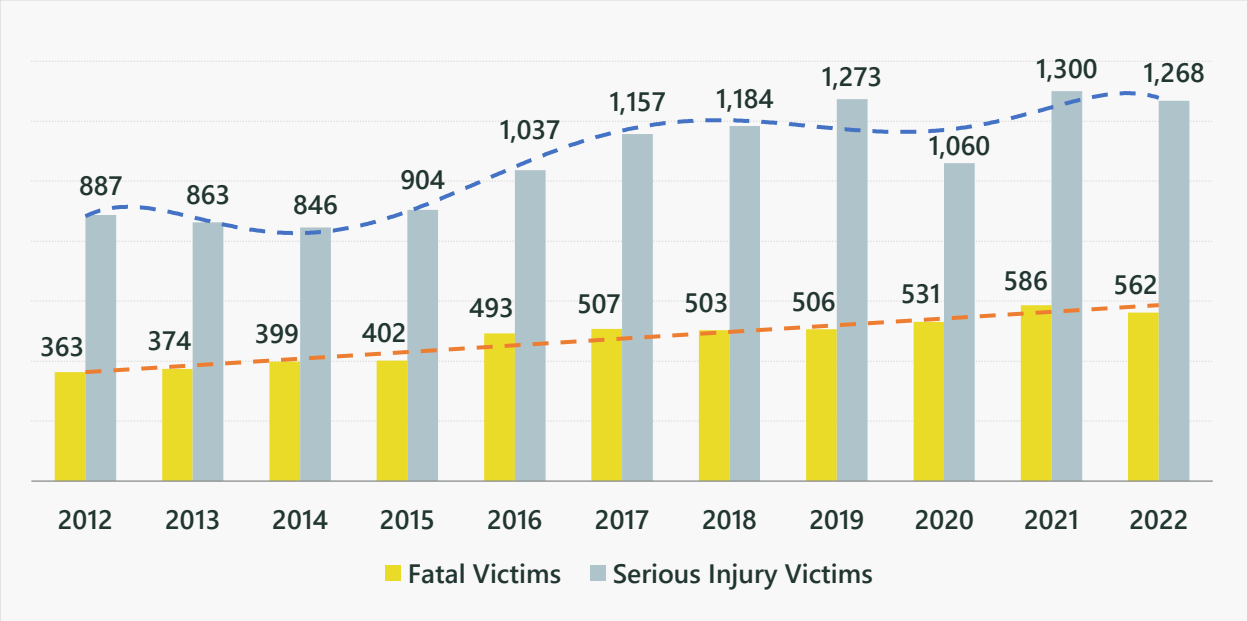

Source: Transportation Injury Mapping System, 2012-2022

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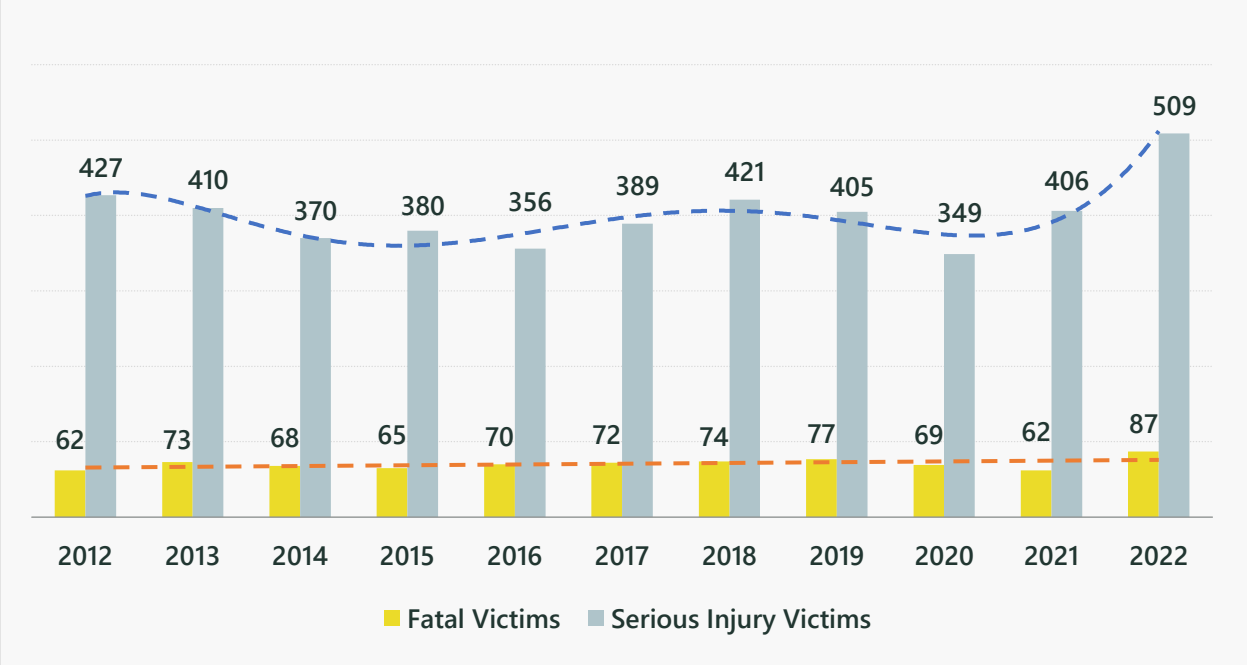


Source: Transportation Injury Mapping System, 2012-2022

essential to provide adequate infrastructure, along with sufficient secure bike parking, for the first and last mile of their journey. The distance pedestrians, bicyclists, and other active transportation users are willing to travel to and from transit/rail stops and stations, known as walksheds and bikesheds, depends on various factors such as transit/rail type, supporting infrastructure, land use, and user mobility. Research indicates that most transit/rail riders will walk approximately a quarter mile or five minutes to reach bus stops, half a mile for Bus Rapid Transit (BRT), and three-quarters of a mile or 15 minutes for commuter rail. Generally, it is understood that it is best to create catchment areas of a half mile for pedestrians and three miles for bicyclists. [40] By making transit/rail stops or stations seamlessly connected with surrounding active transportation options, such as sidewalks, bicycle lanes, and accessible routes for individuals with mobility devices, we can create an inclusive and efficient transportation network. Examples of first/last mile planning across the region include Metro's work on First/Last Mile plans[41] surrounding its rail stations and recently completed Omintrans' Bus Stop Safety Improvement Plan.[42] SCAG is currently working with OCTA on a Bus Stop Safety and Accessibility Study and the City of Montebello on a First/Last Mile Plan.[43]

Figure 3-29. First/Last Mile

Source: OmniTrans

3.12.3 CLIMATE CHANGE

While Southern California generally enjoys favorable weather for outdoor activities, extreme weather events such as heatwaves and severe precipitation/flooding, can pose challenges for those using active transportation. The impacts of climate change are expected to lead to more intense rainfall events, which can cause flooding, and an increased number of extreme heat days—days in which temperature exceeds the 98th percentile of maximum temperature for a given location. Extreme heat days will likely impact whether people choose to travel via active transportation. According to current projections, extreme heat days will increase in frequency, intensity, and duration.[44] These higher temperatures will lead to increased

spring snowmelt which will, in turn, cause swelling of the State's rivers and streams in some years. Consequently, scientists foresee a potential 50 percent[45] increase in stormwater runoff in future years, which will test the capacity of existing infrastructure, including pedestrian and bicycle facilities, particularly those located along greenways. This suggests that stormwater capture project components may be useful for integration into more active transportation projects. Moreover, climate models project that by mid-century, Los Angeles County will experience an average of nine days of extreme heat per year, growing to 12 days per year by the final decades of the century. Trends will be even more severe in some inland counties.[46]

In urban areas, extreme heat in combination with elements of the built environment that exacerbate heat, such as dark pavement or lack of tree canopy, can lead to higher surface temperatures, also known as the urban heat island effect.[47] In these conditions, of particular concern will be those individuals who do not have a choice when making their travel decisions but are forced to use active transportation. As established earlier, active transportation is frequently combined with transit/rail and often transit/rail shelters are missing, which can be especially impactful during periods of extreme heat.[48] Extreme heat can have serious public health impacts. During an extreme heat event, the human body's temperature can quickly rise and reach 106 degrees Fahrenheit, increasing the risk of heat-related illnesses such as heat stroke, which occurs when the body's temperature escalates from 98.6 degrees to 104 degrees Fahrenheit.[49] Other health-risks from extreme heat include dehydration, heat exhaustion or cramps, and even lethality. Because of their exposure to heat and increased body heat production from physical activity, people who travel via active transportation are more vulnerable to heat-related illnesses.[50] In addition, poor air quality resulting from increased heat and pollutants can pose health risks, especially those in disadvantaged communities already facing environmental justice concerns. Ultimately, extreme weather events create, at best, uncomfortable, and at worst, fatal conditions for people who utilize active transportation. It is important for local jurisdictions throughout the region to implement urban greening plans to reduce the impact of the urban heat island effect. These plans should focus on popular pedestrian and bicycling routes, especially routes that connect to transit/rail stops and stations. For example, the City of Los Angeles' 2019 Sustainable City Plan includes initiatives such as increasing greenery, implementing cool pavement corridors and other interventions to improve pedestrian and bicyclist comfort on routes to high-volume transit stops, as well as implementing a Street Furniture program that reduces heat exposure and provides cool transit stops.[51] The City also launched Cool Streets LA, a program to address the effects of climate change by implementing measures such as cool pavements[52] to help lower temperature and add shade in the City's hottest and most vulnerable neighborhoods. For more information on sustainability and resilience focused strategies, please review the Land Use and Communities Technical Report.

3.12.4 TECHNOLOGY AND MICROMOBILITY

Micromobility has emerged as a significant trend in active transportation in Southern California, offering alternative modes of travel that are accessible, environmentally friendly, and well-suited for shorter trips. The region has witnessed notable developments and trends in micromobility in recent years. One prominent trend is the proliferation of dockless electric scooters and electric bicycles. Companies providing these services have deployed fleets of shared electric scooters and electric bikes across the region. Users can easily locate and rent these vehicles using smartphone applications, providing a flexible and convenient mode of transportation for short distances. This trend has gained popularity due to the ease of use, convenience, and the ability to quickly cover short distances without relying on personal vehicles. Additionally, electric bicycles, commonly known as e-bikes, have gained traction. E-bikes provide an extra boost of electric power, making bicycling more accessible to a wider range of individuals, including those who may have physical limitations or need assistance with longer rides. The introduction of e-bikes has

contributed to the growth of active transportation, allowing individuals to travel longer distances with ease and reducing reliance on cars for commuting or running errands.

Local jurisdictions and transportation agencies have also recognized the potential of micromobility in promoting active transportation. Efforts have been made to establish regulations and partnerships with micromobility operators to ensure safe and responsible operations. This includes defining designated parking areas, setting speed limits, and establishing rules to ensure the proper use and maintenance of these devices. Across Los Angeles County, Metro Bike Share offers around 1,800 traditional bikes and e-bikes at more than 200 docking stations in Downtown Los Angeles, Central Los Angeles, North Hollywood, Westwood, and across the Westside. Though e-bikes make up 17 percent of the bikes available in the system, they provide more than eight times the rides per bike per day compared to the traditional bikes in the system (as of June 2023). In addition to Metro's program, there is also the Long Beach Bike Share, the GoSGV Bike Share (e-bikes) in San Gabriel Valley, and the West Hollywood Dockless Mobility Pilot Program, which includes e-bikes and e-scooters. Scooter sharing programs can be found across the region but are primarily located in Los Angeles County. Examples include Culver City's Electric Scooter Share, Los Angeles' Dockless Vehicle Pilot Program, Santa Monica's Shared Mobility Pilot Program, Coachella's E-Scooter Pilot; and Indio's E-Scooter Pilot.

Figure 3-30. GoSGV Bike Share Program

Source: GoSGV

The integration of micromobility with existing transit/rail systems is also gaining traction. Transit/rail agencies are exploring partnerships and pilot programs to enable seamless multimodal travel experiences. This includes facilitating connections between transit/rail stops and stations and mobility hubs with shared micromobility options, making it easier for people to access and utilize public transportation as part of their overall trip. With all that said, challenges persist in managing the impacts of micromobility. Issues such as sidewalk clutter and improper parking, and the resulting safety issues, and ensuring equitable access to these services remain areas of concern. At this time, California offers some level of regulation on micromobility devices (e.g., speed limits, bikeway use, etc.), while other regulations are left to the discretion of the local jurisdiction (e.g., number of operators, parking locations, etc.). In some cases, local jurisdictions have imposed restrictions on the use of these devices at night, but research indicates this motivates more

auto trips [53] and has equity implications (e.g., eliminating access to a more affordable mode of transportation).[54] At minimum, local jurisdictions typically require that companies pull permits to operate. Balancing the benefits of micromobility with the need for proper regulation and infrastructure improvements continues to be a focus for the future. SCAG has previously identified local policies for consideration and will continue to refine these as part of future Smart Cities planning efforts.[55]

3.12.5 CURB SPACE MANAGEMENT

Emerging trends in the transportation industry, such as the rapid growth of on-demand transportation (e.g., shared micromobility and Transportation Network Companies), and e-commerce goods deliveries have greatly impacted the number of curb space users and how the curb space is used. Today, the curb must serve a variety of users, including drivers, bicyclists, pedestrians, micromobility device users, transit riders, emergency service personnel, delivery vehicles, taxis, and TNC drivers. This increased demand for curb space has resulted in competition among modes, roadway congestion, and illegal parking. Additionally, increased reliance on delivery services, shifting of commercial activities to the sidewalk, and increased cycling rates during the COVID-19 pandemic have further highlighted the need for better approaches to curb space management. Curb space management becomes a crucial aspect of local and regional planning that requires innovative solutions to address the challenges it poses. These solutions respond to various dimensions of curb space activity including mobility, livability, safety, economics, and equity. Local jurisdictions face varying degrees of challenges when it comes to curb space management. Each jurisdiction needs to tailor its strategies based on the constraints and local challenges. These might range from interest in adding more bike lanes and enhancing pedestrian safety, to conflicts with parking, TNCs, and loading zones. Additionally, political willingness and budget availability play a significant role in shaping the approach to curb management at local agency level.

3.12.6 DEMOGRAPHIC CHANGES

Between 2024 and 2050, the SCAG region will undergo substantial demographic transitions, including the addition of approximately two million more residents and an aging population. Each of these transitions will have implications for the way we travel and how people can access their destinations. As the region's population continues to grow, additional strain will be placed on our transportation network as people attempt to access their destinations. However, if we are able to concentrate much of that growth into Priority Development Areas (PDAs), as outlined in the Land Use and Communities Technical Report, many of these trips will be shorter in nature, making them more amenable to active transportation and micromobility modes. Likewise, given the additional demand on our streets to convey this expanded population, alternatives to single occupancy travel will become increasingly necessary.

Figure 3-31. Aging Population

Source: Dan Burden via pedbikeimages

Between now and 2050, SCAG anticipates experiencing an overall decrease in the number of children and adolescents, modest growth in the number of middle-aged adults, rapid growth in the 65+ population, and more than doubling in the 85+ population. This will require the region to adapt to provide added services for the elderly population to meet their transportation needs. According to the Centers for Disease Control, older adults engage with the built environment in ways that align with their evolving lifestyles and physical abilities. After retirement, individuals often have more leisure time to partake in park visits, recreational activities, and community facilities. However, factors like chronic illnesses and diminished vision may restrict mobility and give rise to specific transportation needs. For instance, an older adult who can no longer drive but resides in an area with access to transit/rail and other transportation alternatives possesses the opportunity to maintain mobility, surpassing the capabilities of many in suburban communities.[56]

The design of the built environment will also be important to allow these individuals to "age in the community" so that they are not forced to relocate due to limited mobility or rising housing costs.[57] This may require affordable housing close to destinations, improved sidewalks and separated bicycle facilities to allow for continued physical activity, and access to paratransit or shared ride services equipped to work with older adults to ensure they can remain independent, active, and engaged. E-bikes and e-scooters may also make it possible for some of these individuals to continue to travel by active modes later into their lives although overall rates of bicycling will likely be lower for the age group as compared to the others.

3.13 WHO SHAPED OUR APPROACH TO THIS PLAN?

Understanding the current state of the region as it implements projects and plans for future projects is critical in shaping the Plan for the region. Thus, a significant effort is made to conduct meaningful outreach and engagement throughout Connect SoCal 2024's development, to SCAG's Transportation Committee, as well as to other critical stakeholders, including the Safe and Active Streets Working Group, which is

comprised of dozens of local agency staff and community-based organizations, and consultants working in the active transportation field. As part of the planning process, SCAG staff sought to better understand active transportation existing conditions, challenges and opportunities, and potential strategies and actions that could be taken to advance active transportation.

In the summer of 2020 and in the wake of the COVID-19 pandemic shutdown, SCAG staff began meeting virtually with local agencies to discuss active transportation needs in their communities and assist in the development of grant applications for Cycle 5 of the Active Transportation Program (ATP). Throughout this process, SCAG continued to hear that local agency needs were significantly exceeding the funding available from the program. Throughout 2020 and 2021, SCAG staff also regularly met with County Transportation Commissions in the development of the ATP Regional Program and to support the implementation of active transportation projects across the region. SCAG staff also coordinated with the Caltrans Districts regarding their development of the Caltrans Active Transportation Plans.

In late 2022 and early 2023, SCAG staff convened the Next Generation Infrastructure Subcommittee, which was comprised of a dozen policymakers from across the region. The Subcommittee was intended to provide guidance on the priorities and strategies for Connect SoCal 2024, reflecting the rapidly evolving developments specific to the future of mobility and associated implications for public policy. The Subcommittee's September 2023 meeting was focused on how travel behavior had evolved due to pandemic and the implications these changes held for long-range transportation planning. The meeting included perspectives from the 3 Revolutions Future Mobility Program at the University of California, Davis and the Institute of Transportation Studies at the University of California, Los Angeles. Key findings shared included increases in telework were changing the dynamics of travel both in time and location, and more short trips were occurring throughout the day, especially across the afternoon. To address these changing travel patterns, the meeting concluded with a recommendation that transportation planning and operating agencies focus on increasing transportation choices beyond driving, including connecting communities with pedestrian and bicycle facilities.

With that said, overall, feedback from members of the Subcommittee can be grouped into the following broad recommendations that are relevant to active transportation:

- **Maintain a people-centric transportation investment strategy:** Ensure that deployment of new technologies support people's needs and address larger shared goals like advancing equitable access and reducing traffic fatalities and series injuries. Prioritize use of our public rights-of-way for all roadway users, especially focusing on the needs of non-single occupant vehicle users.
- **Continue to invest in system preservation and efficiency investments:** Fix-it-first remains a key strategy for Connect SoCal, especially recognizing greater needs associated with the transition to zero emission vehicles and ensuring system resilience.
- **Expand and enhance mobility choices:** Increase choices beyond driving by enhancing and supporting services across all modes of travel including transit/rail, active transportation, micromobility, and automobiles. Reconsider the role of the automobile in our daily lives and how mobility options can increase reliable accessibility.
- **Re-envision how we plan, fund, and manage the transportation system:** Plan and manage the transportation system more like an investor, including asserting a role in the management of the transportation digital realm. Appropriately pricing the transportation system ensures that the system functions for all users (even during peak demand periods), generates reliable revenue, and establishes resources for addressing equity concerns.

Figure 3-32. Multimodal Integration

Source: South Bay Cities Council of Governments

In spring 2023, SCAG conducted Connect SoCal 2024 outreach and engagement across the region to share information about the Plan and to seek feedback on priorities. The purpose of these events was to gather input regarding challenges each community faces to establish planning priorities for the next 20+ years. Through a series of in-person and virtual workshops, valuable insights were gathered from stakeholders regarding active transportation-related concerns and priorities in the region. Stakeholders expressed strong support for active transportation, emphasizing the need for more comfortable routes and more destinations that can be easily reached by active transportation modes. They also advocated for increased investment in First/Last Mile and Safe Routes to School initiatives. Safety concerns regarding poor pedestrian and bicycling infrastructure were raised, as well as the need for effective regulations for e-bikes and micromobility options. Furthermore, stakeholders demonstrated a keen interest in transportation-related climate mitigation efforts, prioritizing the enhancement of pedestrian and bicycle networks, improved amenities and shade provision near transit/rail stops and stations, and the reduction of the urban heat island effect through the enhancement of the urban tree canopy.

As part of the spring 2023 outreach, SCAG also administered an online survey on SCAG's website and social media pages. The survey included three questions related to active transportation and one question related to transportation equity.[58] Survey responses showed that residents generally feel comfortable walking and/or biking in their neighborhood and prefer to use active transportation modes to access school and/or childcare and fun/leisure activities compared to other destinations. When asked what transportation-related improvements were most important to the stakeholders' communities, the most cited response was "more comfortable routes for walking, bicycling, or rolling" and the third most cited response was "improved street safety." Similarly, "safe streets for bicyclists and pedestrians" was ranked as the second-most significant transportation equity issue affecting the region. The full survey results can be found in "Public Outreach Findings" section of the Public Participation and Consultation Technical Report.
Overall, the outreach and engagement helped SCAG gain a better understanding of stakeholders' perspectives and priorities. Stakeholder feedback revealed a shared vision of active transportation investment, affordability, accessibility, reliability, and safety, while prioritizing the evolving needs of communities. It is evident that stakeholders place great importance on the creation of a robust, multimodal

transportation system that not only provides a wide range of travel options but also ensures the safety of all road users.

3.14 WHAT IS OUR PLAN FOR THE FUTURE?

Connect SoCal's vision is to create a healthy, prosperous, accessible, and connected region for a more resilient and equitable future. This vision is meant to encapsulate an image of what the region can become by 2050. The vision underscores the core purpose and responsibility of the long-range plan in supporting balanced growth of the region's natural and built environments to meet the needs of people in the years to come. Supporting this vision are multiple goals, including one for mobility that is focused on building and maintaining a robust transportation network and one for community that is focused on developing, connecting, and sustaining communities that are livable and thriving. More specifically, this means:

- Supporting investments that are well-maintained and operated, coordinated, resilient and result in improved safety, improved air quality, and minimized greenhouse gas emissions.
- Ensuring that reliable, accessible, affordable, and appealing travel options are readily available, while striving to enhance equity in the offerings in high-need communities.
- Supporting planning for people of all ages, abilities, and backgrounds.

Overall, the future of active transportation is likely to be shaped by a combination of technological, social, and environmental developments. While the exact trajectory is difficult to predict, it is clear that there will be a continued need for efficient and sustainable transportation solutions in the years to come. Some potential trends that could shape the future of active transportation include:

- **Expansion of Active Transportation Infrastructure:** Through California ATP funding cycles, there will be a continued focus on expanding and improving active transportation infrastructure, including the development of connected networks of bike lanes, sidewalks, and multi-use paths. Efforts may also be directed towards creating more Complete Streets, including those that are more pedestrian-friendly, enhancing safety measures, and implementing innovative solutions to address barriers and gaps in the existing infrastructure.
- **Multimodal Integration:** The integration of different modes of transportation, including active transportation, transit/rail, and shared mobility services, is likely to become more prominent. This will likely take the form of mobility hubs across the region. Efforts to create seamless connections and improve first/last mile connectivity can enhance the overall transportation experience and encourage more people to combine active transportation with other modes of travel for longer trips.
- **Integration with Emerging Technologies:** The integration of emerging technologies, such as e-bikes, e-scooters, and autonomous vehicles, could have a significant impact on active transportation. These technologies may offer new mobility options, improved connectivity, and increased accessibility for individuals, potentially transforming the way people move within and between communities.
- **Data-Driven Planning:** Advancements in data collection, analysis, and technology can contribute to more informed and data-driven active transportation planning and decision-making processes. Data on travel patterns, user behavior, safety incidents, and infrastructure needs can inform the design and implementation of active transportation projects, leading to more efficient and effective solutions. In the near-term, SCAG will support Caltrans in its development of a statewide Active

Transportation Database (ATDB), and, for its part, SCAG will continue to support use of the Regional Data Platform (RDP).

- **Emphasis on Equity and Accessibility:** There is likely to be a growing emphasis on equity in active transportation planning, aiming to ensure that all communities, including Priority Equity Communities, have equitable access to safe and convenient active transportation options. This will likely involve ever more targeted investments, community engagement (e.g., via community-based organizations), and policies focused on reducing disparities and improving transportation equity. In California, this may be reinforced by Caltrans' Transportation Equity Index,[59] which is described in more detail in the Plan's Equity Analysis.
- **Changing Demographics and Urban Development:** As noted earlier, shifts in demographics, including an aging population and changing urban development patterns, will shape active transportation. Planning for the diverse needs of different age groups, accommodating changing mobility preferences, and designing walkable and bike-friendly neighborhoods will be critical.

The Plan includes robust investment in active transportation projects with an investment of $38 billion of local, state, and federal funds. These investments will further the Plan's vision in each county.

Regionally significant projects include, but are not limited to:

- The City of Los Angeles secured $32 million in ATP funds for the Boyle Heights Community Connectivity Project, which will add protected/separated bikeways, new sidewalks, improved crosswalks, bike racks, bike lockers, hydration stations, e-bike charging stations, street lighting, shade trees, and benches in areas disproportionately impacted by issues associated with nearby freeways.
- Los Angeles County was awarded a $21.5 million Safe Streets and Roads for All (SS4A) grant for their proposed Vision Zero project, Florence-Firestone (FF) for All: Achieving Vision Zero in South Los Angeles. The County plans to use the SS4A grant funds to implement Proven Safety Countermeasures along three Collision Concentration Corridors (CCCs) in the FF community, including the highest-ranked CCC in the County. Project components include infrastructure improvements such as ADA-compliant curb ramps, curb extensions, pedestrian refuge islands, speed cushions, high-visibility crosswalks, and removing sections of roadway to reduce conflicts. In addition to the infrastructure improvements, the County will undertake an education campaign in schools with teen drivers and establish an education campaign for a Safe Routes for Seniors Program.
- The City of Pasadena secured nearly $10 million in ATP funds for the North Lake Avenue Pedestrian and Safety Enhancement Project. Through this project the City plans to improve pedestrian and traffic safety along North Lake Avenue, which connects to downtown Pasadena and the Gold Line Lake Station.

  The City of Pomona secured more than $11 million in ATP funds for the San Jose Creek Multi-Use Bikeway, which is a section of the San Gabriel Valley Greenway Network. The bikeway will run 3.5 miles diagonally from California State University, Pomona at Temple Avenue to residential Murchison Avenue just south of the 10 Freeway and would connect several schools and public parks.
- The Orange County Transportation Authority secured nearly $46 million in ATP funds for the design and implementation of segments P and Q of the OC Loop project. This will fill a 1.6-mile gap in the region's 66-mile Class I bicycle network and will construct a Class I multi-use path, five roadway and railway underpasses, and install wayfinding signage.

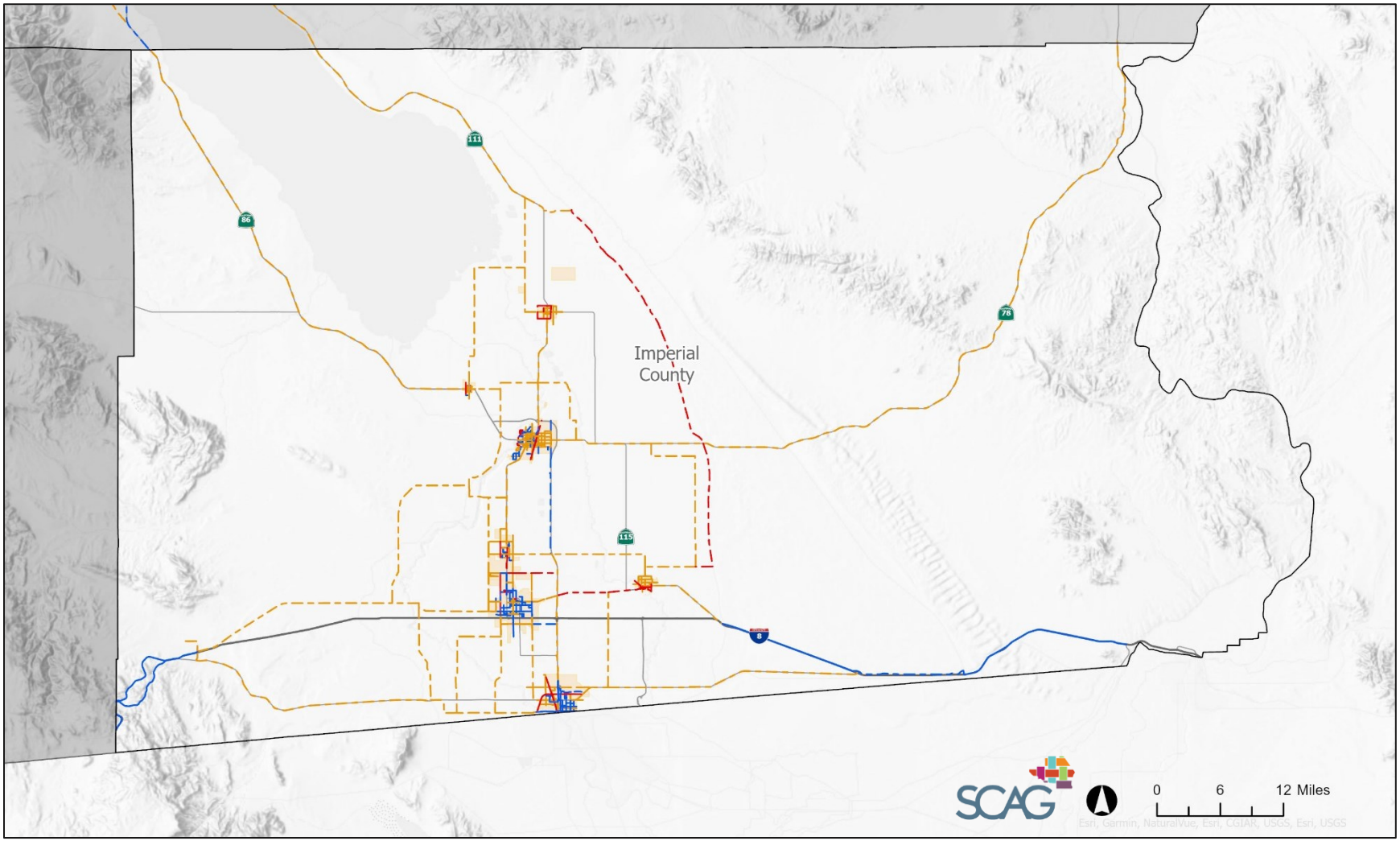
- The City of Rialto secured more than $7 million in ATP funds for the Rialto Pacific Electric Trail Extension. The 1.75-mile extension of the multi-use path along the historic rail corridor, from Cactus Avenue to Pepper Avenue, will provide safe access to several destinations through the heart of Rialto, as well as provide a critical connection to other existing outdoor recreational areas along the corridor.
- The City of Wildomar was awarded a $2 million SS4A grant to provide infrastructure improvements on Sedco Boulevard in its most disadvantaged neighborhood by adding bicycle lanes adjacent to vehicle travel lanes, improving sidewalks, and installing three roundabouts along a 0.19-mile segment that links two planned bicycle corridors. The roundabout installations will function as a traffic calming measure to encourage slower speeds and further support multimodal mobility.
- The Coachella Valley Association of Governments (CVAG) has made significant progress on the construction of the CV Link, a 40-mile active transportation and low-speed electric vehicle pathway connecting Coachella Valley communities. CVAG has secured $36 million in funding for the Arts and Music Line (a 10-mile pathway network) that will further connect Coachella Valley, including the festival grounds.

Figure 3-33. CV Link

Source: Coachella Valley Association of Governments

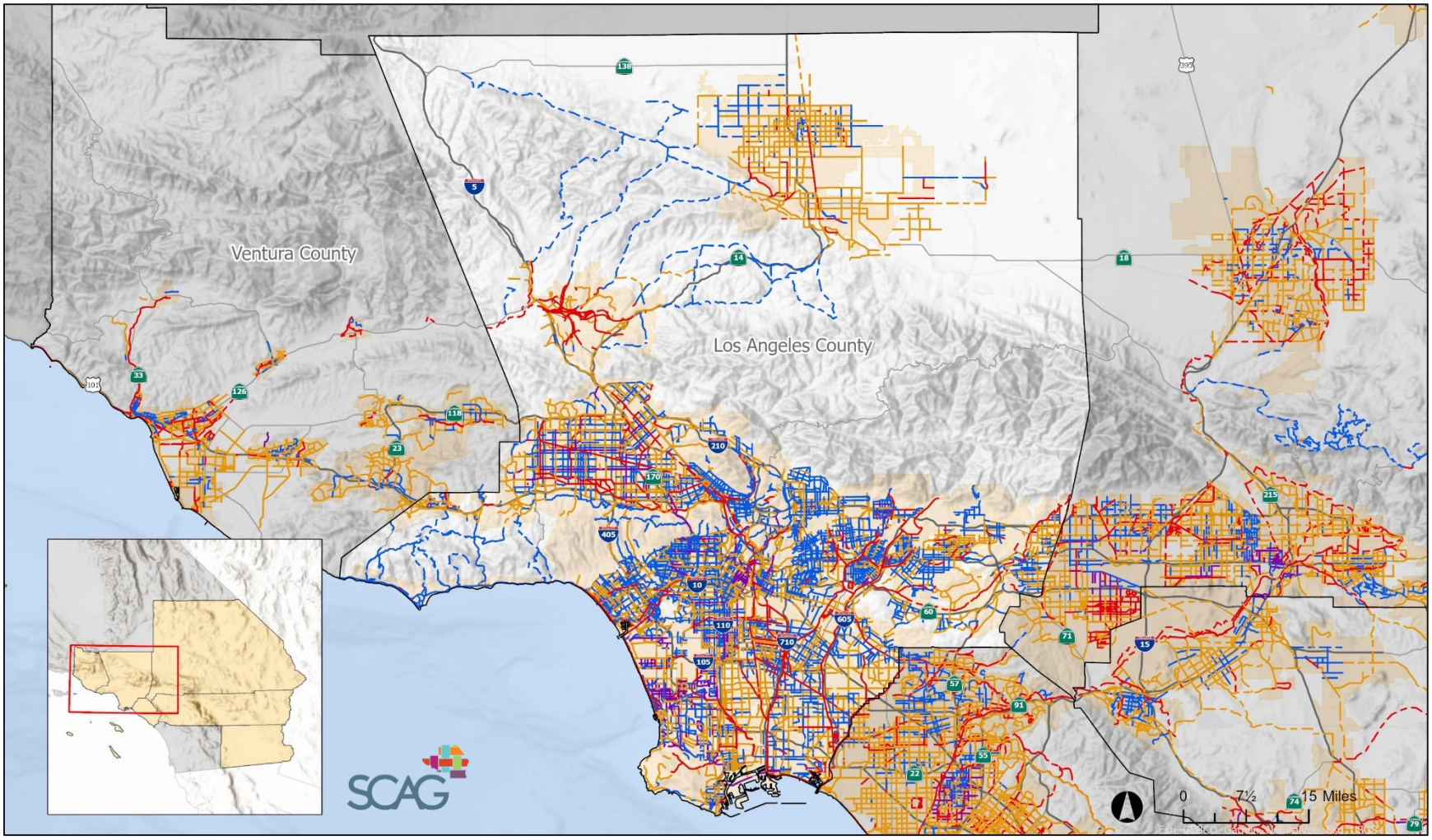
- The City of Ventura secured more than $6 million in ATP funds for the Santa Paula Rail Trail, which will function as an east-west bicycle and pedestrian route. The project will construct a dedicated Class I bicycle and pedestrian facility that will provide a safer route for all active transportation users.

Map 3-2. Imperial County Bikeway Network



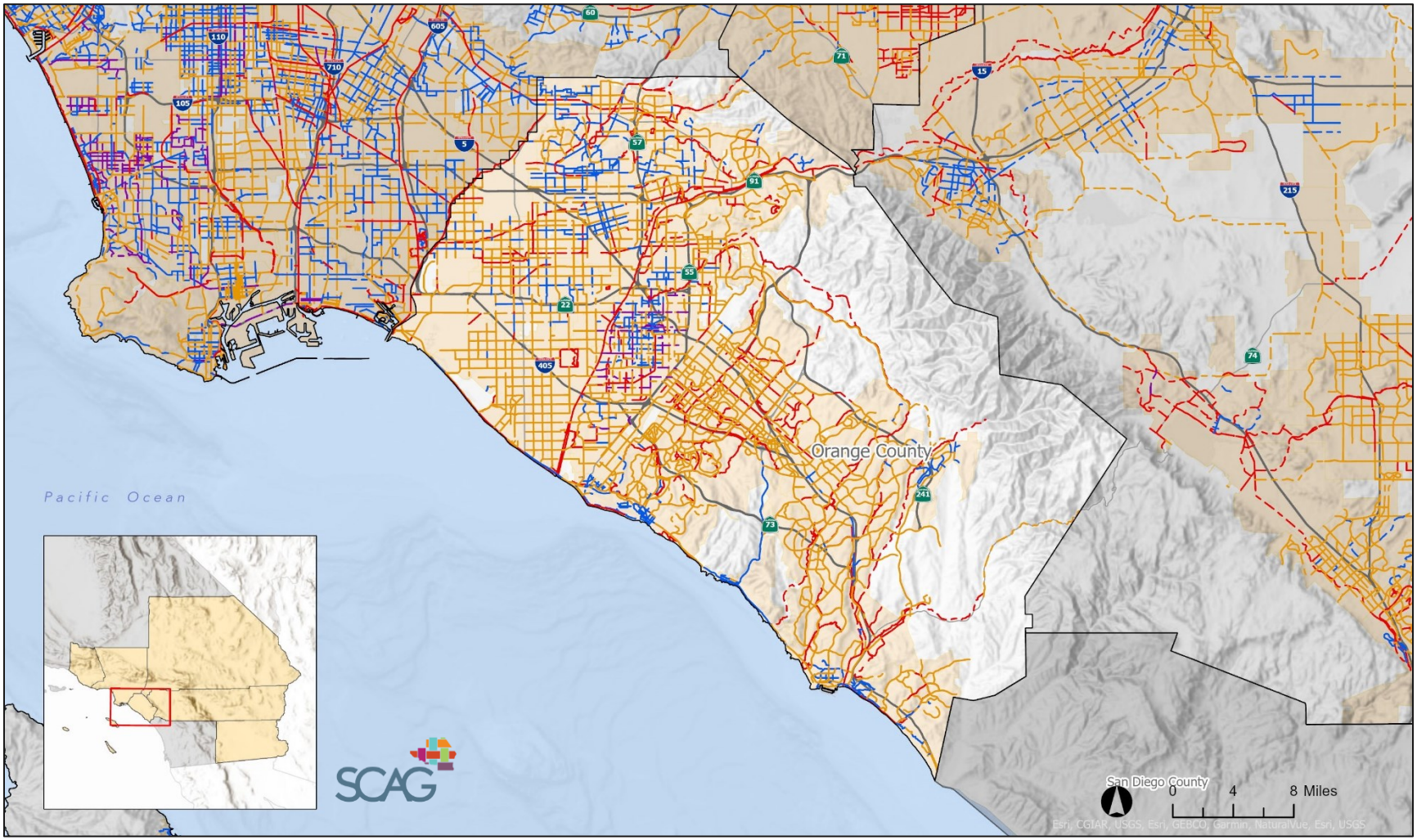
Source: SCAG (2023)

Map 3-3. Los Angeles County Bikeway Network



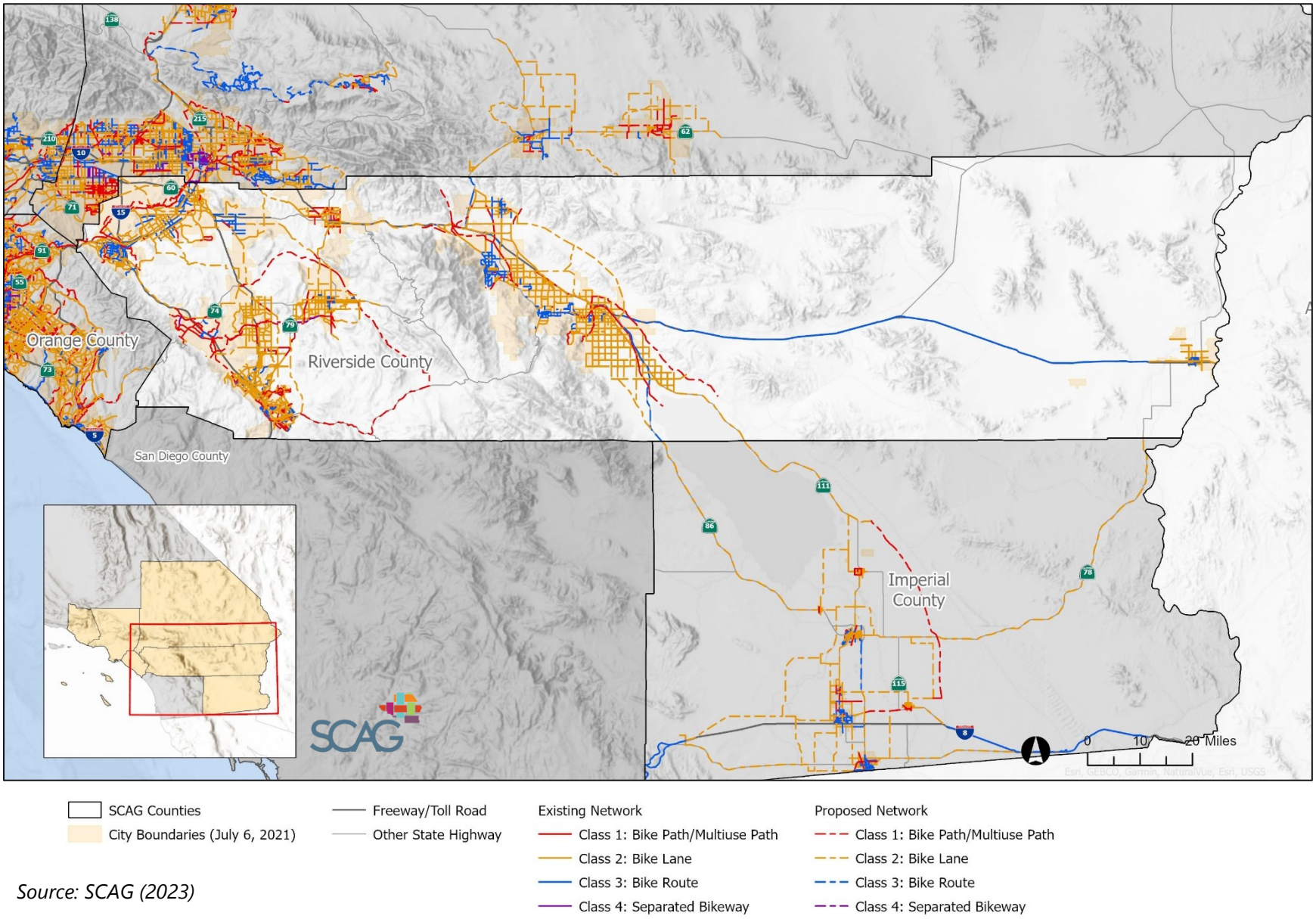
Source: SCAG (2023)

Map 3-4. Orange County Bikeway Network



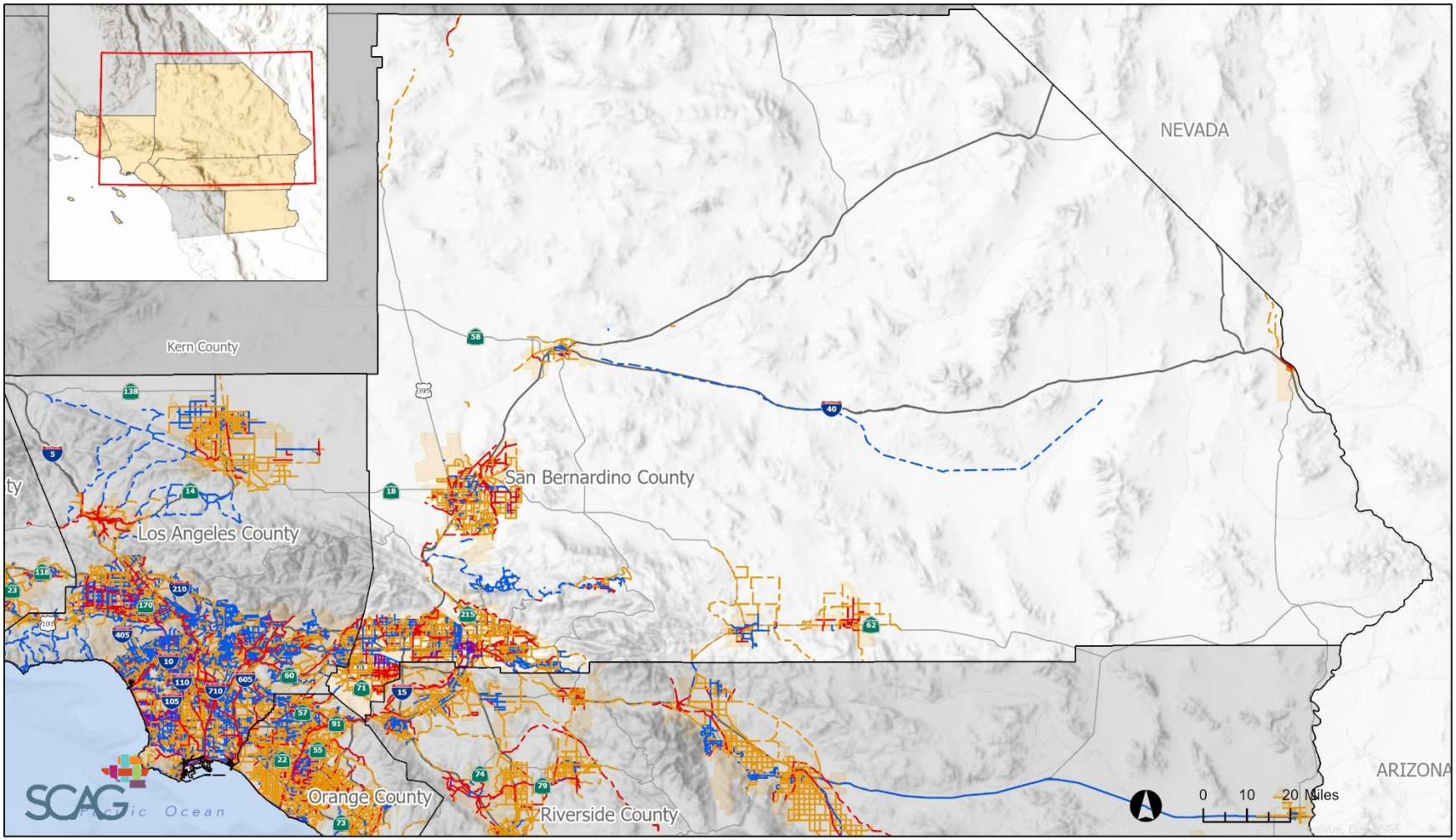
Source: SCAG (2023)

Map 3-5. Riverside County Bikeway Network



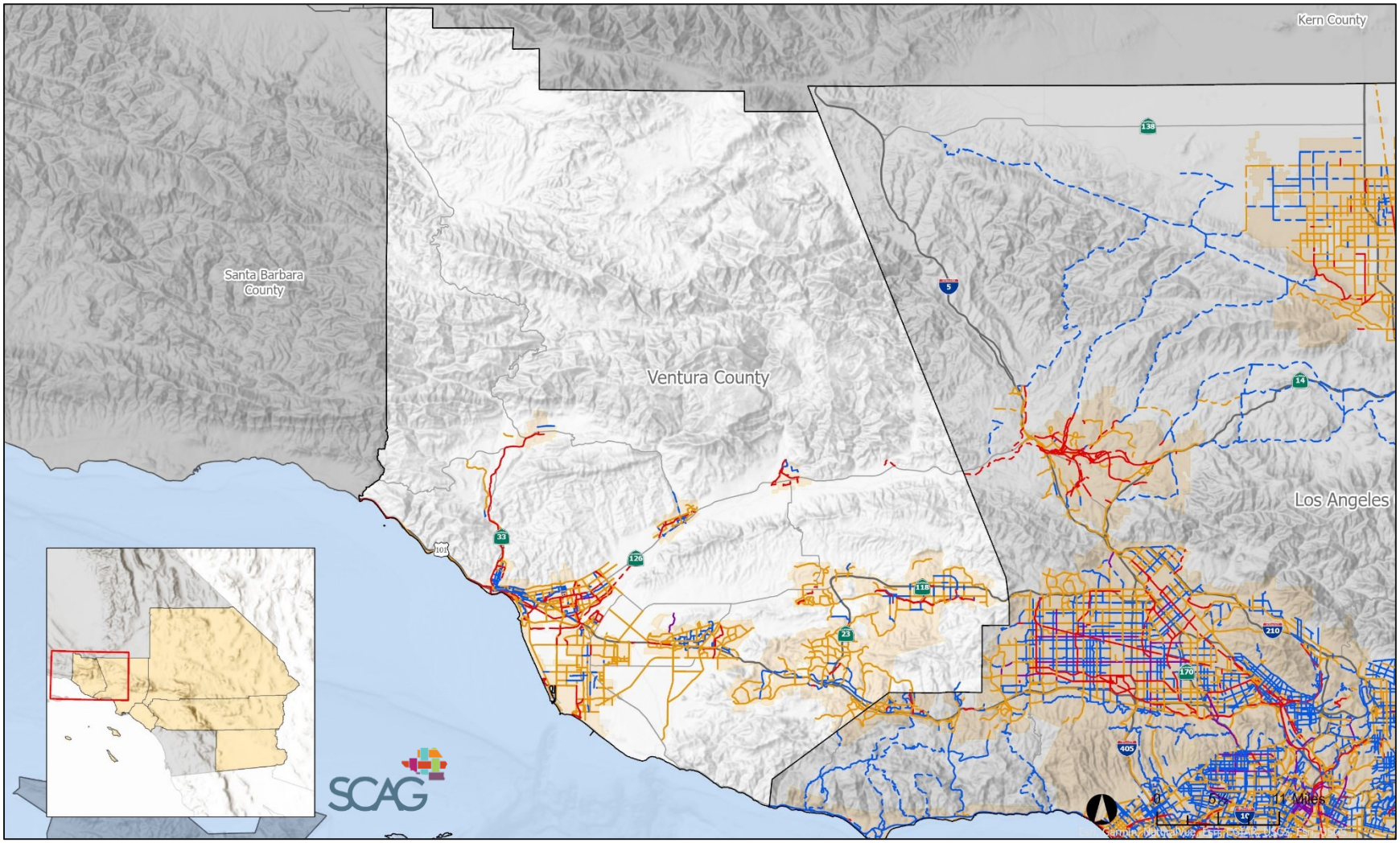
Source: SCAG (2023)

Map 3-6. San Bernardino County Bikeway Network



Source: SCAG (2023)

Map 3-7. Ventura County Bikeway Network



Source: SCAG (2023)

3.15 HOW ARE WE GOING TO COLLECTIVELY ACHIEVE OUR VISION?

As noted elsewhere in the Mobility Technical Report, the opportunity to change the way people travel across the region is significant, particularly when considering our transportation system through a multimodal and Complete Streets approach. The proposed vision for active transportation is one that improves connectivity and integration between bicyclists, pedestrians, micromobility users, and the transit/rail network. It supports safe access for people of all ages and abilities. Active transportation is meant to function as connective tissue within a larger multimodal ecosystem. To further increase the use of active transportation, for both short and long trips, it is critical that we address gaps in the existing networks and promote multimodal integration. Thoughtfully designing and integrating active transportation networks into the larger transportation system supports more multimodal offerings that seamlessly connect. This integration allows people to incorporate active modes into daily commutes, recreational outings, and other longer trips, further reducing reliance on private vehicles and promoting a more sustainable transportation mix and more connected communities. Strategies to support this future are detailed below. Implementation of these strategies should follow a community engagement process centered on advancing equitable communities.

3.15.1 COMPLETE STREETS

As noted earlier, Complete Streets are streets that are planned, designed, built, operated, and maintained to support safety, comfort, and mobility for all road users rather than focusing exclusively on the speed of cars and the flow of traffic. These streets safely accommodate people of all ages and abilities, regardless of whether they are driving, walking, bicycling, rolling, or taking transit/rail. They may incorporate and optimize new technologies, micromobility devices, and curb space management strategies. Complete Streets also involve ensuring that there are first/last mile connections for individuals at the beginning and end of their journeys. Complete Streets are especially attuned to the needs of those who have experienced systemic underinvestment or those whose needs have not been met through a traditional transportation approach, such as older adults, people living with disabilities, people who do not have access to vehicles, and communities of color.

Fortunately, nearly half of all jurisdictions across the region have adopted Complete Streets policies and strategies through their General Plan circulation or mobility elements. For easy reference, the University of California, Berkeley Safe Transportation Research & Education Center (SafeTREC) maintains a California Complete Streets Policy Inventory[60] of jurisdictions with relevant policies, and at the national level, Smart Growth America maintains a similar list.[61] SCAG adopted a formal regional Complete Streets policy in 2023 (see Appendix 7). Across the SCAG region, significant countywide policies include:

- The Los Angeles County Metropolitan Authority (LA Metro) adopted the Metro Complete Streets Policy[62] in 2014, which is intended to function as a tool to help guide Metro to better coordinate internally and with partners across the county. The policy provides design standards as well as high-level policy guidance for local jurisdictions within Los Angeles County to develop their individual Complete Streets policies.
- The Orange County Council of Governments (OCCOG) released the Complete Street Handbook and Funding Toolkit in 2016.[63] The OCCOG Handbook is intended to support policy development and provide design guidance and is written from the standpoint of jurisdictions wanting to use both basic and more robust complete streets measures. The Funding Toolkit explains the funding landscape of potential revenue sources for Complete Streets projects.

- The San Bernardino County Transportation Authority Complete Streets Strategy[64] was adopted in 2015 and aims to help local jurisdictions implement Complete Streets policies and projects in their communities.
- The Western Riverside Council of Governments (WRCOG) developed a Subregional Climate Action Plan Implementation Model Book[65] that includes Complete Streets best practices and strategies for general mobility, Transportation Demand Management (TDM), and parking. These strategies are meant to support the subregion's efforts to motivate more local actions to reduce greenhouse gas emissions and adapt to anticipated climate change effects.

Across the region, there are noteworthy examples of Complete Streets. One example is the Broadway Streetscape Project in Downtown Los Angeles. The project aimed to transform Broadway, a major thoroughfare in the heart of Downtown Los Angeles, into a more vibrant, pedestrian-friendly, and multimodal corridor. The Broadway Streetscape Project incorporated various elements of a Complete Street design, including improved sidewalks, dedicated bicycle lanes, enhanced landscaping, and public spaces. The project widened sidewalks to create more space for pedestrians, added protected bike lanes separated from vehicular traffic, and installed new street furniture, lighting, and street trees to enhance the aesthetics and comfort of the street. Furthermore, the project incorporated public plazas and seating areas, providing spaces for people to gather, relax, and enjoy the surroundings. These enhancements not only improved the pedestrian experience but also contributed to the overall livability and vitality of the area. The transformation of Broadway into a Complete Street not only prioritized the needs and safety of pedestrians and bicyclists but also aimed to revitalize the area as a thriving destination. The project created an inviting and accessible environment that encourages walking, bicycling, and community interaction while promoting economic activity and supporting local businesses.

Figure 3-34. Broadway Streetscape Project

Source: Los Angeles Department of Transportation Livable Streets

Another notable example of a Complete Street can be found in Orange County, the Pacific Coast Highway (PCH) Streetscape Project in Huntington Beach. The project aimed to transform a section of Pacific Coast Highway, a major coastal thoroughfare, into a safer, more pedestrian-friendly, and aesthetically pleasing street. The PCH Streetscape Project incorporated various elements of a Complete Street design, focusing on enhancing the pedestrian experience and improving multimodal connectivity. The project included widening sidewalks to provide more space for pedestrians and adding dedicated bike lanes separated from vehicle traffic, promoting safer bicycling along this busy corridor. To enhance the aesthetics and comfort of the street, the project introduced new street furniture, lighting, and landscaping elements. This included the installation of benches, bike racks, decorative streetlights, and landscaping features like trees and planters, creating a more inviting and visually appealing environment for pedestrians and bicyclists. The project also paid attention to improving pedestrian safety by adding crosswalks with enhanced visibility and pedestrian-scale lighting. Intersection improvements, including updated traffic signals and signage, were implemented to create safer crossings and better accommodate pedestrians and bicyclists. The transformation of the Pacific Coast Highway into a complete street in Huntington Beach aimed to promote active transportation, create a more enjoyable experience for pedestrians and bicyclists, and enhance the overall appeal and livability of the city's coastal area.

3.15.2 MULTIMODAL INTEGRATION

As noted in Chapter 2, multimodal integration refers to the seamless and efficient integration of different modes of transportation, such as cars, buses, trains, bicycles, and walking, to provide travelers with convenient and connected mobility options. It involves coordinating and integrating various transportation services and infrastructure to enable travelers to move smoothly across different modes of transport and complete their journeys efficiently. The goal of multimodal integration in transportation is to create a well-connected and sustainable transportation system that optimizes the use of available resources, reduces congestion, and enhances the overall travel experience for individuals. It recognizes that no single mode of transport can fulfill all travel needs and that combining multiple modes can offer greater flexibility, convenience, and efficiency. By integrating and optimizing the different components of the transportation system, multimodal integration aims to create a more connected and efficient mobility ecosystem. Strategies for achieving multimodal integration are detailed below.

MOBILITY HUBS – As noted earlier, mobility hubs are places where people can seamlessly connect with multiple modes of transportation in a safe, comfortable, and accessible environment. Mobility hubs are locations where there are a range of transportation options (but typically at least two) that connect and interact with each other. They may include transit/rail, active transportation, shared vehicles, and electric vehicle charging stations. They are the infrastructure foundation for multimodal trip planning and promoting mode shift and are considered essential for a safe and convenient transfer between transportation modes. More details on SCAG's regional approach for mobility hubs can be found in the Transit/Rail Chapter.

Figure 3-35. Willowbrook/Rosa Parks Station Mobility Hub

Source: Los Angeles Metro

Examples of mobility hubs in the region are the Wilshire/Vermont Station and Willowbrook/Rosa Parks Station, which include amenities such as car share, bike share, bus shelters, and next bus information. Other examples include regional mobility hubs like Union Station and North Hollywood Station which offer amenities like secure bike parking and bus layover zones.

MOBILITY AS A SERVICE (MaaS) – As noted in Chapter 2, MaaS integrates transportation services into a single mobility platform that provides competitive alternatives over private vehicles to promote universal basic mobility, encourage mode shift, and foster sustainable travel choices. It plays a critical role in providing trip planning and seamless fare payment options for easy access to transit/rail, first/last mile connections, and other travel options. Although it functions well where there is an existing integrated transportation network, it can help create the building blocks for integrated options to develop. MaaS is driven by data standardization and policies that support secured data sharing and interoperability by building on existing standards and principles including General Transit Feed Specification (GTFS), General Bikeshare Feed Specification (GBFS), mobility data specification and the mobility data interoperability principles. Effective data standardization can also support interoperability of transit/rail and other mobility services.

One example of MaaS in Southern California is the Metro TAP app, which was developed by LA Metro. The Metro TAP app includes features like trip planning, real-time arrival information, and fare integration. Users can plan their transit/rail as well as Metro Bike Share trips. Additional programs including microtransit, scooters, ride-hailing, parking, and electric vehicle charging are also forthcoming.

SHARED MOBILITY – Shared mobility is transportation services and resources that are shared among users, either concurrently or one after another. This includes micromobility (bike sharing, scooter sharing); automobile-based modes (car sharing, rides on demand via Transportation Network Companies (TNCs) like Uber and Lyft); microtransit; and commute-based modes or ridesharing (carpooling and vanpooling). To support shared mobility, infrastructure is needed such as micromobility parking and docking zones with

designated areas for parking micromobility devices and charging stations for electric micromobility devices. Micromobility strategies aim to establish shared infrastructure and regulatory frameworks that promote the safe and responsible use of micromobility devices. These strategies address critical considerations, such as where and when these devices should be used and how they can coexist with other modes of transportation on the roadway network. Implementing effective micromobility strategies will involve a variety of approaches. For instance, local jurisdictions can offer incentives to encourage the purchase and use of e-bikes, promoting their adoption as a sustainable transportation option. Equity policies can also be implemented to ensure that privately-owned micromobility devices are distributed in a way that provides access to Priority Equity Communities. For example, Lime, a company that operates scooter share, offers subsidized passes based on income level. While many micromobility devices will likely be provided by the private sector, it is important to recognize that they utilize public streets, and consequently, there may be an increased demand for separated facilities that prioritize safety for users of all ages and abilities. Local jurisdictions are often responsible for regulating these devices, including managing designated parking locations and determining which facilities they can be ridden on. By providing shared infrastructure and establishing effective regulations, local jurisdictions can ensure the safe and responsible use of micromobility devices while enhancing accessibility and promoting equitable transportation options.

As the transportation landscape continues to evolve, incorporating new technologies and micromobility innovations, it is crucial for local jurisdictions to adapt and remain flexible. The focus should be on solutions that provide data-driven insights and scalable multimodal integration. Achieving this requires collaboration and the sharing of best practices among agencies to ensure that the deployment of new technologies minimizes disruption and maximizes benefits. SCAG understands that local agencies and leaders across the region will increasingly face the challenge of making informed decisions regarding emerging technologies. The lack of adequate information regarding the impacts of new technologies on communities may pose significant challenges. To assist in this decision-making process, SCAG developed a set of Guiding Principles for Emerging Technology to support staff and local leaders as they evaluate emerging mobility technologies. Please see Appendix 1 to review these principles.

Examples of shared mobility (also noted earlier) include the Metro Bike Share system, launched in 2016, which makes 1,800 traditional bikes and e-bikes available to residents and visitors at over 220 docking stations throughout Downtown Los Angeles, Central Los Angeles, North Hollywood, and the Westside areas.[66] The Bike Share system is integrated with Metro's Transit Access Pass (TAP) and provides a dedicated Bike Share app which streamlines the undocking and release process. To date, the system has logged over six million miles travelled, reducing approximately 6.3 million pounds of CO2 emissions.[67]

Another example is the Long Beach Bike Share, which includes a fleet of 876 bicycles and 109 self-serve bike share hubs available throughout the city including West Long Beach.[68] In 2019, the City of Long Beach further expanded micromobility options for residents and visitors with the approval of its Shared Micromobility Program, a joint e-scooter and e-bike program. As part of the program, City-approved operators of shared micromobility services must obtain a 12-month Shared Micromobility Permit, which they can use to operate up to 1,000 e-scooters within the city.

Figure 3-36. Metro Bike Share

Source: Los Angeles Metro

3.15.3 SHORT TRIPS

As noted earlier, a significant portion of trips that people make in the region are short— the majority of walking trips are a half-mile, while the majority of bicycle trips are less than one mile. In 2019, 16 percent of work trips and 43 percent of non-work trips in the SCAG region were three miles or less. The implementation of short trip strategies can effectively reduce vehicle miles traveled (VMT), encourage mode shift, and support the use of transit/rail. By prioritizing active transportation options and leveraging both physical infrastructure and innovative technology, communities can achieve these goals while also improving air quality and public health. Furthermore, it is important to focus on supporting short trips, as more people work remotely and complete daytime short trips.

PEDESTRIAN AND BIKEWAY INFRASTRUCTURE – The installation of sidewalks, paths, Americans with Disabilities Act (ADA) required infrastructure, and other pedestrian facilities will support safe conditions for walking. Much of the transportation network currently includes sidewalks; however, as noted earlier, there are often gaps in the network, sidewalks in need of repair, and in some cases, existing sidewalks that do not meet current ADA requirements. Providing complete sidewalk networks and amenities, such as landscaping and trees, allow for safe and comfortable travel for walking and rolling trips and encourage walking and rolling for a variety of short trip purposes. Investments will improve safety outcomes for pedestrians and reduce VMT by shifting short trips to walking modes. Regionally significant pedestrian and bicyclist projects were noted earlier during the discussion of progress since Connect SoCal 2020 was adopted, and later when considering recently funded significant projects.

The expansion of the bicycle network to include more low stress facilities (e.g., Class I, Class II, and Class IV facilities) will support safe conditions for bicycling. This work is closely aligned with the First/Last Mile,

Shared Mobility, and Safe Routes strategies. The region has continued to expand its existing and planned bicycle networks as more local jurisdictions build projects and complete active transportation planning for their communities. Since Connect SoCal 2020 was adopted, the region added more than 1,000 miles of bikeways.[69] Moving forward, the region will need to begin developing complete networks of separated facilities that can serve people of all ages and abilities, as well as a range of micromobility devices. This may require the removal of vehicle lanes to accommodate a wider range of active transportation uses along certain corridors as well as the completion of traffic calming on neighborhood streets that will serve as connectors between larger facilities. It is important to recognize that the removal of vehicle lanes can be contentious due to a variety of factors, including drivers and business owners who may be concerned about potential negative impacts on traffic flow and access to businesses. Implementing these types of projects can highlight the challenges of balancing the needs and interests of different road users and stakeholders. This is when intensive and supportive community outreach and studies to understand the effects of proposed roadway designs prove helpful.

Local jurisdictions may also pursue implementing Slow Streets, a by-product of the COVID-19 pandemic. Slow Streets are safe, comfortable, low-vehicle-traffic routes that prioritize active transportation and community-building. These shared streets are designed and implemented on residential streets to provide safe, comfortable alternatives to driving. They are open to all forms of transportation, including vehicles accessing properties along the corridor, and emphasize slow and safe speeds to support a diverse mix of uses. During the pandemic, some cities used existing Active Transportation Plans to identify which streets could be made into Slow Streets, while others asked neighborhood groups and nonprofits to apply for their roadways to be temporarily converted into Slow Streets. Notably, the City of Los Angeles established a Slow Streets program in May 2020 and was able to install more than 50 miles of Slow Streets in 30 neighborhoods throughout the city.

Local jurisdictions may also implement or enhance walking and bicycling infrastructure with Quick Build projects, which were described earlier, but refer to interim capital improvement projects that typically include active transportation components. The purpose of a Quick Build project is to immediately implement safety needs, allowing a community to benefit quickly from improvements and to provide input before a project is permanently constructed. In other cases, it may make sense to host local demonstration events, where temporary materials like the *Go Human* Kit of Parts is used to demonstrate new active transportation infrastructure improvements to engage community members and solidify support for future permanent projects. SCAG has completed Quick Build projects with the Cities of Beverly Hills, Hermosa Beach, and Ojai, and is currently working with the Cities of Calexico, El Monte, Glendale, Long Beach, Los Angeles, Pasadena, Pomona, and Santa Monica on additional Quick Build projects.

The City of Ojai's Quick Build project included parking protected bikeways along three quarters of a mile of Maricopa Highway. These improvements were installed using paint, delineators, and temporary planters. Data from the community survey showed that 59 percent of respondents supported the changes. In addition to community input, the evaluation process included traffic counts and speed surveys. There was a 59 percent increase in pedestrians along the corridor, 53 percent more bicyclists, and a seven percent reduction in vehicle speed. Ultimately, the City decided to retain the final improvements and is currently seeking funding for full capital improvements in partnership with Caltrans.

Figure 3-37. Go Ojai Demonstration Project

Source: SCAG

In other cases, it may be worthwhile for a local jurisdiction or a group of local jurisdictions to host Open Streets events, which can function as an effective way to conduct outreach and engagement for projects. Open Streets events are typically a single day full closure of streets to automobile traffic with programed hubs along the corridor. On an Open Street, people traffic replaces car traffic, and streets become places where people of all ages, abilities and background can come out and improve their health. They are free and offer communities the opportunity to experience streets in a whole new way. An example of a relatively recent Open Streets event was the Heart of the Foothills event in the San Gabriel Valley, which covered 6.5 miles across the cities of San Dimas, La Verne, Pomona, and Claremont. Within Los Angeles County, most Open Streets events like this one are funded using Metro's Open Streets Grant Program.

FIRST/LAST MILE INFRASTRUCTURE – This strategy is closely aligned with the pedestrian and bikeway infrastructure strategy. As noted earlier, it involves integrating and connecting active transportation with other modes, such as transit/rail, and addressing gaps in the existing transportation network to enhance the convenience, safety, and reliability of travel across the region. The phrase "first mile/last mile" describes situations where travelers are trying to travel from their starting point to a transit/rail stop or station and from the stop or station to their final destination. Since many transit/rail riders need to walk, bike, or roll to transit/rail stops or stations, making the first mile/last mile of their trips accessible to all modes, ages, and abilities makes transit/rail available to a wider population. Improving conditions includes increasing safety, enhancing infrastructure, and reducing time it takes to access the transit/rail stop or station. Infrastructure investments would build on and complement the pedestrian and bicycle network improvements described above and could include dedicated bicycle routes, additional sidewalk enhancements/ traffic calming, mid-block crossings, and reduced waiting periods at traffic signals. In addition, first/last mile infrastructure

includes improvements within stations such as mobility hubs, long term bicycle or micromobility storage facilities, ADA accessibility improvements, landscaping, streetscape furniture, and bus shelters.

SAFE ROUTES (TO SCHOOLS, PARKS, TRANSIT, OR FOR OLDER ADULTS) – Safe Routes strategies aim to increase the number of people walking, bicycling, and rolling by implementing infrastructure improvements to the pedestrian and bicycle network within a specified distance from a school, transit/rail stop or station, park, or location serving older adults. Safe Routes strategies are comprehensive approaches to reduce the number of single occupant vehicle (SOV) trips to these locations. Safe Routes infrastructure strategies include a variety of implementation approaches that complement and build on the larger pedestrian and bicycle infrastructure strategies by focusing on improvements within specific service areas (e.g., near schools, older adult centers, parks, etc.). These include crossing and intersection improvements, bikeways, bicycle parking, improvements to drop-off and pick-up areas to reduce conflicts, and safety improvements to monitor and reduce traffic speeds. Safe Routes infrastructure is often paired with programs that include educational campaigns and policies to create safer environments.

3.15.4 REGIONAL TRIPS

The purpose of the Regional Trip strategies is to provide strategic approaches to developing a regional bikeway/greenway network that connects local jurisdictions throughout the SCAG region, activity centers, downtowns and commercial areas, the coast and educational institutions. The Regional Trip strategies are comprised of four strategies: first/last mile connections to transit/rail, the Regional Bikeway Network, Regional Greenway Network, and California Coastal Trail Access. Regional Trip strategies are for those trips that are generally longer than the typical bicycle ride and include trips for commuting or recreation.

FIRST/LAST MILE INFRASTRUCTURE – First/last mile strategies for regional trips mirror the strategies used for short trips but focus on transit/rail options that travel a longer distance using services such as Metrolink. Using a Complete Streets approach to maximize the number of people walking or bicycling to transit/rail, these strategies improve active transportation conditions up to three miles from a transit/rail stop or station. This strategy works by attracting transit/rail riders by decreasing the door-to-door travel time of a transit/rail trip thereby creating the conditions that allow people to travel a longer distance in the same amount of time as well as improving safety. In addition to the strategies listed for short trips, it is important to provide secure long-term bike or micromobility storage options at the stop or station and also space on the transit/rail vehicle to transport the device alongside the rider.

REGIONAL BIKEWAY NETWORK – The Regional Bikeway Network (RBN) is a proposed 2,233-mile system of interconnected bicycle routes of regional significance. The RBN connects local jurisdictions and counties, and it serves as a spine for local bikeway networks and the Regional Greenway Network. It includes on- and off-road bikeways that link major origins and destinations directly or through connectivity to high-quality transit service. The primary purpose of identifying this network is to provide a strategic regional perspective and to highlight the planning priorities of the County Transportation Commissions. Details on the individual corridors included in the Regional Bikeway Network can be found in Appendix 8.

REGIONAL GREENWAY NETWORK – The Regional Greenway Network (RGN) includes trails, utility corridors, flood control channels, and other off-street facilities that have been, or could be, converted to walking and bicycling facilities. The RGN will support increased rates of physical activity and improve accessibility by providing a low-stress network for recreational trips as well as providing a backbone to the pedestrian and bicycle networks for utilitarian trips. The primary purpose of identifying this greenway network is to provide a strategic regional perspective and highlight the planning priorities of the County Transportation

Commissions. The complete RGN, as well as details on the individual corridors included in the RGN can be found in Appendix 9.

Figure 3-38. San Gabriel Bike Trail

Source: Los Angeles County Department of Public Works

CALIFORNIA COASTAL TRAIL – The California Coastal Trail (CCT), established by the Coastal Act of 1976, is a "continuous public right-of-way along the California coastline; a trail designed to foster appreciation and stewardship of the scenic and natural resources of the coast through hiking and other complementary modes of non-motorized transportation." In 2003, the Coastal Conservancy developed the Completing the California Coastal Trail plan to provide a strategic blueprint to complete the CCT. The CCT currently has 118 miles of trail signed and 374 insignia installed. A map of the CCT can be found in Appendix 8. Pursuant to state law, SCAG is required to incorporate the California Coastal Trail access and completion into its regional transportation planning process.

3.15.5 TRANSPORTATION SAFETY

As noted at the beginning of the Mobility Technical report, transportation safety forms the foundation of a healthy mobility ecosystem. Bicyclists and pedestrians are commonly recognized as vulnerable road users due to their lack of protection compared to those inside vehicles. It is important that efforts are taken to build a safe multimodal network for these road users. This work is often rooted in Vision Zero, Zero Deaths, and Safe System approaches to eliminate all traffic fatalities and serious injuries. The Safe System framework emphasizes a systematic approach toward achievement of the ultimate objective of zero crash-related fatalities. It 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 collisions may be preventable through human-centered roadway structural design enhancements and the implementation of proactive transportation safety policy.

Figure 3-39. Safe System Approach

Source: U.S. Department of Transportation, Published on October 13, 2022

Safety strategies include a range of planning, policy, and programmatic strategies as well as Complete Streets infrastructure improvements (described earlier). Similar to California's Strategic Highway Safety Plan, SCAG anticipates that the prevention of fatalities and serious injuries will occur through the implementation of actions supporting the following overarching strategies (note: those applying to SCAG's work):

- Education: Educate all road users on safe behaviors. For example:
    - Partner on regional safety campaigns to improve driver awareness of the needs and rights of vulnerable road users.

  - Support community engagement strategies grounded in equity that prioritize education over punitive enforcement.
  - Educate local and county law enforcement professionals using regional resources on the rules of the road related to pedestrians, bicyclists, and micromobility users.
  - Educate agency engineering staff to implement the latest innovations in street design that prioritize safety.
  - Pair major infrastructure changes and enforcement activities with messaging to communicate to community members the importance of traffic safety.

- Engineering: Apply effective and/or innovative countermeasures. For example:
  - Implement pedestrian and bicycle safety in all roadway maintenance projects where new striping will be required or existing striping is to be replaced.
  - Ensure all sidewalks and intersections are ADA compliant.
  - Incorporate median sanctuaries for pedestrians at appropriate intersections.
  - Install lighting surrounding crosswalks at intersections and mid-block locations to provide better visibility of pedestrians crossing streets at night.
  - Increase crossing times to account for people walking or rolling at differing speeds.
  - Use intersection control devices that detect bicyclists, particularly left turn signals.
  - Connect low-stress bicycle facilities, including regionally significant bicycle corridors, for bicycle travel throughout the region.
  - Consider pedestrian needs in all roadway and transit/rail projects.

- Emerging Technologies: Apply emerging technologies to roadway, vehicle, and user. For example:
  - Develop a regulatory framework for partnerships with private operators that supports infrastructure improvements to support micromobility and bicyclist safety.
  - Implement innovative curb management programs that repurpose street parking for safe micromobility and bicycle facilities.

3.16 HOW WILL SCAG SUPPORT THE REGION?

We understand that progress towards achieving regional goals will be made primarily through implementation at the local level. We also know that there are strategies SCAG can support to help the region realize Connect SoCal 2024's vision. These SCAG-specific strategies are reflected in Appendix 4 and will be backed by the following efforts:

3.16.1 POLICY AND PLANNING

- Perform analytical studies to move forward the key strategies described.
- Support active transportation legislation. As documented in SCAG's legislative platform, SCAG supports legislation that advances regional transportation interests, including active transportation.
- Support and collaborate on implementation of California's Strategic Highway Safety Plan (SHSP). SCAG serves on the SHSP Executive Leadership Committee, which provides leadership on the direction of statewide transportation safety and policymaking, the SHSP Steering Committee, which establishes the strategies and processes to implement California's statewide transportation safety framework, and several SHSP Challenge Area teams (e.g. Bicyclists and Pedestrians), which evaluate relevant data and track best practices related to their area and are responsible for the development and completion of action items in the Implementation Plan.

3.16.2 DATA COLLECTION AND ANALYSIS

- Establish transportation safety targets and maintain the Regional High Injury Network to support this work. As described below, as a Metropolitan Planning Organization (MPO), SCAG is federally required to establish annual targets.
- Analyze, interpret, and share regional data via platforms such as SCAG's Transportation Safety Resource Hub, the Regional Data Platform, and Story Maps. Through these platforms, monitor implementation progress across the region.
- Conduct transportation safety modeling to help the region understand the impacts of potential and planned projects and to support informed policy decision-making.

3.16.3 SUPPORTING LOCAL EFFORTS

- Assist in the distribution and administration of California's Active Transportation Program funding.
- To the extent that SCAG is able, provide active transportation planning technical assistance to support the development of plans, projects, or programs that implement the key strategies described in this chapter.
- Program local projects into the Federal Transportation Improvement Program (FTIP). Entering projects into the FTIP is a key step in the project development pipeline, particularly for projects using federal funds, requiring federal approvals, or that are regionally significant.
- Convene policymakers and practitioners on at least a quarterly basis to achieve better coordination and uplift best practices via the Safe and Active Streets Working Group and *Go Human* Steering Committee.
- Lead and Collaborate on Safety Education Campaigns. To heighten awareness of the region's transportation safety challenges and opportunities, especially for people who travel via active transportation, and to eliminate collisions resulting in serious injuries or fatalities, SCAG launched the *Go Human* campaign in 2015. *Go Human* is a community outreach and advertising campaign with the goals of reducing traffic collisions and encouraging people to walk and bike more in the SCAG region. *Go Human* is a collaboration between SCAG and the County Transportation Commissions and Public Health Departments in the region. The campaign provides advertising and educational resources to partners and implements temporary safety demonstration projects to showcase innovative transportation designs and help cities re-envision their streets as safer, more accessible places for walking and biking. Other strategies have included distribution of mini grants to local partners to implement safety engagement activities, safety workshops and symposiums, among others.

3.17 HOW WILL WE KNOW HOW WE ARE DOING?

Connect SoCal 2024's performance measures evaluate the performance of the previously referenced investments and strategies that will be implemented at the local, regional, and/or state levels. The Plan's performance is largely evaluated using a combination of modeling tools. The modeling results provide the basis for interpreting the anticipated outcomes of the Plan's investments and strategies. As noted in the Mobility Technical Report Overview (Chapter 1), the Plan's performance measures are detailed in Appendix 3. Among the performance measures, those that correspond to active transportation include trip distance, mode share, average travel time, and travel time by mode. These performance measures are intended to

help us understand how our future might appear – whether our region will become more connected and accessible and grow in ways that promote livability.

To demonstrate the effectiveness of Connect SoCal 2024 toward achieving our regional vision and goals, SCAG conducted a 'Plan' vs 'No Plan' (or 'Baseline') analysis, which compares how the region would perform with and without implementation of the Plan. It is important to understand these terms:

- The region's 'Base Year' represents existing conditions as of 2019 – that is, the regional transportation system as it was on the ground and in service in 2019. The year 2019 was selected as the base year to avoid the COVID-19 pandemic irregularities that impacted travel behavior in 2020.
- Baseline' represents the future regional transportation system that will result from the continuation of current programs including projects currently under construction or undergoing right-of-way acquisition; those programs and projects programmed and committed to in the 2023 Federal Transportation Improvement Program (FTIP); and projects that have already received environmental clearance.
- 'Plan' represents future conditions in 2050 in which the investments and strategies detailed in Connect SoCal are fully implemented and benefits are realized.

Based on this analysis, SCAG found that in comparison to the 2050 Baseline, Connect SoCal 2024 will increase the share of work trips made by active transportation by 2.8 percentage points, and increase the percentage of work trips less than three miles, distances that are easier to cover via active transportation. It is important to note that an increase in active transportation mode share has the potential to significantly reduce greenhouse gas (GHG) emissions. Every single occupancy vehicle trip that is replaced with a walking, bicycling, or multimodal trip that combines active transportation and transit/rail will reduce motor vehicle emissions. This reduction in emissions will significantly improve air quality and public health throughout the region.

Following the Plan's adoption, ongoing monitoring of the Plan's performance helps ensure that the region is making progress towards achieving the established regional goals, and in some cases (e.g., transportation safety), interim targets allow for more near-term performance evaluation. Performance monitoring is key to understanding which investments and strategies are proving successful in meeting specific regional goals and which ones may require modification or reconsideration. In the long term, SCAG will monitor regional active transportation performance utilizing the following measures: average travel time and commute mode share. Transportation safety performance will be monitored as a part of federally required target setting. On an annual basis, SCAG establishes targets for the following federally defined transportation safety performance measures:

- Total number of fatalities
- Rate of fatalities per 100 million vehicle miles traveled (VMT)
- Total number of serious injuries
- Rate of serious injuries per 100 million VMT
- Total number of non-motorized fatalities and non-motorized serious injuries

SCAG's targets are in alignment with California's vision of achieving Zero Deaths (formerly referred to as Toward Zero Deaths). Every year, the region is provided the opportunity to evaluate progress and set new safety targets. More details on the Connect SoCal performance analysis and its results may be found in the Performance Monitoring Technical Report.

3.18 WHERE DO WE GO FROM HERE?

As this chapter has detailed, the future of active transportation in the region holds both challenges and opportunities, and as noted before, though it is difficult to precisely forecast its trajectory, we do know that climate change impacts and technological advances will continue, and with them, movement toward more sustainable transportation options like active transportation. Through our outreach and engagement for the Plan, we have heard that many people feel they have limited reliable travel options besides driving to everyday destinations. If we can invest in active transportation so that it feels like a safe and convenient option that is better connected to other modes, we can provide more viable transportation options for more people across the region and help build a healthier, more accessible, and connected region that is prepared for a resilient and equitable future. To get there, we need to form strong partnerships across agencies and sectors to implement the strategies described in this chapter. We will also need changes in how we plan for and accommodate those who drive, which will be covered in the next chapter that focuses on Streets and Highways.

APPENDICES

1. Guiding Principles for Emerging Technology
2. Mobility Planning and Policy Context Table
3. Connect SoCal 2024 – Mobility Performance Measures Table
4. Connect SoCal 2024 – Mobility Strategies
5. High Quality Transit Corridors Methodology
6. Coordinated Human Services Transportation Plans and Regional Transit/Rail-related Plans
7. Regional Complete Streets Policy
8. Regional Bikeway Network
9. Regional Greenway Network
10. Active Transportation Plans – Regional Assessment
11. Comprehensive Multimodal Corridor Plans

3.19 ENDNOTES

[1] Caltrans (2017). *Toward an Active California: State Bicycle + Pedestrian Plan*. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/f0020350-activeca-final-plan-2017-05-18-a11y.pdf

[2] Price, J., Blackshear, D., Blount, W., Jr., & Sandt, L. (2021). Micromobility: A Travel Mode Innovation. *Public Roads*. https://highways.dot.gov/public-roads/spring-2021/02

[3] National Association of City Transportation Officials. (2018). Shared Micro-mobility in the U.S.

[4] California Department of Transportation (2022). Quick Build Supplemental Guidance. https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/atp/cy6/cy-6-finalquickbuild-supplementalguidance-v2.pdf

[5] Orange County Transportation Authority (OCTA). (2021, March). *Orange County Safe Routes to School Plan*. https://img1.wsimg.com/blobby/go/5e8747f2-d8ba-499d-b038-2786bf17b59f/downloads/Orange%20County%20SRTS%20Action%20Plan%20(final).pdf?ver=1623936907175

[6] City of La Puente. (2023, January). La Puente Safe Routes to School Plan. https://altago.com/wp-content/uploads/La-Puente-Safe-Routes-to-School-Plan-Final-01.30.2023.pdf

[7] Safe Routes Partnership. https://www.saferoutespartnership.org/.

[8] Los Angeles County Metropolitan Transportation Authority (Metro). (2014). First Last Mile Strategic Plan. http://media.metro.net/docs/sustainability_path_design_guidelines.pdf

[9] Francke, A. (2022, June 11). Cycling during and after the COVID-19 pandemic. Advances in Transport Policy and Planning.10:265–90. doi: 10.1016/bs.atpp.2022.04.011. Epub. PMCID: PMC9188448. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9188448/

[10] Boudway, Ira. Bloomberg News. (2022, January 21). America's Best-Selling Electric Vehicles Ride on Two Wheels. https://www.bloomberg.com/news/articles/2022-01-21/u-s-e-bike-sales-outpaced-electric-cars-in-2021

[11] Wang, Fia. Revi Bikes. (2023, February 19). E-Bike Market Report 2022-2023. https://www.revibikes.com/blogs/news/e-bike-market-report-2022-2023.

[12] National Association of City Transportation Officials. (2020). Streets for Pandemic Response and Recovery. https://nacto.org/publication/streets-for-pandemic-response-recovery/

[13] National Association of City Transportation Officials. (2020). Streets for Pandemic Response and Recovery. https://nacto.org/publication/streets-for-pandemic-response-recovery/

[14] San Bernardino County Transportation Authority (SBCTA). (February 2023). Comprehensive Pedestrian Sidewalk Inventory Plan. https://www.gosbcta.com/plan/comprehensive-pedestrian-sidewalk-inventory-plan/

[15] City of El Monte. Sidewalk Inventory Report. (2023). https://www.ci.el-monte.ca.us/DocumentCenter/View/4537/Sidewalk-Inventory-Report?bidId=

[16] Approximately 1,157 new miles of bikeways were added to the existing network since Connect SoCal 2020 was adopted. Note: some of these bikeways are currently or soon will be in the process of being installed.

[17] Mekuria, Furth and Nixon. (2012). Low Stress Bicycling and Network Connectivity.

[18] Note that the research did not consider factors other than traffic that might impose stress on bicyclists, such as perception of crime, pavement quality, noise, lighting, snow removal or aesthetics of surroundings. Additionally, there are differences and crossover amongst those who cycle for different purposes and what level of traffic stress they may be willing to tolerate such as those who cycle for commuting, recreation, people moving goods or cargo, people riding bikeshare, seniors, and others.

[19] https://blog.altaplanning.com/level-of-traffic-stress-what-it-means-for-building-better-bike-networks-c4af9800b4ee
[20] North American Bikeshare and Scootershare Association's Shared Micromobility: State of the Industry Report (2022). https://nabsa.net/2023/08/10/2022industryreport/
[21] National Institute on Aging. (n.d.). Safe Driving for Older Adults. https://www.nia.nih.gov/health/older-drivers
[22] California Department of Public Health. (2016, December). Increasing Walking, Cycling, and Transit: Improving Californians' Health, Saving Costs, and Reducing Greenhouse Gases. https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/Maizlish-2016-Increasing-Walking-Cycling-Transit-Technical-Report-rev8-17-ADA.pdf
[23] Sergio A. Useche, Luis Montoro, Jaime Sanmartin, Francisco Alonso. (2019). Healthy but risky: A descriptive study on cyclists' encouraging and discouraging factors for using bicycles, habits and safety outcomes. https://doi.org/10.1016/j.trf.2019.02.014
[24] California Department of Public Health. (2016, December). Increasing Walking, Cycling, and Transit: Improving Californians' Health, Saving Costs, and Reducing Greenhouse Gases. https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/Maizlish-2016-Increasing-Walking-Cycling-Transit-Technical-Report-rev8-17-ADA.pdf
[25] SCAG. (n.d.). https://transportation-safety-scag.hub.arcgis.com/pages/high-injury-network
[26] Federal Highway Administration (FHWA). (2022, September). Improving Safety for Pedestrians and Bicyclists Accessing Transit. https://safety.fhwa.dot.gov/ped_bike/ped_transit/fhwasa21130_PedBike_Access_to_transit.pdf
[27] SCAG. (2021, March). Toolbox Tuesday: SCAG's Disadvantaged Communities Active Transportation Planning Tool: https://www.youtube.com/watch?v=Bg40Rznv3pA
[28] SCAG. (n.d.). https://transportation-safety-scag.hub.arcgis.com/
[29] The six unincorporated communities include Heber, Niland, Ocotillo, Salton City, Seeley, and Winterhaven. Bombay Beach contributed one survey but is not included as one of the six communities within the Plan.
[30] The three elementary schools include Heber Elementary School, Seely Union Elementary School, and Westmorland Elementary School.
[31] Pedestrian districts are a new component included in Metro's 2023 ATSP.
[32] Los Angeles County Metropolitan Transportation Authority (Metro). (2023, June 26). LADOT and Metro to Celebrate the Completion of the Venice Blvd Safety and Mobility Project. https://www.metro.net/about/ladot-and-metro-to-celebrate-the-completion-of-the-venice-blvd-safety-and-mobility-project/
[33] The five city council districts in the City of Palm Springs provided the subarea boundaries used to complete the study.
[34] Federal Highway Administration. (2023). *Complete Streets Construction Cost Case Study: Village Center in the City of La Quinta, CA* (FHWA-HRT-23-059). U.S. Department of Transportation. https://doi.org/10.21949/1522004
[35] National Highway Traffic Safety Administration (NHTSA). (May 2023). https://www.nhtsa.gov/press-releases/nhtsa-proposes-new-crashworthiness-pedestrian-protection-testing-program
[36] Smart Growth America. (April 12, 2021). Bigger Vehicles are Directly Resulting in More Deaths of People Walking. https://smartgrowthamerica.org/bigger-vehicles-are-directly-resulting-in-more-deaths-of-people-walking/
[37] SCAG. (February 2021). Transportation Safety Resolution. https://scag.ca.gov/sites/main/files/file-attachments/rc020421fullpacket.pdf?1612231563#page=182
[38] SCAG. (n.d.). https://transportation-safety-scag.hub.arcgis.com/

[39] SCAG. (2021). SCAG Transportation Safety Regional Existing Conditions Report. https://scag.ca.gov/sites/main/files/file-attachments/2021-transportation-safety-full-report.pdf?1641417608

[40] Federal Highway Administration (FHWA). (2022, September). Improving Safety for Pedestrians and Bicyclists Accessing Transit. https://safety.fhwa.dot.gov/ped_bike/ped_transit/fhwasa21130_PedBike_Access_to_transit.pdf

[41] Los Angeles County Metropolitan Transportation Authority (Metro). (n.d.). First/Last Mile. https://www.metro.net/about/first-last/

[42] Omnitrans. (February 2022). Omnitrans Bus Stop Safety Improvement Plan. https://omnitrans.org/wp-content/uploads/2022/02/Omnitrans-BSSIP_FINAL-1.pdf

[43] City of Montebello. (n.d.). First Last Mile Plan. https://www.montebelloca.gov/departments/transit/about_us/first_last_mile

[44] California Department of Public Health. (n.d.). California Building Resilience Against Climate Effects (CalBRACE) Project.

[45] California Legislative Analyst's Office. (2022, April). Climate Change Impacts Across California. https://lao.ca.gov/Publications/Report/4575

[46] California Legislative Analyst's Office. (2022, April). Climate Change Impacts Across California. https://lao.ca.gov/Publications/Report/4575

[47] Bedsworth, L., Cayan, D., Franco, G., Fisher, L., & Ziaja, S. (2018). *California's Fourth Climate Change Assessment Statewide Summary Report* (Publication No. SUMCCCA4-2018-013). California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, & California Public Utilities Commission. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

[48] Brozen, M., Engelhardt, C., and Lipman, E. (2023) "Are LA bus riders protected from extreme heat? Analyzing bus shelter provision in Los Angeles County." UCLA Lewis Center for Regional Policy Studies. https://www.lewis.ucla.edu/publications/do-la-bus-riders-have-shelter-from-the-elements/

[49] United States Environmental Protection Agency (EPA) and Centers for Disease Control and Prevention (CDC). (2016). *Climate Change and Extreme Heat: What We Can Do to Prepare*. https://www.epa.gov/sites/production/files/2016-10/documents/extreme-heat-guidebook.pdf

[50] Maricopa Association of Governments. (n.d.). *Shade and Thermal Comfort*. https://azmag.gov/Programs/Transportation/Active-Transportation/Active-Transportation-Plan/Active-Transportation-Toolbox/Pedestrian-Infrastructure/Shade-and-Thermal-Comfort#ref7

[51] City of Los Angeles. (2019). *L.A.'s Green New Deal, Sustainable City pLAn*. https://plan.lamayor.org/sites/default/files/pLAn_2019_final.pdf

[52] Cool pavements are paved surfaces coated with lighter-colored materials designed to reflect more solar energy and enhance water evaporation to reduce the urban heat island effect.

[53] Asensio, O.I., Apablaza, C.Z., Lawson, M.C. *et al.* Impacts of micromobility on car displacement with evidence from a natural experiment and geofencing policy. *Nat Energy* 7, 1100–1108 (2022). https://doi.org/10.1038/s41560-022-01135-1.

[54] Tu, Maylin. (March 22, 2023). E-Scooter Bans, Restrictions Can Leave Some Riders Behind. Smart Cities Dive. https://www.smartcitiesdive.com/news/e-scooter-bans-restrictions-leave-riders-behind-lime-bird/645092/

[55] SCAG (2020). Connect SoCal 2020: Emerging Technology Technical Report. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_emerging-technology.pdf?1606001600,#page=24

[56] Centers for Disease Control (CDC). (2009). Healthy Aging & the Built Environment. https://www.cdc.gov/healthyplaces/healthtopics/healthyaging.htm
[57] Arigoni, Diana. (2018). Preparing for an Aging Population. https://www.aarp.org/livable-communities/about/info-2018/aarp-livable-communities-preparing-for-an-aging-nation.html
[58] SCAG. (2023). Connect SoCal 2024 - Public Participation and Consultation Technical Report.
[59] California Department of Transportation (Caltrans). (2023). Caltrans Transportation Equity Index (EQI). https://dot.ca.gov/programs/planning-modal/race-equity/eqi
[60] University of California, Berkeley. (n.d.). Complete Streets. https://catsip.berkeley.edu/master-plans/complete-streets
[61] Smart Growth America. (n.d.). Complete Streets Policies. https://smartgrowthamerica.org/program/national-complete-streets-coalition/policy-atlas/
[62] Los Angeles County Metropolitan Transportation Authority (Metro). (2014). Metro Complete Streets Policy. https://media.metro.net/projects_studies/sustainability/images/policy_completestreets_2014-10.pdf
[63] Orange County Council of Governments (OCCOG). (n.d.). OCCOG Complete Streets Initiative. https://www.occog.com/occog-complete-streets
[64] San Bernardino County Transportation Authority (SBCTA). (2015, May). Complete Streets Strategy. https://www.gosbcta.com/wp-content/uploads/2022/02/Complete_Streets_Strategy_Final_2015-05-18_2.pdf
[65] Western Riverside Council of Governments (WRCOG). (n.d.). Subregional Climate Action Plan. https://wrcog.us/DocumentCenter/View/187/Subregional-CAP-Implementation-Model-Book-PDF?bidId=
[66] Metro. (2023, June). Metro Facts at a Glance. https://www.metro.net/about/facts-glance/
[67] Metro. (n.d.). *Data*. https://bikeshare.metro.net/about/data/
[68] Long Beach Bike Share. https://www.longbeach.gov/goactivelb/programs/long-beach-bike-share/
[69] Approximately 1,157 new miles of bikeways were added to the existing network since Connect SoCal 2020 was adopted. Note: some of these bikeways are currently or soon will be in the process of being installed.

4. STREETS AND HIGHWAYS CHAPTER

4.1 INTRODUCTION

As we have noted in the prior chapters, when people consider traveling about Southern California, they often think of the automobile, and they aren't wrong. The majority of people here drive a great deal, and they do so on the region's 73,000 lane miles of streets and highways. A substantial portion of the highway network we have today is the result of major 20th century expansions in transportation infrastructure that were motivated by a stimulus of federal funding starting in the 1950s to create the national Interstate Highway System. The SCAG region's transportation system and communities were shaped by this history. Today, our streets and highways handle more than 63 million auto trips each day, connecting urban, suburban, and rural areas, as well industrial hubs and other job centers and recreational destinations. Over time these roadways have evolved to meet the changing needs of those who depend on them. Recent State and federal "Reconnecting Communities" efforts are working to address numerous issues that persist—the divides, constrained growth, and physical isolation of communities. Still, the streets and highways that we have now make up a system that plays a significant and vital role in the overall transportation network in the region. While people in cars travel on our well-worn roads, so do people on bicycles and micromobility devices, and people on buses. The region's economy depends on this vast network to transport people to jobs, container trucks to our ports and packages to homes and businesses. The streets and highways systems are also critical components of the region's emergency response and disaster recovery plans.

Because of regional land use patterns and existing transportation options, many people depend on personal vehicles to move throughout the region, resulting in significant roadway congestion. The SCAG region is home to some of the most congested roadways in the nation. On average, local drivers end up wasting more than 95 hours stuck in traffic every single year due to congestion. In addition to congestion, transportation safety is a significant issue for the region.

Unfortunately, each year across the region, an average of about 1,600 people are killed, more than 7,000 are seriously injured and 140,000 are injured in traffic collisions. These collisions happen to drivers, but disproportionately to people who walk and bike. About 65 percent of collision-related fatalities occur on local roads as compared to 15 percent on arterials and 20 percent on highways. These local roads generally account for the largest percentage of all roadways in terms of mileage.

Improving and maintaining our regional roadways so that they function better for everyone is also a significant challenge. Leading up to 2017, California experienced chronic underinvestment in system preservation. The constant wear and tear from heavy vehicles such as trucks and buses have led to significant damage on regional roadways. Fortunately, Senate Bill 1 (SB 1) was passed in 2017, resulting in increased investment in preserving critical infrastructure like streets and highways, but a great deal of work remains to bring the system up to a state of good repair.

Despite these challenges, the region's streets and highways play an important role in the mobility ecosystem, providing access and connectivity for residents, businesses, and visitors. Streets and highways are critical for a variety of reasons, but especially for their intersection with the region's equity and climate change goals. Significant efforts are underway to address past harm caused by the construction of highways that displaced and divided communities of color. Work is also underway to address the significant transportation safety issues impacting our region through the federal Safe Streets and Roads for All initiative, as well as through California's Strategic Highway Safety Plan and related regional efforts via

SCAG's *Go Human* Program. This is especially important because transportation safety is also an equity issue. SCAG's recent update of its regional High Injury Network (HIN) revealed that approximately 70 percent of HIN roadway miles are within or adjacent to Priority Equity Communities.

With respect to climate change, the transportation sector is the largest contributor to California's greenhouse gas (GHG) emissions, a leading cause of climate change. Fortunately, the adoption of passenger electric vehicles (EVs) has gained momentum in recent years, with advances in battery technology, increased charging infrastructure, and supportive government policies. The proliferation of EVs could help reduce the GHG emissions generated by vehicle travel on streets and highways. However, more work is needed to help reduce congestion and overall motor vehicle travel and to motivate a shift to more efficient modes. While the streets and highways systems play a central role in the mobility ecosystem, it is important to avoid overburdening it as the sole solution for regional travel. A comprehensive approach that integrates multiple transportation modes and strategies is needed to create a sustainable and equitable mobility system.

This Plan envisions a future in which streets and highways function as significant components of the region's mobility ecosystem, enabling seamless and efficient travel. Complete Streets are an integral component of this network—streets that are planned, designed, built, operated, and maintained to support safety, comfort, and mobility for all road users, not just for the speed of cars and the flow of traffic. These streets function well for people using active transportation, traveling on buses, and driving vehicles. This future is aligned with the larger vision for the region, to create a healthy, accessible, and connected region for a more resilient and equitable future. The increasing demand for sustainable and safe transportation options, advancements in technology, and the ongoing impact of the COVID-19 pandemic will shape the future of our roads. This Streets and Highways chapter outlines how we can plan for this future, including a discussion on our existing conditions, challenges and opportunities, and key strategies.

4.2 WHAT CONSTITUTES THE STREETS AND HIGHWAYS SYSTEM?

Our roadway system is a critical component of the region's overall transportation network. With a population of 18.7 million people, and a vast network of streets and highways, the regional roadway system plays a significant role in the daily lives of residents and visitors. While roads primarily serve motorists, it is essential to acknowledge that other transportation users (e.g., active transportation) are also accommodated within the system. For instance, arterial roads may have designated bike lanes, and local roads may facilitate shared use for various modes of active transportation.

Before diving in too deeply, let's first establish some common understandings by defining the terms.

The physical components of streets and highways in the transportation network can be divided into functional classifications of roadways. Roadway classification places roads into categories that correspond with characteristics such as traffic volume, physical configuration and intended usage. According to the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA), roads are categorized as interstate, other freeway or expressway, other principal arterial, minor arterial, major collector, minor collector, local and main streets. To provide general context on the regional roadway system, a summary of functional roadway classifications is described below.

INTERSTATE– Connecting major population centers, ports and important transportation hubs, interstate roadways have "limited access" or "controlled access" roads. "Limited access" refers to the ability to access the roadway and no or limited access to the abutting land use. Access to interstates is controlled or limited to maximize vehicle mobility by eliminating conflict with driveways and at-grade intersections, which would

otherwise hinder travel speed. Interstates are owned and operated by the State with a few exceptions. This roadway classification is limited to the use of vehicles only.

OTHER FREEWAY OR EXPRESSWAY– While there can be regional differences in the use of the terms 'freeway' and 'expressway', for the purpose of functional classification the roads in this classification have directional travel lanes are usually separated by some type of physical barrier, and their access and egress points are limited to on- and off-ramp locations or a very limited number of at-grade intersections. Like interstates, these roadways are designed and constructed to maximize their mobility function and abutting land uses are not directly served by them. Freeways and expressways roads are owned and operated by the State. This roadway classification is limited to the use of vehicles only.

OTHER PRINCIPAL ARTERIAL– These roadways serve major centers of metropolitan areas, providing a high degree of mobility and connectivity. Abutting land uses can be served directly. Forms of access for other principal arterial roadways include driveways to specific parcels and at-grade intersections with other roadways. Principal arterials roads are generally owned and operated by a city, county or other local jurisdiction. This type of roadway classification is open to both motorists and multimodal users, unless expressly prohibited. Pedestrians have the option to use the sidewalk where provided, while other multimodal users can share the road with motorists or utilize designated paths and lanes, such as those found on certain sections of California State Route 1.

MINOR ARTERIAL– Minor arterials provide service for trips of moderate length, serve geographic areas that are smaller than their higher arterial counterparts and offer connectivity to the larger arterial system. In an urban context, they interconnect and augment the overall arterial system, provide intra-community continuity and may carry local bus routes. Typically, these are two-to-four lanes. In rural settings, minor arterials should be identified and spaced at intervals consistent with population density, so that all developed areas are within a reasonable distance of a higher-level arterial. Additionally, minor arterials in rural areas are typically designed to provide relatively high overall travel speeds, with minimum interference to through movement. Minor arterial roads are generally owned and operated by a city, county, or other local jurisdiction. This functional classification type is not limited to only motor vehicles and can be accessible by pedestrians, bicyclists, and other multimodal users. Pedestrians can utilize the sidewalk, while other multimodal users can share the road with motorists or use designed paths/lanes if available.

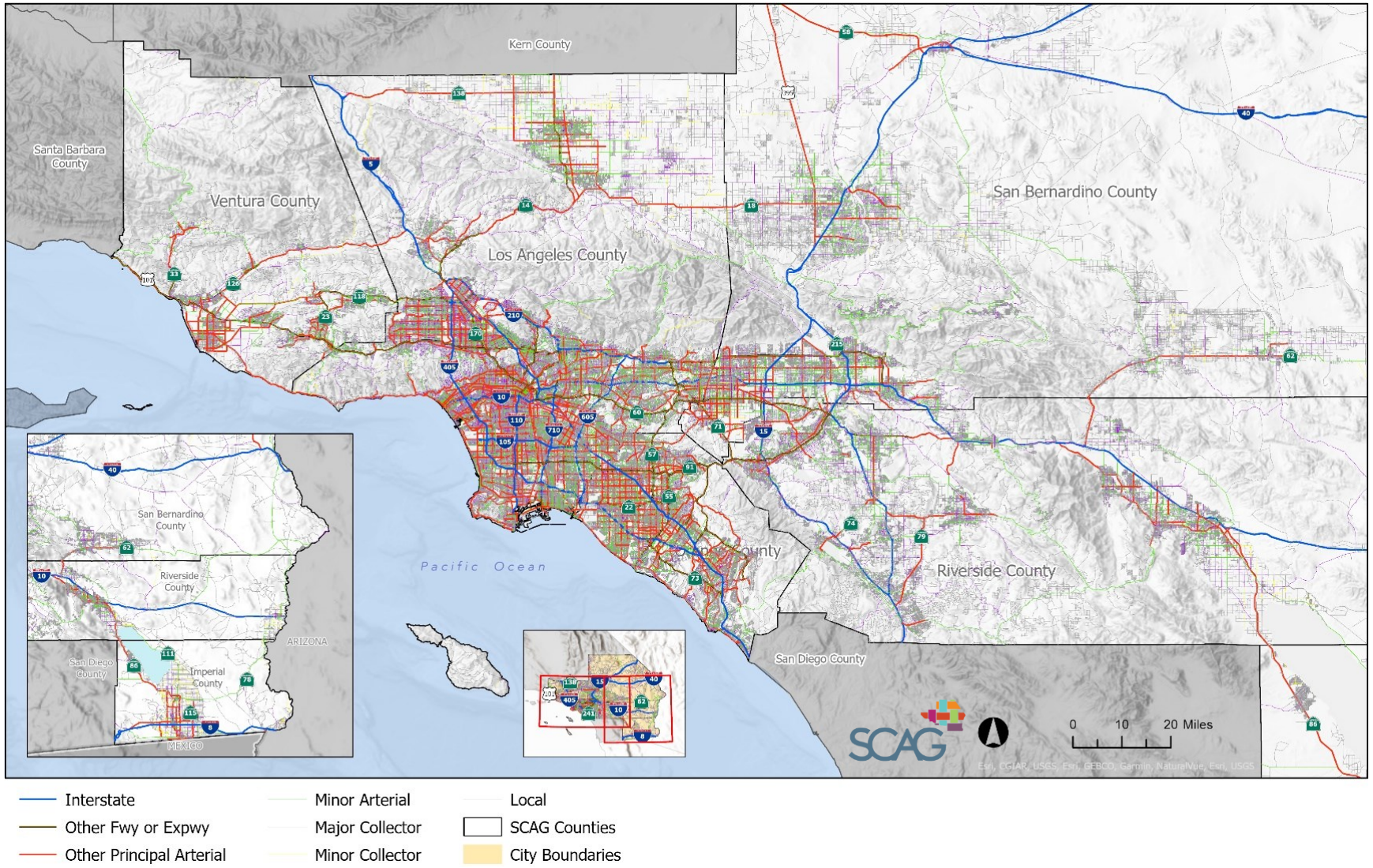
MAJOR AND MINOR COLLECTORS– Collectors are broken down into two categories: major collectors and minor collectors. Generally, major collector routes are longer in length; have lower connecting driveway densities; have higher speed limits; are spaced at greater intervals; have higher annual average traffic volumes; and may have more travel lanes than their minor collector counterparts. Overall, the total mileage of major collectors is typically lower than the total mileage of minor collectors while the total collector mileage is typically one-third of the local roadway network. Collector roads are generally owned and operated by a local jurisdiction or city. This functional classification type is not limited to only motor vehicles and can be accessible by pedestrians, bicyclists, and other multimodal users. Pedestrians can utilize the sidewalk, while other multimodal users can share the road with motorists or use designed paths/lanes if available.

LOCAL– Local roads account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. Local roads are owned and operated by a local jurisdiction or city. This functional classification type is not limited to only motor vehicles and can be accessible by all users including pedestrians, bicyclists, and other multimodal users. Local streets usually feature designated pedestrian walkways or sidewalks, ensuring accessibility for pedestrians and wheelchair users. However, the

permissibility of bicycles on sidewalks is subject to the discretion of local jurisdictions. While some areas may permit bicycles on sidewalks, others may have restrictions in place or impose age limitations for sidewalk riding.

It is important to note that each classification has a corresponding urban or rural designation, with specific criteria for functional and design characteristics based on the roadway's location and context. The Caltrans' functional classification system (see Map 4-1) used by SCAG serves as a foundation for transportation planning, funding, and project development at the local, state, and federal levels, helping to ensure a consistent and coordinated approach to transportation investments.

Map 4-1. Caltrans Functional Classification System



Source: Caltrans (2023)

4.3 HOW DO WE GET AROUND?

As noted elsewhere in the Mobility Technical Report, the transportation network that meets you as you exit your home varies considerably across the region, from county to county, local jurisdiction to local jurisdiction and neighborhood to neighborhood. Though our regional transportation system is multimodal, integration among modes remains challenging. Residents traveling within and across the region may combine, or chain, multiple transportation modes together to complete a trip or trips. At a high level, most of our trips are handled via auto (nearly 90 percent) and the rest are made via biking, walking, or rolling (nine percent) and via transit/rail (three percent). For those who currently have access to vehicles, driving can often feel like the easiest of options. To illustrate the multimodal nature of trips across the region, consider these scenarios:

> Michael is travelling from Anaheim where he works to meet a friend for dinner in Riverside. Michael, running late from a work meeting, will take a single-occupancy vehicle trip but will use the State Route (SR) 91 Express Lanes to reach the restaurant in time for dinner. After Michael parks his car in a smart garage with messaging about the number of available spaces and locations, he will then walk several blocks from the parking garage to meet his friend. As he crosses the streets, he is careful to make eye contact with nearby drivers.
>
> Jennifer and her family are visiting the SCAG region and plan to spend a day at Disneyland. Staying at a hotel in Norwalk, they plan to use a combination of driving, transit/rail and walking for their trip. In the morning, the family drives their car to the Anaheim Regional Transportation Intermodal Center. From there, the OCTA Route 50 bus for Disneyland along Katella Avenue. Once at Disneyland, they will walk to and from the park.

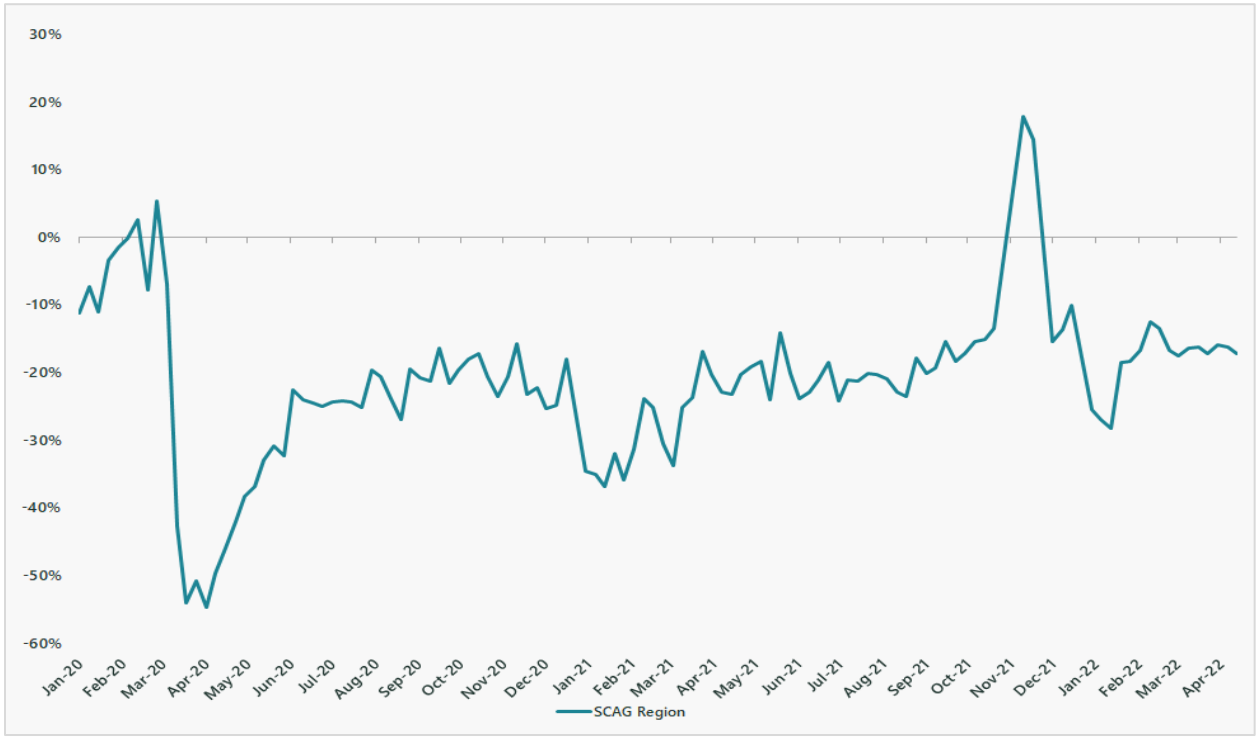
These two simple narratives illustrate the role of multimodality in the SCAG region with the recognition of streets and highways as core components serving many types of trips. These trips are currently supported by the system described below.

4.3.1 TRAVEL BEHAVIOR AND COVID-19

The COVID-19 pandemic had a significant impact on travel patterns, with a clear shift in vehicle miles traveled (VMT) observed. Initially, VMT decreased significantly in the initial stages of the pandemic as lockdowns and restrictions were put in place to control the spread of the virus. However, as restrictions eased and remote work became less common, VMT began to climb again. Over this period, VMT slowly approached pre-pandemic levels and appears to have briefly eclipsed pre-pandemic levels around the end of 2021, before falling again below pre-pandemic levels and remaining there through April 2022 (the most recent data). Figure 4-1 illustrates the changes in regional VMT between January 2020 and April 2022.

One reason for the increase in VMT was the reluctance of many people to use transit/rail during the pandemic, leading them to rely more heavily on personal vehicles. And with more people working from home, there has been an increase in suburban and exurban living, which has led to longer commutes and more miles traveled. The rise in VMT during the pandemic has raised concerns about its impact on the environment and public health. Increased driving leads to higher levels of harmful emissions that can have negative effects on public health. Additionally, more driving means more congestion on the roads, which can lead to longer commute times and increased stress. It's also important to note that the COVID-19 pandemic had a significant impact on the use of TNCs. Many people avoided using these services due to concerns about the risk of infection even as TNCs implemented safety protocols.

Figure 4-1. % Change in Weekly VMT, SCAG Region (vs. Same Week in 2019; Jan. '20 to Apr. '22)



Source: StreetLight Insight (2023)

4.3.2 EXISTING TRANSPORTATION SYSTEM

Our transportation system comprises several components, including the National Highway System (NHS), California State Highway System (SHS), local streets and roads, main streets, managed lanes, an active transportation network, freight movement transportation network and regional transit/rail network. As noted earlier, this chapter is focused on streets and highways. The NHS and SHS provide regional and interstate connectivity, while local streets and roads offer access to homes, businesses, and other destinations. Regional roadways provide access and connections to the many federally owned lands located in the region, including Joshua Tree National Park, Mojave National Preserve, Angeles National Forest, San Bernardino National Forest, Fort Irwin, Marine Corps Air Ground Combat Center Twentynine Palms, and extensive areas managed by the Bureau of Land Management. Managed lanes, such as High Occupancy Vehicle (HOV) and High Occupancy Toll (HOT) lanes and our regional express lane network, offer faster and more reliable travel options for carpoolers, transit vehicles and solo drivers willing to pay a toll. The active transportation network supports biking and walking infrastructure, and the freight movement network provides access to the region's ports, airports, and distribution centers. Finally, the regional transit/rail network connects communities within Southern California and beyond, offering a range of options. Understanding each component is key to identifying opportunities to improve the region's mobility, economic competitiveness, and quality of life. National Highway System (NHS). The NHS is a network of roads and highways that are critical to the nation's economy, defense, and mobility. In the SCAG region, the NHS includes a significant number of pavement lane miles (i.e., total length of roadway lane miles within a given area requiring pavement maintenance or rehabilitation) that are critical to the region's transportation infrastructure. Pavement lane miles are a key indicator of the condition and maintenance needs of roadways,

and they are used to track progress in improving road conditions and safety using tools like the California Transportation Asset Management Plan (TAMP).

As of 2022, the NHS within California consists of 57,699 pavement lane miles, which are owned by Caltrans, Tribal governments and/or local, state, and/or federal agencies. SCAG hosts 12,170 lane miles, or 42 percent, of locally owned NHS pavement lanes in California[i]. By ensuring that pavement lane miles are kept in good condition and regularly maintained, Caltrans helps to safeguard the region's transportation infrastructure so it can continue to support economic growth, quality of life improvements and environmental sustainability. According to the 2022 California Transportation Asset Management Plan, the roadways within the local SCAG region on the NHS are classified as follows: 2.7 percent are in "Good" condition, 76.7 percent are categorized as "Fair," and 20.6 percent are labeled as "Poor." Pavement condition data is collected on an annual basis. All performance data for NHS pavements and bridges presented in this section are based on Federal Regulation (23 CRF 490).

Monitoring and maintaining roadway bridges on the NHS is critical to ensuring the safety and reliability of the region's transportation infrastructure. Caltrans, in partnership with other state and local transportation agencies, is responsible for the management and maintenance of the region's roadway bridges, which include a variety of bridge types such as concrete and steel truss bridges, suspension bridges and cable-stayed bridges. Based on this monitoring, maintenance and repair needs are identified, and repairs or upgrades are carried out as necessary to address any deficiencies. The California NHS system consists of 10,936 bridges totaling 243,347,047 square feet of bridge deck area. Of that, SCAG region has 990 locally owned NHS bridges totaling 14,372,103 square feet of bridge deck area or 59 percent of the statewide bridge deck area. NHS bridges in the SCAG region are categorized as follows: 38.6 percent are classified as Good, 49.2 percent as Fair, and 12.2 percent as Poor. Locally owned bridges on the NHS could fall under the jurisdiction of local governments, which would also manage the finance and repair/maintenance of the bridge(s).

The TAMP is a comprehensive, data-driven plan that provides a framework for managing and maintaining the state's transportation assets over the long term. Developed by Caltrans in collaboration with regional transportation planning agencies and other stakeholders, it includes an inventory of the state's transportation assets, such as roads, bridges, and transit systems. The TAMP provides a detailed analysis of the condition of these assets, as well as the performance of the transportation system. Based on this analysis, the plan identifies priorities for investment and maintenance, and establishes performance targets for asset condition and system performance. The TAMP also includes a set of strategies for improving asset management, such as increasing the use of data-driven decision-making, promoting collaboration among various levels of government and stakeholders, and exploring new technologies and innovations, to improve system performance and efficiency. As part of a statewide effort, an update to the TAMP was completed in July 2022. The most recent TAMP update analyzed existing asset performance, identified gaps/needs, and determined the gap in funds to improve performance levels of roads, bridges, drainage, and the transportation management system (TMS).

Transportation asset management (TAM) is defined by United States Code (23 U.S. Code Section 101) as "a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost".

STATE HIGHWAY SYSTEM (SHS)

Caltrans, the state agency responsible for the legislated State Highway System (SHS), is charged with the planning, development, maintenance, and operation of a diverse range of physical assets encompassing a vast expanse of highway infrastructure. California's SHS comprises of 50,019 lane miles of evaluated pavement, over 13,000 bridges and tunnels, more than 205,000 culverts and more than 20,000 TMS assets. According to the 2023 Draft State Highway Management Plan, the condition of SHS pavement in the state of California is categorized as follows: 53.2 percent in good condition, 45.5 percent in fair condition and 1.3 percent in poor condition. The condition of SHS bridges and tunnels are categorized as follows: 49.3 percent in good condition, 46.9 percent in fair condition, and 3.8 percent in poor condition.

The most notable assets on the SHS, both in terms of their scale and cost, are the pavement and bridges. Nevertheless, the system also relies on numerous other essential assets to facilitate mobility and enhance safety. In many instances, the replacement or rehabilitation of roads and bridges necessitates the concurrent replacement or upgrades to supplementary assets supporting the overall infrastructure. Many system components, built in the 1950s, 1960s and early 1970s, have either reached or are reaching the end of their service life. Asset deterioration is accelerating at a faster rate than in previous decades, because of age and change in traffic demands, often requiring extensive rehabilitation and even full reconstruction.[ii] For more information, please refer to the Caltrans State Highway System Management Plan.

Caltrans is responsible for ensuring that the infrastructure is safe, reliable and efficient. To achieve these goals, Caltrans and other transportation agencies collaborate to monitor and maintain SHS assets using tools and techniques such as pavement management systems, bridge inspection programs and asset management strategies. Regularly monitoring and maintaining the infrastructure helps to ensure that the SHS can support economic growth, improved quality of life, and environmental sustainability over the long term. One of its most notable features in our region is its extensive network of carpool lanes which are designed to encourage the use of HOVs to reduce congestion.

MANAGED LANES

According to FHWA, a managed lane constitutes a "freeway-within-a freeway," whereby a set of lanes within the highway cross section is separated from the general-purpose lanes and access to said lanes is managed by restricting access to all vehicles except those that fulfill certain requirements (e.g., related to vehicle occupancy or vehicle type), or otherwise purchase access rights by paying a toll. Examples of managed lanes include express lanes, HOV lanes, and special use lanes. These various categories of managed lanes are discussed in greater detail below.

Given that managed lanes restrict access to certain qualifying vehicles, with the goal of improving operational performance and vehicle throughput for vehicles that do qualify to access these lanes, enforcement of the access restrictions is a critical component of successfully operating managed lanes. To the extent that managed lanes rely on self-declaration of occupancy status without additional checks or enforcement, road users may be incentivized to gain access to these lanes despite not meeting access requirements. In some cases, enforcement efforts are led by California Highway Patrol officers conducting in-person surveillance of compliance. In other cases—as with several express lanes in the SCAG region—drivers can use switchable FasTrak transponders to self-declare the current occupancy status of their vehicles before entering a tolled lane facility. Some jurisdictions are experimenting with more automated electronic methods of enforcement around occupancy requirement compliance. In the SCAG region, Los Angeles County Metropolitan Transportation Authority's (Metro) conducted a limited test of occupancy

detection systems (ODS) in 2015 and already installed ODS infrastructure at the "highest demand locations" on both the Interstate 10 (I-10) and I-110 Express Lanes facilities. Metro continues to pursue the planning and implementation for ODS. Continued operational improvements around enforcement are key—especially for HOV-only lanes, where users cannot purchase access through tolls.

HIGH-OCCUPANCY VEHICLE LANES

Access to HOV lanes is typically restricted to vehicles that meet prescribed occupancy requirements. Commonly, these occupancy requirements allow vehicles with two or more passengers to access the lane ("HOV 2+"). A limited set of HOV facilities in California and in the SCAG region have higher occupancy requirements, such as policies requiring three or more passengers per vehicle ("HOV 3+") to qualify for HOV lane access.

Beyond vehicles that qualify based on occupancy status, Title 23 U.S.C. Section 166 grants state governments the ability to exempt inherently low-emission vehicles, certain gasoline/electric plug-in hybrid vehicles and toll-paying vehicles to use HOV facilities from meeting occupancy requirements to access HOV lanes. Accordingly, vehicles that display valid Clean Air Vehicle decals are also permitted to access HOV lanes in California, regardless of the exempted vehicle's current occupancy status. Title 23 U.S.C. Section 166 further dictates that any states allowing exemptions from occupancy requirements on managed lane facilities must regularly monitor the performance of those facilities on the metric of degradation, and report findings on a regular basis. Federal law defines an HOV facility as degraded if the average traffic speed during the morning or evening weekday peak hour period is less than 45 mph for more than ten percent of the time over a consecutive 180-day period.

To monitor system operational performance on the SHS in California, Caltrans uses its Performance Measurement System (PeMS). PeMS serves as a central repository to collect, store and analyze traffic data from vehicle detection stations and traffic census stations. Traffic data is collected automatically from PeMS sensors located on or adjacent to highways throughout the State. Caltrans also reports its findings related to performance on the SHS through annual California HOV Facilities Degradation Reports. Facilities can range from "Slightly Degraded" (where degradation occurs from 10 to 49 percent of the time) to "Extremely Degraded" (where degradation occurs 75 percent or more of the time"). According to data reported in Caltrans' 2021 California High Occupancy Vehicle Facilities Degradation Report, released in May 2022, there are over 900 lane-miles of HOV lanes on the SHS in the SCAG region, which is spread across Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. The SCAG region's approximately 928 HOV lane-miles equate to roughly 62 percent of the statewide total. In addition, per this data, there are about 203 lane-miles of HOT facilities on the SHS in the SCAG region, which equates to 62 percent of the statewide total for HOT lanes. (HOT lanes are covered in more detail in the following section on the Regional Express Lanes Network; for the purposes of Caltrans' degradation analysis and reporting, HOV and HOT lanes are combined into a single total.) The SCAG region is covered by Caltrans Districts 7, 8, and 12, and HOV facilities in these Districts showed the highest amounts of degradation in 2021 of any Caltrans Districts in California. HOV/HOT facilities in these Districts experienced widespread degradation in both morning and afternoon peak hour periods:

Caltrans District 7 (Los Angeles and Ventura Counties):

- Morning peak hour period degradation in approximately 30 percent of lane miles
- Afternoon peak hour degradation in approximately 50 percent of lane miles

Caltrans District 8 (Riverside and San Bernardino Counties):

- Morning peak hour period degradation in approximately 30 percent of lane miles
- Afternoon peak hour degradation in approximately 50 percent of lane miles

Caltrans District 12 (Orange County):

- Morning peak hour period degradation in approximately 25 percent of lane miles
- Afternoon peak hour degradation in approximately 50 percent of lane miles

Addressing degradation is critical to the overall health and efficiency of the regional roadway network. In 2019, Caltrans released its California High Occupancy Vehicle Facilities Degradation Input and Action Plan that identified actions to address degradation. Federal regulations require Caltrans to develop a remediation plan to address degradation. The plans for degraded HOV facilities must identify the actions that will be taken to make "significant progress" toward bringing roadway facilities into compliance with the minimum average operating speed performance standard through changes to the facility's operation.

Specific actions may include:

- Increasing the occupancy requirement for the HOV facility. By raising the occupancy requirement, it may be possible reduce the overall number of vehicles using the facility thereby increasing throughput capacity and encourage more carpooling.
- Varying the toll charged to toll-paying vehicles to reduce demand. This strategy can involve dynamic pricing, where the toll rate increases during peak demand times. This can help ensure free flow conditions by deterring solo drivers through the use of pricing.
- Discontinuing allowing exempt vehicles to use the HOV facility. Some HOV lanes allow specific exempt vehicles (like hybrids, electric vehicles, or motorcycles) regardless of their occupancy. By eliminating these exemptions, HOV capacity can be increased to improve traffic flow.
- Increasing the available capacity of the HOV facility. Widening or increasing the number of HOV or HOT lanes approaches the challenge by increasing overall roadway capacity to accommodate greater numbers of vehicles.

SCAG will continue to work closely with Caltrans to support more comprehensive efforts to address degradation on HOV facilities, including the identification of short, mid, and long-term strategies.

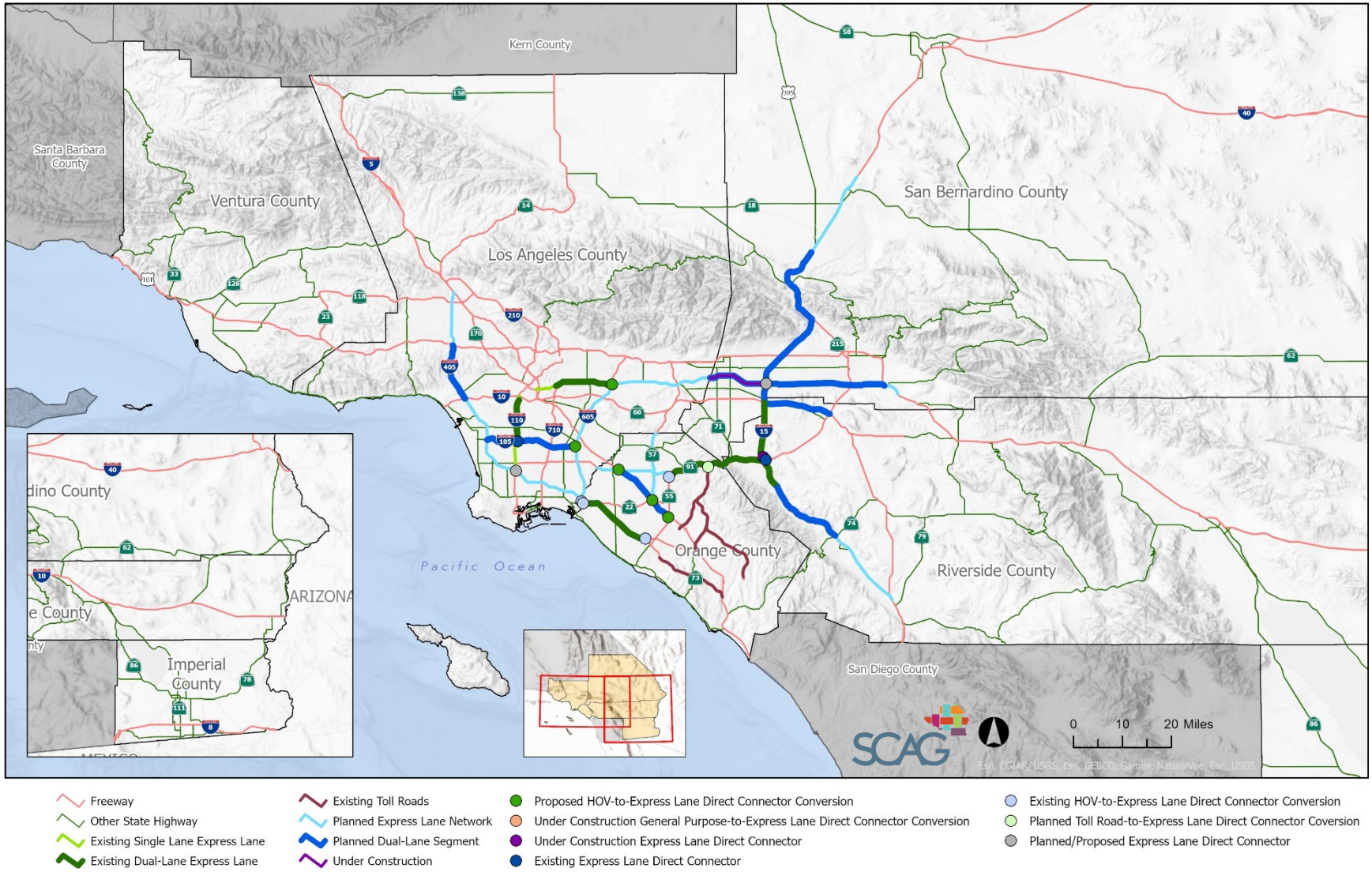
REGIONAL EXPRESS LANES NETWORK

Planning efforts are underway to strategically manage travel demand in the existing system. One such effort involves the integration of transportation systems management and travel demand management, with the goal of improving overall travel time reliability in the region. Express lanes operate on the principle of congestion pricing: when vehicles are travelling on the express lanes, the price to access the lanes changes accordingly to manage congestion. The tolls that drivers must pay to access express lanes are priced to reflect the current levels of roadway demand, and express lanes can reduce congestion during periods of peak travel demand when traveler demand for the roadways regularly outstrips the supply of said roadway. Revenue generated by managed lanes can be reinvested back into improving travel in the same corridor. For example, Metro's Net Toll Reinvestment Policy, which applies to the revenues generated by the I-10 and I-110 Express Lanes, directs that these toll revenues must first be used to pay for maintenance,

administration, and operation of the express lanes and, thereafter, that any remaining revenue must be used in the respective corridor from which it was collected to provide a direct congestion reduction benefit.

The Regional Express Lane network included in Connect SoCal 2024 builds on the success of the six Express Lane segments that are currently in operation across the SCAG region, which include the newly-opened I-405 Express Lanes in Orange County, the I-10 and I-110 Express Lanes in Los Angeles County, the two respective SR-91 Express Lanes facilities connecting Orange and Riverside Counties, and the I-15 Express Lanes that opened in Riverside County in April 2021. In addition to the six currently operational Express Lane facilities identified, several additional facilities and direct connector projects are also under construction. These include a dual-lane Express Lane facility on I-10 in San Bernardino County, which will create two new express lanes in each direction, the 15/91 Express Lanes Connector in Riverside County, and the 241/91 Express Connector project between Orange and Riverside Counties. Additional Express Lane projects in the SCAG region are programmed to be completed by 2027, including the San Bernardino County Transportation Authority's (SBCTA's) planned six-mile extension of the I-15 Express Lanes and Metro's planned 16-mile, dual Express Lane facility located on the I-105 corridor between I-405 and I-605. The privately financed toll roads in Orange County are interoperable with – but independent from – the regional express lanes network in the SCAG region. Additional Express Lane facilities are currently being planned for other major regional highway corridors as illustrated in Map 4-2.

Map 4-2. SCAG Regional Express Lanes Network



Source: SCAG (2024)

Note: The privately financed toll roads in Orange County are interoperable with but independent from the regional express lanes network in the SCAG region.

SCAG prepared its first Regional Express Lane Network Concept of Operations (ConOps) document in 2016. The study featured a stakeholder-led process that identified the regional express lane network to be implemented in three tiers over a 30-year period. The ConOps provided a blueprint for integrating individual express lane projects into a regional system by identifying a comprehensive set of issues that should be addressed as individual express lane projects advanced. In general, the Regional Express Lanes Network ConOps convened by SCAG are intended to provide regional stakeholder agencies with a forum to discuss policy issues related to express lanes implementation that would benefit from a coordinated regional response. Deliberate and strategic regional coordination on policy and operational matters affecting express lanes operation and consumer experience, such as signage and occupancy policies, helps to improve the user experience and bolster public approval for the express lanes system while supporting systemwide revenue generation and operational goals.

As more projects are implemented, the need for a regionally integrated vision grows. In 2021—and with the encouragement of both Caltrans and FHWA—SCAG began work to update the SCAG Regional Express Lanes ConOps document. This most recent ConOps update revisits the recommendations included in the 2016 Regional ConOps (e.g., related to facility design, enforcement and incident management, and transit integration), and focuses on a broader discussion of policy issues that have arisen over the past five years—particularly issues that would benefit from a more coordinated regional response. Conceptualizing the Regional Express Lanes Network is a balance between a regional desire for consistency and the flexibility for county transportation commissions and express lane operators to address local needs and requirements in their express lane planning and implementation. In this way, the need for appropriate express lane policy choices in the ConOps update and regional consistency is not about express lanes having the same policies but understanding the differences between express lane corridors and working within that flexibility to improve the user experience.

Investment in express lane facilities is a significant commitment in Connect SoCal 2024. Planned express lane facilities will extend across county lines in the SCAG region and, within the next decade, will provide continuous connections between Los Angeles, Orange, Riverside, and San Bernardino counties. Moving forward, there will be a need for greater regional cooperation as the network continues to expand and more express lane segments that cross county lines are created and become operational. Please refer to the SCAG Regional Express Lanes Network ConOps Update for more information on the regional express lane network.

MAIN STREETS

Main streets serve as crucial transportation facilities that facilitate travel and daily activities. They are often the heart of a community as they may provide goods and services and job opportunities and serve as critical inputs to the local economy. Main streets commonly instill a sense of community, often supporting special events like parades, festivals, and sporting events. Many main streets also have historic significance (e.g., architectural, cultural, etc.) and operate as touchpoints for local community identity. In the SCAG region, main streets often mirror the cultural diversity of the region, offering unique food, shopping, and entertainment experiences. Main streets also serve as California State Highways. Since they also serve as State highways, main streets face the challenge of balancing the local community's need for a vibrant street with the public's need for roadways that provide local, regional, and statewide connections. Just as mobility is essential to our region's economic and civic vitality, the planning, design, and operation of main streets is tied to the prosperity and quality of life for local communities.

LOCAL STREETS AND ROADS

Our local arterial system is composed of all local streets and roads that provide residents with connections to homes, schools, jobs, healthcare, recreation, and retail. Operations and maintenance for local streets and roads are typically conducted by those owned and/or maintained by local jurisdictions. To ensure that local streets and roads can support the needs of the region, local governments and transportation agencies work together to monitor and maintain the infrastructure. Maintenance activities are funded through a combination of local and State funding sources, including gas taxes, sales taxes, and other transportation-related fees and assessments. This includes regular inspections, repairs, and upgrades to address any deficiencies or performance issues. In addition, they also work to improve the sustainability of local streets and roads by investing in sustainable transportation options such as bike lanes and pedestrian infrastructure, and by promoting the use of transit/rail and other sustainable transportation options.

To ensure that maintenance activities are conducted in a timely and effective manner, many local jurisdictions have developed comprehensive pavement management programs that use data-driven approaches to prioritize maintenance needs and allocate resources. These programs typically include regular pavement condition assessments, analysis of maintenance needs and costs and development of long-term maintenance plans. The City of Los Angeles' Bureau of Street Services offers one example. The Bureau uses a comprehensive pavement management system that includes regular pavement inspections, analysis of maintenance needs and costs and development of long-term maintenance plans. The Bureau also uses innovative technologies, such as laser-based pavement profiling, to accurately assess pavement conditions and prioritize maintenance needs.

In the SCAG region, there are a total of 35,883,270 lane miles of local streets and roads. The local streets and highways network is important for mobility and accessibility in the region as it can serve essentially all users—pedestrians, bicyclists, personal mobility device users, transit/rail users and motorists. Local streets and roads are part of the broader transportation system and are interconnected with the NHS. Local streets and roads often serve as feeder routes and access points that connect to main arteries of the NHS, linking communities, neighborhoods, and businesses to the larger regional and national transportation network. The local streets and roads are essential components of the overall transportation system through its relationship with NHS, which allows for efficient and effective movement of people and goods.

As noted earlier, while people in cars travel on our well-worn roads, so do people on bicycles, and people on buses. The region's economy also depends on this vast network, to transport people to jobs, but also to transport container trucks to our ports and packages to homes and businesses. Please see the Mobility Technical Report's Active Transportation and Transit/Rail chapters for more information.

Preserving local streets and roads is of utmost importance to prevent the emergence of roadway hazards and to improve safety and resilience. In 2023, the regional average pavement conditions index measured at 69, indicating an "At Risk" condition for the SCAG region. With aging infrastructure and the compounding challenges posed by climate change, our local streets and roads system faces ongoing difficulties. Connect SoCal 2024 estimates a substantial investment of $87.7 billion into our region, paving the way for improvements and addressing these pressing concerns. Despite this substantial investment, a significant funding gap still exists that hinders the realization of substantial improvements.

GOODS MOVEMENT

Goods movement generally refers to the movement of raw, semi-finished and finished materials and products used by businesses and residents across the transportation system. These goods move in myriad ways and through complex systems, often using multiple modes of transportation (e.g., ships, trucks, trains, planes, etc.). The regional goods movement system comprises interconnected infrastructure components designed to serve commercial activities spurred by regional, national and global demand. It provides the backbone for the flow of goods between businesses and consumers. Numerous demand factors (e.g., types of products, destinations, urgency, costs, etc.) create unique markets that must be accommodated by varying types of goods movement activities. These markets depend directly on the regional transportation network that provides the mobility and speed necessary to support economic growth. Beyond the seaports, railroads, and airports, goods movement in the region is strongly supported by the highway system and local roads. This roadway system provides mobility for truck trips of all types to locations in the region and connections outside it. The regional roadway system serves multiple functions and can be thought of as the connective tissue that ties together the multimodal freight transportation system in Southern California, therefore providing critical last mile connections to intermodal terminals, marine terminals, airports, border crossings, warehouses and distribution centers and manufacturing facilities. The highway system allows trucks to perform several critical roles that support goods movement in the region.

Trucking connections to suppliers and markets are an important element in many manufacturing supply chains. These involve both intraregional connections to clusters of related businesses, and long-haul corridors. Significant amounts of regional manufacturing are located along key roadway corridors that facilitate connections to the Interstate highway system, intermodal rail facilities and air cargo facilities. Another critical roadway function that supports regional manufacturing is the ability to make interregional connections. The Interstate highway system serves as the primary connection among the region, national markets and suppliers with considerable support from several state routes. These interregional corridors are also important to regional and national distribution centers that are significant components of growing logistics activities in Southern California. Arterials throughout the region provide direct connections to commercial centers and residential areas that allow for deliveries to stores, homes, construction sites and service businesses.

FHWA created the Primary Freight Network (PFN), a component of the National Freight Network (NFN), intended to "assist states in strategically directing resources toward improved system performance for the efficient movement of freight on the highway portion of the nation's freight transportation system." Later, the Primary Highway Freight System (PHFS) was designated using a 41,000-mile highway network. In the SCAG region, about 1,633 miles of highways were designated as a part of the PHFS. Our region's major international gateways heavily rely on robust roadway connections.

- I-710 serves as a primary access corridor, providing direct connectivity to the San Pedro Bay Ports, as well as facilitating connections to major east-west highways. It also acts as a vital access route to intermodal rail terminals, marine terminals, warehouses, transloading facilities, and logistics service providers located in the Gateway Cities subregion.
- Similarly, I-110 grants access to specific marine terminals at the Port of Los Angeles. Furthermore, the local arterial roadway system plays a critical role in providing crucial "last mile" connections to the San Pedro Bay Ports and intermodal terminals. SR-47/SR-103 near the San Pedro Bay Ports is an example.

- The primary access route to the Port of Hueneme is U.S. 101, complemented by secondary routes such as SR-126 and SR-1. The City of Oxnard's General Plan specifies that the preferred arterial access route for trucks is Hueneme Road and Rice Avenue.
- Major air cargo complexes at Los Angeles International Airport (LAX) are strategically located along West Century Boulevard and SR-90/Imperial Highway. These roadways, along with La Cienega Boulevard, have been identified by the Los Angeles Department of Transportation as the primary arterial truck routes serving air cargo at LAX. Major highway connections, including I-405 and I-105, further facilitate goods movement.
- The region's warehouse and distribution facilities are concentrated along key goods movement highway corridors. For instance, I-405 provides access to clusters of air cargo facilities near LAX, while I-710 grants access to logistics service providers, truck terminals, and transload facilities serving the San Pedro Bay Ports, in addition to connecting to warehouse concentrations in Downtown Los Angeles and East Los Angeles.
- I-5 provides access to warehouse clusters in the Gateway Cities subregion and northern Orange County, including warehousing clusters in Anaheim. Lastly, east-west corridors like SR-60 and I-10 provide access to major warehouse clusters in the San Gabriel Valley and the Inland Empire.

Please see the Goods Movement Technical Report for more information.

4.4 HOW DOES LAND USE COME INTO PLAY?

15-MINUTE COMMUNITIES

A 15-minute community is one in which you can access all of your most basic, day-to-day needs within a 15-minute walk or bike ride of your home. For the roadway network, achieving 15-minute communities also highlights the importance of developing Complete Streets. For SCAG's purposes, the 15-minute community includes access to daily needs through a range of mobility options that create opportunities to reduce single occupancy vehicle trips. It is an aspirational framework for making our cities more inclusive, more equitable, and thereby more effective.

The 15-minute community concept was identified for consideration because the concept can apply broadly to communities across the SCAG region and touches on a number of land use and policy goals integral to realizing the growth vision in Connect SoCal. Specifically, the 15-minute community:

- Can exist in different place types, from rural to suburban and urban when the general principles and policies are applied.
- Can be realized through day-to-day incremental neighborhood changes as well as master planned communities.
- Have many health and quality of life benefits such as: less commute time, allowing people to have more free time at their disposal; physical and mental health benefits of active travel, cleaner air, easy access to healthy food options, quality green space, and stronger community ties that reduce loneliness.
- Promotes sustainable and active transportation modes, and by its nature reduces the carbon footprint of residents by reducing the need for long trips. Walkable, accessible neighborhoods can also benefit older people who may lack the physical ability or income to make longer trips.
- Is designed to help access-focused urban transformations be what we need them to be.

Connect SoCal 2024 offers several strategies centered on supporting 15-minute communities:

- Promote 15-minute communities as places with a mix of complementary land uses and accessible mobility options that align with and support the diversity of places (or communities) across the region where residents can either access most basic, day-to-day needs within a 15-minute walk, bike ride, or roll from their home or as places that result in fewer and shorter trips because of the proximity of complementary land uses.
- Support communities across the region to realize 15-minute communities through incremental changes that improve equity, quality of life, public health, mobility, sustainability and resilience, and economic vitality.
- Encourage efforts that elevate innovative approaches to increasing access to neighborhood destinations and amenities through an array of people-centered mobility options.

Encouraging smart growth and land use planning can help to reduce the need for long-distance travel and promote more efficient use of the roadway system. Smart growth strategies foster more compact and walkable development patterns. By locating homes, businesses and services within reasonable proximity, residents can more easily walk, bike or take transit to their destinations thereby reducing the reliance on personal vehicles. Similarly, mixed-use development combines multiple uses in an individual location. Smart growth also promotes the development of Complete Streets that can encourage more sustainable and efficient use of the roadway system. Smart growth strategies can support TDM to reduce the overall demand for transportation by promoting alternative modes of transportation.

4.5 WHAT GUIDES US IN PLANNING FOR STREETS AND HIGHWAYS?

Long-range planning for streets and highways require consideration of federal and state requirements and planning documents, including:

FEDERAL

Bipartisan Infrastructure Law (Investment, Infrastructure, and Jobs Act, or IIJA, 2021)
Fixing America's Surface Transportation (FAST) Act (2015)

STATE

Assembly Bill 1358 – Complete Streets Act (2008)
Senate Bill 375 – Sustainable Communities and Climate Protection Act (2008)
California Strategic Highway Safety Plan (SHSP, 2022)
California Transportation Plan 2050 (CTP, 2021)
Complete Streets Elements Toolbox (2018)
Complete Streets Implementation Action Plan (DD-64-R2, 2014)
General Plan Guidelines (2017)
California Transportation Asset Management Plan (2022)
State Highway Operation and Protection Program (2022)

Appendix 2 provides a more detailed explanation of these federal and state requirements and planning documents.

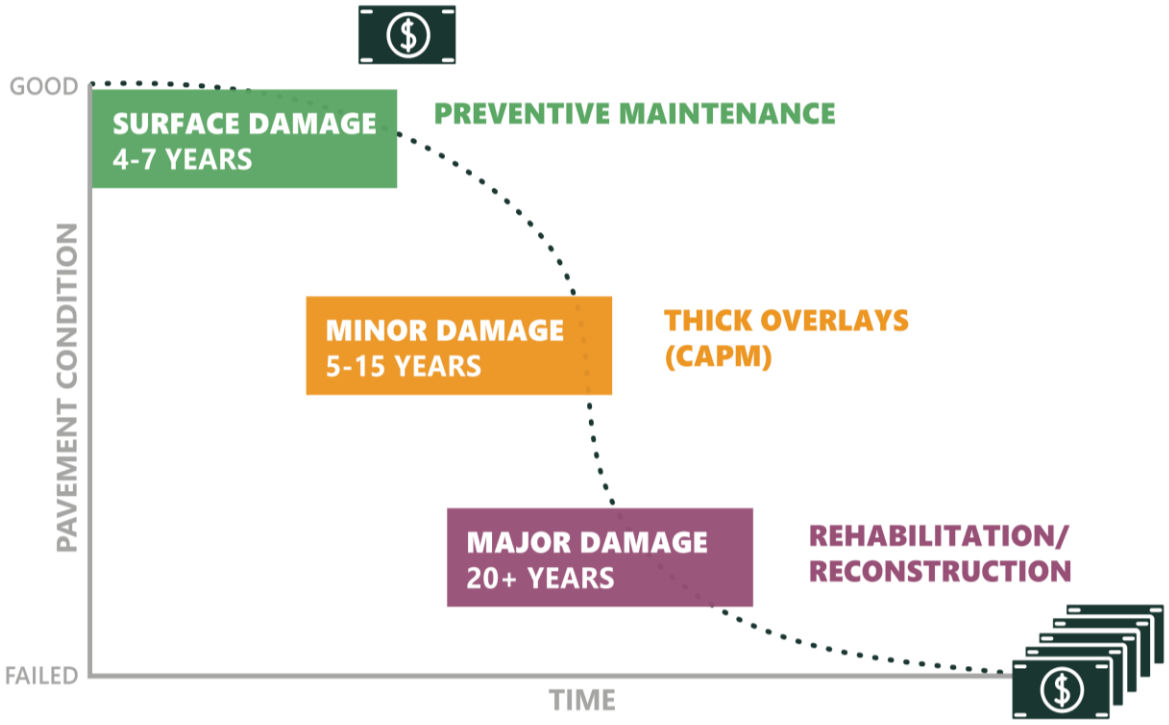
4.6 WHAT ARE THE CHALLENGES?

4.6.1 DECLINING INFRASTRUCTURE

Maintaining and managing continues to be a key regional challenge. Over several years, the State has unfortunately faced chronic underinvestment in system preservation, which has led to accelerated rates of deterioration and damage of our local streets and roads assets. Without adequate funding, these critical components of our infrastructure are already teetering on the brink of risk. If the current funding trends persist, the situation will only worsen, posing a grave threat to public safety for all users, including pedestrians, transit users, and motorists. The constant wear and tear from heavy vehicles such as trucks and buses can lead to significant damage to regional roadways. The damage can range from minor issues such as potholes and cracks to more serious structural failures that can compromise the safety of the road. The weight of heavy vehicles causes damage to the road in several ways. Over time, cracks form in the surface of the road that can eventually lead to structural failure. Additionally, heavy vehicles can cause rutting which occurs when the weight of the vehicle compresses the pavement and causes it to deform. Our hot and dry climate can further exacerbate the damage caused by heavy vehicles as high temperatures can cause the asphalt to soften, making it more susceptible to deformation and cracking. Additionally, the lack of rainfall can cause the road surface to become brittle, making it more prone to cracking and other forms of damage. Challenges exacerbated by climate change also contribute to stresses on the physical system. The constant wear and tear can lead to a range of issues that compromise the safety and reliability of the roads. Finally, as technology advances closer to achieving fully autonomous vehicles on our roadways, the necessity for well-maintained pavement conditions and consistently clear road markings becomes even more crucial.

As shown in Figure 4-2, deferred maintenance leads to much costlier repairs in the future. Repairs to keep roadways in a state of good repair cost on average $115,000 per lane mile for preventative maintenance with major rehabilitation work being eight times more expensive. Therefore, in keeping with the “Fix-it-First” principle, Connect SoCal 2024 supports prioritizing earlier preventive maintenance work. The Plan also allocates over $87.7 billion for operations and maintenance of regionally significant local streets and roads.

Figure 4-2. Cost Effectiveness of Pavement Treatment

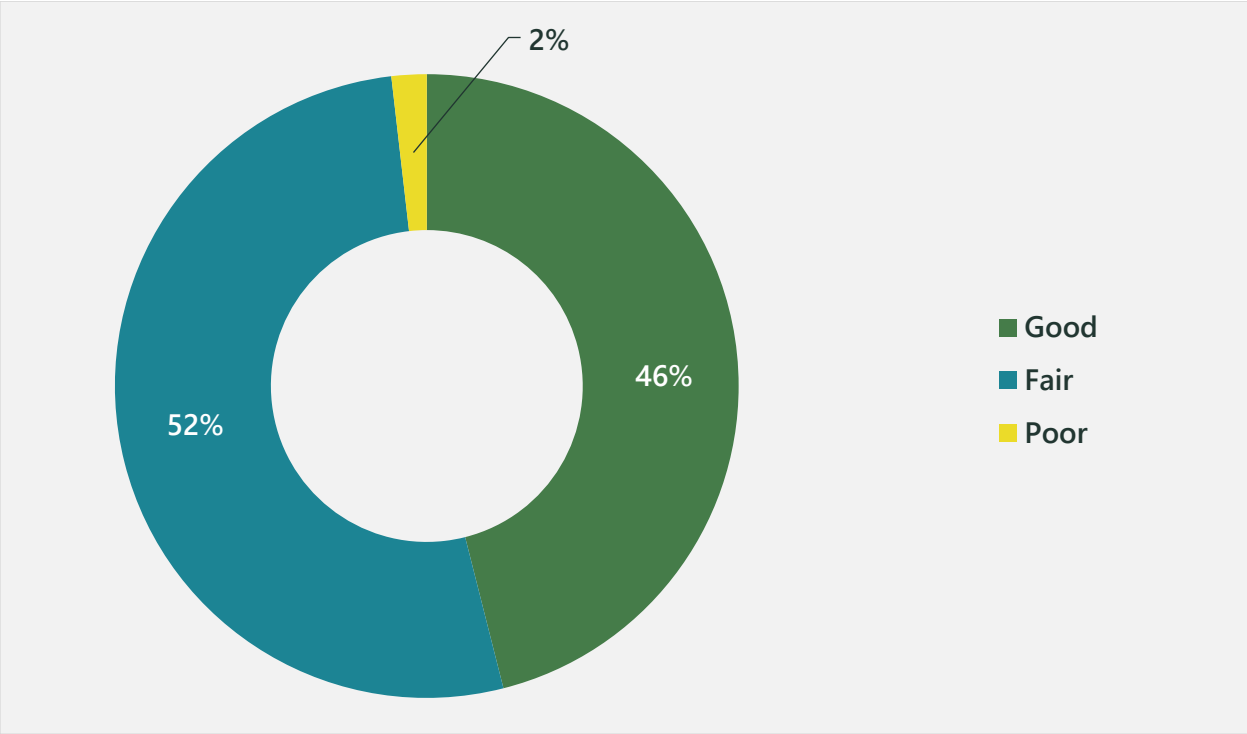


Source: Caltrans

While strides are being made in maintaining and improving infrastructure conditions, it is crucial to recognize that the regional deferred maintenance backlog was substantial prior to the passage of SB 1. Additionally, the emergence of new needs and concerns, such as providing Complete Street components (e.g., active transportation elements), improving accessibility, and addressing roadway deterioration exacerbated by the effects of climate change, has intensified the financial demands for maintaining our system. Current funding levels are insufficient to adequately maintain of our infrastructure in a state of good repair and they fall short when it comes to making significant improvements. In addition, as noted in both Connect SoCal 2020 and 2024, SB 1 does not fully address the fuel tax-based revenue loss projected over the course of the Plan due to increases in vehicle fuel efficiency and the increased adoption of alternative fuel and powered vehicles and resulting reduction in fuel consumption. Therefore, Connect SoCal 2024 continues to emphasize the importance of system preservation and system management, and advocates for additional funding sources.

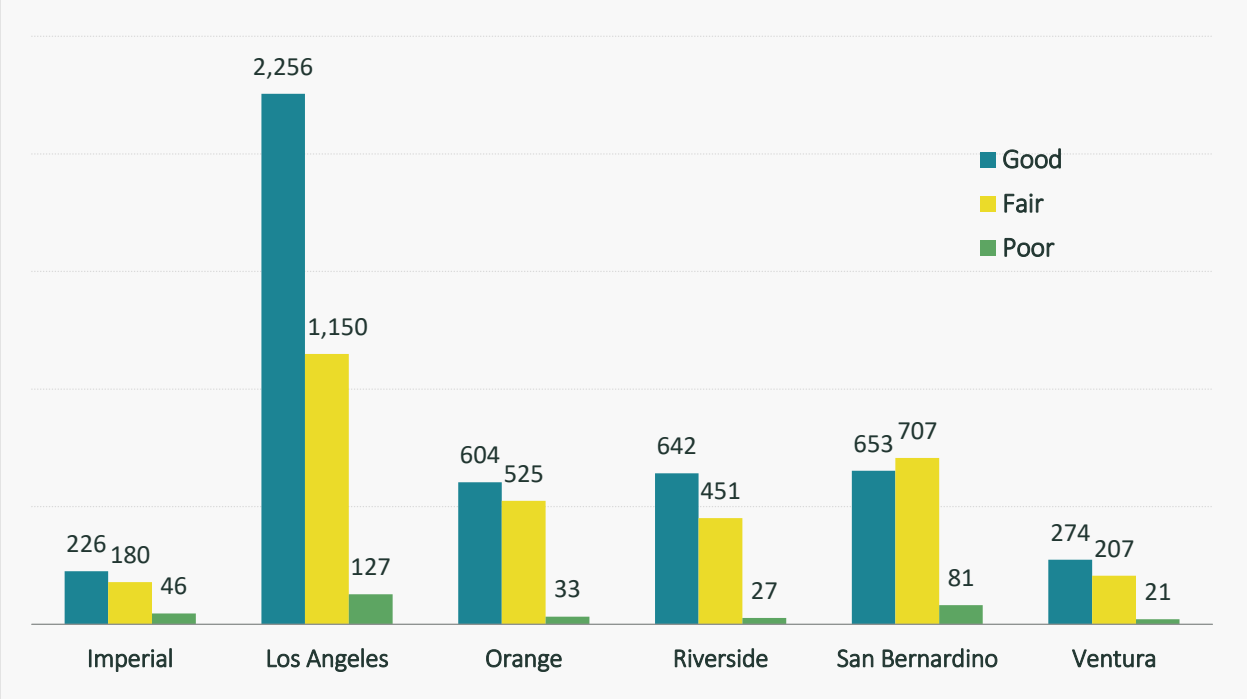
Connect SoCal 2024 identifies approximately $75 billion to address the preservation, operation and resilience needs of the state highway infrastructure system. Connect SoCal 2024 also allocates over $87 billion for operations and maintenance of regionally significant local streets and roads. Figure 4-3 displays the current pavement condition of the state highway system. Figure 4-4 reflects the current bridge conditions in the SCAG region.

Figure 4-3. 2022 State Highway System Pavement Condition



Source: Caltrans Automated Pavement Condition Survey (2022)

Figure 4-4. 2022 Bridge Condition in the SCAG Region

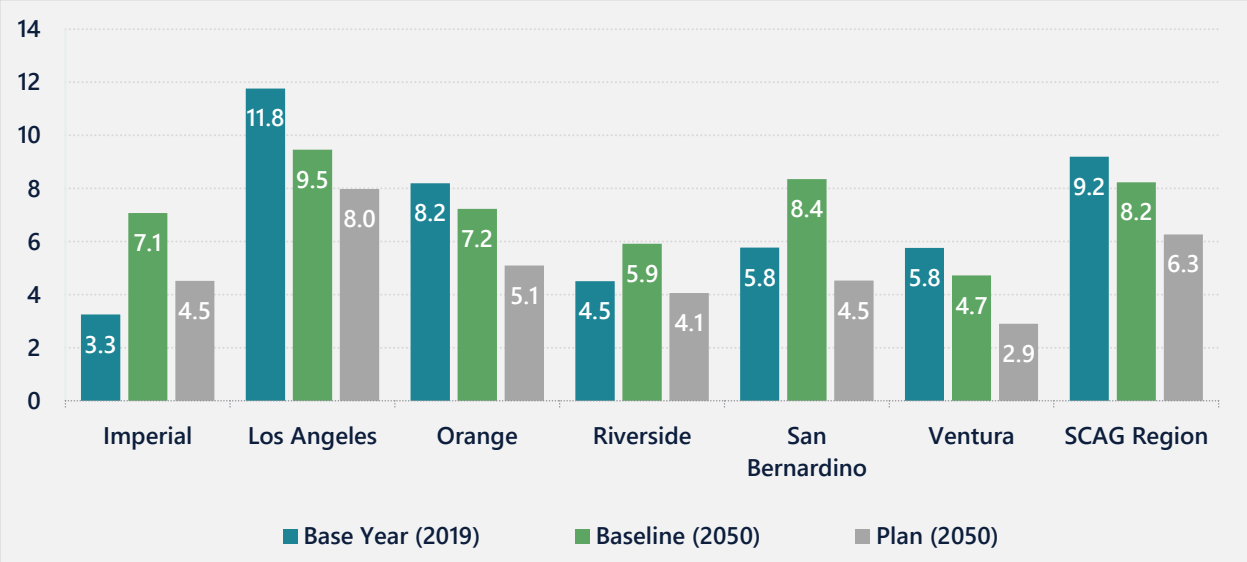


Source: Federal Highway Administration National Bridge Inventory (2022)

4.6.2 CONGESTION AND DELAY

Normalizing delay by the number of people living in the area demonstrates how the system is performing as a whole in light of anticipated population growth. As shown in Figure 4-5, it is expected that implementation of Connect SoCal 2024 would substantially reduce person delay per capita. The region's daily person delay per capita under Baseline conditions is estimated to be 8.2 minutes and 6.3 minutes by Plan conditions—a decrease of 1.9 daily person delay per capita. In summary, the daily person delay per capital is expected to decrease by 23.8 percent under the Plan versus Baseline conditions.

Figure 4-5. Daily Person Delay Per Capita (Minutes)



Source: SCAG

Roadway capacity constraints are limitations in a roadway system's ability to handle the demand for transportation services. When the demand for transportation exceeds the available roadway capacity, congestion can occur, leading to longer travel times, increased air pollution, reduced safety (e.g., lower congestion and higher speed is also associated with more severe crashes). And lost productivity. Roadway capacity constraints can be caused by a variety of factors including insufficient roadway and sprawling development patterns, insufficient physical roadway capacity, inadequate traffic control devices or roads that cannot accommodate the volume of traffic. At the regional level, capacity constraints can occur due to bottlenecks or inadequate access points that prevent traffic from flowing smoothly. The consequences of roadway capacity constraints can be significant, both economically and environmentally.

Congestion also results in vehicles traveling slower and/or taking longer routes, which results in increased travel time and distance and more fuel consumption and emissions. Parts of the SCAG region already have some of the worst air quality in the country and expanding roadway capacity would likely exacerbate the problem.

Induced traffic can also have negative impacts on local communities. New or expanded roadways can lead to increased noise and congestion that can impact the quality of life for people living nearby. In addition, new roadways may be built in areas that were previously undeveloped, leading to habitat destruction and

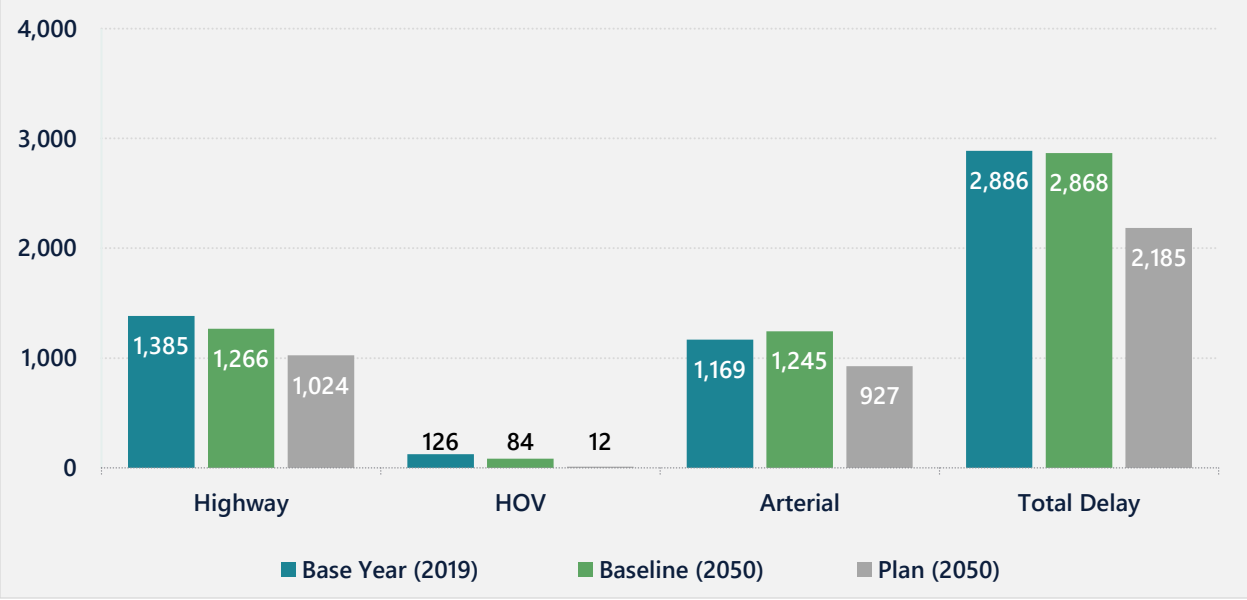
loss of biodiversity. The construction of transportation infrastructure raises safety concerns related to active mobility options as it can be difficult to navigate busy streets and intersections thus increasing the risk for collisions and injuries. Additionally, associated environmental impacts can contribute to a range of negative health impacts, particularly for vulnerable populations such as children, the elderly and people with respiratory conditions. Finally, it can lead to displacement of local residents and businesses, particularly in communities that are already vulnerable or marginalized, exacerbating existing inequalities and creating new social and economic challenges for affected populations.

There are several sources of congestion and challenges to improving accessibility in our region. Chief among them is the high reliance on single-occupancy vehicles, which has resulted in a built environment that is often more conducive to cars than people. This can reduce the attractiveness and viability of alternative modes of transportation such as transit/rail and active transportation modes. Moreover, the imbalance between jobs and housing in many areas presents significant challenges to access and mobility given our region's geography and urban sprawl. The ongoing trend of residents moving further inland to access lower-priced housing further exacerbates these challenges. Other factors impacting congestion on roadways and transit/rail accessibility include natural impediments such as mountains and waterways, gaps in the road network and bottlenecks that reduce capacity at pinch points.

The transportation system can be differentiated based on the characteristics and categorization by facility type for highway/expressway, HOV and arterials, we are able to forecast anticipated delays by facility type based on the base year, baseline and plan year. Figure 4-6 showcases the expected decrease in daily person hours of delays by facility type when investments in Connect SoCal are implemented by 2050. Connect SoCal 2024 plan investments are estimated to decrease daily person-hours of delay by just over 683,000 hours and 23.8 percent overall, decrease highway hours of delay by about 241,000 hours and 19.1 percent, and over 317,000 hours and 25.5 percent on arterials compared to Baseline conditions.

Please see the Congestion Management Technical Report for more information.

Figure 4-6. Daily Person-Hours of Delay by Facility Type (Thousands)



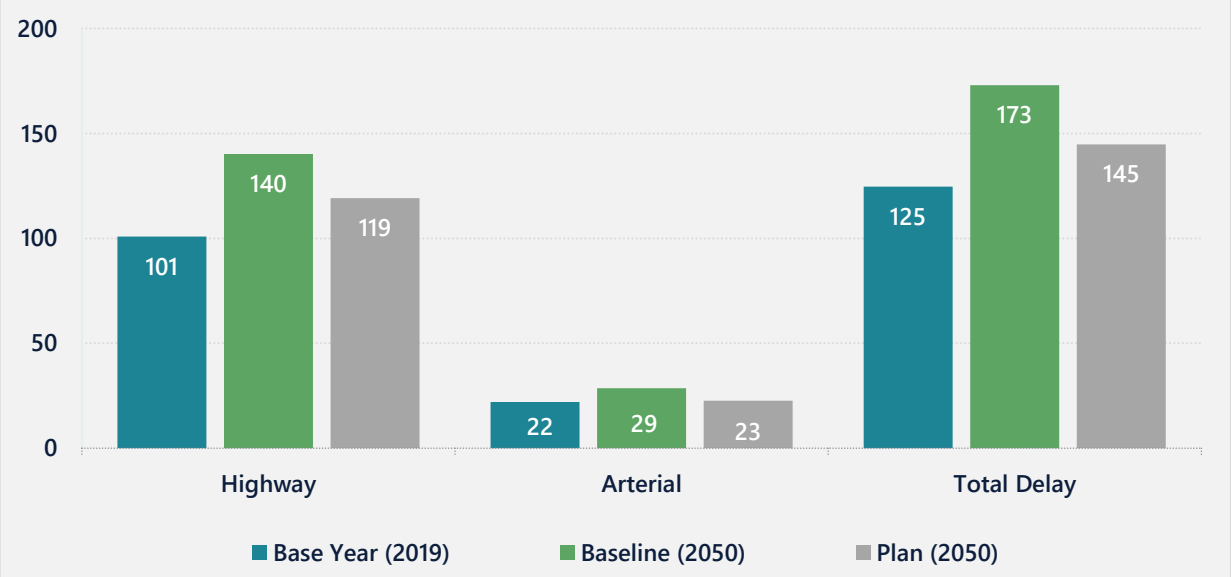
Source: SCAG

Bottlenecks cause significant congestion in the region. SCAG identified the top 100 regional bottleneck locations for 2019, with most bottlenecks active during the morning and afternoon peak periods. The U.S. 101 and Interstate 5 interchange in Los Angeles was the top-ranked bottleneck, resulting in nearly two million annual hours of vehicle delay, while the second-ranked bottleneck, where I-405 meets the Santa Monica Freeway (I-10) in Los Angeles, still resulted in over 1.9 million hours of delay.

Bottlenecks affect travel time reliability, or the consistency or predictability of travel times on a given route or transportation network. It's a critical factor for drivers who depend on predictable travel schedules. Bottlenecks, caused by factors such as narrow lanes, intersections, collisions, or even simply increased demand during rush hour, lead to congestion and unpredictable delays. The resulting inconsistency makes travel time reliability unpredictable, making it difficult for commuters to plan their daily routes or for goods movement companies to maintain schedules. The erratic nature of these delays can force drivers to seek alternative routes, often leading to a cascading effect of further congestion and unpredictability across the greater regional network.

Figure 4-7 shows the estimated average daily truck delay by facility type. Connect SoCal 2024 is estimated to reduce truck delay by just over 21,000 hours and 15.1 percent over Baseline conditions for the category of highway/expressway, and by nearly 6,000 hours and 20.5 percent over Baseline conditions for arterials.

Figure 4-7. Truck Delay by Facility Type (Hours)



Source: SCAG

4.6.3 CLIMATE CHANGE

Climate change poses significant vulnerabilities to roadway infrastructure in Southern California. The regional transportation system is already struggling with increasing congestion and harmful emissions, deteriorating road conditions and limited funding. Climate change impacts, such as sea-level rise, extreme heat, and increased precipitation, will exacerbate these challenges and threaten the safety and reliability of our roadways. Specific threats include:

- **Sea level rise.** Rising sea levels caused by climate change are a significant threat to the region's coastal highways and bridges. As the sea levels continue to rise, critical roadways may become inundated or flooded, making them impassable and potentially damaging or destroying critical infrastructure.
- **Extreme heat.** Elevated temperatures can cause asphalt to soften and deform, leading to dangerous road conditions (e.g., softening, cracking, buckling) and traffic disruptions to transportation networks. Extreme heat can also contribute to the increased frequency and intensity of wildfires, which can damage or destroy roadways and other critical infrastructure. High pavement temperatures may also create hazards such as decreased tire traction. Finally, extreme temperatures typically increase auto air conditioner use, leading to greater energy use and GHG emissions.
- **Increased precipitation and flooding.** Southern California is prone to flash flooding during periods of heavy rain, which can lead to landslides, road closures and damage to bridges and culverts. Climate change is expected to increase the frequency and severity of these events, which could cause significant disruptions to transportation networks.
- **Extreme weather events.** Our region is vulnerable to a range of extreme weather events such as drought and torrential rains and corresponding flooding and mudslides that are often exacerbated in areas affected by wildfires. These events can cause severe damage to roadways and other critical infrastructure, disrupting the transportation network and increasing the risk of collisions and injuries.
- **Power outages can occur during heat events.** Because of increased cooling demand and supply/demand imbalances, which can lead to service disruptions and a host of other impacts.
- **Water supply.** Water supply and quality are reduced, which, compounded with increases in water demand, contribute to limited water resources for communities.

To address these vulnerabilities, transportation leaders and policymakers must consider the impacts of climate change in planning and investment decisions. Infrastructure upgrades and retrofits, such as elevating roadways and bridges and installing drainage systems, can help mitigate the impacts of sea-level rise and flooding. The use of cool pavements and other materials can help reduce the effects of extreme heat on roadways. Furthermore, investments in alternative transportation modes, such as transit/rail and active transportation, can help reduce GHG emissions and lessen the impacts of climate change on the region's transportation network.

4.6.4 SECURITY

Transportation security is a significant concern in the SCAG region due to our complex transportation network, population, diverse land use patterns and the economic significance of the region. With millions of residents and visitors depending on a functional and secure roadway system daily, ensuring security is paramount. Roadway transportation security encompasses a wide range of topic areas, from the physical safety of infrastructure and protection against criminal activity to the resilience of the network during natural disasters and the integrity of cybersecurity measures. Economically, major local industries (e.g., entertainment, technology, tourism, international trade, etc.) rely on a secure and efficient transportation system. However, the region faces both common and unique challenges. These include traffic congestion, aging infrastructure, vulnerability to natural disasters, cybersecurity threats and funding constraints. Specifically:

- **Aging infrastructure.** As noted, many roads and bridges in the region are old and in need of repair or replacement. This deteriorating infrastructure presents security vulnerabilities that can be exploited by criminals or terrorists.
- **Funding constraints.** Limited funding for transportation infrastructure and security initiatives hinders the implementation of necessary improvements and upgrades.
- **Congestion.** Our region is known for notorious traffic congestion that can impede emergency response times and make it difficult to monitor and manage security incidents on roadways.
- **Natural disasters.** The region is prone to earthquakes, wildfires, and landslides, which can disrupt transportation networks and pose challenges to maintaining security during emergencies. Addressing sea level rise and flooding is also crucial, and involves assessing the vulnerability of transportation infrastructure, ensuring efficient evacuation routes, developing contingency plans for road closures and detours, enhancing emergency response capabilities and incorporating long-term adaptation measures. Regionally, the recent multiple closures of the rail lines running between Los Angeles and San Diego because of a slow-moving landslide near San Clemente due to shifting sand. While a short-term stabilization project is underway to restore service, local officials are considering long-term solutions that could even include rerouting the corridor along I-5.
- **Cybersecurity threats.** Increasing reliance on technology for Transportation System Management and Operations (TSMO) and communication exposes the transportation system to potential cyberattacks that could disrupt operations or compromise sensitive information.

Addressing these challenges requires innovative solutions, cross-sector collaboration and strategic investments in technology and infrastructure. At the same time, these challenges also present the region with opportunities to enhance regional security on our streets and highways. The following approaches may be considered:

- **Private Sector Collaboration.** Collaborating with private sector partners can help leverage additional resources and expertise to address transportation security challenges and develop innovative solutions.
- **Technological advancements.** Emerging technologies such as AVs, smart traffic management systems and advanced surveillance systems offer opportunities to enhance security and reduce risks across the transportation network.
- **Community engagement.** Strengthening relationships among transportation agencies, law enforcement and local communities can improve information sharing and foster a more collaborative approach to addressing security concerns.
- **Regional collaboration.** By working together, neighboring jurisdictions can better coordinate their efforts to maintain transportation security, share best practices and address cross-border security issues, especially through forums like SCAG.
- **Resilient infrastructure.** Investing in more resilient transportation infrastructure can reduce the impact of natural disasters and other disruptions on roadway security, ensuring that critical networks remain functional in times of crisis.

SCAG also serves as a regional convener in the occurrence of a disaster or emergency. Addressing security challenges such as aging infrastructure, congestion, natural disasters, and cybersecurity threats requires

innovative solutions, cross-sector collaboration, and strategic investments. SCAG can play a vital role in disaster recovery planning. While SCAG does not have a direct role in first response or emergency management, it can potentially play a role in providing a coordinating forum working with appropriate regional partners. In this role, SCAG could offer the capacity to identify policy directions and conduct planning regarding resource needs. In addition, the agency's Geographic Information Systems and transportation modeling expertise offers a regional tool that may support security and emergency management planning and deployment and evacuation preparedness and response.

4.6.5 TRANSPORTATION SAFETY

Ensuring the safety of vulnerable roadway users, such as children, older adults, pedestrians, cyclists and scooter riders, is a critical concern. These individuals lack the protection afforded by automobiles, which makes fatalities more likely in the event of a collision. On average, each year in the SCAG region, approximately 1,600 people are killed and 124,000 are injured, 7,000 of which are serious injuries, in traffic collisions. These numbers represent children, parents, spouses, relatives and friends. Collisions happen to people who drive, and disproportionately to people who walk and bike. Low income and communities of color are also negatively impacted. These communities often have less access to safe and reliable transportation options, which can lead to higher rates of walking, biking and public transportation use. Coupled with the lack the resources to advocate for road safety measures, such as traffic calming infrastructure and education campaigns, many communities of color and low income are more vulnerable to collisions and collisions. A sizable portion of SCAG's High Injury Network (HIN), about 70 percent, exists within or adjacent to Priority Equity Communities.

Most fatal and serious injury collisions in our region occur in urbanized areas and urban clusters. Most fatal collisions across all modes occur on local roads (65 percent). Local roads generally account for the largest percentage of the mileage of all roadways, and vehicles traveling on these roads have more opportunities to interact with oncoming traffic, cross-traffic and vulnerable road users like pedestrians and bicyclists. All these factors may explain why so many collisions occur on these types of roadways.

To provide greater detail on where fatalities and serious injuries occur and correspondingly target investments that prioritize safety, SCAG created the regional High Injury Network (HIN). The HIN identifies roadways throughout the region where high concentrations of collisions are occurring. SCAG's regional HIN shows that 65 percent of all fatal and serious injuries occurred on just 5.5 percent of the regional transportation network. To learn more about where collisions are occurring throughout Southern California, visit the High Injury Network webpage of the SoCal Transportation Safety Resource Hub.

Infrastructure improvements can help reverse this trend by creating safer streets that accommodate all modes of transportation. Additionally, reducing speed limits can mitigate the severity of high-speed collisions.

4.6.6 SPEED MANAGEMENT STRATEGIES

The impacts of congested and heavy traffic this has on the environment and safety are significant, but a series of speed reduction strategies offers a promising solution. At the core of this issue is fuel efficiency, which diminishes at higher speeds. Vehicles often achieve optimal fuel efficiency at speeds between 45-55 mph, but as they move faster, both fuel consumption and emissions rise. By controlling speed, not only is fuel efficiency improved, but the way people drive changes as well. There's less sudden acceleration and

braking, resulting in a smoother, more environmentally friendly ride. This slower pace may even foster mode shifts as more people opt for alternative modes of transportation, further cutting down on emissions.

Speed reduction also has a positive effect on VMT (i.e., VMT reduction). Strategies that encourage compact, walkable urban development can reduce the need for long car trips making certain routes less attractive for through-traffic and cutting down on overall VMT. And with a successful intermodal integration, such as improving transit, VMT can be further reduced.

AB 43, signed by Governor Newsom in October 2021, allows local governments the power to lower speed limits on roads, including state highways, in business and residential areas and other stretches identified as "safety corridors" without following the "85th percentile rule" mandated by state law—a rule that has often caused governments to raise speed limits on roads throughout the state. Under the "85th percentile" standard set by Caltrans, before any speed limit is set or altered, traffic engineers must survey a road to determine the speed at which 85 percent of cars travel. That speed, rounded to the nearest five mph, is set as the speed limit. Caltrans calls the 85th percentile rule "the single most influential indicator of what is safe and reasonable" when it comes to determining safe driving speeds. AB 43 coupled with a successful rollout of the provisions of AB 645, has the potential reduce speeds through the use of speed cameras. AB 645 would authorize a pilot program of privately operated camera systems to detect violations of the speed limit, take a photograph of the license plate and transmit the data so a citation can be mailed to the registered owner of the vehicle. Within SCAG region, the bill would authorize City of Los Angeles, Glendale, and Long Beach to establish a speed safety system pilot program if the system meets the requirements.

4.7 WHO SHAPED OUR APPROACH TO THIS PLAN?

4.7.1 NEXT GEN SUBCOMMITTEE

As part of the development of Connect SoCal 2024, three special Connect SoCal 2024 Policy Subcommittees were created around Next Generation Infrastructure, Resilience and Conservation, and Racial Equity and Regional Planning. The Next Generation Infrastructure Subcommittee met five times between September 2022 and February 2023 to identify recommendations to inform how emerging issues are addressed in Connect SoCal 2024.

The goal of the Next Generation Infrastructure Subcommittee was to build on Connect SoCal 2020 and provide guidance on the priorities and strategies for Connect SoCal 2024, reflecting the rapidly evolving developments across the region specific to the future of mobility and associated implications for public policy. The need for a more comprehensive understanding of these developments and consensus building on key regional strategies and policies is even more evident today in preparation for Connect SoCal 2024 as we continue to grapple with the pandemic, a more challenging economic environment, and shifting state and federal priorities with increasing uncertainties across the planning horizon.

To facilitate greater policy discussion of key areas anticipated to be critical for the development of Connect SoCal 2024, the Next Generation Infrastructure Subcommittee discussed and responded to the following policy questions: 1) How has travel changed with COVID-19 and what will this mean for long-range transportation planning? 2) How should our objectives for highway investment evolve? 3) How do we ensure transit recovery? And 4) should we better align the way we pay for and fund transportation with equity and resiliency goals? In answering these four questions over the five subcommittee meetings, several recommendations emerged.

RECOMMENDATIONS

Overall, feedback from members of the Subcommittee can be grouped into four broad recommendations.

- **Maintain a people-centric transportation investment strategy.** Ensure that deployment of innovative technologies support people's needs and address larger shared goals like advancing equitable access and reducing traffic fatalities and serious injuries. Prioritize use of our public rights-of-way for all roadway users, especially focusing on the needs of non-single occupant vehicle users.
- **Continue to invest in system preservation and efficiency.** Fix-it-first remains a key strategy for Connect SoCal, especially recognizing greater needs associated with the transition to zero emission vehicles and ensuring system resilience. Within this context, operational improvements and targeted strategic highway capacity expansion projects are warranted when coupled with complementary efforts to offset any potential increases in vehicle miles traveled and especially single-occupant vehicle travel.
- **Expand and enhance mobility choices.** Focus on understanding and meeting the needs of existing transit riders, which will also attract new riders. Increase choices beyond driving by enhancing and supporting services across all modes of travel including transit, active transportation, micro-mobility, and automobiles. Reconsider the role of the automobile in our daily lives and how mobility options can increase reliable accessibility.
- **Re-envision how we plan, fund, and manage the transportation system.** Plan and manage the transportation system more like an investor, including asserting a role in the management of the transportation digital realm. Appropriately pricing the transportation system ensures that the system functions for all users (even during peak demand periods), generates reliable revenue, and established resources for addressing equity concerns.

SUBCOMMITTEE HIGHLIGHTS

Each of the Subcommittee meetings included facilitated discussions led by the Subcommittee Chair. The Subcommittee presentations and subsequent discussions highlighted the following key findings:

- Increases in telework are changing the dynamics of travel both in time and in location.
- Post-pandemic, the region is experiencing more short trips throughout the day, especially across the afternoon period.
- Transportation system preservation remains a universal priority, and with greater needs associated with transition to zero emissions vehicles.
- The deployment of new technology should focus on people and addressing larger shared goals (e.g., advancing equitable access).
- Expanding highway capacity may be warranted but should be aligned with efforts to mitigate potential increases in VMT, especially single-occupant vehicle travel.
- Transportation solutions should involve increasing choices beyond driving, including connecting communities with pedestrian and bicycle facilities, and prioritizing transit to make it competitive with driving.
- Center solutions on people and their evolving travel needs, for example supporting more local short trips versus long commutes.

- Focus on understanding and meeting the needs of existing transit riders because this will also help attract new riders.
- Leverage technology and data to better understand people's needs, communicate information and invite feedback, attract riders that might otherwise never consider transit and facilitate unified planning and payment for multimodal trips.
- Public agencies should partner across agencies and sectors to develop projects and in doing so, minimize risk, build trust, and recognize/leverage unique strengths that each party brings.
- Cities should encourage the shift of the mobility paradigm by enhancing and supporting services across all modes including transit, micromobility and automobiles.
- Public agencies need to engage and assert a role in management of the transportation digital realm.
- Re-envision the transportation system more like a utility.
- Rethink the role of the automobile in our daily lives, but in a sophisticated manner that goes beyond just focusing on the need to reduce vehicle miles traveled.
- Place greater importance on valuing accessibility.
- Recognize that we can achieve many environmental goals with modest changes in travel behavior.
- Plan and manage the transportation system like an investor.
- Road pricing can be a revenue source, mechanism to improve driving and system performance, and tool for addressing equity concerns.

4.8 WHAT IS OUR PLAN FOR THE FUTURE?

Connect SoCal is committed to working to create a safe, equitable, sustainable and efficient roadway system that improves mobility, equity, safety, and quality of life while supporting regional economic growth and lowering emissions. This recognizes the importance of transportation as a critical component of our regional economic and social fabric, and the parallel need to address congestion, harmful emissions, and accessibility challenges. It will require a multifaceted approach including investments in infrastructure, technology and innovation. Fortunately, there are several tactics that can be employed to address these issues including:

- **Focus on Safety**. By implementing infrastructure and technology solutions that prioritize safety, such as Complete Streets design, improved signage and intelligent transportation systems, we can reduce traffic collisions and fatalities on our streets and highways.
- **Vehicles in Complete Streets**. Though essential, vehicles are only one component within the broader Complete Streets framework, which emphasizes the integration and coexistence of various transit modes. This approach recognizes the importance of vehicles but also prioritizes pedestrians, bicyclists, public transportation, and other mobility options to create a more balanced, inclusive, and sustainable urban transportation network.
- **Improve Mobility through Congestion Reduction.** Through congestion reduction, TDM strategies, such as incentivizing telecommuting and promoting shared mobility options like carpooling and ridesharing, can improve our overall regional mobility Please see Congestion Management Technical Report for more information.
- **Equity and Access.** Ensure that all residents have equitable access to transportation and mobility options by promoting transit, active transportation and other mobility options in low-income

communities and communities of color and promoting policies and programs that promote accessibility and equity.

- **System Preservation.** Ensure the safety and reliability of our streets and highways by investing in maintenance and repair needs, prioritizing the replacement and upgrade of aging infrastructure and maximizing funding resources.
- **Embrace Technology.** Support and promote the adoption of technological solutions and innovations to improve the efficiency and effectiveness of our transportation system (e.g., using big data and intelligent transportation systems to manage traffic flow, implementing connected and autonomous vehicle technologies, etc.).
- **Resilience.** Plan for the impacts of climate change on our streets and highways through the implementation of green infrastructure and adoption of climate adaptation measures that increase the transportation system's resilience to extreme weather events, sea-level rise and other climate impacts.

4.8.1 PROGRAMMED COMMITMENTS AND PLANNED INVESTMENTS

The Federal Transportation Improvement Program (FTIP) is a federally mandated four-year program of all surface transportation projects that will receive state and/or federal funding, are subject to a federally required action, and/or are regional significant. The FTIP is a comprehensive listing of such transportation projects proposed over the first six years of Connect SoCal 2024. As the Metropolitan Planning Organization (MPO) for the region, SCAG is responsible for developing the FTIP for submittal to the Caltrans and the federal funding agencies. The FTIP for the SCAG region is developed in partnership with the six County Transportation Commissions (CTCs) of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura as well as Caltrans Districts 7, 8, 11, 12 and Headquarters. The projects vary by type and range from highway improvements, transit, rail and bus facilities to high occupancy vehicle (HOV) lanes, signal synchronization, intersection improvements and highway ramps. Each of the six CTCs within the SCAG region also identified committed projects through the year 2050. These projects have been identified either through countywide long-range transportation plans (LRTPs), voter approved sales tax initiatives or in coordination with regional partners like SCAG. SCAG's project selection process follows a performance-based evaluation and selection approach and ensures that selected projects further Connect SoCal goals. SCAG ensures that all projects included in the RTP/SCS align with Plan goals and further the region's progress on key performance measures. Finally, Connect SoCal 2024 includes a listing of Unconstrained Projects that represent illustrative projects that the region could consider if additional funding were to become available. Please see the Project List Technical Report for more information.

Table 4-1 shows Connect SoCal 2024's highway capital investments by category. Connect SoCal invests more than $33 billion for various highway improvements, including mixed-flow and interchange improvements, HOV/express lanes and transportation system management. Connect SoCal also commits over $25 billion for capital investment in arterials. In addition, Connect SoCal commits more than $62 billion toward goods movement improvements, of which a portion of these funds are allocated specifically toward highway and local arterial improvements.

Table 4-1. Plan Highway Capital and Other Programs Investments (in Nominal Dollars, Billions)

Type	Purpose	Total
Mixed-Flow and Interchange Improvements	To close critical gaps in the highway network to provide access to all parts of the region.	**$11.9**
High-Occupancy Vehicle (HOV)/Express Lanes	To close gaps in the HOV/Express Lane network.	**$10.0**
Transportation System Management	To improve traffic efficiency and reliability.	**$11.9**

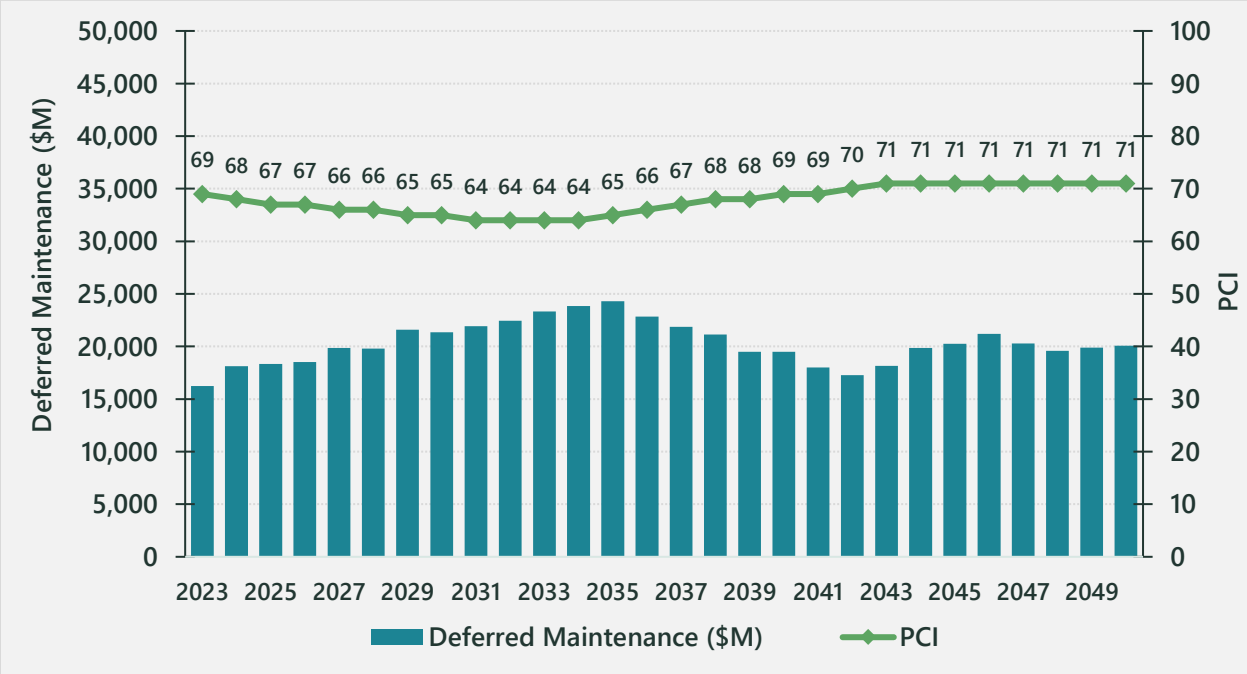
Source: SCAG Financial Model (2024)

4.8.2 SYSTEM PRESERVATION- INFRASTRUCTURE CONDITION IN JEOPARDY

Preservation of our streets and highways remains a persistent challenge. A crucial aspect of this challenge involves incorporating life cycle costs, such as maintenance and preservation expenses, into the development of infrastructure projects. Ensuring that our past investments continue to benefit future residents stands as a top priority for SCAG and its partner agencies. Unfortunately, due to significant funding limitations, the condition of our roadways has progressively worsened over time and will continue to worsen without significant investments.

The compromised condition of our roadways and bridges is due to years of underfunding our statewide preservation needs. As shown in Figure 4-8, if current funding trends continue it will be challenging to see any major improvement in condition levels. Significant investments are also necessary to address needs and new challenges, particularly those exacerbated by climate change.

Figure 4-8. Pavement Condition Index and Deferred Maintenance



Source: System Metrics Group (SMG)

Given the magnitude of our need, Connect SoCal 2024 continues to prioritize funding for system preservation. The Plan includes over $75 billion towards preservation, operation and resilience needs of the state highway system, and over $87 billion towards preservation, operation and resiliency needs of the regionally significant local streets and roads.

SCAG will continue to collaborate with federal, State and local partners to monitor the conditions of transportation assets and pursue new research and partnerships to ensure plan resources are deployed to address the region's greatest vulnerabilities.

4.8.3 EQUITY

It is imperative to prioritize equity and address the intersectionality of racial equity and climate change through short- and long-term strategies. By incorporating key strategies into the planning process, our region can support a sustainable and equitable transportation system. One way to address these challenges is using an equity-centered approach to guide decision-making processes by identifying and mitigating the disproportionate environmental burdens faced by communities of color. Moreover, by reducing emissions, and thus enhancing air quality, the region can mitigate climate change impacts and promote healthier environments, especially in communities of color. Additionally, expanding the regional EV charging network to improve access for underserved communities of color while commensurately promoting the adoption of clean vehicle technology through incentives and subsidies offers the opportunity to reduce GHG emissions and address historic transportation inequities due to race, income or other factors. Increased community engagement is also critical. It allows for more responsive mobility solutions as normally unheard voices and unique transportation needs are captured through the engagement process. Collaborating with community-based organizations (CBOs), conducting effective outreach and incorporating local perspectives and knowledge can lead to more equitable outcomes for communities of color.

- The Eastside neighborhood in the City of Riverside has faced transportation inequities due to historical transportation planning decisions that disproportionately affected its Black residents. By routing SR-91 and SR-60 through the community, residents were displaced and the community fragmented. Over time, transportation facilities have reduced access to jobs, education, and healthcare.
- The construction of multiple highways in the Los Angeles neighborhood of Boyle Heights has physically divided the community and led to increased pollution and displacement of residents and businesses, most of whom were Hispanic/Latino.
- The development of the Pasadena Freeway (SR-110) in Los Angeles displaced residents and businesses severing the physical and social connections of Chinatown. The highway cut through the heart of the community. Isolating it from adjacent neighborhoods and limiting access to employment and services leading to an erosion of economic and social fabric that endures until today.

The ways in which the region funds and pays for transportation needs also has equity implications. One strategy for alleviating regional gridlock is through the use of congestion pricing. As discussed in this chapter, congestion pricing involves pricing the use of a regional connected roadway system to improve throughput, reduce congestion, and decrease emissions, among other things. A portion of the money collected from these priced lanes can then be reinvested in other congestion relief solutions such as improving the existing transit/rail network. SCAG is currently exploring pilot programs that would essentially

complement and/or subsidize travel on the priced lanes for lower-income and other qualifying users. Please see the Equity Analysis Technical Report for more information.

Finally, leveraging technology and data-driven solutions can help to optimize our regional roadway network. Some examples include using ITS to reduce congestion and/or emissions, implementing digital platforms that provide for equitable ridesharing and using real-time analytics to provide the basis necessary for data-driven decision-making to help target transportation investments for needs for communities of color. For example, by analyzing traffic patterns, travel demand, and user preferences, areas of improvement can be identified, and resources allocated more efficiently. This data-driven approach can aid in identifying bottlenecks, optimizing roadway capacity and targeting investments in infrastructure that address the specific needs of communities of color, ultimately promoting equity and enhancing transportation efficiency.

To achieve equitable mobility, it is crucial to prioritize investments in our streets and highways system that enhance accessibility for individuals with disabilities, older adults and immigrant communities. This includes implementing universal design principles to ensure that sidewalks, crosswalks and intersections are accessible to people with diverse mobility needs. Additionally, allocating space for safe pedestrian crossings, wheelchair-accessible curb ramps, and adequate lighting can improve mobility and safety for these communities.

Equity-focused transportation planning involves several key strategies such as implementing a Complete Streets approach that prioritizes the needs of pedestrians, cyclists and transit/rail riders, ensuring equitable access to safe and well-designed infrastructure. Additionally, equitable allocation of resources directs investments towards underserved communities, addressing historical disparities and ensuring that all areas have well-maintained streets and highways. While these approaches are not mutually exclusive, an equitable approach to addressing system preservation needs may require that implementing jurisdictions navigate complex tradeoffs between a Fix-It-First-oriented approach to system preservation and approaches centering investment in Priority Equity Communities. Implementing jurisdictions should carefully consider any associated tradeoffs and broader implications for system preservation. Strategies such as TDM and Safe Routes to Schools further promote equitable mobility by offering diverse transportation choices and enhancing safety for all users. Integrating these strategies will allow our region to create a multimodal transportation system that is more inclusive, accessible and responsive to the diverse needs of its communities, thus ensuring equitable mobility for all residents.

RECONNECTING COMMUNITIES

The newly launched federal Reconnecting Communities Pilot Program provides dedicated funding ($1 billion) to state, local, and Tribal governments and MPOs to restore community connectivity. This program dedicates $250 million for planning grants and $750 million for capital construction grants over Federal Fiscal Year (FFY) 2022 to FFY 2026. Funding supports planning grants and capital construction grants, and technical assistance, to restore community connectivity through the removal, retrofit, mitigation or replacement of eligible transportation infrastructure facilities.

In February 2023, a historic $185 million in grant awards for 45 projects (six capital and 39 planning) through the new Reconnecting Communities Pilot Program were announced. One capital project (Shoreline Drive Gate in Long Beach - $30 million) and one Planning project (SR 710 Northern Stub Re-Envisioning Project in Pasadena - $2 million) received awards in this first-of-its-kind initiative to reconnect communities cut off from opportunity and burdened by past transportation infrastructure decisions.

In response to the adoption of Streets & Highways Code 104.3 at the end of June 2022, Caltrans launched the Reconnecting Communities: Highways to Boulevards (RC: H2B) Pilot Program. Caltrans established $149 million in the FY 22/23 State budget to plan for, and fund the conversion of, key underutilized highways in the State into multimodal corridors to reconnect communities divided by transportation infrastructure. These legacy impacts will be addressed through community-based transportation planning, design, demolition and/or reconstruction of city streets, parks or other infrastructure.

HIGHWAYS TO BOULEVARDS (H2B)

SCAG's highways to boulevards regional study aims to identify opportunities to reconnect communities by removing, retrofitting, or mitigating transportation facilities such as highways or railways that create barriers to community connectivity including to mobility, access, or economic development. Offering a path for communities to reknit by removing, retrofitting, or mitigating transportation facilities so that what remains is a better fit for the context of their surroundings and serves all people. It involves providing a framework to identify and evaluate potential transportation facilities to reconnect communities for performance improvements to provide more multi-modal travel options. Focusing on areas that intersect with Priority Equity Communities and preserving local communities and creating opportunities for safer and healthier communities. The goal of Highways to Boulevards is to equitably enhance mobility, support economic development and improve the livability of communities.

There is growing momentum at both the State and Federal levels for pursuing Highways to Boulevards planning and implementation. According to the Congress for New Urbanism, "the Highways to Boulevards movement offers a path forward for communities to repair, rebuild, and reknit. It seeks to replace aging highways that damage communities with assets like city streets, housing, and green space. These streets become places for the people who live around them, with local businesses and places for public interaction, as well as better integration with a city's transit systems. Highways to Boulevards conversions increase access to jobs and services and allow for the creation of neighborhood-driven, well-functioning urban space." By replacing highways with boulevards, communities previously divided by large, disruptive roadways can be reconnected, promoting economic development, social cohesion and access to essential services. Additionally, H2B projects can encourage the use of alternative transportation modes, such as walking, cycling, and transit/rail.

Regionally, several communities have embraced the H2B approach. The City of Long Beach has transformed a section of the former Terminal Island Freeway into a pedestrian-friendly boulevard with bike lanes, landscaped medians and new public spaces. Similarly, the City of Pasadena is exploring options for converting a section of the 710 Freeway into a boulevard that better integrates with the surrounding neighborhoods. H2B represents an innovative approach to addressing the challenges of roadway capacity constraints and creating more sustainable, equitable and livable urban environments.

4.9 HOW ARE WE GOING TO COLLECTIVELY ACHIEVE OUR VISION?

The opportunity to change how people travel across the region is significant, particularly when considering technological advancements and the potential for greater partnership across sectors. The faster responsible agencies act, the better chance the region has to maintain the key streets and highways that make the region move. Key strategies to support the future we envision are detailed below.

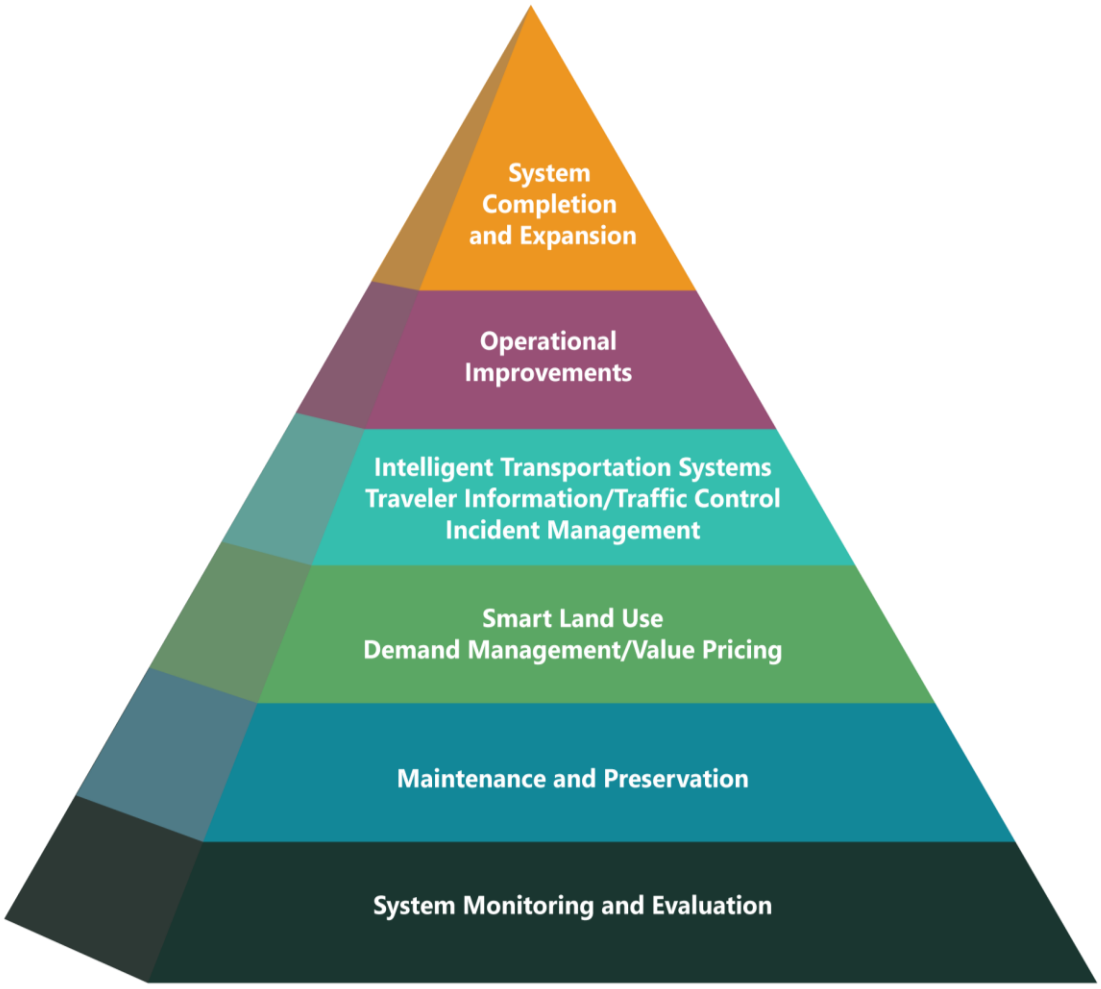
4.9.1 TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS (TSMO)

Given the latest statewide approach to reduce highway expansion projects, we as a region must lean more heavily on TSMO. The climate for highway expansion will continue to be particularly challenging for implementation, making the decision to utilize more TSMO smart and effective. TSMO is a set of strategies and practices aimed at optimizing a transportation system's performance.

It encompasses a wide range of activities, including traffic management, incident management, road maintenance, public transportation management and traveler information services, among others. The goal of TSMO is to improve safety, reduce congestion, enhance mobility, increase system efficiency and supply better services to the public. It involves the integration of various technologies, such as advanced transportation management systems (ATMS), intelligent transportation systems (ITS) and big data analytics, to monitor and manage the transportation network in real-time. By implementing effective TSMO strategies, our regional transportation agencies can minimize disruptions caused by incidents, minimize the impact of construction activities and provide timely information to travelers, among other benefits. The regional benefits of TSMO can include improved quality of life, smoother and more reliable traffic flow, improved safety, reduced congestion, cleaner air, less wasted fuel, increased economic vitality and more efficient use of resources.

The Caltrans System Management Pyramid (Pyramid) is a conceptual framework used to organize and prioritize transportation system management strategies (see Figure 4-9). The overarching guidance of the Pyramid is to protect and preserve our existing system through a “Fix it First” principle, support system preservation funding, maximize strategic investment productivity, close gaps in the system and support policies that will generate more seamless trips for users.

Figure 4-9. System Management Pyramid



Source: Caltrans

The foundation of the Pyramid emphasizes the importance of monitoring and evaluating the existing transportation network to allow SCAG to have a clear understanding of how the system currently operates. There are several other elements and tiers of the Pyramid including:

- The evaluation and monitoring of current metrics to inform the development of solutions to improve roadway safety, reliability and mobility lies at the base of the Pyramid. Protecting existing investments through maintenance and preservation of the region's transportation infrastructure to achieve the maximum productivity of the system is also critical. Further up the Pyramid are smart lane use, transportation demand management TDM and value pricing strategies, which aim to reduce travel demand and improve the overall efficiency and productivity of our system.
- Smart land use approaches aim to better integrate land use and transportation decisions. By improving the connections between jobs and housing, daily commute trips can be reduced and opportunities for using alternative modes of transportation can increase (e.g., walking, biking, and

transit/rail). Value pricing strategies, which are essentially a form of TDM, aim to incorporate pricing as part of the highway network in the form of express/HOT lanes to better utilize existing capacity. Express/HOT lanes that are appropriately priced can improve overall throughput in the system. Revenues generated from the express/HOT lanes can be used to deliver and/or improve upon existing complementary transit service thereby further reducing single-occupancy vehicle trip demand.

- The next tier of the Pyramid includes ITS strategies. ITS strategies seek to optimize the capacity of the transportation system using various technologies that can adapt to changing traffic conditions and inform drivers about driving conditions to enable informed traveler decisions.
- The next tier of the pyramid is operational improvements. Operational improvements are elements added to the existing transportation system with the goal of making it better for its users. Examples of operational improvements include auxiliary lanes, message signs, improvement to ramp and weaving sections and sight distance improvements.
- System expansion and completion are at the top of the Pyramid and should be considered only when all other options have been taken into account. However, SCAG recognizes that critical gaps and congestion chokepoints still exist within our system, and improvements beyond TDM strategies still should be considered.

4.9.2 PM 1 – TRANSPORTATION SAFETY

FHWA issued a Final Rule, effective April 14, 2016, to establish national performance measures for State DOTs to implement the Highway Safety Improvement Program as required by MAP-21. State DOTs and MPOs are expected to use the information and data generated from the federally established performance management program to inform statewide and regional transportation planning and programming decision-making and to link investments to performance outcomes. The Performance Management Package 1 (PM 1) transportation safety performance measures and targets are intended to facilitate statewide and regional transportation investment decision-making that will provide the greatest possible reduction in fatalities and serious injuries resulting from collisions occurring on the multimodal transportation system. The following five PM 1 transportation safety performance measures were established through the federal rulemaking for which annual statewide and regional performance targets are required:

- Number of fatalities
- Rate of fatalities per 100 million VMT
- Number of serious injuries
- Rate of serious injuries per 100 million VMT
- Number of non-motorized fatalities and non-motorized serious injuries

4.9.3 PM 2 – PAVEMENT AND BRIDGE CONDITION

As required under MAP-21, FHWA issued 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. FHWA rulemakings establish a four-year performance target setting and reporting cycle, with a two-year mid-term progress evaluation point. As provided in the federal rule-making process, SCAG coordinated closely with Caltrans in the establishment of specific performance targets for the state and for our region in the various transportation performance areas established under MAP-21.

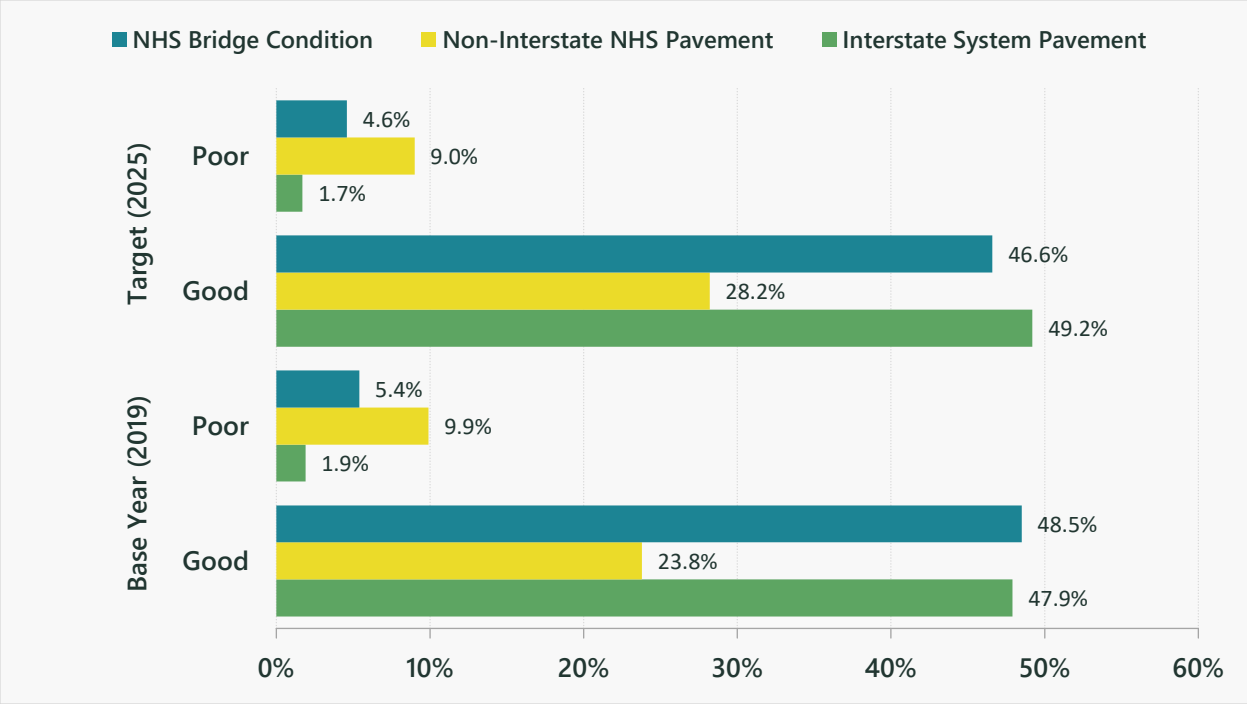
MAP-21 requires FHWA to establish rules for implementing transportation system performance management planning at a national level. FHWA rulemaking in support of MAP-21 and the FAST Act provides performance management and target-setting guidance in support of Performance Measure 2 (PM 2) which monitors pavement and bridge condition on the National Highway System (NHS).

By ensuring that pavement lane miles are kept in good condition and regularly maintained, Caltrans helps to safeguard the region's transportation infrastructure so it can continue to support economic growth, quality of life improvement and environmental sustainability. In the SCAG region, 2.7 percent of the local roadway pavements on the NHS are categorized as "Good," 76.7 percent as "Fair," and 20.6 percent as "Poor." All performance data for NHS pavements and bridges presented in this section are based on federal regulation and rulemaking (23 CRF 490).

Monitoring and maintaining NHS bridges is critical to ensuring the safety and reliability of the region's transportation infrastructure. Caltrans, in partnership with other state and local transportation agencies, is responsible for the management and maintenance of the region's NHS bridges, which include a variety of bridge types such as concrete and steel truss bridges, suspension bridges and cable-stayed bridges.

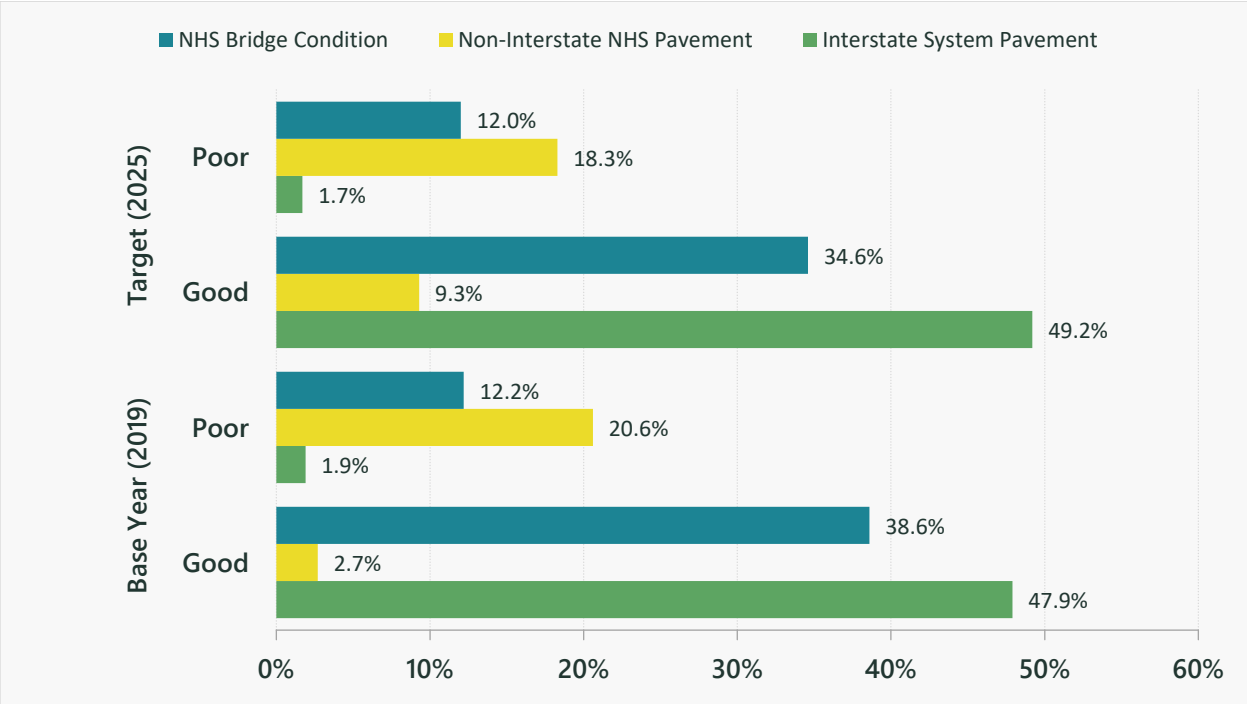
Based on this monitoring, bridge maintenance and repair needs are identified, and repairs or upgrades are carried out as necessary to address any deficiencies. The NHS consists of a total of 10,936 bridges with 243,347,047 square feet of bridge deck area. The SCAG region has 990 locally owned NHS bridges totaling 14,372,103 square feet of bridge deck area or 59 percent bridge deck area in California. In summary, as a region, 38.6 percent of NHS bridges are categorized as Good, 49.2 percent as Fair, and 12.2 percent Poor.

Figure 4-10. Statewide NHS Pavement and Bridge Condition (PM 2) Targets



Source: SCAG

Figure 4-11. SCAG Region NHS Pavement and Bridge Condition (PM 2) Targets



Source: SCAG

4.9.4 PM 3 – NHS SYSTEM, FREIGHT, AND CMAQ PROGRAM PERFORMANCE

The PM 3 group of federal transportation performance measures includes six metrics under three general categories: NHS system performance, 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 on the Interstate System. The CMAQ program evaluation measures assess the effectiveness of regional CMAQ investments toward achievement of the program's objectives of relieving traffic congestion and improving air quality. The specific performance measures associated with each of the three PM 3 performance categories are provided below.

National Highway System (NHS) Performance

- 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

- Percent of Interstate System mileage reporting reliable truck travel times

CMAQ Program

- 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

NHS SYSTEM PERFORMANCE

Table 4-2 provides the statewide and regional targets 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 4-2. NHS System Performance 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	2017-19	2017-21			
Interstate System	64.60%	65.1% (+0.5%)	65.6% (+1.0%)	65.20%	73.80%	0.60%	9.20%	73.80%	74.3% (+0.5%)	74.8% (+1.0%)
Non-Interstate NHS	73.00%	N/A	74.0% (+1.0%)	76.10%	83.70%	3.10%	10.70%	83.70%	84.2% (+0.5%)	84.7% (+1.0%)

Source: SCAG

FREIGHT MOVEMENT PERFORMANCE

Table 4-3 shows the statewide and regional targets for the PM 3 'Freight' measure for truck travel time reliability on the Interstate system. This metric may be used to evaluate the efficiency of the regional Interstate network in facilitating the transport of freight from ports to distribution facilities throughout the region and beyond.

Table 4-3. 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	1.6	0.02	-0.09	1.6	1.60 (No Change)	1.60 (No Change)

Source: SCAG

CMAQ PROGRAM PERFORMANCE

The PM 3 CMAQ program performance measures include four metrics for assessing the regional CMAQ program toward achievement of improved air quality and reduced traffic congestion. The first of the four CMAQ program measures is criteria air pollutant emissions. 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).

The second PM 3 CMAQ program performance measure is used to monitor traffic congestion through the assessment of annual hours of 'Peak Hour Excessive Delay' (PHED) experienced per capita. PHED is a calculated value based on 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.'

Unlike the PM 3 measures described previously, the PHED metric is only required to be reported for U.S. Census designated Urban Areas with 2020 Census populations exceeding 200,000 that are also within air quality nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. In the SCAG region, there are ten Urban Areas that meet that inclusion criteria.

Table 4-4 presents the PM 3 PHED targets for the ten applicable Urban Areas in the SCAG region.

Table 4-4. Peak Hour Excessive Delay Targets

Urban Area	2017 Baseline	4-Yr Target (2021)		2021 Baseline	4-Yr Target (2025)	
		Value	Change		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%

Source: SCAG

The third CMAQ program metric evaluates traffic congestion performance 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. This measure is also only applicable to Urban Areas with populations of more than 200 thousand.

Table 4-5 shows the PM 3 non-SOV mode share targets for the ten applicable Urban Areas in the SCAG region.

Table 4-5. Non-SOV Mode Share Targets (10 Applicable Urban Areas in the SCAG Region)

Urban Area	2017 Baseline	4-Yr Target (2021) Value	4-Yr Target (2021) Change	2021 Baseline	4-Yr Target (2025) Value	4-Yr Target (2025) Change
Los Angeles/Long Beach/Anaheim	25.60%	26.60%	0.50%	36.70%	36.70%	0.00%
Riverside/San Bernardino	22.70%	23.70%	0.50%	25.20%	25.20%	0.00%
Mission Viejo/Lake Forest/San Clemente	N/A	N/A	N/A	38.60%	38.60%	0.00%
Temecula/Murrieta/ Menifee	N/A	N/A	N/A	33.10%	33.10%	0.00%
Oxnard/San Buenaventura	N/A	N/A	N/A	28.60%	28.60%	0.00%
Indio/Palm Desert/Palm Springs	N/A	N/A	N/A	25.20%	25.20%	0.00%
Lancaster/Palmdale	N/A	N/A	N/A	23.70%	23.70%	0.00%
Victorville/Hesperia/ Apple Valley	N/A	N/A	N/A	27.60%	27.60%	0.00%
Santa Clarita	N/A	N/A	N/A	32.70%	32.70%	0.00%
Thousand Oaks	N/A	N/A	N/A	35.90%	35.90%	0.00%

Source: SCAG

4.10 WHERE DO WE GO FROM HERE?

As this chapter details, the future of streets and highways in the region holds both challenges and opportunities, and though it is difficult to precisely forecast its trajectory, we do know that climate change impacts and technological advances will continue, and with them, movement toward more sustainable transportation options. Connect SoCal is committed to working to create a safe, equitable, sustainable and efficient roadway system that improves mobility, equity, safety, and quality of life while supporting regional economic growth and lowering emissions. This recognizes the importance of transportation as a critical component of our regional economic and social fabric, and the parallel need to address congestion, harmful emissions, and accessibility challenges. It will require a multifaceted approach including investments in infrastructure, technology and innovation.

Monitoring the performance of our regional streets and highways is key to ensuring that the region successfully moves toward achieving its goals. As described in this report, performance measures provide the tracking and data necessary to make decisions based on empirical data. Regular reporting on progress towards goals helps ensure accountability and transparency in planning and decision-making. Reporting can also help build public trust and confidence by providing a transparent and accessible way for stakeholders to understand how public resources are being used and how transportation investments benefit the community. This includes publishing performance reports, holding public meetings and hearings and responding to feedback and concerns from our stakeholders.

Comparing progress towards goals with other regions can provide valuable insights and help identify areas for improvement. Benchmarking can involve comparing data on key indicators such as safety, sustainability and mobility with other regions in California or across the nation, as well as learning from best practices and successful interventions in other areas.

Over the years, the region has made significant investments to build and maintain our transportation system. Congestion has been reduced, safety improved, and accessibility enhanced for residents and businesses through investments in system preservation and resilience projects through a "Fix-It-First" approach. This approach is also more cost-effective than building new roads as repairing existing infrastructure typically requires less time and resources and minimizes community impacts. In fact, the cost of rebuilding roadways could be 14 times more than preventative maintenance[iii] Therefore, investment in preservation of the transportation system can extend the pavement life in a cost-effective manner while also improving safety. Applying "fix-it-first" policies for regional roadways can create a more sustainable, efficient and livable region.

The streets and highways component of the regional transportation network is also key to economic vitality and access for residents. It provides access to employment, health, social and educational services that support a high quality of life. On a typical day, residents use streets and highways to get to work, school, shopping, medical appointments, recreation, and many other destinations, whether traveling by car, bicycle, or transit/rail. During the COVID-19 pandemic, movement was limited, and people were encouraged to stay home. These widespread changes in travel behavior substantially increased demand for service providers that deliver groceries, packages, and other goods – all of which were likely carried on vehicles that drove on our streets and highways at some point of their journey. The regional streets and highway system is an integral piece of our daily lives and overall economy, and therefore it is important to maintain and preserve this critical asset.

Building and maintaining a robust transportation network is crucial for mobility in our region. We can achieve this by:

- Supporting investments and programs that are well-maintained and operated, coordinated and resilient and result in improved safety and air quality;
- Ensuring reliable, accessible, affordable and quality travel options while striving to enhance equity in transportation resources offered in underserved communities; and
- Planning for people of all ages, abilities, and backgrounds.

4.10.1 A SYSTEM FOR ALL USERS

Our extensive streets and highways system has helped improve and shape regional accessibility. However, our transportation system has often perpetuated transportation inequities, disproportionately affecting communities of color. To address these disparities and ensure equitable access to essential services and destinations such as employment opportunities and healthcare facilities, a strategic approach is required. By integrating targeted strategies into Connect SoCal, such as transit-oriented development (TOD), enhanced transit/rail networks, Complete Streets, and other targeted transportation programs, our region can proactively prioritize accessibility for communities of color and low-income communities using equity-centered planning approaches, fostering partnerships with community-based organizations (CBOs) and expanding mobility options (especially transit/rail). These efforts aim to reduce transportation barriers,

enhance connectivity, and drive equitable access to opportunities and services for a more inclusive and equitable transportation system.

Ensuring the prioritization of accessibility to essential services and destinations for communities of color in Southern California demands a combination of strategies. For example, investing in enhanced transit/rail networks and implementing Complete Streets and active transportation infrastructure is crucial to ensuring a system accessible to all users regardless of race, income and any number of other characteristics.

For example, implementing Complete Streets principles, such as enhancing sidewalks, bike lanes, and crosswalks can improve safety and encourage active transportation, providing communities with accessible options to reach essential services and employment opportunities without relying solely on private vehicles. Targeted transportation investments and programs can address the specific needs of communities of color through initiatives such as discounted transit passes or fare subsidies for low-income residents, specialized transportation services for elderly or disabled individuals and community-based shuttle services that connect underserved neighborhoods to key destinations, can greatly enhance accessibility. SCAG continues to explore potential solutions (e.g., subsidies, reduced rates, etc.) for the user pricing system identified in this report and in the Transportation Finance Technical Report for Connect SoCal 2024.

There are several potential strategies and/or policies the region can explore to mitigate the exacerbation of historic transportation inequities. For example, by embracing an equity-oriented planning approach, there are opportunities to engage with communities of color and to better understand their transportation needs. The region could also use data collection and analysis to identify disparities and make policy decisions by disaggregating data based on race, income and other factors. Other strategies include investments in sustainable and clean transportation options, such as EVs and renewable energy sources, which can mitigate environmental injustices in areas disproportionately affected by transportation corridors.

Addressing equity in Connect SoCal 2024 involves understanding and confronting historical biases, engaging underrepresented communities and prioritizing investments that serve diverse mobility needs. The challenge lies in shifting the focus from predominantly vehicle-oriented infrastructure to a balanced approach that incorporates alternative transportation options while promoting environmental justice and equal access to opportunities for all residents.

4.10.2 CORRIDOR PLANNING

Corridor planning, or planning for streets and highways, is a comprehensive, multimodal transportation planning approach among geographic, demographic, economic and social factors that influence the transportation needs of communities. Multimodal corridor planning involves the integration of multiple modes of transportation, such as walking, biking, transit/rail and driving, into a coordinated and interconnected network.

The evolution of technology, including real-time trip planning, ridesharing services and the impending introduction of connected and autonomous vehicles (CAVs), as well as advanced air mobility, will have a profound impact on the transportation landscape. To effectively address these challenges, multimodal corridor planning must engage diverse stakeholders, including local governments, transportation providers, community groups and residents, and leverage data analysis and modeling to ensure that proposed transportation investments are both efficient and equitable.

When planning for corridors, there are several factors taken into consideration to ensure safety for drivers and other road users. Goals for multimodal corridor planning include:

- **Safety**. To improve safety for all users of the transportation network. This includes reducing the number of traffic collisions, injuries and fatalities, and providing safe and accessible routes for pedestrians, cyclists and transit users.
- **Climate.** To reduce GHG emissions and mitigate the impacts of climate change. By promoting active transportation modes like walking and cycling, and improving transit/rail infrastructure, multimodal corridors can reduce the reliance on single-occupancy vehicles, which are a major contributor to climate change.
- **Equity.** Prioritize equity and address the needs of historically underserved communities. This includes ensuring that all residents have access to affordable and reliable transportation options and improved connectivity between neighborhoods and job centers.
- **Accessibility.** To improve accessibility for all users, regardless of their mobility needs. This includes designing sidewalks, bike lanes and transit/rail infrastructure to be accessible to people with disabilities and ensuring that transit routes serve areas with high concentrations of seniors and people with disabilities.
- **Quality of life and public health**. Multimodal corridors can improve quality of life for residents by creating more livable and vibrant communities. Promoting active transportation modes and improving access to parks and public spaces allows multimodal corridors the ability to contribute to public health by reducing sedentary behavior and promoting physical activity.
- **Economy**. Multimodal corridor planning contributes to economic development by improving access to job centers and reducing transportation costs for businesses and residents. By promoting sustainable transportation modes, multimodal corridors can also help attract and retain businesses that prioritize sustainability.
- **Environment.** Multimodal corridor planning should aim to minimize the environmental impacts of transportation. This includes reducing air and noise pollution, preserving natural habitats, and promoting sustainable land use patterns that prioritize transit-oriented development and compact, walkable communities.

4.10.3 SUSTAINABILITY

Planning for both sustainability and mobility ensures that our regional transportation system is efficient and environmentally responsible. It is a daunting challenge to create a system that promotes sustainable transportation modes while accommodating the region's high demand for other types of mobility. Achieving this balance will require a multifaceted approach that promotes sustainable roadway planning strategies, such as green infrastructure, active transportation, transit/rail, and EVs, with mobility-focused strategies such as ITS, user pricing, and coordinated land use planning.

Our region can adopt sustainable roadway planning strategies to reduce GHG emissions from cars and improve public health. For example, we can implement green infrastructure that filters stormwater runoff and reduces the urban heat island effect. Prioritizing active transportation methods, such as constructing bike lanes, sidewalks and multi-use paths that connect individuals to their destinations can encourage walking and biking, thereby reducing car trips and emissions. Further investments in transit/rail, coupled

with the promotion of EV usage through the expansion of charging infrastructure and incentives for EV purchases, can contribute significantly to the reduction of GHG emissions. Lastly, transitioning from internal combustion engine vehicles to zero or near-zero emission alternatives, including electric or hybrid vehicles, can effectively improve air quality and further mitigate GHG emissions. Investing in sustainable transportation options, such as transit/rail, biking and walking, can help to reduce congestion and improve air quality.

4.10.4 SMART CITIES

Smart city technologies and related innovations have the potential to revolutionize the way we design, build and manage our streets and highways. The following are potential opportunities and/or strategies to leverage this shift:

- **ITS.** To help improve traffic flow and safety on regional streets and highways by enabling more efficient and automated traffic management, ATMS can use real-time traffic data to optimize traffic flow, while connected vehicle technology can help prevent collisions and reduce traffic congestion.
- **Smart Parking.** Parking is a major issue throughout our region, and smart city technologies can help solve this problem. Smart parking systems use sensors and real-time data to provide drivers with information about available parking spaces, reduce traffic congestion and improve the overall parking experience.
- **Infrastructure Monitoring.** Smart city technologies monitor the condition of streets and highways, detecting damage and potential issues before they become major problems. For instance, sensors embedded in pavement can detect cracks or other damage, allowing maintenance crews to address the issue before it becomes a safety hazard. The cost of rebuilding roadways is exceptionally more (up to fourteen times more) than preventative maintenance. Therefore, preserving investment in preservation of the transportation system can extend the pavement life in a cost-effective manner.
- **Public Safety.** Smart city technologies can help enhance public safety on highways and streets by providing real-time information about potential hazards or emergencies. For example, intelligent traffic management systems can use real-time data to monitor traffic flow, detect collisions and coordinate emergency responses. Additionally, smart city technologies can facilitate the deployment of autonomous vehicles and subsequently reduce the number of collisions caused by human error.
- **Electric Vehicle Charging Infrastructure.** As EVs grow in popularity, including through incentives (overall fuel savings, federal and State tax credits and rebates) and adopted law (e.g., Executive Order N-79-20), there is significant opportunity to decrease traffic congestion by reducing the time drivers spend looking for a place to charge their vehicles. This can help to reduce travel time, reduce fuel consumption, and improve overall mobility for drivers.
- **Smart Signage.** Smart signage can provide real-time traffic information, like weather updates, to drivers to improve safety and reduce congestion.

Technologies such as these can help improve traffic flow, reduce energy consumption, enhance public safety and improve the overall quality of life in cities and urban areas, and it can play a significant role in improving the performance of streets and highways, especially given its integral nature to TSMO. To support ITS, an integration of effective transportation information systems is necessary. These systems provide the

foundation for real-time tracking. Key components include data collection, analysis and processing, traveler information delivery and data security and privacy.

As noted previously, TSMO is a set of strategies that aims to optimize performance of the regional transportation system, especially during periods of heavy congestion. The following are some technologies that can enhance TSMO:

- **Advanced Traffic Management Systems (ATMS).** ATMS is a technology-based system that integrates data from various sources, such as traffic sensors, cameras and GPS-equipped vehicles, to monitor and manage the transportation system in real-time. ATMS can monitor and manage traffic flow, reducing the number of stops and starts, and the amount of time vehicles spend idling in traffic.
- **Intelligent Transportation Systems (ITS)**. ITS also uses advanced technologies, such as sensors, cameras and GPS, to improve the safety and efficiency of transportation systems. It can be used to monitor and manage traffic flow, reducing the number of collisions and fatalities on the road, and traffic, in real-time, providing valuable information to make informed decisions about how to optimize system performance.
- **Smart Parking Systems.** Smart parking systems can improve the efficiency of parking by providing real-time information about available spaces and optimizing the use of parking resources which reduces the time and fuel spent searching for parking, and congestion caused by circling for parking spots.
- **Automated Vehicles (Avs).** AVs can reduce congestion and improve safety by enabling more efficient use of road space and reducing human error. Our region is already a hub for AV development and testing, and continued investment in this technology could yield significant benefits for the region. More information about automated vehicles can be found in the proceeding section on CAV and V2X.
- **Traffic Signal Coordination.** Traffic signal coordination is used to manage traffic signals, allowing for more efficient traffic flow and reduced congestion. Using real-time traffic data to adjust signal timings, we can ensure that vehicles are able to move through intersections more quickly and smoothly, reducing delays and improving safety.

While strides are being made to achieve fully automated vehicles, we are still far from ubiquitous, fully autonomized driving as a reality. During the transition, demand may remain for both semi-autonomous and human driving on our roadway infrastructure. To offset the demand for the system, advanced TSMO strategies play a key role in mitigating increasing congestion. To support TSMO, a robust and reliable infrastructure is necessary. This infrastructure includes sensors and detectors, and communication networks.

Transportation agencies rely on sensors and detectors to obtain real-time information about the transportation system. Traffic sensors such as loop detectors and microwave sensors collect data on traffic flow and provide real-time updates about traffic conditions. Roadway detectors such as cameras and video detectors monitor road conditions and provide real-time information about collisions, road closures and lane closures. Additionally, GPS-equipped vehicles can supply real-time information about both traffic and road conditions. With these devices, our regional transportation agencies can monitor and manage the transportation system proactively and ensure that they provide safe and efficient travel for all users.

Communication networks play a vital role in facilitating the collection, analysis and dissemination of real-time information to transportation agencies and travelers. These networks come in various forms, including wireless networks such as Wi-Fi and cellular networks, which collect and transmit data about traffic conditions, road conditions and incidents to transportation agencies. Dedicated Short-Range Communications (DSRC) networks, on the other hand, are wireless communication networks designed for transportation systems, offering a secure and reliable means for vehicles to communicate with one another and the transportation network in real-time. Meanwhile, Vehicle-to-Infrastructure (V2I) networks allow vehicles to communicate with the transportation network, providing valuable information about traffic conditions, road conditions and incidents. In addition to these networks, data management and computing systems are essential tools that transportation agencies utilize to collect, store and analyze data from various sources to optimize system performance. Through the integration of communication, data management and computing systems, we can proactively manage and operate our transportation system that ensures the safety and efficiency of travel for all users.

The emergence of CAV and V2X technologies has the potential to revolutionize the transportation system. V2X technology enables communication between vehicles and everything else in the transportation system, including other vehicles, the transportation network itself and other road users. Vehicles can exchange real-time information about road conditions, traffic incidents and other hazards, improving safety and reducing congestion. V2X and CAV technologies are closely related, as V2X technology provides the foundation for the deployment of CAVs. CAVs are equipped with advanced technologies such as sensors, cameras and GPS, enabling them to communicate with each other and with the transportation network in real-time. This technology has the potential to enable vehicles to coordinate their movements and avoid collisions, further improving safety and reducing congestion.

It is important to ensure that innovative technologies are designed and implemented in a way that promotes equity and addresses disparities. This may include prioritizing transportation infrastructure in historically underserved communities, providing access to affordable transportation options and ensuring that these technologies are accessible to all regardless of income or socioeconomic status. Additionally, it is important to engage with these communities throughout the planning and implementation process to ensure that their unique transportation needs and concerns are considered. Integrating these technologies will require significant investment in infrastructure, and the development of policies and regulations to govern their use on the roadway.

Advances in transportation technology, such as connected and automated vehicles, can help improve roadway system efficiency and safety. The development, deployment and adoption of CAVs and AVs offers several benefits for our regional roadway system. One of the most significant is improved traffic flow. Through vehicle-to-vehicle (V2V) and V2I communication systems, CAVs can communicate with each other and with the surrounding roadway infrastructure to optimize traffic flow and reduce congestion. This can lead to reduced travel times and a more efficient roadway system overall.

AVs are equipped with advanced safety features that can enhance safety for all road users, such as collision avoidance systems, adaptive cruise control and lane departure warning systems. This technology can help reduce collisions on the road and improve safety. CAVs and AVs and other advanced vehicles can also be designed to operate more efficiently and with lower emissions than traditional vehicles, which can help reduce the environmental impact of transportation and improve air quality. For individuals who are unable to drive due to age, disability or other factors, advanced transportation technologies can increase mobility and access. These technologies can also help promote transportation equity and reduce disparities in access for underserved communities by providing improved transportation and connectivity options.

Moreover, encouraging the use of alternative transportation options can reduce reliance on personal vehicles, help reduce traffic congestion and improve mobility for all road users. Alternative transportation options can be more sustainable and environmentally friendly, leading to reduced emissions and a more sustainable transportation system overall using technology. Examples include mobile apps that allow users to find and pay for transportation services in real-time or provide real-time information about transportation options, including availability, cost and expected arrival times, making it easier for people to use alternative transportation options.

4.10.5 CURB SPACE MANAGEMENT

Curbside management is not new. People have been parking in the curb space, driving through it or using it as a loading zone for decades. The rise of the term "curbside management" in recent years is from a parallel shift in technology-based mobility, such as transportation network companies (TNCs) and bike share, the rise of e-commerce and a desire to prioritize active transportation and safety.

Over the past decade, emerging trends in the transportation industry have greatly impacted the number of curb space users and how the curb space is used. Every single road user interacts with the curbside at some point, including drivers, cyclists, pedestrians, transit users, emergency services, delivery vehicles, taxis and TNCs, among other users. The impacts of the COVID-19 pandemic forced cities to quickly reimagine what the curb can be used for, repurposing on-street parking spaces to better support local businesses and residents through the implementation of curbside delivery zones, patios and parklets. The number of competing uses results in curb space being a very scarce resource that needs to be carefully managed to ensure that it serves the users that need it the most. Complex curb uses, multiple modes mismatched land use with parking needs, congestion, lack of enforcement and user safety issues, are among a few of the challenges related to curb management.

Curb management can resolve these challenges by leveraging upcoming and established technologies to take inventory of the curb. After understanding the curb inventory, local jurisdictions can focus on curb strategies to better understand curb congestion through data, for instance using computer vision cameras and Lidar. Curb space management is an opportunity to explore technologies and strategies to resolve congestion, mode and land use conflicts at the local level. For instance, fluctuating parking occupancy rates present an opportunity to create flexible curb zones to accommodate various curbside functions throughout the day. It also presents us with the opportunity to implement parking pilot programs to regulate curb demand and access. These improvements can create safer street space for users, especially pedestrians, say by improving enforcement, is another strategy.

The region has been initiating curb space-related work at regional and local levels. One such example of curb space management initiative is the first Zero Emission Delivery Zone (ZEDZ) Pilot in 2022 launched by Santa Monica-Los Angeles Cleantech Incubator partnership. This initiative aimed to encourage clean, electric delivery vehicles by granting priority curb space within a designated test zone. Various zero emission transportation technologies were tested, including electric bikes and trucks, along with supportive charging infrastructure and curb access strategies. The goals included setting a precedent for similar zones, providing operational insights for delivery companies, reducing pollution, managing congestion, and offering economic benefits. The rise in delivery traffic prompted this initiative, aligning with Santa Monica's environmental and climate action plans. The program utilized marked loading zones, monitored by cameras, where zero emission vehicles could park briefly for deliveries or pickups.

In addition to that, SCAG developed an extensive curbside management strategy as part of its Curb Space Management Study, covering a wide region with participation from multiple cities. This effort involved analyzing busy curb spaces and devising strategies, policies, and technological solutions to address curb-related challenges. The outcome included shovel-ready pilot project ideas to swiftly guide the participating cities from collaboration to implementing solutions for curbside issues along with a Curb Space toolkit that any SCAG city can utilize to develop similar pilot workplans. This represents the largest curbside management strategy completed in North America. SCAG continues its efforts towards curb space management by promoting the toolkit, creating platform and opportunities for peer exchange to share aspirations, challenges and lessons learnt.

4.10.6 SELF-ASSESSING (SMART) INFRASTRUCTURE

Deferred maintenance leads to much costlier repairs in the future. Challenges of timely maintenance and repairs include lack of up-to-date conditions data, funding and unforeseen damage caused by man-made or natural disasters. If damaged assets are not reported and addressed in a timely manner, consequences include further damage and unsafe conditions that could cause injury, illness and/or death.

Smart infrastructure uses imbedded sensors to allow agencies to better plan for asset maintenance repairs and the coordination of repair work. As it exists, roadway condition data collection is costly and only reflects a snapshot in time. Due to the costs associated with data collection, many jurisdictions only assess the condition annually or whenever required. Oftentimes, roadway condition data is not completely accurate but averaged out based on a smaller sample size of data collected. Having more accurate data on pavement and bridge conditions would allow better leverage for additional funding necessary to bring all assets to good condition.

Smart infrastructure uses sensors and other advanced technology to monitor performance in real-time, allowing for more efficient use of resources and better decision-making. For example, smart traffic management systems can use real-time data to optimize traffic flow and reduce congestion, improving the efficiency of the roadway system. By identifying potential maintenance needs and addressing them before they become more serious, smart infrastructure can help to reduce the environmental impact of infrastructure and transportation systems by optimizing resource use and reducing emissions. For example, the strategic positioning of EV charging stations can support sustainable transportation options, thereby reducing emissions from traditional gasoline-powered vehicles. Lastly, smart infrastructure can be designed to better withstand and respond to shocks and stressors such as earthquakes, wildfires and flooding. Incorporating resilience measures into infrastructure design and maintenance can help to improve the overall resilience of the built environment.

Many local jurisdictions are required to report pavement condition index (PCI) score and use the PCI to prioritize maintenance and repair activities for their local streets and roads. The PCI is a numerical rating system, ranging from 1-100, used to evaluate the condition of pavement surfaces. The PCI is calculated based on a visual inspection of the pavement surface and considers factors such as cracking, rutting and surface texture. The goal is to maintain the pavement in a state of good repair to extend the life of the roadway and reduce the need for costly rehabilitation or reconstruction. The PCI can also be used to help local jurisdictions make funding decisions for pavement maintenance. By prioritizing maintenance activities based on the condition of the pavement, local jurisdictions can ensure that limited funding is used effectively.

As every jurisdiction has diverse needs and preferences, information from PCI reports may vary in detail. The benefit of widely used, self-assessing smart infrastructure to collect data is its ability to standardize, analyze, collect and share information regionwide.

4.10.7 CLEAN TRANSPORTATION TECHNOLOGY AND CONNECTED AUTONOMOUS VEHICLES

Replacing vehicles with internal combustion engines with zero or near zero emission vehicles can significantly improve air quality. Zero-emission passenger vehicles are widely available, and most are EVs. As of December 2022, there were 50 passenger battery electric vehicle (EV) models, 51 plug-in hybrid electric vehicle (PHEV) models, and three hydrogen fuel cell electric vehicle (FCEV) models commercially accessible and available for sale in California (According to the CEC Dashboard on Zero Emission Vehicle and Infrastructure Statistics).

Zero emission passenger vehicles can also be powered by hydrogen fuel cells. However, these comprise a much smaller portion of the market. Data from the CEC Dashboard on New ZEV Sales in California, which draws from Department of Motor Vehicle (DMV) data, shows that in 2022, 16 percent of light-duty vehicle sales in California were EVs, and less than one percent of light duty vehicle sales were hydrogen fuel cell vehicles. Plug in EVs, which can operate in zero emission mode until their battery charge runs out, were 2.7 percent of sales. In August 2022, the California Air Resources Board passed the Advanced Clean Cars II rule, requiring vehicle manufactures to sell an increasingly higher percentage of zero-emission vehicles until 100 percent of new light-duty vehicle sales are zero-emission in 2035. Creating accessible and reliable EV charging infrastructure will play a crucial role in supporting this. California is expected to need 1.2 million EV charging stations to support the eight million light-duty EVs expected by 2030.

The roadway network in our region is impacted by vehicles due to concerns about safety, congestion, and environmental impacts. Connect SoCal 2024 considers a range of strategies to reduce congestion and GHG emissions while supporting sustainable mobility options. As battery technology continues to improve, EVs should become more affordable, and their range increase. Promoting the use of EVs and expanding the charging station network can significantly reduce GHG emissions and improve air quality. ITS technologies are being used to improve traffic flow and reduce congestion. Transit-oriented development, or TOD, can reduce the number of cars on the road and improve air quality by creating mixed-use developments around transit stations. And to address safety concerns, the development and deployment of AVs and CAVs are being explored to reduce collisions while improving system mobility.

CAVs can significantly reduce congestion by improving traffic flow and reducing the number of collisions caused by human error by communicating with each other and the infrastructure. CAVs could also increase the capacity of existing roadways without physical expansion, as included in guiding documents such as the Climate Action Plan for Transportation Infrastructure, or CAPTI.

In addition to CAVs, the development of platooning technology for trucks is another potential strategy to improve mobility on our streets and highways. This technology allows trucks to communicate with each other and travel in a tightly packed formation, reducing aerodynamic drag and improving fuel efficiency. By reducing the number of trucks on the road and improving their efficiency, platooning technology has the potential to reduce congestion and improve the flow of goods throughout the region.

4.10.8 TRANSPORTATION NETWORK COMPANIES

Transportation Network Companies (TNCs) such as Uber and Lyft are a popular mode of transportation in Southern California, especially in densely populated urban areas. These services have had a significant impact on the roadway system, both positive and negative. Positively, TNCs have helped to reduce the number of single-occupancy vehicles on the road, which can reduce congestion and improve overall efficiency. TNCs have also been shown to be a convenient and affordable transportation option for many people, particularly those without access to a personal vehicle. However, there are also negative impacts associated with TNCs. For example, they may contribute to increased congestion and reduced transit/rail ridership. In addition, TNC drivers may cause safety concerns as they often need to stop suddenly to pick up or drop off passengers.

For Connect SoCal 2024 to be successful, we need integration across modes and compelling solutions that lie outside the purview of SCAG and its partners.

APPENDICES

1. Guiding Principles for Emerging Technology
2. Mobility Planning and Policy Context Table
3. Connect SoCal 2024 – Mobility Performance Measures Table
4. Connect SoCal 2024 – Mobility Strategies
5. High Quality Transit Corridors Methodology
6. Coordinated Human Services Transportation Plans
7. Regional Complete Streets Policy
8. Regional Bikeway Network
9. Regional Greenway Network
10. Active Transportation Plans – Regional Assessment
11. Comprehensive Multimodal Corridor Plans

4.11 ENDNOTES

[i] (California Transportation Asset Management Plan, 2022)
[ii] (Draft 2023 State Highway System Management Plan 2023)
[iii] (California Statewide Local Streets and Roads Needs Assessment, 2023)

APPENDIX 1:
GUIDING PRINCIPLES FOR EMERGING TECHNOLOGY

APPENDIX 1: GUIDING PRINCIPLES FOR EMERGING TECHNOLOGY

1. **Equity:** Technology should eliminate barriers that may exist based on factors such as race, income, gender, age, language barriers, disability, or geography to ensure people can live a healthy and prosperous life[1].
2. **Accessibility:** Infrastructure and technologies should be designed to provide equal access to mobility, employment and economic opportunity, education, health and other quality of life opportunities.
3. **Safety:** Technology should be developed with safety as a high priority, and strive to reduce the number of fatalities and serious injuries occurring on our mobility networks[2].
4. **Sustainability:** Technology should reduce the environmental impact of the transportation network over its entire life cycle, and support the transition to net zero-emission mobility.
5. **Integration:** Technology should connect seamlessly into existing mobility infrastructure, such as roads, bridges, and public transit, to create a cohesive, interoperable network. This includes considering the impacts of proposed technology on modal choices, emergency vehicle response times, and transit performance.
6. **Adaptability:** Technology should be efficient and responsive to ensure that it remains up-to-date and effective to meet the evolving needs of users and stakeholders.
7. **Data Privacy and Security:** Technology should ensure the privacy and security of user data while incorporating equity centered best practices during data collection and integrating any requirements from applicable data specifications[3].
8. **Transparency and Accountability:** Technologies providers should share relevant data with local jurisdictions in order for the public and local agencies to effectively evaluate the services' benefits and impacts on communities.
9. **Resilience:** Technology should increase the ability of the SCAG region's transportation systems to anticipate and effectively respond to changing conditions, acute shocks, and chronic stressors[4].
10. **Workforce Development Investments:** Recognizing that technology has the capacity to facilitate economic growth, investments in technology should improve workforce development opportunities, including worker retraining, where these technologies are deployed.

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[1] Based on SCAG's Special Committee on Equity and Social Justice's definition of racial equity. https://scag.ca.gov/our-work-inclusion-diversity-equity-and-awareness#:~:text=%E2%80%9CAs%20central%20to%20SCAG's%20work,participate%20fully%20in%20civic%20life.%E2%80%9D

[2] Based on SCAG's 2023 Transportation Safety Priorities. https://scag.ca.gov/sites/main/files/file-attachments/rc020223fullpacket.pdf?1674781193,#page=18

[3] Based on SCAG's Racial Equity and Regional Planning Subcommittee's recommendation regarding data. https://scag.ca.gov/sites/main/files/file-attachments/jpc030223fullpacket.pdf?1677214791,#page=34

[4] Based on SCAG's Resilience and Conservation Subcommittee's definition of Resilience. https://scag.ca.gov/sites/main/files/file-attachments/jpc030223fullpacket.pdf?1677214791,#page=79

APPENDIX 2:
MOBILITY PLANNING AND POLICY CONTEXT TABLE – FEDERAL AND STATE STATUTES, ADOPTED LEGISLATION

APPENDIX 2: FEDERAL AND STATE STATUTES, ADOPTED LEGISLATION, GUIDELINES, INITIATIVES, PLANS, AND TOOLS CONSULTED

TITLE	DESCRIPTION	MODE(S)
Federal		
Infrastructure Investment and Jobs Act/Bipartisan Infrastructure Law (IIJA/BIL, 2021)	The Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Bill (BIL), is a $1 trillion investment in the physical and digital infrastructure of the U.S., which was passed in August 2021. The bill allocates $110 billion of new funds for roads, bridges, and major projects, while also reauthorizing the surface transportation program. The IIJA updated the regulatory and guiding principles set by the 2015 Fixing America's Surface Transportation (FAST) Act, and continues the FAST Act legacy of making the funding and planning processes of surface transportation performance-based and multimodal. Furthermore, in an effort to increase safe and accessible transportation options, the IIJA requires the adoption of Complete Streets standards and policies and not less than 2.5 percent of the funds made available to the metropolitan planning organizations (MPOs) be dedicated to activities to increase safe and accessible options for multiple travel modes for people of all ages and abilities.	All
Fixing America's Surface Transportation Act (FAST, 2015)	The Fixing America's Surface Transportation (FAST) Act, which updated the regulatory and guiding principles set by the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21), was signed into law in 2015. The FAST Act continues the MAP-21 legacy of making the funding and planning processes of Federal surface transportation performance-based and multimodal in an effort to address challenges facing the transportation system. The FAST Act requires metropolitan planning organizations (MPOs) to review and consider multiple factors, including, but not limited to increasing safety, security, accessibility, mobility, sustainability and connectivity, while supporting economic vitality of the metropolitan area. In an effort to promote safety, the FAST Act authorized alternative design standards and guidelines for roadway infrastructure in 2016 to better accommodate pedestrian and bicyclists and directed the Department of Transportation to identify best practices that adequately accommodate all users of surface transportation. The FAST Act eliminated the MAP-21 Transportation Alternatives Program, which had previously been used to fund active transportation, and replaced it with a set-aside of the Surface Transportation Block Grant (STBG) program, for which States and MPOs participate in a competitive selection process to receive funding. In California, this funding is allocated through Caltrans' Active Transportation Program (ATP) which was created under Senate Bill 99. Furthermore, key provisions of the FAST Act related to public transit included an increase in transit program funding, increased Buy America requirements, discretionary bus programs, and funding towards improving the nation's transit systems' state of repair.	All
Moving Ahead for Progress in the 21st Century Act (MAP-21, 2012)	The Moving Ahead for Progress in the 21st Century (MAP-21) was signed into law in July 20212. MAP-21 was widely considered to be a groundbreaking achievement in that it provided a legislative foundation for the establishment of a national performance-based transportation planning program. MAP-21 required that Metropolitan Planning Organizations (MPOs) establish targets focused on performance outcomes supportive of seven key national transportation goals related to transportation investment efficiency. These national performance goals included: 1) transportation system safety, 2) infrastructure condition, 3) congestion reduction, 4) system reliability, 5) freight movement and economic vitality, 6) environmental sustainability, and 7) reduced project delivery delays. 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 provided a standardized quantitative metric for evaluating progress toward meeting each of the national goals. Performance targets provided a numeric threshold by which the performance measures could be interpreted as having made acceptable progress toward achieving a specific performance goal. For further information, please refer to the Performance Monitoring Technical Report.	All
Metropolitan Planning Final Rule	Metropolitan Planning Organization (MPO) responsibilities for coordination and target setting as part of the Regional Transportation Plan (RTP) development, are included in the Metropolitan Planning Final Rule (23 CFR 450.206). Transit safety and asset management (TAM) targets must be set every four years in the MPO's Regional Transportation Plan (RTP). MPOs must integrate into their RTP, either directly or by reference, a system performance report evaluating the condition and performance of the transportation system with respect to the performance targets, including progress achieved in meeting the performance targets in comparison with system performance recorded in previous reports, including baseline data. Similarly, the Federal Transportation Improvement Program (FTIP) must include, to the maximum extent practicable, a description of the anticipated effect of the FTIP toward achieving the targets identified in the RTP, linking investment priorities to those performance targets.	Transit

TITLE	DESCRIPTION	MODE(S)
Metropolitan Planning Agreements	In 23 CFR § 450.314(a), the Federal Transit Administration (FTA) requires metropolitan planning agreements (MPAs) to be executed between metropolitan planning organizations (MPOs) and providers of public transportation. Specifically, the FTA requires that: The MPO, the State(s), and the providers of public transportation shall cooperatively determine their mutual responsibilities in carrying out the metropolitan transportation planning process. These responsibilities shall be clearly identified in written agreements among the MPO, the State(s), and the providers of public transportation serving the MPA. To the extent possible, a single agreement between all responsible parties should be developed. The written agreement(s) shall include specific provisions for the development of financial plans that support the metropolitan transportation plan (see § 450.324) and the metropolitan transportation improvement program (TIP) (see § 450.326), and development of the annual listing of obligated projects (see § 450.334). In Southern California, there are seven agreements in place, one for each of the six counties including the county transportation commission (CTC) and transit operators, and one with the multi–county commuter rail provider. These agreements acknowledge the important role the county transportation commissions play in the region's bottom–up transportation planning practice. The agreements specify that local transit agencies will work with their county transportation commission to include projects and programs in SCAG's Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and Federal Transportation Improvement Program (FTIP). SCAG last updated these agreements in 2018.	Transit
Regional Transportation Plan (RTP) Guidelines	California Government Code § 14522 requires the California Transportation Commission (CTC) to adopt guidelines for the development of Regional Transportation Plans (RTPs). RTPs are developed by Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs) every four or five years in cooperation with Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Caltrans, and other stakeholders, including system users to identify a 20+ year vision for transportation priorities and investments. The purposes of the RTP Guidelines are to: • Promote an integrated, statewide, multimodal, regional transportation planning process and effective transportation investments; • Set forth a uniform transportation planning framework throughout California by identifying federal and state requirements and statutes impacting the development of RTPs; • Promote a continuous, comprehensive, and cooperative transportation planning process that facilitates the rapid and efficient development and implementation of projects that maintain California's commitment to public health and environmental quality; and, • Promote a planning process that considers the views of all stakeholders. The CTC has authorized an update to the 2017 RTP Guidelines to be adopted in 2023. Caltrans will prepare revisions that promote implementation of statutory requirements and a statewide approach to the transportation planning process.	All

TITLE	DESCRIPTION	MODE(S)
Americans with Disabilities Act (ADA, 1990)	Perhaps the most important statutory change to the provision of public transportation over the last 40 years is the Americans with Disabilities Act (ADA) and the Complementary Paratransit Mandate. The Federal Transit Administration's rulemaking, 49 CFR §37.131 specifies the service criteria for complementary paratransit as: "(a) Service Area—(1) Bus. (i) The entity shall provide complementary paratransit service to origins and destinations within corridors with a width of three– fourths of a mile on each side of each fixed route. The corridor shall include an area with a three–fourths of a mile radius at the ends of each fixed route. (ii) Within the core service area, the entity also shall provide service to small areas not inside any of the corridors but which are surrounded by corridors. (iii) Outside the core service area, the entity may designate corridors with widths from three–fourths of a mile up to one- and one-half miles on each side of a fixed route, based on local circumstances. (iv) For purposes of this paragraph, the core service area is that area in which corridors with a width of three–fourths of a mile on each side of each fixed route merge together such that, with few and small exceptions, all origins and destinations within the area would be served. (a) Service Area—(2) Rail. (i) For rail systems, the service area shall consist of a circle with a radius of \3/4\ of a mile around each station. (ii) At end stations and other stations in outlying areas, the entity may designate circles with radii of up to 1\1/2\ miles as part of its service area, based on local circumstances." In previous analysis of transit system performance, SCAG identified that average demand response trip lengths were growing rapidly and SCAG has initiated further study to produce tools to better forecast, and plan for, long–term changes in demand for paratransit.	Transit, Paratransit
Federal Highway Administration (FHWA)	The Federal Highway Administration (FHWA) supports State and local governments in the design, construction, and maintenance of the Nation's highway system (Federal Aid Highway Program) and various federally and tribal owned lands (Federal Lands Highway Program). Through financial and technical assistance to State and local governments, the FHWA is responsible for ensuring that U.S. roads and highways continue to be among the safest and most technologically sound.	Streets and Freeways
Federal Railroad Administration (FRA)	The Federal Railroad Administration (FRA) promulgates and enforces rail safety regulations for all passenger and freight rail travel in the US, administers railroad assistance programs, conducts research and development in support of improved railroad safety and national rail transportation policy, provides for the rehabilitation of Northeast Corridor rail passenger service, and consolidates government support of rail transportation activities. FRA regulates public and intercity rail services. Most notably, the FRA enforces safety regulations, such as speed limits and requirements for safety features such as positive train control (PTC).	Freight Rail and Passenger Rail
Federal Transit Administration (FTA) Certifications and Assurances and Triennial Review	The Federal Transit Administration (FTA) consolidates the certifications and assurances required by federal law or regulations for its programs (49 U.S.C. §5323(n)) into a single document that an applicant for or recipient of federal assistance under 49 U.S.C. Chapter 53 must submit annually or as part of its application for federal assistance. FTA is also required to publish a list of these certifications and assurances annually. These documents are necessary to apply for any federal transit assistance. Similarly, the Triennial Review is a key tool the FTA uses to establish adherence to federal policies and requirements, as well as grantee performance. Mandated by Congress in 1982, the Triennial Review occurs once every three years. It examines how recipients of Urbanized Area Formula Program funds meet statutory and administrative requirements. The review currently examines up to twenty-one areas. In addition to helping evaluate grantees, the review gives FTA an opportunity to provide technical assistance on FTA requirements and aids FTA in reporting to the Transportation Secretary, Congress, other oversight agencies and the transit community on the Urbanized Area Formula Program. To assist grantees in preparing for the Triennial Review, FTA conducts workshops, provides training materials, procedural guides and other supporting materials. Useful resources for grantees can be found in the Triennial Review Workshop workbooks. SCAG supports transit agencies undergoing their Triennial Reviews by providing documentation of regional collaboration in the metropolitan planning and programming processes. None of the strategies in a Metropolitan Transportation Plan requiring FTA funds would be possible to implement without complying with these requirements. The Triennial Review and the Certifications and Assurances are areas where SCAG could partner with local agencies to improve the monitoring of plan implementation.	Transit

TITLE	DESCRIPTION	MODE(S)
Federal Transit Administration (FTA) Grant Programs	SCAG is the Designated Recipient of Federal Transit Administration (FTA) Urbanized Area Formula Grants under 49 U.S.C. §5307 for the large urbanized areas (UZAs) with populations of 200,000 or more in the SCAG region. As the Designated Recipient of Section 5337 and Section 5339 funds for large UZAs, SCAG allocates the funds to eligible Direct Recipients and tracks grant activity at the UZA levels. Additionally, SCAG may apply for and pass–through competitive Section 5339 and 5312 funds for specialized transportation programs and projects.	Passenger Rail, Transit
National Transit Database (NTD)	The National Transit Database (NTD) is the primary source for information and statistics on transit systems in the United States. Congress requires the NTD to collect financial and service information annually from transit agencies that benefit from Federal Transit Administration (FTA) grants (49 USC §5335(a) and (b)). Each year, the FTA uses performance factors derived from NTD data to apportion funding to urbanized areas (UZAs) and states through funding programs such as: •Section 5307 Urbanized Area Formula Grants •Section 5311 Formula Grants for Rural Areas •Section 5329 State Safety Oversight Grants •Section 5337 State of Good Repair Grants Transit agencies employing Section 5037 or 5311 federal funds to provide services must report on a broad range of performance data to the NTD. These reports must be consistent with Generally Accepted Accounting Principles (GAAP) and the Uniform System of Accounts and are required to be submitted within four months of the conclusion of a reporting agency's fiscal year. •5307 Program Recipients: Recipients or beneficiaries of the FTA's Urbanized Area Formula Program (FTA 5307) must file annual reports, monthly ridership and safety and security reports with the NTD. These reporters are also called Urban Reporters. Beginning in FY 2011, transit agencies with 30 or fewer vehicles became eligible for reduced reporting requirements, including reporting exemptions for passenger miles, mode–specific capital and operations costs, employee counts, maintenance performance, energy consumption, monthly ridership, and safety data. This is referred to as the Small Systems Waiver and agencies receiving automatic Small Systems Waivers are referred to as Reduced Reporters. •5311 Program Recipients: Recipients or beneficiaries of the FTA's Rural Area Formula Program (FTA 5311) must file annual reports to the rural module of the NTD. These recipients are also called Rural Reporters. States and Indian Tribes report directly to the NTD. States file reports on behalf of their sub–recipient rural transit agencies who do not report directly to the NTD. •Voluntary NTD Reporters: The FTA accepts voluntary NTD reports from other transit systems, both public and private, that serve both urbanized and non–urbanized areas. Voluntary reporters must provide public transportation services and meet the same reporting obligations as mandatory reporters. Some agencies report to the NTD but do not operate transit service. Build Reporters are agencies that benefit from federal funding and are in the process of building transit infrastructure but do not yet operate service. Planning Reporters do not operate transit service but instead receive federal funding and distribute the funds among transit operators in their area.	Transit
Transit Asset Management (TAM) Final Rule (2016)	The Federal Transit Administration (FTA) published the Transit Asset Management (TAM) Final Rule (49 CFR §625 et seq.), which became effective October 1, 2016, to implement asset management provisions of the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21), which mandates the development of a National TAM System, defines "state of good repair" (SGR), how agencies can increase system reliability and performance through adoption of a Transit Asset Management Plan (TAM Plan). The rule requires operators to inventory their assets, set performance targets, develop a list of prioritized investments, and report to the National Transit Database (NTD) on an annual basis. The rule also requires operators to coordinate with their respective Metropolitan Planning Organizations (MPOs) to set regional TAM targets. MPOs and transit providers are to develop performance targets and to report on progress towards meeting the targets.	Passenger Rail and Transit
Public Transportation Agency Safety Plan (PTASP) Final Rule (2018)	The Public Transportation Agency Safety Plan (PTASP) Final Rule , became effective on July 9, 2019, and requires transit operators who are recipients and subrecipients of the Federal financial assistance under 49 U.S.C. Chapter 53, and rail transit agencies that are subject to Federal Transit Administration's (FTA) State Safety Oversight (SSO) Program, to develop an Agency Safety Plan (ASP). Exempt from this requirement are commuter rail agencies regulated by the Federal Railroad Administration (FRA), ferries and recipients that only receive Section 5310 and/or 5311 funds. Agencies must certify they have a plan in place, initially by July 20, 2020. Due to the COVID-19 public health emergency, FTA published a Notice of Enforcement Discretion which extended the initial compliance deadline to December 31, 2020, later extended to July 20, 2021. The PTASP Final Rule requires transit agency coordination with the metropolitan and statewide planning process, including sharing safety performance targets with the Metropolitan Planning Organization (MPO) and coordination with the MPO in the selection of MPO safety performance targets.	Transit

TITLE	DESCRIPTION	MODE(S)
Passenger Rail Investment and Improvement Act (PRIIA, 2005)	The Passenger Rail Investment and Improvement Act of 2005 (PRIIA) clarifies that intercity passenger rail service means transportation services with the primary purpose of passenger transportation between towns, cities and metropolitan areas by rail, including high-speed rail. The Federal Code of Regulations (49 CFR 238.5), identifies three tiers of passenger rail operations, as follows: •Tier I means operating at speeds not exceeding 125 mph; •Tier II means operating at speeds exceeding 125 mph but not exceeding 160 mph; and •Tier III means operating in a shared right-of-way at speeds not exceeding 125 mph and in an exclusive right-of-way without grade crossings at speeds exceeding 125 mph but not exceeding 220 mph.	Passenger Rail
State		
Assembly Bill 390 (Santiago, 2017)	Assembly Bill 390 (AB 390) amended the Vehicle Code to decriminalize the act of beginning pedestrian crossings during the red countdown segment of the signal.	Active Transportation
Assembly Bill 1096 (Chiu, 2015)	Assembly Bill 1096 (AB 1096) created the designation of Class 3 Electric Bicycles, defined regulations for manufacturers, required Class 3 users to wear a helmet, and prohibited the operation of Class 3 Electric Bicycles on specified paths, lanes or trails, unless that operation is authorized by a local ordinance.	Active Transportation
Assembly Bill 1193 (Ting, 2014)	Assembly Bill 1193 (AB 1193) introduced cycle tracks or separated bikeways to be classified as Class IV bikeways, and established minimum safety Class IV bikeway design criteria with consideration for the safety of vulnerable road users.	Active Transportation
Assembly Bill 1371 (Bradford, 2013)	Assembly Bill 1371 (AB 1371), the Three Feet for Safety Act, protects public safety and promotes participation in active transportation by mandating that motorized vehicles leave a three-foot margin while passing a cyclist if practicable.	Active Transportation
Assembly Bill 1358 (Complete Streets Act) (Leno, 2008)	Assembly Bill 1358 (AB 1358), the Complete Streets Act of 2008, requires cities and counties to incorporate the concept of Complete Streets in the circulation element of the local jurisdiction's general plan update. The circulation element is required to identify a balanced multi-modal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel. Complete Streets refer to streets that are designed and operated to provide safe and accessible transportation options for all users, regardless of their mode of transportation, age, ability, or income. Examples of complete street elements include protected bicycle lanes, pedestrian improvements, curb extensions (i.e., bulb outs) and traffic calming, among others. Specific regional examples include protected bicycle lanes in Downtown Los Angeles and Pasadena, boldly marked crosswalks to make pedestrians more visible in Santa Monica and Long Beach, and the City of South Gate's Complete Streets Master Plan that includes traffic calming measures such as roundabouts, chicanes and traffic circles.	All
Senate Bill 1 (Beall, 2017)	California Senate Bill 1 (SB 1) raises the State gas tax and indexes it to inflation and increases Department of Motor Vehicle (DMV) fees. SB 1 invests the proceeds, estimated at $54 billion over the next decade to fix roads, freeways, and bridges in communities across California, and steers increased funding toward transit and safety. One of the major impacts of SB 1 on our streets and highways has been increases in funding for road and bridge maintenance and repair. SB 1 provides significant funding for local jurisdictions and agencies to address the backlog of maintenance needs on local streets and roads. It also provides funding for several major regional highway and transit projects. SB 1 funding programs include the Solutions for Congested Corridors Program (SCCP), Trade Corridor Enhancement Program (TCEP), Local Streets and Roads Program (LSRP), Local Partnership Program (LPP), Active Transportation Program (ATP), State Highway Operation and Protection Program (SHOPP) and State Transportation Improvement Program (STIP). Eligibility and requirements vary dependent on the specific program. In the case of Solutions for Congested Corridor Program (SCCP), SB 1 requires preference to be given to comprehensive corridor plans that demonstrate collaboration and a comprehensive planning approach.	All
Senate Bill 672 (Fuller, 2017)	Senate Bill 672 (SB 672) indefinitely extended the requirement for cities, counties, and Caltrans to incorporate technologies to detect bicycle or motorcycle traffic on the roadway whenever new or modified installations were made of traffic actuated traffic signals.	Active Transportation
Senate Bill 99 (Chapter 359, 2013)	Senate Bill 99 (SB 99) created the statewide Active Transportation Program (ATP) by consolidating several federal and state transportation programs into a single program with the goal to encourage increased use of active modes of transportation. The California Transportation Commission administers the program and distributes funds through a competitive program in partnership with the metropolitan planning organizations (MPOs).	Active Transportation

TITLE	DESCRIPTION	MODE(S)
Senate Bill 743, Environmental Quality (Steinberg, 2013)	Senate Bill 743 (SB 743) revised the transportation impact assessment requirements of California Environmental Quality Act (CEQA). The Governor's Office of Planning and Research recommended CEQA transportation impacts to be measured using Vehicle Miles Traveled (VMT) rather than the previously methodology of Level of Service (LOS). The new guidelines promote infill development and mitigation efforts to include investments in public transit, pedestrian, and bicycle facilities. For instance, certain types of projects within "transit priority areas" (TPAs) can benefit from a CEQA exemption if they are consistent with an adopted specific plan and the Sustainable Communities Strategy (SCS). A TPA is an area within one–half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Federal Transportation Improvement Program (FTIP).	All
Senate Bill 375, Sustainable Communities and Climate Protection Act (Steinberg, 2008)	Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act of 2008, mandated the state board establish the State's greenhouse gas (GHG) emission reduction goals, as set forth by Assembly Bill 32 the California Global Warming Solutions Act, and determine per capita GHG emission reduction targets for each California Metropolitan Planning Organization (MPO). Each MPO must prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its GHG reduction target through integrated transportation, land use, housing and environmental planning. Active transportation measures and policies act as one strategy to reduce GHG emissions from the transportation network. Furthermore, SB 375 creates incentives for residential or mixed–use residential projects that may be exempt from, or subject to a limited review of, the California Environmental Quality Act (CEQA), provided they are consistent with the MPO's adopted SCS. These "transit priority projects" must, among other criteria, be located within one–half mile of a major transit stop or high–quality transit corridor (HQTC).	All
Senate Bill 908 (Chesbro, 2001)	Senate Bill 908 (SB 908) stimulated the development of the California Coastal Trail (CCT) and authorized the distribution of grants and assistance to public agencies and nonprofit organizations to establish and expand inland trail systems that may be linked to the CCT. Transportation planning agencies located within the coastal zone are required to include provisions for the CCT in its regional plan.	Active Transportation
California Air Resources Board (CARB) Innovative Clean Transit Final Rule (2018)	In December 2018, the California Air Resources Board (CARB) unanimously voted to adopt the Innovative Clean Transit (ICT) Rule , which mandates the purchase of zero–emissions buses by transit agencies. The rule became effective in 2020, but the implementation is phased and the requirements impact agencies differently based on fleet size and air basin. The rule mandates that agencies must produce a Zero–Emissions Bus (ZEB) Rollout Plan and must begin purchasing zero–emissions buses by either 2023 or 2026, depending on agency size. The rule also has requirements transit agencies must include in the ZEB Rollout plans. ZEBs are buses with zero tailpipe emissions and is either a battery electric bus (BEBs) or a fuel cell electric bus (FCEBs). The ICT regulation applies to all types of rubber-tire buses, including standard buses, articulated, over-the-road "coach" buses, double-decker, and cutaway buses. The ICT rule applies to all public transit agencies in California that own, operate, lease, or rent buses with gross vehicle weight over 14,000 pounds, including those that contract out the operation to another entity (with some exceptions). The regulation excludes vehicles that operate on rails, like trolleybuses, and school buses.	Transit (Bus)
California Intercity Bus Study (2022)	Intercity bus service in California is delivered and funded through three primary means: 1. Rural access (funded through 5311(f) Program) 2. Rail connections (funded through the Amtrak thruway bus program) 3. Private/for profit bus service Caltrans is currently reviewing opportunities to develop a statewide bus network in response to this fragmented service delivery approach and funding model. The CIBS will: • Design a statewide bus network based on interconnected regional networks. • Establish a business case for the network and a roadmap for a statewide program for implementation. • Identify partners who can help implement pilot programs to launch the program in the next year.	Transit (Bus)

TITLE	DESCRIPTION	MODE(S)
California Transportation Plan 2050 (CTP, 2021)	The California Transportation Plan (CTP) 2050 is a long-term vision for California's transportation system that provides a roadmap for achieving a sustainable, equitable and resilient transportation system. It is the State's statutorily fiscally unconstrained long-range transportation roadmap that aims to address the challenges of climate change, technological advances, changing demographics and economic conditions by promoting a more integrated, multimodal transportation system that is safe, reliable and accessible for all Californians. CTP 50 is required to show how California can reduce transportation sector greenhouse gas (GHG) emissions to 80 percent below 1990 levels by 2050 and support numerous other pieces of ambitious climate legislation. The plan is grounded in six key policy goals including safety, sustainability, equity, livability, system performance and economic prosperity. To achieve these goals, CTP 2050 proposes a range of strategies, including the promotion of active transportation and transit-oriented development, the deployment of advanced technologies to improve system efficiency and safety and the incorporation of climate resilience into transportation planning and design. CTP 2050 provides a comprehensive, coordinated framework for transportation planning and investment in California, helping to ensure that the state's transportation system can continue to support economic growth, quality of life, and environmental sustainability over the long term. Goals of CTP 2050 include that the plan: • Provides a unifying and foundational policy framework for making effective, transparent, and transformational transportation decisions in California. • Addresses the varied transportation needs of urban, suburban, rural, and Tribal communities. • Emphasizes implementation and identifies a timeline, roles, and responsibilities for each plan recommendation. CTP 2050 does not contain projects, but instead policies and strategies required to close the gap between what an regional transportation plan (RTP) aims to achieve and how much more is required to meet 2050 goals.	All
Interregional Transportation Strategic Plan (ITSP, 2021)	As noted, the California Transportation Plan (CTP) creates a vision that articulates strategic goals, policies and recommendations to eliminate transportation disparities and improve multimodal mobility and accessibility while reducing greenhouse gas (GHG) and climate change impacts. The Interregional Transportation Strategic Plan (ITSP) implements the interregional portion of the CTP and is required to be consistent with the CTP's most current iteration. The ITSP proposes a range of strategies, including the promotion of alternative modes of transportation such as transit, walking and biking, the deployment of advanced technologies to improve system efficiency and safety and the incorporation of climate resilience into transportation planning and design. Goals of the ITSP include: • Safety: Provide a safe and secure transportation system. • Climate: Advance climate stewardship and resilience. • Equity: Eliminate transportation burdens across all communities, particularly low-income communities, communities of color, and people with disabilities. • Accessibility: Improve multimodal mobility and access to destinations for all users. • Quality of Life & Public Health: Enable vibrant, healthy communities. • Environment: Enhance environmental health and reduce negative transportation impacts. • Economy: Support a vibrant, resilient economy. • Infrastructure: Maintain a high-quality, resilient transportation system. The plan also emphasizes the importance of collaboration and coordination among different levels of government, as well as with private sector partners and community organizations, to ensure that transportation investments are targeted and effective. It is updated every five years following the completion of the CTP to reflect changing conditions and priorities, and it serves as a critical tool for guiding transportation decision-making and investment in the state.	All

TITLE	DESCRIPTION	MODE(S)
Climate Action Plan for Transportation Infrastructure (CAPTI, 2021)	Completed in March 2021, the Climate Action Plan for Transportation Infrastructure (CAPTI) details how the State recommends investing billions of discretionary transportation dollars annually to aggressively combat and adapt to climate change while supporting public health, safety and equity. CAPTI builds on a series of executive orders (Executive Order (EO) N-19-19) and Executive Order N-79-20) signed by Governor Gavin Newsom in 2019 and 2020 targeted at reducing greenhouse gas (GHG) emissions in transportation, which account for more than 40 percent of all emissions, to reach the state's ambitious climate goals. Developed in partnership with regional and local stakeholders, CAPTI includes a detailed analysis of the State's transportation infrastructure and its vulnerability to the impacts of climate change, such as sea-level rise, flooding and extreme weather events. The plan identifies strategies for reducing GHG emissions from the transportation sector, including promoting alternative modes of transportation such as transit, walking, and biking, increasing the use of electric and other low-emission vehicles and promoting sustainable development patterns that reduce vehicle travel. It also emphasizes the importance of integrating climate resilience into transportation infrastructure design, including measures such as improving drainage systems, using permeable pavements, and elevating critical infrastructure to protect against flooding and sea-level rise.	All
Caltrans Smart Mobility Framework (2010)	The California Smart Mobility Framework is a comprehensive statewide approach to advancing smart mobility and modernizing infrastructure. It aims to improve transportation safety, efficiency and sustainability through innovative technologies and data-driven strategies. This framework identifies several key objectives such as the integration of connected and autonomous vehicles, the expansion of electric vehicle infrastructure and the promotion of shared mobility options. The framework also emphasizes the importance of data sharing and collaboration among stakeholders to develop and implement effective transportation solutions. A major component involves the development of a Smart Mobility Innovation Hub as a central resource for stakeholders to collaborate and share information on emerging technologies and best practices to encourage the development of new technologies to improve the transportation system. Some regional examples of the application of the California Smart Mobility Framework include a commitment from the City of Los Angeles to install 10,000 publicly accessible EV charging stations by 2025, the creation of transit-oriented development (TOD) in places like Culver City and Mobility as a Service (MaaS) that combines multiple modes of transportation (e.g., public transit, ridesharing, etc.) into a single, integrated service that can be accessed through a mobile app.	All
Complete Streets Implementation Action Plan: DD-64-R2 (2014)	Caltrans' Complete Streets efforts include a variety of policy requirements to support increased mobility and access for travelers of all ages and abilities as outlined in the Complete Streets Implementation Action Plan. DD-64-R2 (2014) expanded the action list to a total of 182 items which included the development of a State Bicycle and Pedestrian Plan, collecting complete streets data and performance measures.	All
California State Bicycle and Pedestrian Plan (2017)	"Toward an Active California" was California's first statewide plan that laid out the policies and actions that Caltrans and its partner agencies would take to achieve ambitious statewide goals . It included a detailed analysis of the state's existing bicycle and pedestrian network, and a comprehensive set of goals, objectives and strategies for improving active transportation infrastructure, policies and programs. The plan emphasized the importance of a coordinated, multimodal approach to transportation planning, and it identified opportunities for integrating active transportation into the broader transportation system. Key strategies included improving safety and connectivity, increasing access to active transportation options, and promoting active transportation through education and outreach programs. The Plan also highlighted the importance of equity in transportation planning and investment, recognizing that historically underserved communities often face greater barriers to active transportation access and mobility. By providing a coordinated, data-driven framework for improving bicycle and pedestrian infrastructure and access, the plan aimed to help create a more sustainable, equitable, and accessible transportation system for Californians	All
Caltrans District Level Active Transportation (CAT) Plans	Caltrans Active Transportation (CAT) Plans build on the 2017 California State Bicycle and Pedestrian Plan, Toward an Active California, to evaluate bicycle and pedestrian needs on and across the State Transportation Network, and prioritize improvements to develop and support an integrated bicycle and pedestrian network. Caltrans has developed one CAT plan for each district in the SCAG region (Districts 7, 8, 11 and 12).	Active Transportation
General Plan Guidelines (2017)	General Plan Guidelines are published by the Office of Planning and Research (OPR) and require local governments to periodically update their general plan which serves as a long-term blueprint for the community's vision of future development and growth. General Plans are required to include a circulation element that must address the needs of all users of the surface transportation network and correlate with the land use element. Senate Bill 1000 (Leyva, 2016) requires jurisdictions that have identified disadvantaged communities to also address environmental justice in their general plans. The updated guidelines contain new requirements and guidance around climate change and health. Investments in active transportation can yield direct effects to improve public health and strengthen social cohesion within communities.	All

TITLE	DESCRIPTION	MODE(S)
Complete Streets Elements Toolbox (2018)	In order to address multimodal street design and Complete Streets throughout the state, Caltrans developed the Complete Streets Elements Toolbox in 2018 to provide detailed guidance on the development of Complete Streets projects. This toolbox is designed to help with implementation of Deputy Directive 64-R2 (2014) which calls for Caltrans to "provide for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system."	Active Transportation, Streets and Freeways, Transit
California Strategic Highway Safety Plan (SHSP, 2021)	The State Strategic Highway Safety Plan (SHSP) is a requirement of Moving Ahead for Progress in the 21st Century Act (MAP-21) and Fixing America's Surface Transportation (FAST) Act. States are required to develop an SHSP. California's ultimate goal is to reach zero deaths and serious injuries on our highways—a concept known as "Toward Zero Deaths" (TZD) or more simply, "Zero Deaths." California aims to achieve zero fatalities and serious injuries by 2050. The SHSP outlines various actions that state and local agencies can take to reduce fatalities and serious injuries such as Vision Zero initiatives. In response to a desire for bolder and more inclusive actions, the SHSP was updated in 2021 to include a new set of Guiding Principles and defining High Priority and Focus Areas to further improve safety on all California roadways.	Active Transportation, Streets and Freeways
California Transportation Asset Management Plan	The California Transportation Asset Management Plan (TAMP) is a comprehensive, data-driven plan that provides a framework for managing and maintaining the state's transportation assets over the long term. Developed by Caltrans in collaboration with regional transportation planning agencies and other stakeholders, it includes an inventory of the state's transportation assets, such as roads, bridges and transit systems. The TAMP provides a detailed analysis of the condition of these assets, as well as the performance of the transportation system. Based on this analysis, the plan identifies priorities for investment and maintenance, and establishes performance targets for asset condition and system performance. The TAMP also Includes a set of strategies for improving asset management, such as increasing the use of data-driven decision-making, promoting collaboration among various levels of government and stakeholders and exploring new technologies and innovations, to improve system performance and efficiency. As part of a statewide effort, an update to the TAMP was completed in July 2022. The most recent TAMP update analyzed existing asset performance, identified gaps/needs, and determined the gap in funds to improve performance levels of roads, bridges, drainage and the transportation management system (TMS).	Streets and Freeways, Transit
State Highway Operation and Protection Program (SHOPP, 2022)	The 2022 State Highway Operation and Protection Program (SHOPP) is a four-year program of projects that collectively improves the condition, operation, and sustainability of the State Highway System (SHS) and associated transportation infrastructure in California for fiscal years 2022-23 through 2025-26. The SHOPP funds safety and condition improvements, damage repairs and highway operational and modal improvements on the SHS. The SHOPP is the State's "fix-it-first" funding mechanism for the rehabilitation and reconstruction of all state highways and bridges, including Interstate highway and the supporting infrastructure for those facilities such as culverts, traffic management centers, safety roadside rest areas and maintenance stations to address safety and emergency repair needs. Though specified auxiliary lanes are eligible for SHOPP funding as operational improvements, SHOPP projects are prohibited from adding through highway lanes. The 2022 SHOPP is a performance-driven project portfolio built entirely by the principles of asset management. Projects in the 2022 SHOPP were developed under an asset management framework established through the California Transportation Asset Management Plan (TAMP) and implemented with the 2019 SHS Management Plan (SHSMP). These three plans, the SHOPP, TAMP and SHSMP, are integrated to ensure that the State transportation system can support safe, reliable, and efficient mobility. While SHOPP focuses on the preservation and safety of California's infrastructure, the TAMP offers a strategic framework to manage State transportation assets. The SHSMP marries these plans together to create a comprehensive management approach for the SHS. Complete Streets was considered for all projects, where feasible to incorporate, as part of the SHOPP process. Furthermore, the 2022 SHOPP includes projects that address condition improvements of the primary asset classes (i.e., pavement, bridge, drainage, and TMS) in supporting progress to meet 2027 performance targets established in SB 1 and by the California Transportation Commission. The 2022 SHOPP includes projects that carry out several climate action efforts such as investments in bicycle, pedestrian, and transit features to provide low or no emission modal transportation choices and projects that expand zero-emission vehicle charging facilities. SHOPP projects further reduce emissions by using recycled materials, especially for large pavement projects. It includes early work for some of the first sea-level rise adaptation projects involving the SHS. Through these projects and actions, the SHOPP is helping to reduce the impacts of climate change and make the system more resilient to realized impacts.	Streets and Freeways

TITLE	DESCRIPTION	MODE(S)
California State Hazard Mitigation Plan (SHMP)	The California State Hazard Mitigation Plan (SHMP) is crucial for establishing the state's mitigation priorities, strategies and actions. It ensures coordination between local mitigation plans and provides resources for local planners. The SHMP is required to be reviewed, revised, and resubmitted to the Federal Emergency Management Agency (FEMA) every five years to maintain eligibility for Stafford Act funding, including FEMA's hazard mitigation assistance programs, the Fire Management Assistance Grant Program and Public Assistance grants. As a state with an approved Enhanced SHMP, California is eligible for increased funds under the Hazard Mitigation Grant Program. In California, the Governor's Office of Emergency Services (Cal OES) leads the SHMP update process, collaborating with State Hazard Mitigation Team members, strategic working groups and other stakeholders to create a comprehensive plan that highlights the state's hazard mitigation efforts. The SHMP helps regional and local transportation planners identify and address vulnerabilities in the roadway network, such as potential flooding, landslides, wildfires and seismic events. By incorporating the SHMP's guidance and recommendations into transportation planning, regional planners and decision-makers can better anticipate and prepare for potential hazards, which can lead to improved infrastructure design, the prioritization of projects to minimize disruptions and the allocation of resources to areas most in need.	Streets and Freeways
Comprehensive Multimodal Corridor Plans (CMCP)	The Road Repair and Accountability Act of 2017, or Senate Bill 1 (SB 1), created the Solutions for Congested Corridor Programs (Congested Corridors Program). The primary objective of the Congested Corridors Program is to fund projects designed to reduce congestion in highly traveled and highly congested corridors through performance improvements that balance transportation improvements, community impacts and that provide environmental benefits. California Code, Streets and Highways Code (SHC § 2392), requires the preparation of a comprehensive corridor plan to apply for a portion of the annual $250 million awarded annually by the State for the Congested Corridor Program funding. Multimodal corridor planning is defined as planning for all modes of transportation that are presently used or have the potential to move people and goods within the designated corridor. The result of a comprehensive multimodal corridor plan identifies transportation system improvements that will address performance deficiencies in areas specified in the California Code, Streets and Highways Code (SHC § 2392). The SCAG region offers several examples of multimodal corridor planning such as the Wilshire Boulevard Bus Rapid Transit (BRT) project in Los Angeles. Using dedicated bus lanes and transit-only signals along a 9.9-mile stretch of Wilshire Boulevard, the BRT provides faster and more reliable transit service for thousands of daily passengers while also improving traffic flow and reducing emissions. The Metro Express Lanes Program is a comprehensive planning initiative that aims to improve mobility on several major freeways in Los Angeles County by converting High Occupancy Vehicle (HOV) lanes into high-occupancy toll (HOT) lanes and includes a range of multimodal improvements such as dedicated bike lanes, improved transit service and enhanced pedestrian access. Lastly, the Orange County Streetcar Project is a comprehensive planning initiative that aims to improve multimodal transportation including the construction of a new streetcar line that will connect major destinations in the city, including the downtown area, Santa Ana College, and the train station.	Streets and Freeways
California Statewide Transit Strategic Plan (2017)	The Statewide Transit Strategic Plan by the California Department of Transportation (Caltrans) is a guidance document for transit providers in the state offering tools, best practices, data and guides the provision of seamless public mobility and better coordination. The most recent report defines four central goals for transit: •Effective, high-quality transit is integral to transforming California into a more thriving, just, and sustainable place. •A California transit passenger's multimodal experience should be seamless, safe, and affordable. •Transit agencies must become more innovative and agile to vigorously pursue their missions. Use strategic investments to make transit more sustainable and resilient.	Transit
California State Rail Plan (2023)	The California State Rail Plan is a guidance document and roadmap. The Plan establishes a strategic vision for prioritizing state investments in the passenger and freight rail network statewide and includes a framework for coordination between planning partners, rail operators, host railroads and the state to develop a robust rail network.	Freight Rail and Passenger Rail

TITLE	DESCRIPTION	MODE(S)
Caltrans Division of Rail and Mass Transportation (DRMT)	The Caltrans Division of Rail and Mass Transportation's (DRMT) vision is to make public transportation a viable option for all. Its mission is to provide measurable improvements to California's integrated and sustainable public transportation system. Specifically for passenger rail, it is responsible for: • Administering and managing state and federal transit and rail grant programs that provide funding for operating assistance, capital improvements and equipment to California's public transportation agencies, • Planning and developing intercity rail capital projects and highway/railroad crossing improvements, • Developing the California State Rail Plan and the Statewide Transit Strategic Plan to strategically plan, support, and coordinate California's rail and mass transportation system, and • Coordinating and planning California's rail, transit and high-speed rail network integration efforts. In addition to providing funding, planning, coordination, budgeting, and administrative support, the DRMT develops, procures and manages state owned rail equipment and facilities for the three state-supported intercity passenger rail routes in California administered by their respective joint powers authorities (JPAs). These are: • The LOSSAN Rail Corridor Agency (LOSSAN Agency) for the Pacific Surfliner, • The San Joaquin Joint Powers Authority (SJJPA) for the San Joaquin, and • The Capitol Corridor Joint Powers Authority (CCJPA) for the Capitol Corridor.	Passenger Rail

APPENDIX 3:
CONNECT SOCAL 2024 – MOBILITY PERFORMANCE MEASURES TABLE

APPENDIX 3: CONNECT SOCAL 2024 MOBILITY PERFORMANCE MEASURES

CONNECT SOCAL MOBILITY GOAL				
Outcome	**Performance Measure**	**Description**	**Change From Last Plan**	**Equity Measure**
Accessibility	Access to Jobs	Share of regional employment centers accessible during peak travel periods. Considering auto/transit/local bus accessibility & timeframes.	New measure for 2024	X
Accessibility	Major Destination Accessibility	Share of major destinations accessible within 30 minutes by automobile or 45 minutes by transit.	Revised: Assess AM peak, PM peak, & mid-day	X
Accessibility	Average Trip Distance	Average distance traveled for work & for all trips, including trip lengths 10 miles or less & 25 miles or less.	Continuing measure from 2020	X
Accessibility	Travel Mode Share	Share of total work trips & all trips by travel mode: auto, transit, non-motorized, & other.	Continuing measure from 2020	
Accessibility	Person Hours of Delay by Facility Type	Excess travel time resulting from the difference between a reference speed & actual speed (mixed flow, HOV, & arterials).	Continuing measure from 2020	X
Accessibility	Person-Delay per Capita	Daily amount of delay experienced per capita due to traffic congestion.	Continuing measure from 2020	
Accessibility	Truck Delay by Facility Type	Excess heavy duty truck travel time based on difference between reference speed & actual speed (highways/arterials).	Continuing measure from 2020	

Outcome	Performance Measure	Description	Change From Last Plan	Equity Measure
Accessibility	Average Travel Time	Average travel time (work & non-work trips) by travel mode: single occupancy vehicle (SOV), high-occupancy vehicle (HOV). walk, bike, & transit.	Revised: Addition of non-work trips	X
Accessibility	Travel Time Distribution by Mode	Travel time distribution by mode: single occupancy vehicle (SOV), high-occupancy vehicle (HOV), & transit.	Continuing measure from 2020	X
Transit	Transit Seat Utilization	Transit seat capacity utilization during peak demand hour (available seats for all transit types).	New measure for 2024	

CONNECT SOCAL COMMUNITY GOAL				
Outcome	**Performance Measure**	**Description**	**Change From Last Plan**	**Equity Measure**
Accessibility	Percent of Trips Less than 3 Miles	Share of work & non-work trips less than 3 miles in length.	Continuing measure from 2020	

APPENDIX 4:
CONNECT SOCAL 2024 – MOBILTY STRATEGIES

APPENDIX 4: CONNECT SOCAL 2024 MOBILITY STRATEGIES

STRATEGY	SCAG ROLE	OTHER RESPONSIBLE PARTIES
System Preservation and Resilience		
Per federal requirements, establish and monitor regional targets for pavement conditions, bridge conditions and transit/rail assets, in coordination with Caltrans	Lead	Support: Local jurisdictions, transit/rail agencies, CTCs
Repair, operate, maintain and preserve the SCAG region's transportation assets in a state of good repair	Support	Lead: Caltrans, local jurisdictions, transit/rail agencies, CTCs
Collaborate to work toward a regional asset management approach	Partner	Lead: Local jurisdictions, transit/rail agencies, CTCs
Evaluate projects submitted for inclusion in the FTIP and RTP/SCS according to contributions in achieving system performance targets	Lead	Support: Caltrans, transit/rail agencies, CTCs
Complete Streets		
Support implementation of Complete Streets demonstrations (including those addressing curb space management) to accommodate and optimize new technologies and micromobility devices, first/last mile connections to transit and last-mile deliveries	Partner	Lead: Local jurisdictions, transit/rail agencies, CTCs
Support community-led Complete Streets plans and projects, including those that take into account how to mitigate or adapt to climate change impacts (e.g., extreme heat)	Partner	Lead: Local jurisdictions, transit/rail agencies, CTCs
Encourage data-driven approaches to inform Complete Streets policies	Lead	Support: Local jurisdictions, transit/rail agencies, CTCs
Develop a Complete Streets network and integrate Complete Streets into Regional policies and plans, including consideration of their impacts on equity areas	Lead	Support: Local jurisdictions, transit/rail agencies, CTCs
Engage regional stakeholders in Complete Streets policy and plan development, implementation and evaluation	Lead	Support: Local jurisdictions, transit/rail agencies, CTCs
Provide leadership at the state and regional levels to promote Complete Streets, including involvement on the statewide Complete Streets Advisory Committee and the Active Transportation Technical Advisory Committee	Lead	n/a
Transit and Multimodal Integration		
All Modes. Increase multimodal connectivity (e.g., first/last mile transit and airport connections), which includes planning for and developing mobility hubs throughout the SCAG region	Support	Lead: Transit/rail agencies, local jurisdictions, CTCs
All Modes. Enable a more seamless mobility experience through the implementation of Mobility as a Service (MaaS). This may include leveraging Cal-ITP's support, initiate open-loop payment demonstrations, and test shared-product systems and post-payment solutions.	Support	Lead: Transit/rail agencies, local jurisdictions Support: Private sector companies
All Modes. Test, deploy and scale new and shared mobility services, including micromobility (e.g., bike share, e-scooters, etc.) and microtransit pilot projects	Support	Lead: Local jurisdictions, CTCs, transit/rail agencies, private sector companies

STRATEGY	SCAG ROLE	OTHER RESPONSIBLE PARTIES
Transit/Rail. Expand the region's dedicated lanes network—including new bus rapid transit, dedicated bus lanes, express bus service on managed and express lanes, as well as the region's urban and passenger rail network and transit/rail signal priority treatments. Improve transit/rail frequency, reliability, and fare and scheduling integration across operators.	Partner and Support	Lead: Transit/rail agencies, CTCs Partner and Support: Local jurisdictions
Transit and Multimodal Integration (continued)		
Transit/Rail. Improve transit/rail safety and security for riders, including promoting best practices through SCAG advisory committees and working groups	Support	Lead: Transit/rail agencies, CTCs, local jurisdictions
Transit/Rail. Through land use planning, support residential development along high-frequency transit corridors and around transit/rail facilities and centers	Partner	Lead: Local jurisdictions Support: Transit/rail agencies, CTCs
Active Transportation. Support community-led active transportation and safety plans, projects and programs (e.g., Safe Routes to Schools). Partner with local jurisdictions on demonstrations and quick-build projects through SCAG's Go Human initiative.	Partner	Lead: Local jurisdictions, transit/rail agencies, CTCs
Active Transportation. Expand the region's networks of bicycle and pedestrian facilities. This includes creating more low stress facilities, such as separated bikeways and bike paths, slow streets, and open streets.	Partner and Support	Lead: Local jurisdictions Partner and Support: CTCs
Streets and Freeways. Reconnect communities by removing, retrofitting or mitigating transportation facilities such as highways or railways that create barriers to community connectivity.	Partner	Partner: local jurisdictions, CTCs, Caltrans
Transportation System Management		
Develop a regional Transportation System Management and Operations (TSMO) plan that integrates Intelligent Transportation System (ITS) strategies to maximize the efficiency of the existing and future transportation system	Lead	Support: Caltrans, CTCs, transit/rail agencies
Evaluate projects submitted for inclusion in RTP/SCS and FTIP for progress in achieving travel-time reliability in the SCAG region	Lead	Support: Caltrans, CTCs, transit/rail agencies
Transportation Demand Management		
Incentivize and promote the development of more Transportation Management Agencies/Organizations (TMAs/TMOs)	Support	Lead: CTCs
Facilitate partnerships and provide a forum between public and private sector TDM practitioners and stakeholders to develop and implement policies, plans and programs that encourage the use of transportation alternatives	Lead	Support: Local jurisdictions, CTCs, air district, TMAs/TMOs
Develop and promote the use of a regional TDM data clearinghouse. Leverage data and TDM Toolbox best practices to identify cost-effective strategies	Partner	Lead: Local jurisdictions, CTCs, TMAs/TMOs
Collaborate to develop regional and localized marketing campaigns that promote TDM modes such as transit, carpool, walking and biking to school	Support	Lead: Local jurisdictions, transit/rail agencies

STRATEGY	SCAG ROLE	OTHER RESPONSIBLE PARTIES
Technology Integration		
Develop a Smart Cities Vision Plan and periodically revise the Technology Guiding Principles to inventory existing policies, evaluate emerging technologies, recommend best practices, implement ITS priorities, assess current trends and research, identify pilot opportunities and improve transportation system safety and efficiency	Lead	Support: SCAG Policy committees, Caltrans, CTCs, local jurisdictions
Provide local technical assistance grants in support of innovative technology solutions that reduce VMT and GHG emissions. Pursue funding and partners to continue the testing and deployment of emerging technologies	Lead	Support: Local jurisdictions, CBOs, CTCs, SCAG policy committees
Technology Integration (continued)		
Implement ITS priorities to improve the safety and efficiency of the current transportation system	Partner	Lead: CTCs Support: FHWA, Caltrans, local jurisdictions
Further develop a Regional Configuration Management process among CTCs, Caltrans districts, ports and local governments to ensure consistent and compatible integration of ITS technologies and interoperable operations	Support	Lead: Caltrans, local jurisdictions, CTCs
Conduct regional assessment of current and planned Connected and Automated Vehicle (CAV) implementation in the SCAG region to determine opportunity zones for future deployments and develop toolkits and best practices for local jurisdictions	Lead	Support: CTCs, Caltrans, local jurisdictions
Safety		
Integrate equity into regional safety and security planning processes through analysis of the disproportionate impacts on disadvantaged communities and vulnerable roadway users, like pedestrians, bicyclists, older adults and young people	Partner	Partner: CTCs, Caltrans, local jurisdictions, CBOs, regional bike/ped organizations
Promote implementation of data-driven approaches to guide transportation safety and security investment decision-making, including development of High Injury Networks and innovative safety modeling tools	Lead	Partner: Local jurisdictions Support: Caltrans, FHWA
Provide leadership at the state and regional levels to promote transportation safety and security planning, including involvement on the statewide Strategic Highway Safety Plan (SHSP) Steering Committee and Executive Leadership Committee	Lead	Partner: Caltrans, regional safety stakeholder groups
Evaluate projects submitted for inclusion in RTP/SCS and FTIP for their progress in achieving safety targets in the SCAG region	Lead	Partner: Caltrans, CTCs Support: Transit/rail agencies
Work with local, state, and federal partners to advance safer roadways including reduced speeds to achieve zero deaths and reduce GHGs	Partner	Partner: Local jurisdictions, Caltrans, FHWA
Funding the System/User Pricing		
Coordinate with local, regional, state and national partners to support transition to a mileage-based user fee	Support	Lead: Caltrans, FHWA Support: CTCs

STRATEGY	SCAG ROLE	OTHER RESPONSIBLE PARTIES
Support local and regional partners on implementation of dynamic and congestion-based pricing programs, including facilitation of regional coordination	Support	Lead: Caltrans, CTCs Support: Local jurisdictions, FHWA
Continue development and support for job-center parking pricing, including through Smart Cities and the Mobility Innovations SCP grant program	Support	Lead: Local jurisdictions Support: CTCs
Continue to coordinate with regional partners to support build-out of regional express lanes network	Support	Lead: Caltrans, CTCs Support: Local jurisdictions, transit/rail agencies
Study and pilot transportation user-fee programs and mitigation measures that increase equitable mobility	Lead	Support: Caltrans, CTCs, local jurisdictions, mobility service providers, CBOs, regional partners
Conduct education and outreach work to support the public acceptance of user fees	Lead	Support: Caltrans, CTCs, transit/rail agencies
15-Minute Communities		
Develop technical-assistance resources and research that can support 15-minute communities across the SCAG region by deploying strategies that include, but are not limited to, redeveloping underutilized properties and increasing access to neighborhood amenities, open space and urban greening, job centers, and multimodal mobility options	Lead	Partner: Local jurisdictions, private developers
Identify and pursue funding programs and partnerships for local jurisdictions across the region to realize 15-	Partner	Partner: COGs, SGC, local jurisdictions

APPENDIX 5: HIGH QUALITY TRANSIT CORRIDORS METHODOLOGY

APPENDIX 5: HIGH QUALITY TRANSIT CORRIDORS METHODOLOGY

BACKGROUND

The Sustainable Communities and Climate Protection Act of 2008, Senate Bill (SB) 375, requires that Metropolitan Planning Organizations (MPOs) develop a Sustainable Communities Strategy (SCS) to reduce per capita greenhouse gas emissions through integrated transportation, land use, housing, and environmental planning. SB 375 creates incentives for residential or mixed–use residential projects that may be exempt from, or subject to a limited review of, the California Environmental Quality Act (CEQA), provided they are consistent with the MPO's adopted SCS. These "transit priority projects" must, among other criteria, be located within one–half mile of a major transit stop or high-quality transit corridor (HQTC).

SB 743, signed into law in 2013, provides further opportunities for CEQA exemption and streamlining to facilitate transit-oriented development (TOD). Specifically, certain types of projects within "transit priority areas" (TPAs) can benefit from a CEQA exemption if they are consistent with an adopted specific plan and the SCS. A TPA is an area within one–half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Federal Transportation Improvement Program (FTIP).

STATUTORY DEFINITIONS

Definitions of "major transit stop" and "high quality transit corridor" are set forth under California law as follows:

CA Pub. Res. Code § 21155(b)
For purposes of this chapter, a transit priority project shall (1) contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 percent and 50 percent nonresidential uses, a floor area ratio of not less than 0.75; (2) provide a minimum net density of at least 20 dwelling units per acre; and (3) be within one–half mile of a major transit stop or high–quality transit corridor included in a regional transportation plan. A major transit stop is as defined in Section 21064.3, except that, for purposes of this section, it also includes major transit stops that are included in the applicable regional transportation plan. For purposes of this section, a high–quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. A project shall be considered to be within one–half mile of a major transit stop or high–quality transit corridor if all parcels within the project have no more than 25 percent of their area farther than one–half mile from the stop or corridor and if not more than 10 percent of the residential units or 100 units, whichever is less, in the project are farther than one–half mile from the stop or corridor.

CA Pub. Res. Code § 21064.3

"Major transit stop" means a site containing any of the following:

(a) An existing rail or bus rapid transit station.

(b) A ferry terminal served by either a bus or rail transit service.

(c) The intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

CA Pub. Res. Code § 21060.2

(a) "Bus rapid transit" means a public mass transit service provided by a public agency or by a public-private partnership that includes all of the following features:

(1) Full-time dedicated bus lanes or operation in a separate right-of-way dedicated for public transportation with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

(2) Transit signal priority.

(3) All-door boarding.

(4) Fare collection system that promotes efficiency.

(5) Defined stations.

(b) "Bus rapid transit station" means a clearly defined bus station served by a bus rapid transit.

METHODOLOGY

SCAG's technical methodology for identifying HQTCs and major transit stops is based on input from the Regional Transit Technical Advisory Committee (RTTAC), as well as consultation with local agencies, other large MPOs in California, and the Governor's Office of Planning and Research. The methodology and assumptions are discussed below. This methodology may be periodically updated to incorporate revisions or clarifications. Questions should be directed to Priscilla Freduah-Agyemang, at agyemang@scag.ca.gov.

SCAG maps and data depicting HQTCs and major transit stops are intended for planning purposes only. SCAG shall incur no responsibility or liability as to the completeness, currentness, or accuracy of this information. SCAG assumes no responsibility arising from use of this information by individuals, businesses, or other public entities. The information is provided with no warranty of any kind, expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

EXISTING HQTCS AND MAJOR TRANSIT STOPS

SCAG updates its assessment of existing major transit stops and HQTCs with the adoption of every new Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) every four years. Data for the existing ("base year") condition for the RTP/SCS are typically obtained several years before Plan adoption. The base year transit network for Connect SoCal 2024 (RTP/SCS), is based primarily on data for the year 2019. However, due to COVID-19 impacts on service levels the assessment of existing major transit stops and HQTCs is based on only 2022, and does not reflect the existing levels of transit service for any other timeframe. Transit agencies make adjustments to bus services on a regular basis. Therefore, given the limitations of the RTP/SCS base year transit network, local jurisdictions should consult with the appropriate transit provider(s) to obtain the latest information on existing transit routes, stop locations, and service intervals before making determinations regarding CEQA exemption or streamlining. It is the responsibility of the lead agency under CEQA to determine if a project meets statutory requirements.

STOP-BASED ANALYSIS

SCAG calculates peak commute bus service intervals at the stop level using schedule data published by transit agencies in the General Transit Feed Specification (GTFS) format (see for example,

www.transitfeeds.com). An HQTC therefore comprises or is determined by the qualifying stops on an individual bus route.

PEAK PERIOD BUS SERVICE INTERVAL (FREQUENCY)

To determine whether the peak commute bus service interval (also called frequency) meets the statutory threshold of 15 minutes or less, SCAG uses the peak period defined in its regional travel demand model. The morning peak is defined as 6 AM to 9 AM and the afternoon peak is defined as 3 PM to 7 PM. A transit operator may have a different, board–adopted or de facto peak period; in such cases SCAG will accept requests to use operator–specific peak–hour periods on a case–by–case basis.

SCAG uses the total population of bus trips during the combined seven–hour morning and afternoon peak periods to determine the peak frequency at a bus stop. This is done for each bus route, by direction. The peak frequency is calculated by dividing 420 minutes (the seven–hour peak converted to minutes) by the total peak bus trips. This average frequency should be 15 minutes or less in order to qualify. The threshold is strict, at 15.0 minutes.

DIRECTIONAL FREQUENCY

A bus route must only meet the 15–minute service interval threshold in one direction to qualify as an HQTC. This is based on RTTAC feedback that transit agencies often operate very peak–directional service or operate predominantly one–way service on a corridor.

CORRIDORS WITH MULTIPLE OVERLAPPING BUS ROUTES

Separate but overlapping bus routes that do not individually meet the 15–minute threshold may not be combined in order to qualify as an HQTC. However, based on RTTAC feedback, there are certain corridors where overlapping "line families" or local/bus rapid transit (BRT) lines are intended to function as one bus route. On these corridors, transit riders typically board the first bus available, whether it be a local, express, or a BRT line. For these line families or local/BRT corridors, SCAG uses the combined routes to calculate the frequency.

ROUTE ALIGNMENT

The entire alignment of a bus route, based on the stops that meet the 15–minute peak frequency threshold, is considered an HQTC. This would include, for example, express bus services that operate along freeways where there are no stops along the freeway right–of–way.

BUS RAPID TRANSIT

As defined in statute, a BRT must include full-time dedicated bus lanes. In the SCAG region, there are existing and proposed BRT projects that have only a portion of their alignment in a full-time dedicated bus lane. For these BRT projects, only those stations that are adjacent to a full-time dedicated bus lane are considered major transit stops. For the BRT projects that have a full-time dedicated bus lane on their entire route, all of the stations are considered major transit stops.

MAJOR TRANSIT STOPS AND INTERSECTING SERVICE TRANSFER ZONES

As defined in statute, major transit stops include the intersection of two or more HQTCs. For purposes of transferring between intersecting service, SCAG uses a 500–foot buffer to determine a major transit stop. In other words, two intersecting HQTCs must have stops that are within 500 feet of each other to qualify as a major transit stop. A 500–foot buffer is assumed to be a reasonable limit to the distance that a transit patron would walk to transfer between bus routes. It is also consistent with the Metro Transfers Design Guide definition of a transfer zone.

AMTRAK STATIONS AND FERRY STATIONS

Amtrak intercity passenger rail stations with only limited long–distance service are not automatically included as a major transit stop unless requested by a local agency. Similarly, ferry stations with seasonal and/or non–commuter-based service (and that are served by bus or rail transit) are not automatically included as a major transit stop unless requested by a local agency.

PLANNED HQTCS AND MAJOR TRANSIT STOPS

HQTCs and major transit stops in the RTP/SCS horizon year 2050 include existing HQTCs and major transit stops (based on 2022 inputs and the general assumption that pre-pandemic service would be restored by 2025), combined with future improvements that are expected to be implemented by transit agencies by 2050. These are assumed by definition to meet the statutory requirements of an HQTC or major transit stop. SCAG updates its assessment of planned major transit stops and HQTCs with the adoption of a new RTP/SCS, every four years. However, transit planning studies may be completed by transit agencies on a more frequent basis than the RTP/SCS is updated by SCAG. Local jurisdictions should consult with the appropriate transit provider(s) to obtain the latest information on planned transit routes, stop locations, and service intervals/frequencies before making determinations regarding CEQA exemption or streamlining.

APPENDIX 6:
COORDINATED HUMAN SERVICES TRANSPORTATION PLANS

APPENDIX 6: COORDINATED HUMAN SERVICES TRANSPORTATION PLANS AND REGIONAL TRANSIT/RAIL-RELATED PLANS

COORDINATED HUMAN SERVICES TRANSPORTATION PLANS

Regional	Description	Mode(s)
Imperial County Transportation Commission (ICTC) Coordinated Public Transit-Human Services Transportation Plan (2021)	ICTC's 2021 Coordinated Public Transit-Human Services Transportation Plan Update includes an overview of existing conditions and transportation resources in Imperial County, a summary of the 2014 Coordinated Plan's implementation, community engagement activities, a mobility needs assessment, and recommended strategies divided into four categories: Operations, Capital, Marketing/Outreach, and Technology. Changes in demographics, such as an increase in the senior population and the incidence of disability (7.4 percent), will impact the mobility of Imperial County residents. Through community engagement activities, various mobility needs and barriers were identified, including the important role public transportation continues to play in the overall mobility of Imperial County residents, the increase in the incidence of "aging in place", and the need for better access to activity centers as well as affordable transportation options to the Mexico border. Other needs include increased travel training, expanded service areas, improved frequency and bus stop spacing, online transit fare/ticket sales, funding for pedestrian and ADA improvements, addressing language and technology barriers, and increasing the availability of wheelchair accessible vehicles.	Transit
Los Angeles County Metropolitan Transportation Authority (Metro) 2021-2024 Coordinated Public Transit-Human Services Transportation Plan (2021)	Metro's 2021-2024 Coordinated Public Transit-Human Services Transportation Plan addresses the mobility needs and service gaps for target populations including seniors, persons with disabilities, low-income individuals, and veterans in Los Angeles County. Specifically, the Plan covers the current and future mobility needs of target populations, goals and strategies to address gaps in transportation services, and prioritized projects and programs to improve mobility for target population groups. Through a comprehensive public participation process, the highest priorities for service agencies and target population groups were safety protocols and standards, safety equipment, supplies and services, followed by programs to serve same-day transportation and serving critical need trips. Additionally, more traditional capital investment in vehicle and fleet expansion/replacement, upgrading and modifying vehicles, and better mobility management/pooling multi-agency resources were also high on the priority list.	Transit

Regional	Description	Mode(s)
Orange County Transportation Authority (OCTA) Human Services Transportation Coordination Plan (2020)	OCTA's Human Services Transportation Plan guides the prioritization and selection of projects for Federal Transit Administration (FTA) Section 5310 funding. The goal of the Section 5310 program is to improve mobility for target populations (seniors, individuals with disabilities, veterans, and low-income individuals) by removing barriers to transportation services and expanding transportation mobility options. To gain a greater understanding of the transportation needs and challenges faced by these target populations, OCTA conducted a stakeholder survey, as well as telephone interviews and videoconference meetings involving various stakeholders such as cities, human service agencies, members of the target populations, and OCTA program staff. Based on the findings from these outreach activities, the most frequently reported transportation needs were accessing local and regional medical facilities, followed by shopping and escorted trips. Other commonly expressed needs included transportation to or from South Orange County, multi-destination trips, and commuting to workplaces. Consequently, four goals were formulated in response to these identified needs and gaps: 1) Restore and enhance the specialized public transit network to meet the needs of the target populations in a post-COVID-19 environment; 2) Rebuild specialized services for target populations; 3) Leverage transportation information to enhance mobility and measure outcomes; and 4) Improve and expand mobility infrastructure.	Transit

Regional	Description	Mode(s)
Riverside County Transportation Commission (RCTC) Coordinated Public Transit-Human Services Transportation Plan for Riverside County, 2021-2025 (2021)	RCTC's Coordinated Public Transit-Human Services Transportation Plan documents mobility needs and gaps of seniors, persons with disabilities, persons of low income, veterans, and tribal members living and traveling within the County. Through goals to enhance mobility, strategies, and potential projects, the 2021-2025 Coordinated Plan provides direction to Riverside County stakeholders that include RCTC, the County's public transit providers and human service agencies, as well as sovereign Tribes, municipalities, and the County. Notable demographic changes within the target populations, such as a 14.8 percent increase in the senior population and a 5.9 percent rise in individuals with disabilities underline the importance of addressing these evolving needs. Extensive outreach efforts, including over 20 stakeholder interviews and a Countywide e-survey, identified several key themes in terms of mobility needs, including the crucial role of public transit in serving the target groups, the existence of unique travel challenges beyond the scope of public transit, the need for specialized transportation to meet specific mobility requirements, the challenges associated with long-distance trips on public transit, the importance of sustaining and expanding specialized transportation, effective information strategies tailored to the target populations, infrastructure needs for safe travel, and the potential for enhanced coordination among transit services and human service programs. As a result, the Coordinated Plan outlines 20 strategies organized around four goals: 1) Build a More Responsive, Sustainable Public Transit Network; 2) Strengthen Specialized Transportation Options; 3) Equitably Distribute Transportation Resources; and 4) Grow Public Transportation Awareness.	Transit

Regional	Description	Mode(s)
San Bernardino County Transportation Authority (SBCTA) Public Transit-Human Services Transportation Coordination Plan for San Bernardino County, 2021-2025 (2021)	The 2021-2025 Public Transit-Human Services Transportation Coordination Plan establishes a unified comprehensive strategy for public transportation service delivery through a coordinated planning process. Notable demographic changes highlighted in the 2021 Coordinated Plan include an increase of 15.3 percent in the number of older adults, along with a 14.8 percent rise in older adults living in poverty. Outreach efforts revealed key themes concerning mobility needs, emphasizing the vital role of public transit for the target populations and underscoring the need for ongoing funding and improvements. The 2021 Coordinated Plan recognizes the critical importance of specialized transportation in meeting unique trip requirements that public transit cannot address, necessitating its continued enhancement and funding, with a focus on capacity-building and strengthened coordination. The findings also revealed challenges related to long-distance trips and identified subsidy programs such as mileage reimbursement, subsidy programs, and transit passes as beneficial for low-income individuals, warranting sustained funding and enhancements. Safety and infrastructure concerns were raised by transit users, pedestrians, and bicyclists, prompting the development of 22 strategies encompassing four key goals: 1) supporting public transportation recovery and growth while ensuring accessibility for those with the greatest need; 2) building the capacity of specialized and alternative transportation programs; 3) promoting communication to educate riders and the general public about transportation options; and 4) developing infrastructure projects to improve safety and access and provide first mile/last mile connections.	Transit

Regional	Description	Mode(s)
Ventura County Transportation Commission (VCTC) Coordinated Public Transit-Human Services Transportation Plan (2022)	VCTC's Coordinated Public Transit-Human Services Transportation Plan Update examines Ventura County's demographics and transportation environment with the aim of identifying the mobility needs of older adults, individuals with disabilities, people with low incomes, and veterans. Since the adoption of the previous Coordinated Plan, the total population of Ventura County increased by one percent, while the share of older adults (65 or older) increased by 21 percent and the share of individuals living with a disability increased by nine percent. These trends will have significant implications on the demand for transit services in the region, as an increasing share of the population loses their ability to drive and the necessity to provide services to support aging in place increases. Community engagement activities highlighted notable gaps in the County's transportation system experienced by the target populations, including the complexity of trips involving multiple demand-response systems, challenges in accessing unprotected fixed-route stops, limited on-demand transportation options for non-emergency medical trips, insufficient assistance options to reach the front door of destinations for older and disabled passengers, and difficulties in achieving cross-county and inter-county travel, particularly outside of major population centers and transit hubs. Various developments have also impacted public transit in Ventura County, such as the lifting of spending restrictions on certain FTA allocations with the CARES ACT and the provision of direct service between Oxnard and Camarillo by Camarillo Area Transit and Gold Coast Transit District. The goals of the 2022 Coordinated Plan prioritize the needs of the target communities while considering the changing transportation landscape in the County. These goals have been informed by stakeholder feedback gathered throughout the planning process. A total of 10 strategies have been developed under four proposed goals: 1) enhancing mobility of key communities; 2) improving connections and access to transit and services; 3) expanding transportation options; and 4) prioritizing convenience.	Transit

APPENDIX 6: COORDINATED HUMAN SERVICES TRANSPORTATION PLANS AND REGIONAL TRANSIT/RAIL-RELATED PLANS

ZERO-EMISSION BUS (ZEB) ROLLOUT PLANS

County	Agency	Plan Date
Los Angeles	Santa Clarita Transit	May 2022
Los Angeles	Santa Monica Big Blue Bus	June 2020
Los Angeles	Montebello Bus Lines	October 2021
Los Angeles	Los Angeles Metro	March 2021
Los Angeles	Los Angeles Department of Transportation (LADOT)	October 2020
Los Angeles	Long Beach Transit	June 2020
Los Angeles	Foothill Transit	September 2019
Los Angeles	*City of El Monte	May 2023
Los Angeles	*City of Glendora	September 2022
Los Angeles	*City of Lakewood Transit	June 2023
Los Angeles	*City of Pasadena	November 2022
Orange	Orange County Transportation Authority	June 2020
Riverside	Riverside Transit Agency	December 2020
Riverside	*City of Beaumont	June 2023
San Bernardino	*City of Needles	June 2023
San Bernardino	Omnitrans	April 2020
San Bernardino	San Bernardino County Transportation Authority	April 2020
San Bernardino	SunLine Transit	June 2020
San Bernardino	*Morongo Basin Transit Authority	May 2023
Ventura	Gold Coast Transit	October 2022
Ventura	*City of Camarillo	May 2023

* Acquired post draft TAM target development.

APPENDIX 6: COORDINATED HUMAN SERVICES TRANSPORTATION PLANS AND REGIONAL TRANSIT/RAIL-RELATED PLANS

TRANSIT ASSET MANAGEMENT (TAM) PLANS

Agency (by County)	Plan Date
Imperial County	
Imperial County Transportation Commission	September 2022
Los Angeles County	
Access Servicess Los Angeles County	July 2022
Antelope Valley Transit Authority	September 2018
City of Commerce Municipal Bus Lines	December 2018
City of Gardena's Gtrans	October 2022
City of La Mirada	January 2019
City of Los Angeles Department of Transportation	December 2022
City of Redondo Beach's Beach Cities Transit	November 2022
Culver City Municipal Bus Lines	October 2022
Foothill Transit	September 2018
Los Angeles County Metropolitan Transportation Authority	October 2022
Los Angeles County Tier II Providers (Metro Group Plan)	October 2020
Long Beach Transit	August 2022
Montebello Bus Lines	October 2022
Norwalk Transit	June 2022
Santa Clarita Transit	June 2022
Santa Monica's Big Blue Bus	October 2018
Torrance Transit	October 2022
Orange County	
Anaheim Transportation Network	October 2018
Orange County Transportation Authority	September 2022
Riverside County	
City of Corona Transit Service	October 2022
City of Riverside Special Transit	2019
Riverside County Transportation Commission	September 2022
Riverside Transit Agency	July 2022
Sunline Transit Agency	September 2018
San Bernardino County	
City of Needles	September 2022
Morongo Basin Transit Authority	July 2022
Mountain Area Regional Transit Authority	November 2022
Omnitrans	August 2022
Victor Valley Transit Authority	September 2018

Agency (by County)	Plan Date
Ventura County	
Gold Coast Transit	September 2022
Ventura County Transportation Commission Group Plan	October 2022

*Operators with older adopted TAM plans provided recent targets in 2022 for draft target development.

APPENDIX 6: COORDINATED HUMAN SERVICES TRANSPORTATION PLANS AND REGIONAL TRANSIT/RAIL-RELATED PLANS

PUBLIC TRANSPORTATION AGENCY SAFETY PLANS (PTASP)

Agency (by County)	Plan Date
Imperial County	
Imperial County Transportation Commission	March 2020
Los Angeles County	
Access Services Los Angeles County	December 2022
Antelope Valley Transit Authority	June 2020
City of Arcadia	July 2021
City of Commerce Municipal Bus Lines	February 2020
City of Claremont	March 2023
City of Gardena's Gtrans	September 2022
City of La Mirada	February 2021
City of Los Angeles Department of Transportation	January 2022
City of Redondo Beach's Beach Cities Transit	December 2020
Culver City Municipal Bus Lines	December 2022
Foothill Transit	June 2022
Los Angeles County Metropolitan Transportation Authority	October 2022
Long Beach Transit	April 2022
Montebello Bus Lines	August 2020
Norwalk Transit	December 2022
Santa Clarita Transit	July 2022
Santa Monica's Big Blue Bus	October 2020
Torrance Transit	August 2022
Orange County	
Anaheim Transportation Network	June 2020
Orange County Transportation Authority	May 2020
Riverside County	
City of Corona Transit Service	December 2022
City of Riverside Special Transit	November 2020
Riverside Transit Agency	June 2022
San Bernardino County	
Omnitrans	December 2022
Victor Valley Transit Authority	March 2021
Ventura County	
City of Camarillo	November 2020
City of Moorpark	December 2020
City of Simi Valley	November 2020

Agency (by County)	Plan Date
City of Thousand Oaks	October 2020
Gold Coast Transit	December 2022
Ventura County Transportation Commission	July 2020

APPENDIX 7:
REGIONAL COMPLETE STREETS POLICY

SCAG
INNOVATING FOR A BETTER TOMORROW

SOUTHERN CALIFORNIA
ASSOCIATION OF GOVERNMENTS
900 Wilshire Blvd., Ste. 1700
Los Angeles, CA 90017
T: (213) 236-1800
www.scag.ca.gov

RESOLUTION NO. 23-653-2

A RESOLUTION OF THE SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS APPROVING A REGIONAL COMPLETE STREETS POLICY

WHEREAS, SCAG is the largest Metropolitan Planning Organization (MPO) in the United States covering six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura), and serving 19 million people pursuant to 23 USC § 134 et seq. and 49 USC § 5303 et seq.;

WHEREAS, SCAG is responsible for bringing Southern California's diverse residents and local partners together with unifying regional plans, policies, and programs that result in more healthy, livable, sustainable, and economically resilient communities;

WHEREAS, improving mobility, accessibility, reliability, and transportation safety has been a goal included in SCAG's long-range plans, including Connect SoCal, for decades;

WHEREAS, Complete Streets further these goals, as they are streets that are planned, designed, built, operated, and maintained to support safety, comfort, and mobility for all road users instead of the speed of cars and the flow of traffic;

WHEREAS, Complete Streets also contribute to the region achieving reduced Vehicle Miles Traveled (VMT) and greenhouse gas emissions, improving transportation safety and mode shift, and furthering equity;

WHEREAS, SCAG's Regional Council unanimously adopted a Climate Action Resolution in January 2021 that affirmed a commitment to reduce greenhouse gas emissions and establish partnerships to support local jurisdictions' climate adaptation and mitigation initiatives, including urban heat mitigation plans that can reduce harmful health impacts from extreme heat on active transportation mode users;

WHEREAS, in California, the Complete Streets Act of 2008 (AB 1358) requires cities and counties to incorporate the concept of Complete Streets in the circulation element of the local jurisdiction's general plan update;

WHEREAS, although AB 1358 provides no statutory requirement for MPOs, California Department of Transportation (Caltrans) Regional Transportation Plan (RTP) guidance (2017) recommends that MPOs integrate Complete Streets policies into their RTPs, not only as a means to develop a Sustainable Communities Strategy and drive greenhouse gas emissions reductions, but also to identify the financial resources necessary to accommodate such policies;

WHEREAS, Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20) supports Complete Streets as they further the California's efforts to achieve carbon neutrality;

WHEREAS, at the federal level, the Bipartisan Infrastructure Law (Investment, Infrastructure, and Jobs Act, 2021) requires that MPOs use 2.5 percent of their overall funding to develop and adopt complete streets policies, active transportation plans, transit access plans, transit-oriented development plans, or regional intercity rail plans; and

WHEREAS, SCAG recognizes that it can help in encouraging and facilitating action to develop Complete Streets, and it seeks to continue to lead or join aligned Complete Streets efforts.

NOW, THEREFORE, BE IT RESOLVED by the Regional Council of the Southern California Association of Governments, that SCAG hereby adopts a regional Complete Streets policy, with the long-term aim of achieving Zero Deaths, encouraging mode shift, improving air quality and reducing greenhouse gas emissions; and

BE IT FURTHER RESOLVED THAT:

1. SCAG will work with partner agencies to encourage data-driven approaches to inform Complete Streets policy and planning and the strategic use of available funds and resources;

2. SCAG will support local agencies as they work to implement Complete Streets that are sensitive to urban, suburban, or rural contexts;

3. SCAG will integrate Complete Streets in regional policies and plans, including considering equity impacts on Disadvantaged Communities, Communities of Concern, and Environmental Justice Areas;

4. SCAG will endeavor to protect vulnerable roadway users, such as pedestrians and bicyclists, people with disabilities, older adults and youth;

5. SCAG will engage regional stakeholders in Complete Streets policy and plan development, implementation, and evaluation; and

6. SCAG will provide leadership at the state and regional levels to promote Complete Streets, including supporting work on statewide efforts and legislation that further motivate the development of Complete Streets.

PASSED, APPROVED AND ADOPTED by the Regional Council of the Southern California Association of Governments at its regular meeting this 2nd day of March, 2023.

Jan C. Harnik
President, SCAG
Riverside County Transportation Commission

Attested by:

Kome Ajise
Executive Director

Approved as to Form:

Michael R.W. Houston
Chief Counsel

APPENDIX 8:
REGIONAL BIKEWAY NETWORK

APPENDIX 8: REGIONAL BIKEWAY NETWORK

The Regional Bikeway Network (RBN) is a proposed 2,205-mile system of interconnected bicycle routes of regional significance. The RBN connects local jurisdictions and counties serving as a spine for local bikeway networks and the regional greenway network. It includes on-road and off-road bikeways (including the regional greenway network) that link major origins and destinations directly, or through connectivity to high quality transit service. The primary purpose is to serve regional trips, commuting and recreational bicycling, taking local existing and planned bikeways and providing a strategic regional focus (Figure 1).

BICYCLE ROUTE 5

Bicycle Route 5 will travel from the unincorporated community of Gorman in northwestern Los Angeles County, through the Grapevine and along the shoulder of Interstate 5 until it reaches the City of Santa Clarita. Then, using local streets, it connects to the San Fernando Valley and into downtown Los Angeles.

BICYCLE ROUTE 8

Bicycle Route 8 will connect the Cities of El Centro and Holtville in Imperial County to Yuma, Arizona.

BICYCLE ROUTE 10

Bicycle Route 10 will travel (from east to west) from the City of Blythe in eastern Riverside County, mostly along the Interstate 10 freeway shoulders (where legal) into the Coachella Valley, connecting to western Riverside County. It then links to the Santa Ana River Trail into north Orange County where it leaves the trail and travels to Los Angeles County's South Bay area.

BICYCLE ROUTE 33

Bicycle Route 33 is a combination of existing trails traversing 18 miles that connect the Cities of Ventura and Ojai. This Route includes the Ventura Beach Trail, Ventura River Trail (Ojai Valley Trail extension), and the Ojai Valley Trail.

BICYCLE ROUTE 66

United States Bicycle Route 66 (USBR 66) is part of the United States Bicycle Route System being developed by the Adventure Cycling Association and various state departments of transportation. The California section of USBR 66 is approximately 334 miles and generally follows the historic Route 66.[1] Beginning at the Arizona border, the route crosses the Colorado River then travels along the high desert National Trails Highway, passes through the Cities of Barstow, Victorville and San Bernardino, follows the Pacific Electric Trail across the eastern end of the San Gabriel Valley, and then reaches Los Angeles, where highlights include Olvera Street, Chinatown, and the Cities of Hollywood and Beverly Hills, before it ends on the Santa Monica Pier.

BICYCLE ROUTE 78

Bicycle Route 78, once designated, will connect San Diego County to Imperial County. It is currently part of the Adventure Cycling Association's "Southern Tier" Bicycle Route, connecting California to Florida. The route connects to Imperial County along Interstate 8, then follows State Route 98 to the City of Calexico, and then north along State Route 111 to the City of Brawley before traveling along State Route 78 to the City of Blythe.

BICYCLE ROUTE 86

Bicycle Route 86 will connect the City of Calexico along the Mexican Border to the Coachella Valley in Riverside County, linking to the Coachella Valley Link (CV Link) trail and Bicycle Route 10. A portion of the route could potentially be part of a bicycle loop around the Salton Sea.

BICYCLE ROUTE 90

Bicycle Route 90 is proposed route that will connect San Diego County to Imperial County. The route follows Interstate 8 to the City of El Centro, then travels north along State Route 111 to the City of Brawley, and then along State Route 78 to the City of Blythe. Once established by local governments and adopted by the California Department of Transportation, the route will become Unites States Bicycle Route 90.

BICYCLE ROUTE 95

The Pacific Coast Bicycle Route is currently part of a multi-state bicycle route from the State of Washington to Baja, Mexico. The route was developed by the American Cycling Association for bicycle tourists. Once designated, the route will become United States Bicycle Route 95.

BICYCLE ROUTE 111

Bicycle Route 111 will connect the local jurisdictions in Imperial County to the Coachella Valley, along the less traveled State Route 111 on the east side of the Salton Sea and serve as part of a bicycle loop around the Salton Sea.

BICYCLE ROUTE 126

Bicycle Route 126 will connect the Cities of Lancaster and Palmdale to the City of Santa Clarita within Los Angeles County and Bicycle Route 5, before traveling along the State Route 126 corridor to Ventura County.

CALIFORNIA COASTAL TRAIL

The California Coastal Trail (CCT), established by the Coastal Act of 1976, is an interconnected public trail system being developed along the California coastline that will span over 1,230 miles from Oregon to Mexico. Currently, approximately 70 percent of the CCT is completed. The CCT is designed to make the coast more accessible, foster appreciation and stewardship of the scenic and natural resources of the coast, provide recreational opportunities, and encourage non-motorized transportation. It is considered a braided

network, meaning there can be parallel routes that accommodate different experiences, such as a sandy beach route for beach visitors, a bluff top dirt hiking path providing scenic views, and a paved path for bikers, wheelchair users, and people needing firmer footing. In 2003, the Coastal Conservancy developed the Completing the California Coastal Trail Plan to provide a strategic blueprint to complete the CCT. SCAG is required to incorporate the CCT access and completion into its regional transportation planning process (Figure 2).

COACHELLA VALLEY (CV) LINK

The Coachella Valley Association of Governments has been developing Coachella Valley Link (CV Link), a 40-plus-mile multi-use pathway that will run mostly along the Whitewater River and extend from the City of Palm Springs to the City of Coachella in Riverside County. By expanding on existing portions of paved trail, CV Link will serve as the backbone for the Coachella Valley, connecting to local routes, and helping to reduce congestion on State Route 111. There are currently three segments of CV Link open to ride. The first segment of CV Link runs 2.3 miles between Ramon Road in the City of Cathedral City and Vista Chino in the City of Palm Springs. The second segment of CV Link open is approximately one mile and runs adjacent to Demuth Park in Palm Springs. The third segment of CV Link open is on-street in the City of Palm Desert and consists of 3.5 miles running from the Bump and Grind trail head to the College of the Desert and ultimately ending at the wash near Deep Canyon Road. Other segments are being constructed as right-of-way is available.[2]

HIGH DESERT CORRIDOR

The High Desert Corridor (HDC) is a proposed 54-mile multimodal corridor that will connect the Antelope Valley in northern Los Angeles County with Victor Valley in San Bernardino County.[3] Since the State adopted the No-Build alternative for the highway element of the previous HDC Preferred Alternative, the current direction of the High Desert Corridor Joint Powers Agency (HDC JPA) is focused on developing the rail mode of the multi-purpose corridor in the form of high speed rail (HSR) project. As the HDC JPA progresses with the HSR Project, the HDC JPA will consider exploring and evaluating the feasibility of a bicycle path along this corridor at the appropriate time. The purpose of the bicycle facility would be to complement the proposed high-speed rail system without impeding on operational performance or compromising safety. This new facility could also connect some of the fastest growing residential, commercial and industrial areas in the SCAG region, including the Cities of Palmdale, Lancaster, Adelanto, Victorville and the Town of Apple Valley.

LOS ANGELES RIVER TRAIL

While technically a greenway, the Los Angeles River Trail connects to the Pacific Ocean and the California Coastal Trail— it is considered a regionally significant bikeway. Portions of the trail are still being constructed or are in planning stages. The largest segment to be planned is from Elysian Valley, just north of downtown Los Angeles, to the City of Maywood. This eight-mile segment[4] will close the gap in the Los Angeles River Trail, creating a safe, efficient active transportation travel option connecting the San Fernando Valley and the City of Long Beach. The Draft Environmental Impact Report (EIR) for this segment is expected to be released in spring 2023, with the anticipated project opening in 2027. Rail lines and other commercial development alongside the river will require innovative planning to develop greenways.

ORANGE COUNTY (OC) LOOP

The Orange County (OC) Loop is a planned 66-mile route that will connect the residents and tourists of 17 Orange County cities to some of California's most scenic beaches and inland destinations. Currently, approximately 88 percent of the OC Loop is in place, with nearly 58 miles of off-street trails along the San Gabriel River, Coyote Creek, Santa Ana River, and the Coastal/Beach Trail.[5] When complete, the OC Loop will link 650,000 residents and thousands of tourists to 200 parks, 180 schools, and popular destinations, as well as serve as a first mile/last mile connection to numerous bus stops and three Metrolink stations.

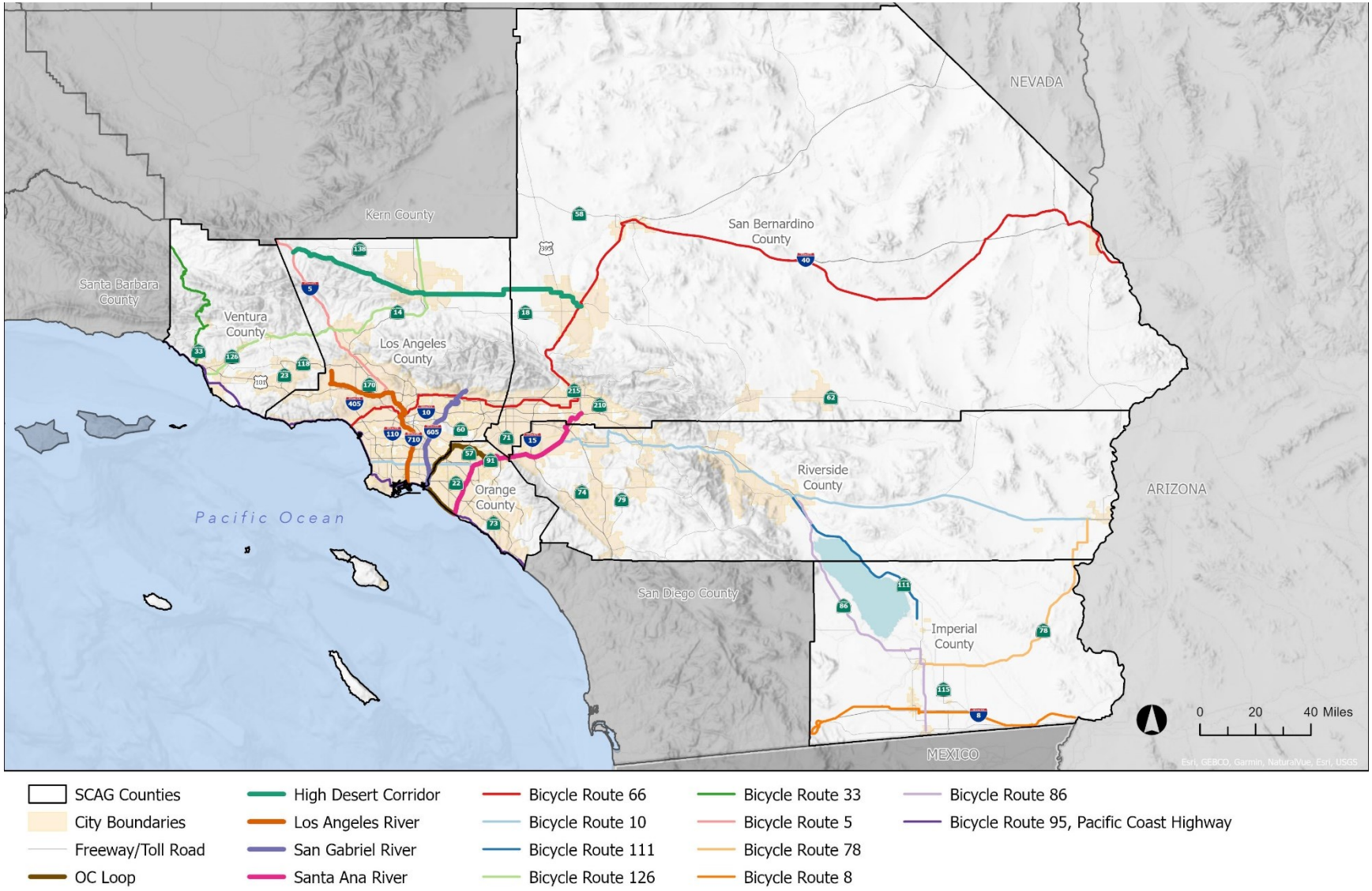
SAN GABRIEL RIVER TRAIL

While also technically a greenway, the 35-mile[6] San Gabriel River Trail connects the San Gabriel Mountains to the Pacific Ocean and the California Coastal Trail and is considered a regionally significant bikeway. More specifically, the trail connects the City of Azusa in the San Gabriel Valley region of Los Angeles County to the City of Seal Beach in Orange County.

SANTA ANA RIVER TRAIL

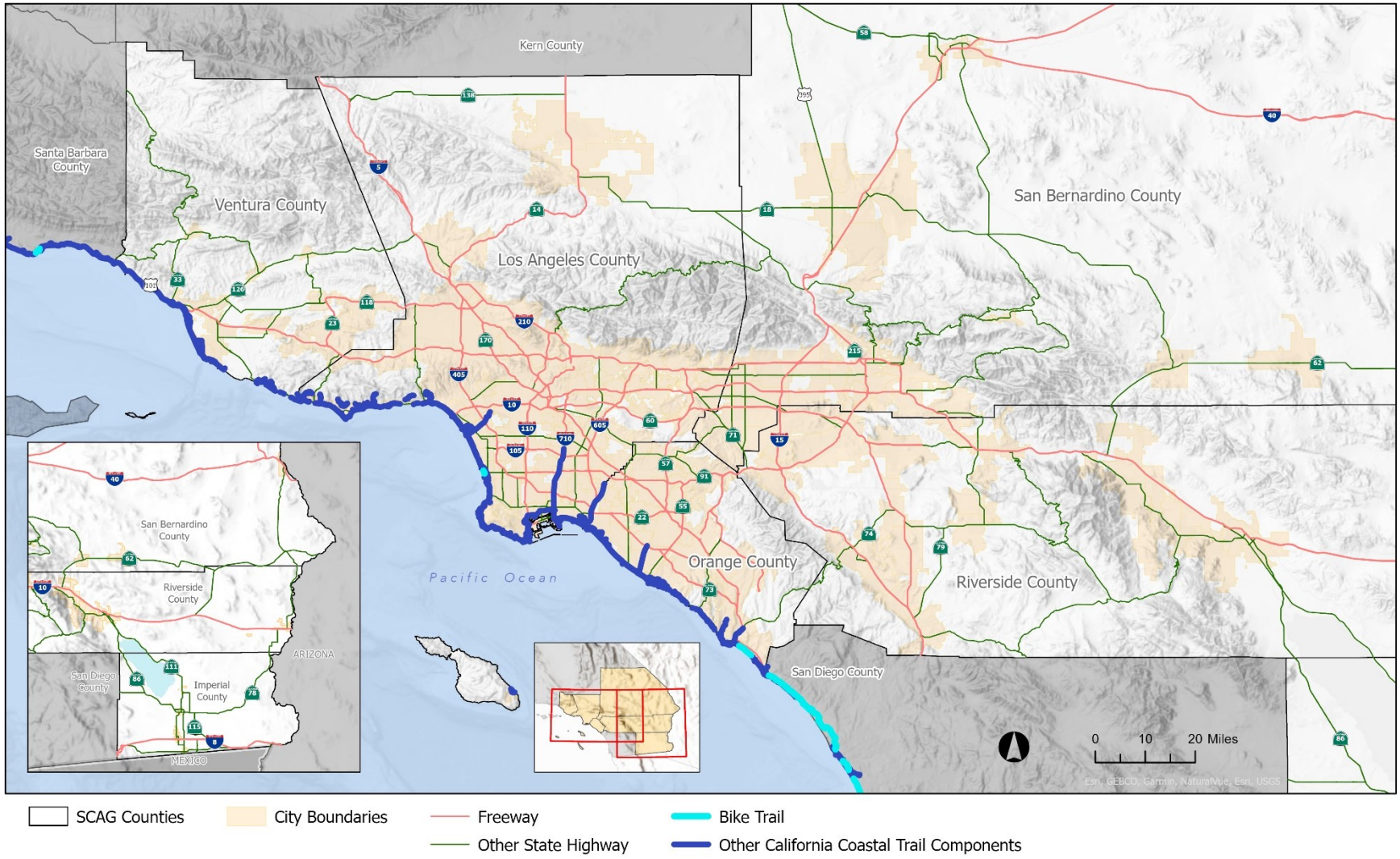
The Santa Ana River Trail (SART) extends from the City of Huntington Beach in Orange County through Riverside County to the San Bernardino Mountains and is a regionally significant bikeway. The concept of this 110-mile multi-use trail was originally conceived in 1955 and includes paved Class I and Class II facilities for bicyclists and pedestrians, as well as unpaved sections for equestrian, hiking, and mountain biking use. The Orange County section is largely completed, and the Riverside County Transportation Commission is currently constructing a portion of the trail to address gaps in the system. When completed, the SART will bridge three counties (Orange, Riverside, and San Bernardino), 17 cities, two national forests, and other regionally significant bikeways such as the California Coastal Trail.

Figure 1. Regional Bikeway Network



Source: SCAG (2023)

Figure 2. California Coastal Trail



Source: California Coastal Commission Mapping Unit (2023)

ENDNOTES

[1] Adventure Cycling Association. (n.d.). *USBRS Maps and Route Resources.* https://www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/maps-and-route-resources/?route=california66
[2] Coachella Valley Association of Governments. (n.d.). *Maps.* https://coachellavalleylink.com/maps/
[3] High Desert Corridor Joint Powers Agency. (2022, April 14). *HDC April 14, 2022, Board Meeting Agenda Packet.* https://highdesertcorridor.org/hdc-april-14-2022-board-meeting/
[4] Metro. (n.d.). *LA River Path Project.* https://www.metro.net/projects/lariverpath/
[5] Orange County Transportation Authority. (n.d.). *OC Loop.* https://octa.net/getting- around/active/oc-bike/oc-loop/
[6] Los Angeles County Department of Parks and Recreation. (n.d.). *San Gabriel River Trail.* https://trails.lacounty.gov/Trail/265/san-gabriel-river-trail

APPENDIX 9:
REGIONAL GREENWAY NETWORK

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The Regional Greenway Network (RGN) is a 2,275-mile network designed to increase walking and biking by creating separated bikeways that are designed for most potential bicyclists. It makes use of available open space such as rivers, drainage canals, separated bikeways and utility corridors. This strategy meets the concerns of bicyclists and pedestrians who do not want to be traveling near motor vehicle traffic. In addition, the network facilitates re-imagining of how to integrate our river systems with active transportation initiatives. Many of the region's riverbeds have been turned into channels designed to handle 500-year floods flushing water runoff to the ocean. The RGN, combined with river restoration efforts, provides a unique opportunity to create open space, greenways or wetlands where not only biking or walking can occur, but also kayaking and other recreation activities. Expanding on the river restoration efforts, the RGN also incorporates Class I existing and planned routes, and other notable bikeways highlighted below (Figure 1).

BALLONA CREEK

The Ballona Creek Bike Path parallels Ballona Creek, extending about seven miles from the City of Culver City to the Pacific Ocean at the City of Marina Del Rey.[1] The trail connects to the Marvin Braude Costal Bike Path which goes from the community of Pacific Palisades in the north to the City of Torrance in the south. This bicycle path provides multiple entrances to facilitate access to transit, job centers, residential neighborhoods and alternative local bike paths.

BICYCLE ROUTE 33

Bicycle Route 33 is a combination of existing trails traversing 18 miles that connect the Cities of Ventura and Ojai. This Route includes the Ventura Beach Trail, Ventura River Trail (Ojai Valley Trail extension), and the Ojai Valley Trail.

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THE EMERALD NECKLACE

The Emerald Necklace is comprised of the following Regional Bikeway Network trails: the San Gabriel River Trail, Rio Hondo Trail, and the Los Angeles River Trail. Since 2005, local stakeholders have developed and

implemented the Emerald Necklace Vision, which identifies a series of proposed trail and greening projects that provide a continuous, looped network of bike paths and multi-use trails along urban waterways. This 17-mile loop connects 10 cities and nearly 500,000 residents along the Rio Hondo and San Gabriel River watershed areas of East Los Angeles County.[3]

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PACIFIC ELECTRIC TRAIL

The Pacific Electric Trail is a 20-mile multi-use pedestrian and bicycle path that follows the old Pacific Electric Railway from the City of Claremont in Los Angeles County to the City of Rialto in San Bernardino County. It has transformed active transportation opportunities for the region, enhancing old railways into new trails for communities.[6] The Trail has possibilities for connecting to a massive network of pathways that include the Santa Ana River Trail and San Jose Creek connecting to the San Gabriel River Trail.[7]

SAN GABRIEL RIVER TRAIL

The San Gabriel River Trail is a 35-mile[8] greenway that connects the San Gabriel Mountains to the Pacific Ocean and the California Coastal Trail. More specifically, the trail connects the City of Azusa in the San Gabriel Valley region of Los Angeles County to the City of Seal Beach in Orange County.

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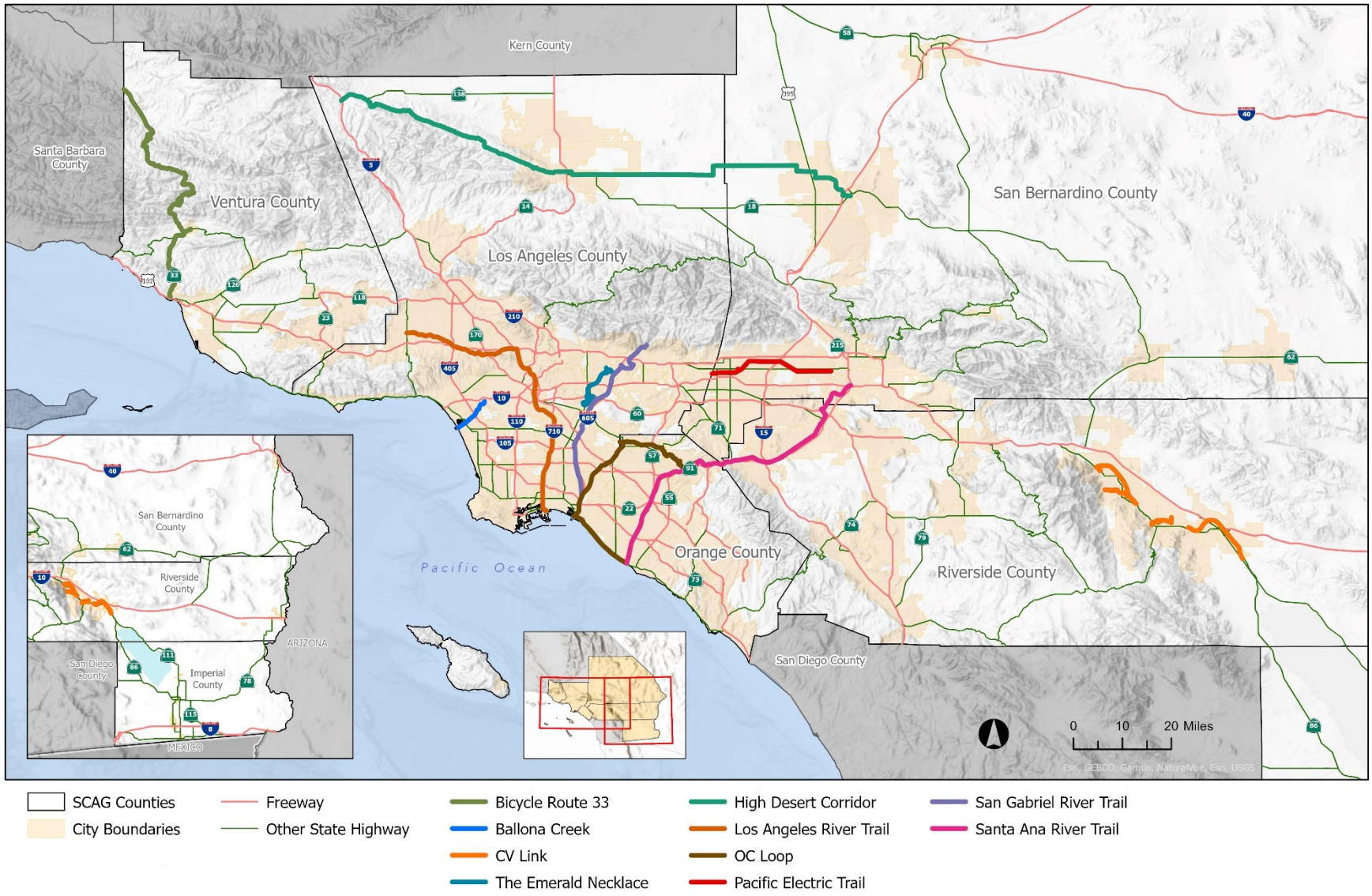
The Santa Ana River Trail (SART) extends from the City of Huntington Beach in Orange County through Riverside County to the San Bernardino Mountains. The concept of this 110-mile multi-use trail was originally conceived in 1955 and includes paved Class I and Class II facilities for bicyclists and pedestrians, as well as unpaved sections for equestrian, hiking, and mountain biking use. The Orange County section is largely completed, and the Riverside County Transportation Commission is currently constructing a portion of the trail to address gaps in the system. When completed, the SART will bridge three counties, 17 cities, two national forests and other regionally significant bikeways such as the California Coastal Trail.

Figure 1. Regional Greenway Network



Source: SCAG (2023)

ENDNOTES

[1] Los Angeles County Department of Parks and Recreation. (n.d.). *Ballona Creek Bike Path*. https://trails.lacounty.gov/Trail/91/ballona-creek-bike-path
[2] Coachella Valley Association of Governments. (n.d.). *Maps*. https://coachellavalleylink.com/maps/
[3] Amigos de los Rios. (n.d.). https://amigosdelosrios.org/emerald-necklace/
[4] High Desert Corridor Joint Powers Agency. (2022, April 14). *HDC April 14, 2022, Board Meeting Agenda Packet*. https://highdesertcorridor.org/hdc-april-14-2022-board-meeting/
[5] Metro. (n.d.). *LA River Path Project*. https://www.metro.net/projects/lariverpath/
[6] City of Rialto. (n.d.). *Pacific Electric Trail Extension*. https://www.yourrialto.com/762/Pacific-Electric-Trail
[7] TrailLink. (n.d.). *Pacific Electric Inland Empire Trail*. https://www.traillink.com/trail/pacific-electric-inland-empire-trail/#trail-detail-about
[8] Los Angeles County Department of Parks and Recreation. (n.d.). *San Gabriel River Trail*. https://trails.lacounty.gov/Trail/265/san-gabriel-river-trail

APPENDIX 10:
ACTIVE TRANSPORTATION PLANS – REGIONAL ASSESSMENT

APPENDIX 10: ACTIVE TRANSPORTATION PLANS – REGIONAL ASSESSMENT

BICYCLE MASTER PLANS

County	Level	Agency	Plan Name	Year
Imperial	Local	Brawley	City of Brawley Non-Motorized Transportation Plan	2013
Imperial	Local	Calexico	City of Calexico Bicycle Master Plan Update	2018
Imperial	Local	El Centro	City of El Centro Active Transportation and Safe Routes to School Plan	2019
Imperial	Local	Holtville	City of Holtville Bicycle Master Plan	2014
Imperial	Regional	Imperial County Transportation Commission (ICTC)	Imperial County Transportation Commission (ICTC) Regional Active Transportation Plan	2022
Los Angeles	Local	Agoura Hills	City of Agoura Hills Bicycle Master Plan	In Progress
Los Angeles	Local	Anaheim	Bike Anaheim: City of Anaheim Bicycle Master Plan	2020
Los Angeles	Local	Artesia	City of Artesia Active Transportation Plan	2022
Los Angeles	Local	Avalon	City of Avalon Master Active Transportation Plan	2021
Los Angeles	Local	Baldwin Park	San Gabriel Valley Regional Bicycle Master Plan	2014
Los Angeles	Local	Bell	City of Bell Bicycle Master Plan	2016
Los Angeles	Local	Bell Gardens	City of Bell Gardens Complete Streets Plan	2020
Los Angeles	Local	Bellflower	Bellflower-Paramount Joint Active Transportation Plan	2019
Los Angeles	Local	Beverly Hills	City of Beverly Hills Complete Streets Plan/Complete Streets Action Plan	2021/2023
Los Angeles	Local	Burbank	Complete Our Streets: City of Burbank Complete Streets Plan	2020
Los Angeles	Local	Calabasas	City of Calabasas Bicycle Master Plan	2013
Los Angeles	Local	Carson	City of Carson Master Plan of Bikeways	2015
Los Angeles	Local	Commerce	City of Commerce Bicycle and Pedestrian Plan	2020
Los Angeles	Local	Compton	City of Compton Bicycle Master Plan	2015
Los Angeles	Local	Covina	City of Covina Active Streets and Multi Modal Connectivity Plan	In Progress
Los Angeles	Local	Culver City	City of Culver City Bicycle and Pedestrian Action Plan	2020
Los Angeles	Local	Downey	Walk Downey Active Transportation Plan	2021
Los Angeles	Local	El Monte	City of El Monte Vision Zero Action Plan	2022
Los Angeles	Local	Glendale	City of Glendale Bicycle Transportation Plan Update	In Progress
Los Angeles	Local	Hermosa Beach	South Bay Cities Bicycle Master Plan (Chapter 5)	2011
Los Angeles	Local	Huntington Park	City of Huntington Park Bicycle Transportation Master Plan	2014
Los Angeles	Local	Inglewood	City of Inglewood Active Transportation Plan and Safe Routes to School Plan	2022
Los Angeles	Local	Irwindale	City of Irwindale Active Transportation Plan	2021
Los Angeles	Local	La Verne	City of La Verne Active Transportation Plan	2021

County	Level	Agency	Plan Name	Year
Los Angeles	Local	Lakewood	City of Lakewood Bicycle System Master Plan	2018
Los Angeles	Local	Lancaster	City of Lancaster Master Plan of Trails and Bikeways	2012
Los Angeles	Local	Lomita	City of Lomita Bicycle and Pedestrian Master Plan	2018
Los Angeles	Local	Long Beach	City of Long Beach Bicycle Master Plan	2016
Los Angeles	Local	Los Angeles	City of Los Angeles Mobility Plan 2035	2016
Los Angeles	Local	Lynwood	Connect Lynnwood: Active and Accessible Transportation Plan	2022
Los Angeles	Local	Manhattan Beach	The South Bay Bicycle Master Plan	2011
Los Angeles	Local	Maywood	City of Maywood Active Transportation Plan	In Progress
Los Angeles	Local	Monrovia	City of Monrovia Bicycle Master Plan	2018
Los Angeles	Local	Montebello	City of Montebello First Last Mile Plan	In Progress
Los Angeles	Local	Monterey Park	San Gabriel Valley Regional Bicycle Master Plan	2014
Los Angeles	Local	Norwalk	City of Norwalk Bicycle Master Plan	2022
Los Angeles	Local	Palmdale	City of Palmdale Sustainable Transportation Plan	In Progress
Los Angeles	Local	Paramount	Bellflower-Paramount Joint Active Transportation Plan	2019
Los Angeles	Local	Pasadena	City of Pasadena Bicycle Transportation Action Plan	2015
Los Angeles	Local	Pico Rivera	City of Pico Rivera Urban Greening Plan	2018
Los Angeles	Local	Pomona	City of Pomona Active Transportation Plan: Bicycle Master Plan and Pedestrian Master Plan	2012
Los Angeles	Local	Redondo Beach	The South Bay Bicycle Master Plan	2011
Los Angeles	Local	San Dimas	City of San Dimas Bicycle Master Plan	2011
Los Angeles	Local	San Fernando	City of San Fernando Safe and Active Streets Plan	2022
Los Angeles	Local	Santa Fe Springs	City of Santa Fe Springs Active Transportation Plan	2020
Los Angeles	Local	Santa Clarita	City of Santa Clarita Non-Motorized Transportation Plan	2020
Los Angeles	Local	Santa Monica	City of Santa Monica Bike Action Plan	2011
Los Angeles	Local	Santa Monica	City of Santa Monica Bike Action Plan Amendment	2020
Los Angeles	Local	South El Monte	San Gabriel Valley Regional Bicycle Master Plan	2014
Los Angeles	Local	South Gate	City of South Gate Bicycle Transportation Plan	2012
Los Angeles	Local	South Pasadena	Cycle South Pasadena Bicycle Master Plan Update	2011
Los Angeles	Local	Temple City	City of Temple City Bicycle Master Plan	2011
Los Angeles	Local	Torrance	The South Bay Bicycle Master Plan	2011
Los Angeles	Local	Vernon	City of Vernon 25 Year Master Transportation Plan	2015
Los Angeles	Local	West Hollywood	City of West Hollywood Pedestrian and Bicycle Mobility Plan	2017
Los Angeles	Local	Whittier	City of Whittier Bicycle Transportation Plan	2013
Los Angeles	Regional	San Gabriel Valley Council of Governments (SGVCOG)	San Gabriel Valley Greenway Network Implementation Plan	In Progress

County	Level	Agency	Plan Name	Year
Los Angeles	Regional	San Gabriel Valley Council of Governments (SGVCOG)	San Gabriel Valley Council of Governments (SGVCOG) – Regional Active Transportation Planning Initiative	2019
Los Angeles	Regional	San Gabriel Valley Council of Governments (SGVCOG)	San Gabriel Valley Regional Bike Master Plan	2014
Los Angeles	Regional	Los Angeles County Public Works Department	Los Angeles County Bicycle Master Plan Update	In Progress
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro First Last Mile Strategic Plan and Planning Guidelines	2014
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Blue Line First/Last Mile Plan	2018
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Aviation/96th Street First/Last Mile Plan	2019
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Inglewood First/Last Mile Plan	2019
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Gold Line Extension 2B First/Last Mile Plan	2019
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro East San Fernando Valley Light Rail Transit First/Last Mile Plan	2020
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Expo/Crenshaw First/Last Mile Plan	2020
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Purple Line First/Last Mile Plan Phases 2 and 3	2020

County	Level	Agency	Plan Name	Year
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Purple (D Line) Extension Transit Project First/Last Mile Plan Phase 1	2021
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro G Line (Orange) Sepulveda Station First/Last Mile Plan	2021
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Active Transportation Strategic Plan	In Progress
Los Angeles	Regional	South Bay Cities Council of Governments	The South Bay Bicycle Master Plan	2011
Orange	Local	Anaheim	City of Anaheim Bicycle Master Plan	2017
Orange	Local	Brea	Brea Core Plan: Active Transportation Plan	2020
Orange	Local	Buena Park	City of Buena Park Active Transportation Plan	In Progress
Orange	Local	Costa Mesa	City of Costa Mesa Active Transportation Plan	2018
Orange	Local	Fullerton	City of Fullerton Bicycle Master Plan	2012
Orange	Local	Fullerton	Downtown Fullerton on the Go Active Transportation Plan	2022
Orange	Local	Garden Grove	City of Garden Grove Active Streets Master Plan	2018
Orange	Local	Huntington Beach	City of Huntington Beach Bicycle Master Plan	2013
Orange	Local	Irvine	City of Irvine 2020 Strategic Active Transportation Plan	2020
Orange	Local	La Habra	City of La Habra Bikeway Master Plan	2017
Orange	Local	Laguna Beach	City of Laguna Beach Enhanced Mobility and Complete Streets Transition Plan	2015
Orange	Local	Lake Forest	City of Lake Forest Bicycle Master Plan	2013
Orange	Local	Los Alamitos	City of Los Alamitos Active Transportation Plan	2021
Orange	Local	Mission Viejo	City of Mission Viejo Comprehensive Bikeway and Transportation Connectivity Master Plan	2019
Orange	Local	Newport Beach	City of Newport Beach Bicycle Master Plan	2014
Orange	Local	Orange	City of Orange Bikeways Master Plan	2001
Orange	Local	San Clemente	City of San Clemente Bicycle and Pedestrian Master Plan	2013
Orange	Local	Santa Ana	City of Santa Ana Active Transportation Plan	2019
Orange	Local	Stanton	City of Stanton Active Transportation Plan	In Progress
Orange	Regional	County of Orange Public Works Department	County of Orange Active Transportation Plan for Unincorporated Communities and Orange County (OC) Flood Control Channels	2023

County	Level	Agency	Plan Name	Year
Orange	Regional	Orange County Transportation Authority (OCTA)	Orange County Transportation Authority (OCTA) Commuter Bikeways Strategic Plan	2009
Orange	Regional	Orange County Transportation Authority (OCTA)	Orange County Transportation Authority (OCTA) Fourth District Bikeways Strategy	2012
Orange	Regional	Orange County Transportation Authority (OCTA)	Orange County (OC) Active: Orange County Active Transportation Plan	2019
Riverside	Local	Banning	City of Banning Active Transportation Plan	In Progress
Riverside	Local	Blythe	Coachella Valley Association of Governments (CVAG) Active Transportation Plan	2016
Riverside	Local	Cathedral City	City of Cathedral City Active Transportation Plan	2023
Riverside	Local	Coachella	City of Coachella Active Transportation Plan	2020
Riverside	Local	Desert Hot Springs	City of Desert Hot Springs Bicycle and Pedestrian Master Plan	2016
Riverside	Local	Eastvale	City of Eastvale Bicycle Master Plan	2016
Riverside	Local	Indian Wells	Coachella Valley Association of Governments (CVAG) Active Transportation Plan	2016
Riverside	Local	Indio	City of Indio Complete Streets and Drainage Master Plan	2020
Riverside	Local	Jurupa Valley	City of Jurupa Valley Circulation Master Plan for Bicyclists and Pedestrians	2018
Riverside	Local	La Quinta	Coachella Valley Association of Governments (CVAG) Active Transportation Plan	2016
Riverside	Local	Lake Elsinore	Active Lake Elsinore (LE): City of Lake Elsinore Active Transportation Plan	2019
Riverside	Local	Moreno Valley	City of Moreno Valley Bicycle Master Plan	2014
Riverside	Local	Norco	City of Norco Pedestrian and Bicycle Master Plan	In Progress
Riverside	Local	Palm Desert	Coachella Valley Association of Governments (CVAG) Active Transportation Plan	2016
Riverside	Local	Perris	City of Perris Active Transportation Plan	2020
Riverside	Local	Rancho Mirage	Coachella Valley Association of Governments (CVAG) Active Transportation Plan	2016
Riverside	Local	Riverside	City of Riverside Bicycle Master Plan Update	2012
Riverside	Local	Riverside	City of Riverside Active Transportation Plan	n.d.
Riverside	Local	San Jacinto	City of San Jacinto Trails Master Plan	2018
Riverside	Local	Wildomar	City of Wildomar Active Transportation Plan	In Progress
Riverside	Local	Temecula	City of Temecula Multi-Use Trails and Bikeways Master Plan	2016

County	Level	Agency	Plan Name	Year
Riverside	Regional	Coachella Valley Association of Governments (CVAG)	Coachella Valley Association of Governments (CVAG) Active Transportation Plan	2016
Riverside	Regional	County of Riverside Transportation Department	Neighborhood Mobility Plan for the Communities of Thermal and Oasis	2018
Riverside	Regional	County of Riverside Transportation Department	Neighborhood Mobility Plan for the Communities of North Shore and Mecca	2020
Riverside	Regional	County of Riverside Transportation Department	Regional Mobility Plan for the Unincorporated Communities of the Eastern Coachella Valley	2020
Riverside	Regional	Western Riverside Council of Governments (WRCOG)	Western Riverside County Non-Motorized Transportation Plan	2010
Riverside	Regional	Western Riverside Council of Governments (WRCOG)	Western Riverside County Active Transportation Plan	2018
San Bernardino	Local	Big Bear Lake	Big Bear Valley Pedestrian, Bicycle and Equestrian Master Plan	2014
San Bernardino	Local	Chino	City of Chino Bicycle and Pedestrian Master Plan	2016
San Bernardino	Local	Colton	City of Colton Active Transportation Plan	2018
San Bernardino	Local	Fontana	City of Fontana Active Transportation Plan	2017
San Bernardino	Local	Grand Terrace	City of Grand Terrace Active Transportation Plan	2018
San Bernardino	Local	Montclair	City of Montclair Active Transportation Plan	2020
San Bernardino	Local	Ontario	Get Around Ontario: Active Transportation Master Plan	In Progress
San Bernardino	Local	Rancho Cucamonga	Connect Rancho Cucamonga (RC): Active Transportation Infrastructure Assessment and Improvement Plan	In Progress
San Bernardino	Local	Redlands	City of Redlands Bicycle Master Plan	2014
San Bernardino	Local	Redlands	City of Redlands Sustainable Mobility Plan	2021

County	Level	Agency	Plan Name	Year
San Bernardino	Local	Rialto	City of Rialto Active Transportation Plan	2020
San Bernardino	Local	San Bernardino	City of San Bernardino Active Transportation Plan	2022
San Bernardino	Local	Twentynine Palms	Morongo Basin Active Transportation Plan	2019
San Bernardino	Local	Victorville	City of Victorville Non-Motorized Transportation Plan and Compass Blueprint Demonstration Project	2010
San Bernardino	Local	Yucca Valley	Morongo Basin Active Transportation Plan	2019
San Bernardino	Regional	San Bernardino County – Morongo Basin	Morongo Basin Active Transportation Plan	2019
San Bernardino	Regional	San Bernardino County Transportation Authority (SBCTA)	San Bernardino County Non-Motorized Transportation Plan	2018
Ventura	Local	Ojai	City of Ojai Bicycle and Pedestrian Master Plan	1999
Ventura	Local	Oxnard	City of Oxnard Bicycle and Pedestrian Facilities Master Plan	2011
Ventura	Local	Oxnard	City of Oxnard Sustainable Transportation Plan	2023
Ventura	Local	Simi Valley	City of Simi Valley Bicycle Master Plan	2008
Ventura	Local	Thousand Oaks	City of Thousand Oaks Active Transportation Plan	2019
Ventura	Local	Ventura	City of Ventura Active Transportation Plan	In Progress
Ventura	Regional	Ventura County Transportation Commission (VCTC)	Ventura Countywide Bicycle Master Plan	2007
Ventura	Regional	County of Ventura	County of Ventura Active Transportation Plan	In Progress

APPENDIX 10: ACTIVE TRANSPORTATION PLANS – REGIONAL ASSESSMENT

PEDESTRIAN MASTER PLANS

County	Level	Agency	Plan Name	Year
Imperial	Local	Brawley	City of Brawley Non-Motorized Transportation Plan	2013
Imperial	Local	El Centro	City of El Centro Active Transportation and Safe Routes to School Plan	2019
Imperial	Local	Holtville	City of Holtville Complete Streets Plan	2016
Imperial	Regional	Imperial County Transportation Commission (ICTC)	Imperial County Transportation Commission (ICTC) Regional Active Transportation Plan	2022
Imperial	Regional	County of Imperial	Imperial County Pedestrian Master Plan	2021
Los Angeles	Local	Artesia	City of Artesia Active Transportation Plan	2022
Los Angeles	Local	Avalon	City of Avalon Master Active Transportation Plan	2021
Los Angeles	Local	Azusa	City of Azusa Pedestrian Plan	2022
Los Angeles	Local	Bell Gardens	City of Bell Gardens Complete Streets Plan	2020
Los Angeles	Local	Bellflower	Bellflower-Paramount Joint Active Transportation Plan	2019
Los Angeles	Local	Beverly Hills	City of Beverly Hills Complete Streets Plan/Complete Streets Action Plan	2021/2023
Los Angeles	Local	Burbank	Complete Our Streets: City of Burbank Complete Streets Plan	2020
Los Angeles	Local	Carson	City of Carson Pedestrian Master Plan	2015
Los Angeles	Local	Commerce	City of Commerce Bicycle and Pedestrian Plan	2020
Los Angeles	Local	Covina	City of Covina Active Streets and Multi Modal Connectivity Plan	In Progress
Los Angeles	Local	Culver City	City of Culver City Bicycle and Pedestrian Action Plan	2020
Los Angeles	Local	Downey	Walk Downey Active Transportation Plan	2021
Los Angeles	Local	El Monte	City of El Monte Vision Zero Action Plan	2022
Los Angeles	Local	Glendale	City of Glendale Citywide Pedestrian Plan Part I: Taking Stock/Part II: Taking Steps	2016/2021
Los Angeles	Local	Glendale	City of Glendale Active Transportation Plan	2019
Los Angeles	Local	Inglewood	City of Inglewood Active Transportation Plan and Safe Routes to School Plan	2022
Los Angeles	Local	Irwindale	City of Irwindale Active Transportation Plan	2021
Los Angeles	Local	La Verne	City of La Verne Active Transportation Plan	2021
Los Angeles	Local	Lomita	City of Lomita Bicycle and Pedestrian Master Plan	2018
Los Angeles	Local	Long Beach	City of Long Beach Communities of Excellence in Nutrition, Physical Activity and Obesity Prevention (CX3) Pedestrian Plan	2017
Los Angeles	Local	Los Angeles	City of Los Angeles Mobility Plan 2035	2016

County	Level	Agency	Plan Name	Year
Los Angeles	Local	Lynwood	Connect Lynnwood: Active and Accessible Transportation Plan	2022
Los Angeles	Local	Maywood	City of Maywood Active Transportation Plan	In Progress
Los Angeles	Local	Montebello	City of Montebello First Last Mile Plan	In Progress
Los Angeles	Local	Palmdale	City of Palmdale Sustainable Transportation Plan	In Progress
Los Angeles	Local	Paramount	Bellflower-Paramount Joint Active Transportation Plan	2019
Los Angeles	Local	Pasadena	City of Pasadena Pedestrian Plan	2022
Los Angeles	Local	Pico Rivera	City of Pico Rivera Urban Greening Plan	2018
Los Angeles	Local	Pomona	City of Pomona Active Transportation Plan: Bicycle Master Plan and Pedestrian Master Plan	2012
Los Angeles	Local	San Fernando	City of San Fernando Safe and Active Streets Plan	2022
Los Angeles	Local	Santa Fe Springs	City of Santa Fe Springs Active Transportation Plan	2020
Los Angeles	Local	Santa Clarita	City of Santa Clarita Non-Motorized Transportation Plan	2020
Los Angeles	Local	Santa Monica	City of Santa Monica Pedestrian Action Plan	2016
Los Angeles	Local	Vernon	City of Vernon 25 Year Master Transportation Plan	2015
Los Angeles	Local	West Hollywood	City of West Hollywood Pedestrian and Bicycle Mobility Plan	2017
Los Angeles	Local	Westlake Village	City of Westlake Village Pedestrian Safety Study Report	2022
Los Angeles	Regional	Los Angeles County Department of Public Health	Step by Step: Los Angeles County Pedestrian Plans for Unincorporated Communities	2019
Los Angeles	Regional	San Gabriel Valley Council of Governments (SGVCOG)	San Gabriel Valley Council of Governments (SGVCOG) – Regional Active Transportation Planning Initiative	2019
Los Angeles	Regional	San Gabriel Valley Council of Governments (SGVCOG)	San Gabriel Valley Greenway Network Implementation Plan	In Progress
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro First Last Mile Strategic Plan and Planning Guidelines	2014
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Blue Line First/Last Mile Plan	2018

County	Level	Agency	Plan Name	Year
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Aviation/96th Street First/Last Mile Plan	2019
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Inglewood First/Last Mile Plan	2019
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Gold Line Extension 2B First/Last Mile Plan	2019
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro East San Fernando Valley Light Rail Transit First/Last Mile Plan	2020
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Expo/Crenshaw First/Last Mile Plan	2020
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Purple Line First/Last Mile Plan Phases 2 and 3	2020
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Purple (D Line) Extension Transit Project First/Last Mile Plan Phase 1	2021
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro G Line (Orange) Sepulveda Station First/Last Mile Plan	2021
Los Angeles	Regional	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Active Transportation Strategic Plan Update	In Progress
Orange	Local	Brea	Brea Core Plan: Active Transportation Plan	2020
Orange	Local	Buena Park	City of Buena Park Active Transportation Plan	In Progress
Orange	Local	Costa Mesa	City of Costa Mesa Pedestrian Master Plan	2022
Orange	Local	Fullerton	Downtown Fullerton on the Go Active Transportation Plan	2022
Orange	Local	Garden Grove	City of Garden Grove Active Streets Master Plan	2018

County	Level	Agency	Plan Name	Year
Orange	Local	Irvine	City of Irvine 2020 Strategic Active Transportation Plan	2020
Orange	Local	La Habra	City of La Habra Complete Streets Master Plan	2019
Orange	Local	Laguna Beach	City of Laguna Beach Enhanced Mobility and Complete Streets Transition Plan	2015
Orange	Local	Laguna Niguel	Comprehensive Bikeway and Transportation Connectivity Master Plan	In Progress
Orange	Local	Los Alamitos	City of Los Alamitos Active Transportation Plan	2021
Orange	Local	Mission Viejo	City of Mission Viejo Comprehensive Bikeway and Transportation Connectivity Master Plan	2019
Orange	Local	San Clemente	City of San Clemente Bicycle and Pedestrian Master Plan	2013
Orange	Local	Santa Ana	City of Santa Ana Active Transportation Plan	2019
Orange	Local	Stanton	City of Stanton Active Transportation Plan	In Progress
Orange	Regional	County of Orange Public Works Department	County of Orange Active Transportation Plan for Unincorporated Communities and Orange County (OC) Flood Control Channels	2023
Orange	Regional	Orange County Transportation Authority (OCTA)	Orange County (OC) Active: Orange County Active Transportation Plan	2019
Riverside	Local	Banning	City of Banning Active Transportation Plan	In Progress
Riverside	Local	Coachella	City of Coachella Active Transportation Plan	2020
Riverside	Local	Cathedral City	City of Cathedral City Active Transportation Plan	2023
Riverside	Local	Desert Hot Springs	City of Desert Hot Springs Bicycle and Pedestrian Hot Springs	2016
Riverside	Local	Indio	City of Indio Complete Streets and Drainage Master Plan	2020
Riverside	Local	Jurupa Valley	City of Jurupa Valley Circulation Master Plan for Bicyclists and Pedestrians	2018
Riverside	Local	Lake Elsinore	Active Lake Elsinore (LE): City of Lake Elsinore Active Transportation Plan	2019
Riverside	Local	Norco	City of Norco Pedestrian and Bicycle Master Plan	In Progress
Riverside	Local	Palm Springs	City of Palm Springs Pedestrian Plan	2021
Riverside	Local	Perris	City of Perris Active Transportation Plan	2020
Riverside	Local	Riverside	City of Riverside Pedestrian Target Safeguarding Plan	n.d.
Riverside	Local	Temecula	City of Temecula Multi-Use Trails and Bikeways Master Plan	2016
Riverside	Local	San Jacinto	City of San Jacinto Trails Master Plan	2018
Riverside	Local	Wildomar	Wildomar Active Transportation Plan	In Progress
Riverside	Local	Riverside	City of Riverside Pedestrian Target Safeguarding Plan	n.d.

County	Level	Agency	Plan Name	Year
Riverside	Regional	Coachella Valley Association of Governments (CVAG)	Coachella Valley Association of Governments (CVAG) Active Transportation Plan	2016
Riverside	Regional	County of Riverside Transportation Department	Neighborhood Mobility Plan for the Communities of Thermal and Oasis	2018
Riverside	Regional	County of Riverside Transportation Department	Neighborhood Mobility Plan for the Communities of North Shore and Mecca	2020
Riverside	Regional	County of Riverside Transportation Department	Regional Mobility Plan for the Unincorporated Communities of the Eastern Coachella Valley	2020
Riverside	Regional	Western Riverside Council of Governments (WRCOG)	Western Riverside County Non-Motorized Transportation Plan	2010
Riverside	Regional	Western Riverside Council of Governments (WRCOG)	Western Riverside County Active Transportation Plan	2018
San Bernardino	Local	Big Bear Lake	Big Bear Valley Pedestrian, Bicycle and Equestrian Master Plan	2014
San Bernardino	Local	Chino	City of Chino Bicycle and Pedestrian Master Plan	2016
San Bernardino	Local	Colton	City of Colton Active Transportation Plan	2018
San Bernardino	Local	Fontana	City of Fontana Active Transportation Plan	2017
San Bernardino	Local	Grand Terrace	City of Grand Terrace Active Transportation Plan	2018
San Bernardino	Local	Montclair	City of Montclair Active Transportation Plan	2020
San Bernardino	Local	Ontario	Get Around Ontario: Active Transportation Master Plan	In Progress
San Bernardino	Local	Rancho Cucamonga	Connect Rancho Cucamonga (RC): Active Transportation Infrastructure Assessment and Improvement Plan	In Progress
San Bernardino	Local	Redlands	City of Redlands Sustainable Mobility Plan	2021

County	Level	Agency	Plan Name	Year
San Bernardino	Local	Rialto	City of Rialto Active Transportation Plan	2020
San Bernardino	Local	San Bernardino	City of San Bernardino Active Transportation Plan	2022
San Bernardino	Local	Twentynine Palms	Morongo Basin Active Transportation Plan	2019
San Bernardino	Local	Victorville	City of Victorville Non-Motorized Transportation Plan and Compass Blueprint Demonstration Project	2010
San Bernardino	Local	Yucca Valley	Morongo Basin Active Transportation Plan	2019
San Bernardino	Regional	San Bernardino County Transportation Authority (SBCTA)	San Bernardino County Non-Motorized Transportation Plan	2018
San Bernardino	Regional	San Bernardino County – Morongo Basin	Morongo Basin Active Transportation Plan	2019
San Bernardino	Regional	San Bernardino County Transportation Authority (SBCTA)	San Bernardino County Transportation Authority (SBCTA) Points of Interest Pedestrian Plan	2017
Ventura	Local	Ojai	City of Ojai Bicycle and Pedestrian Master Plan	1999
Ventura	Local	Oxnard	City of Oxnard Bicycle and Pedestrian Facilities Master Plan	2011
Ventura	Local	Oxnard	City of Oxnard Sustainable Transportation Plan	2023
Ventura	Local	Thousand Oaks	City of Thousand Oaks Active Transportation Plan	2019
Ventura	Local	Ventura	City of Ventura Active Transportation Plan	In Progress
Ventura	Regional	Ventura County Transportation Commission (VCTC)	Ventura Countywide Bicycle Master Plan	2007
Ventura	Regional	County of Ventura	County of Ventura Active Transportation Plan	In Progress

APPENDIX 10: ACTIVE TRANSPORTATION PLANS – REGIONAL ASSESSMENT

SAFE ROUTES TO SCHOOL PLANS AND PROGRAMS

County	Level	Agency	Plan Name	Year
Imperial	Local	Brawley	City of Brawley Non-Motorized Transportation Plan	2013
Imperial	Local	Calexico	Imperial County Safe Routes to School Regional Master Plan	2016
Imperial	Local	Calipatria	Imperial County Safe Routes to School Regional Master Plan	2016
Imperial	Local	El Centro	City of El Centro Active Transportation and Safe Routes to School Plan	2019
Imperial	Local	Holtville	Imperial County Safe Routes to School Regional Master Plan	2016
Imperial	Regional	County of Imperial	Imperial County Safe Routes to School Regional Master Plan	2016
Los Angeles	Local	Baldwin Park	Safe Routes to School Master Plan for City of Baldwin Park	2014
Los Angeles	Local	Bell	City of Bell Safe Routes to School Plan	In Progress
Los Angeles	Local	Bellflower	Bellflower-Paramount Joint Active Transportation Plan	2019
Los Angeles	Local	Burbank	City of Burbank Safe Routes to School Project	2020
Los Angeles	Local	Commerce	City of Commerce Bicycle and Pedestrian Plan	2020
Los Angeles	Local	Culver City	City of Culver City Walk n' Rollers Safe Routes to School Education Programs	n.d.
Los Angeles	Local	Duarte	City of Duarte Safe Routes to School Plan	In Progress
Los Angeles	Local	Glendale	Safe Routes to School Plan for City of Glendale – 3 Phases	2016
Los Angeles	Local	Hermosa Beach	City of Hermosa Beach Safe Routes to School Program	2012
Los Angeles	Local	Hunington Park	City of Huntington Park Safe Routes to School Recommendations Report	2019
Los Angeles	Local	Inglewood	City of Inglewood Active Transportation Plan and Safe Routes to School Plan	2022
Los Angeles	Local	La Puente	City of La Puente Safe Routes to School Plan	2023
Los Angeles	Local	La Verne	City of La Verne Active Transportation Plan	2021
Los Angeles	Local	Lakewood	City of Lakewood Suggested School Routes	2014
Los Angeles	Local	Lancaster	City of Lancaster Safe Routes to School Master Plan	2014
Los Angeles	Local	Los Angeles	City of Los Angeles Safe Routes to School Action Plan and Progress Report	2016
Los Angeles	Local	Lynwood	Connect Lynnwood: Active and Accessible Transportation Plan	2022

County	Level	Agency	Plan Name	Year
Los Angeles	Local	Manhattan Beach	City of Manhattan Beach Safe Routes to School Program	2011
Los Angeles	Local	Maywood	City of Maywood Active Transportation Plan	In Progress
Los Angeles	Local	Montebello	City of Montebello First Last Mile Plan	In Progress
Los Angeles	Local	Palmdale	City of Palmdale Sustainable Transportation Plan	In Progress
Los Angeles	Local	Palos Verdes Estates	Palos Verdes Peninsula-Wide Safe Routes to School Plan	2020
Los Angeles	Local	Pasadena	City of Pasadena Safe Routes to School Program	2017
Los Angeles	Local	Paramount	Bellflower-Paramount Joint Active Transportation Plan	2019
Los Angeles	Local	Pico Rivera	City of Pico Rivera Safe Routes to School Program	n.d.
Los Angeles	Local	Pomona	City of Pomona Safe Routes to School Action Plan	2018
Los Angeles	Local	Rancho Palos Verdes	Palos Verdes Peninsula-Wide Safe Routes to School Plan	2020
Los Angeles	Local	Rolling Hills	Palos Verdes Peninsula-Wide Safe Routes to School Plan	2020
Los Angeles	Local	Rolling Hills Estates	Palos Verdes Peninsula-Wide Safe Routes to School Plan	2020
Los Angeles	Local	San Fernando	City of San Fernando Safe and Active Streets Plan	2022
Los Angeles	Local	San Gabriel	City of San Gabriel Safe Routes to School Master Plan	2023
Los Angeles	Local	Santa Monica	City of Santa Monica Safe Routes to School Program	2023
Los Angeles	Local	South Gate	City of South Gate Safe Routes to School Program	In Progress
Los Angeles	Local	West Covina	City of West Covina Safe Routes to School and Pedestrian Safety Project	In Progress
Los Angeles	Regional	San Gabriel Valley Council of Governments (SGVCOG)	San Gabriel Valley Council of Governments (SGVCOG) – Regional Active Transportation Planning Initiative	2019
Orange	Local	Brea	Brea Core Plan: Active Transportation Plan	2020
Orange	Local	Buena Park	City of Buena Park Active Transportation Plan	In Progress
Orange	Local	Garden Grove	City of Garden Grove Safe Routes to School: Phase I Master Plan	2019
Orange	Local	La Habra	City of La Habra Complete Streets Master Plan	2019
Orange	Local	Laguna Beach	City of Laguna Beach Enhanced Mobility and Complete Streets Transition Plan	2015
Orange	Local	Mission Viejo	City of Mission Viejo Safe Routes to School Program	n.d.
Orange	Local	San Clemente	City of San Clemente Bicycle and Pedestrian Master Plan	2013
Orange	Local	Santa Ana	City of Santa Ana Safe Routes to School Plan	2020
Orange	Regional	Orange County Transportation Authority (OCTA)	Orange County Safe Routes to School Action Plan	2021

County	Level	Agency	Plan Name	Year
Riverside	Local	Desert Hot Springs	City of Desert Hot Springs Safe Routes to School Plan	2008
Riverside	Local	Indio	City of Indio Safe Routes to School Master Plan	2019
Riverside	Local	Jurupa Valley	City of Jurupa Valley Circulation Master Plan for Bicyclists and Pedestrians	2018
Riverside	Local	Lake Elsinore	Riverside County Safe Routes to School Program, City of Lake Elsinore	2022
Riverside	Local	Moreno Valley	City of Moreno Valley Safe Routes To School Program	n.d.
Riverside	Local	Palm Springs	City of Palm Springs Pedestrian Plan	2021
Riverside	Local	Perris	Riverside County Safe Routes to School Program, City of Perris	2015
Riverside	Local	San Jacinto	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II (Volumes I & II)	2017
Riverside	Local	Wildomar	City of Wildomar Active Transportation Plan	In Progress
Riverside	Regional	Riverside County Department of Public Health	Riverside County Safe Routes to School Program	2022
San Bernardino	Local	Adelanto	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II, Volume II – City of Adelanto	2017
San Bernardino	Local	Barstow	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II, Volume II – City of Barstow	2017
San Bernardino	Local	Big Bear Lake	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II, Volume II – City of Big Bear Lake	2017
San Bernardino	Local	Chino	City of Chino Bicycle and Pedestrian Master Plan	2016
San Bernardino	Local	Colton	City of Colton Active Transportation Plan	2018
San Bernardino	Local	Fontana	City of Fontana Active Transportation Plan	2017
San Bernardino	Local	Grand Terrace	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II, Volume II – City of Grand Terrace	2017
San Bernardino	Local	Hesperia	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II, Volume II – City of Hesperia	2017
San Bernardino	Local	Highland	City of Highland Safe Routes to School Program	2010

County	Level	Agency	Plan Name	Year
San Bernardino	Local	Loma Linda	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II (Volumes I & II)	2017
San Bernardino	Local	Montclair	City of Montclair Safe Routes to School Plan	2020
San Bernardino	Local	Needles	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II (Volumes I & II)	2017
San Bernardino	Local	Ontario	Get Around Ontario: Active Transportation Master Plan	In Progress
San Bernardino	Local	Palm Springs	City of Palm Springs Pedestrian Plan	2021
San Bernardino	Local	Rancho Cucamonga	Healthy Rancho Cucamonga (RC) Safe Routes to School Program	n.d.
San Bernardino	Local	Redlands	City of Redlands Pedestrian and Safe Routes to School Plan	In Progress
San Bernardino	Local	Rialto	City of Rialto Safe Routes to School Program	2018
San Bernardino	Local	San Bernardino	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II (Volumes I & II)	2017
San Bernardino	Local	Twentynine Palms	Morongo Basin Active Transportation Plan	2019
San Bernardino	Local	Victorville	City of Victorville Non-Motorized Transportation Plan and Compass Blueprint Demonstration Project	2010
San Bernardino	Local	Yucaipa	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II, Volume II – City of Yucaipa	2017
San Bernardino	Local	Yucca Valley	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II, Volume II – Town of Yucca Valley	2017
San Bernardino	Regional	San Bernardino County – Morongo Basin	Morongo Basin Active Transportation Plan	2019
San Bernardino	Regional	San Bernardino County Transportation Authority (SBCTA)	San Bernardino County Transportation Authority (SBCTA) Regional Safe Routes to School Plan Phase II (Volumes I & II)	2017
Ventura	Local	Oxnard	City of Oxnard Safe Routes to School Program	2022
Ventura	Local	Thousand Oaks	City of Thousand Oaks Active Transportation Plan	2019
Ventura	Local	Ventura	City of Ventura Active Transportation Plan	In Progress
Ventura	Regional	County of Ventura	County of Ventura Active Transportation Plan	In Progress

APPENDIX 10: ACTIVE TRANSPORTATION PLANS – REGIONAL ASSESSMENT

COMPLETE STREETS POLICIES AND PLANS

County	Level	Agency	Plan Name	Year
Imperial	Local	Holtville	City of Holtville Complete Streets Plan	2016
Los Angeles	Local	Baldwin Park	City of Baldwin Park Complete Streets Policy	2011
Los Angeles	Local	Bell	Resolution No. 2021-58 City of Bell Complete Streets Policy	2021
Los Angeles	Local	Bell Gardens	City of Bell Gardens Complete Streets Plan	2020
Los Angeles	Local	Beverly Hills	City of Beverly Hills Complete Streets Plan	2021
Los Angeles	Local	Burbank	Complete Our Streets: City of Burbank Complete Streets Plan	2020
Los Angeles	Local	Compton	City of Compton Complete Streets Policy	In Progress
Los Angeles	Local	Covina	City of Covina Active Streets and Multi Modal Connectivity Plan	In Progress
Los Angeles	Local	Culver City	City of Culver City Complete Streets Policy	2020
Los Angeles	Local	Duarte	Resolution No. 19-08 City of Duarte Complete Streets Policy	2019
Los Angeles	Local	El Monte	City of El Monte Complete Streets Policy	In Progress
Los Angeles	Local	El Segundo	Resolution No. 5005 City of El Segundo Complete Streets Policy	2016
Los Angeles	Local	Hawthorne	City of Hawthorne Crenshaw Station Active Transportation Plan, Neighborhood Electric and Electric Vehicle Strategies, and Overlay Zone	2015
Los Angeles	Local	Hermosa Beach	Resolution No. 12-6821 City of Hermosa Beach Living Streets Policy	2012
Los Angeles	Local	Huntington Park	City of Huntington Park Complete Streets Plan	2016
Los Angeles	Local	La Habra	City of La Habra Complete Streets Master Plan	2019
Los Angeles	Local	La Verne	Resolution No. 17-71 City of La Verne Complete Streets Policy	2017
Los Angeles	Local	Lancaster	City of Lancaster Master Plan of Complete Streets	2016
Los Angeles	Local	Los Angeles	City of Los Angeles Complete Streets Design Guide	2014
	Local	Los Angeles	City of Los Angeles Mobility Plan 2035	2016
Los Angeles	Local	Lynnwood	City of Lynnwood Complete Streets Ordinance	2022
Los Angeles	Local	Maywood	Resolution No. 6158 City of Maywood Complete Streets Policy	2021
Los Angeles	Local	Norwalk	City of Norwalk Complete Streets Policy and Design Manual	In Progress
Los Angeles	Local	Palmdale	City of Palmdale Sustainable Transportation Plan	In Progress
Los Angeles	Local	Pomona	City of Pomona Complete Streets Ordinance	In Progress
Los Angeles	Local	Redondo Beach	City of Redondo Beach Living Streets Policy	2013

County	Level	Agency	Plan Name	Year
Los Angeles	Local	Los Angeles Metropolitan Transportation Authority (Metro)	Metro Complete Streets Policy	2014
Orange	Local	Brea	Brea Core Plan: Active Transportation Plan	2020
Orange	Local	Buena Park	City of Buena Park Complete Streets Master Plan	2017
Orange	Local	Costa Mesa	City of Costa Mesa Active Transportation Plan	2018
Orange	Local	Laguna Beach	City of Laguna Beach Enhanced Mobility and Complete Streets Transition Plan	2015
Orange	Local	San Clemente	City of San Clemente Bicycle and Pedestrian Master Plan	2013
Orange	Local	Placentia	Streetscape Master Plans for the TOD and Old Town Project Areas	n.d.
Orange	Local	Orange County Council of Governments	Complete Street Handbook and Funding Toolkit	2016
Riverside	Local	Banning	City of Banning Downtown Revitalization and Complete Streets Plan	In Progress
Riverside	Local	Indio	City of Indio Complete Streets and Drainage Master Plan	2020
Riverside	Local	Riverside	City of Riverside Complete Streets Ordinance	n.d.
Riverside	Regional	Western Riverside Council of Governments (WRCOG)	Subregional Climate Action Plan Implementation Model Book	2014
San Bernardino	Local	Montclair	City of Montclair SAFE (Streets Are For Everyone) Complete Streets Implementation Plan	2017
San Bernardino	Local	Rancho Cucamonga	City of Rancho Cucamonga Complete Streets Ordinance	2012
San Bernardino	Regional	San Bernardino County Transportation Authority (SBCTA)	San Bernardino County Transportation Authority (SBCTA) Complete Streets Strategy	2015
Ventura	Local	Ojai	City of Ojai Complete Streets Policy	2012
Ventura	Local	Ojai	City of Ojai Complete Streets Master Plan	2017
Ventura	Local	Oxnard	City of Oxnard Sustainable Transportation Plan	2023
Ventura	Local	Ventura	City of Ventura Active Transportation Plan	In Progress
Ventura	Regional	County of Ventura	Ventura County 2040 General Plan	2020

APPENDIX 11:
COMPREHENSIVE MULTIMODAL CORRIDOR PLANS

APPENDIX 11: COMPREHENSIVE MULTIMODAL CORRIDOR PLANS

Multimodal corridor planning is defined as planning for all modes of transportation that are presently used or have the potential to move people and goods within the designated corridor. The result of a Comprehensive Multimodal Corridor Plan (CMCP) are documents that identify projects and strategies aimed at relieving congestion, reducing GHG emissions, and improving the quality of life along a specific transportation corridor, and transportation system improvements to address performance deficiencies in areas specified in the California Streets and Highways Code (SHC Section 2392).

Our region offers several examples of multimodal corridor planning such as the Wilshire Boulevard Bus Rapid Transit (BRT) corridor plan in Los Angeles. Using dedicated bus lanes and transit-only signals along a 9.9-mile stretch of Wilshire Boulevard, BRT provides faster and more reliable transit service for thousands of daily passengers while also improving traffic flow and reducing emissions. The Metro *ExpressLanes* Program is a comprehensive planning initiative that aims to improve mobility on several major highways in Los Angeles County by converting High Occupancy Vehicle (HOV) lanes into high-occupancy toll (HOT) lanes and includes a range of multimodal improvements such as dedicated bike lanes, improved transit service and enhanced pedestrian access. Lastly, the Orange County Streetcar Project is a comprehensive planning initiative that aims to improve multimodal transportation, including the construction of a new streetcar line that will connect major destinations in Santa Ana and Garden Grove, including the downtown Santa Ana area, Santa Ana College, Santa Ana Regional Transportation Center and the Harbor Transit Center.

I-405 CMCP

In September 2022, the Metro Board adopted the I-405 CMCP. The I-405 CMCP creates a guiding vision to reimagine the possibilities for getting around one of the most congested corridors in Los Angeles County. In fall 2022, Metro staff assessed and nominated projects for the SCCP grant funding cycle. Nominated programs and projects included the following:

- Metro Light Rail CORE Capacity & System Integration Project. This project will extend the LAX/Aviation Station platform and add two additional traction power substations that will allow for the future operation of three-car trains on the Metro K Line when it connects to the Metro C (Green) Line.
- Metro's I-405 Corridor Community Bus Service Improvement Program. This program includes the electric bus purchases that will support the North San Fernando Valley Transit Corridor Project as well as the Venice Boulevard Bus Speed and Reliability Improvement Project that would add bus boarding islands, upgrade bus shelters, and add real-time travel information as the second phase of the City of Los Angeles' Venice Boulevard Mobility Improvement Project.
- City of Long Beach Shoreline Drive Gateway: Corridor Realignment & Community Connections Project. This project is an early action component of the Shoemaker Bridge Project, which will reconfigure an existing highway ramp and add multimodal infrastructure for vehicles, pedestrians, and bicyclists to improve multimodal transportation operations and safety. SCCP Cycle 3 grant recipients are anticipated to be announced by the California Transportation Commission (CTC) in June 2023.

U.S. 101 CMCP

The U.S. 101 South CMCP presents a holistic approach for managing congestion, improving safety and maximizing flow for all modes and incorporates measures to reduce air pollution and GHG gases for the Ventura County roadway. Key strategies include the addition of managed/express lanes to maximize the efficient use of the existing highway for motorists, the development of express bus services, rail and local transit improvements and improved bicycle/pedestrian facilities.

INLAND EMPIRE CMCP (IE CMCP)

The IE CMCP has multiple uses that will benefit local, regional, and state agencies as they deal with balancing infrastructure, livability, economic, and sustainability needs as they relate to the transportation system. The IE CMCP covers the urbanized portion of both Riverside and San Bernardino Counties, excluding the Coachella Valley. The original concept for the IE CMCP was to have two corridors, a north/south and an east/west corridor. However, as the study progressed, it was decided to create focused smaller "sub-corridors" to facilitate more detailed assessment of corridor conditions and to focus the recommended improvements and strategies.

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