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CHAPTER 9 HIGHLIGHTS

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LOOKING AHEAD

This Plan has discussed many long-term needs for our region's transportation system. Despite \$556.5 billion in investments reviewed in the 2016 RTP/SCS, this still will not be enough to address all of our needs as we head toward mid-century. In addition, as noted earlier, state policies will continue to push the region to achieve sustainability goals beyond the horizon of the plan.

INTRODUCTION

The implication of the Governor’s Executive Order B-30-15, referenced earlier, is that state-mandated targets to reduce greenhouse gas emissions will likely become more ambitious and will be extended to target years beyond 2040. The first part of this chapter describes the 2016 Regional Strategic Plan, a list of projects without identified funding that would benefit mobility in the region. The second part of this chapter, which concludes this presentation of the 2016 RTP/SCS, provides insight into developments that will impact the region beyond 2040.

THE 2016 STRATEGIC PLAN

This chapter serves as a Strategic Plan for discussing what strategies, programs and projects the region should pursue in coming decades if and when additional funding becomes available. This Strategic Plan is intended to help inform future updates to SCAG’s RTP/SCS, beyond the 2016 RTP/SCS. Back in 2008, SCAG first developed a Strategic Plan to guide long-term decisions for transportation investments and strategies. The Strategic Plan in the agency’s 2008 RTP helped inform what kinds of investments to include in the 2012 RTP/SCS—as part of that Plan’s financially constrained transportation network.

Not surprisingly, the Strategic Plan included in the 2012 RTP/SCS played a large role in informing the investments and strategies detailed in the Financially Constrained Plan of the 2016 RTP/SCS (also referred to as the “Constrained Plan”). Among these are:

- **Promoting Active Transportation:** The 2012 Strategic Plan called for further enhancements to the active transportation system, including an increased focus on first/last mile connections to and from public transit, increasing the density of bikeways, incorporating Complete Streets practices that make streets friendlier to pedestrians and bicyclists, and increasing connectivity for pedestrians and bicyclists between jurisdictions. As part of the 2012 RTP/SCS, \$6.7 billion was allocated for active transportation. Since the 2012 RTP/SCS was adopted, active transportation has been recognized as a regional priority, not just a local priority. Orange County began work on a strategic bikeway network and completed the first portion in 2012, and it is fully incorporated into the 2016 RTP/SCS. Meanwhile, Los Angeles County is developing its own Active Transportation Strategic Plan.

- **Expanding the High-Occupancy Vehicle (HOV) Lanes System:** The 2012 Strategic Plan recommended expanding our regionwide HOV lane network, although these improvements were unfunded. The 2016 RTP/SCS now fully funds an HOV expansion project within Orange County as part of its Constrained Plan.
- **Improving Local Highway Grade Separations:** The 2012 Strategic Plan recommended constructing grade separations on our local highways, although these improvements were unfunded as well. The 2016 RTP/SCS fully funds several grade separation projects throughout the region as part of its Constrained Plan.

It is clear that the 2012 Strategic Plan played a large role in influencing the 2016 Constrained Plan, as intended. Moving forward, we expect the Strategic Plan discussed in this chapter will help inform future RTP/SCS updates. Should additional funding become available to pursue projects beyond our Constrained Plan, more consensus would be needed and in some cases further studies would be warranted before specific projects could move forward.

LONG-TERM EMISSIONS-REDUCTION STRATEGIES FOR RAIL

As part of our current Strategic Plan, we will continue ongoing work with railroads, air quality management agencies and other stakeholders to reach our goal of a zero-emissions rail system.

FREIGHT RAIL

Achieving a rail system with zero emissions will be challenging because freight rail operates as a national system and locomotives cannot remain captive to our region. Any new technology will require an operational strategy to change out locomotive types, or it will require compatible infrastructure nationwide to provide new types of cleaner power and/or fuel to locomotives.

These challenges are formidable, but several near zero- and zero-emissions rail technologies are actually under development. A zero-emissions rail system would require full electrification and such a system could be powered by electric catenary or linear synchronous motors. There are also options for a hybrid-electric engine or a battery tender car, which provide additional power, allowing locomotives to operate in zero-emissions mode while battery power is available.

Opportunities for near zero-emissions include incorporating liquid natural gas tender cars and after treatment systems. Tier 4 engines and earlier engine types can be retrofitted to operate with natural gas, though safety and operational issues remain challenging. Additional after-treatment options are in the conceptual stage, which could go beyond Tier 4 standards.

Please see the Goods Movement Appendix for more detail on these technologies, as well as a plan to deploy these technologies as they become commercially viable.

CALIFORNIA HIGH-SPEED TRAIN

The California High-Speed Train will be electrified and will therefore produce no emissions along its operating corridors. Furthermore, the California High-Speed Rail Authority (CHSRA) has committed to using 100 percent renewable energy to power its trains. Because of the expected reduction in air and auto travel, the CHSRA estimates its service will save 2.0 million to 3.2 million barrels of oil annually, beginning in 2030.¹ With plans for a zero-emissions high-speed rail system in Southern California, and as the freight rail sector makes advances in near zero- and zero-emissions technologies, the region's passenger and commuter rail systems should pursue a similar strategic vision.

LONG-TERM EMISSIONS-REDUCTION STRATEGIES FOR TRUCKS

The reduction or elimination of emissions from heavy-duty trucking is equally important to our long-term vision of a zero-emissions goods movement system. In the near term, our 2016 RTP/SCS proposes an aggressive program to bring into service more clean fuel trucks and hybrid trucks that are now available. For the longer term, we provide a detailed plan to advance zero-emissions truck technologies, as described in the Goods Movement Appendix.

The trucking market offers unique challenges because of heavy vehicle and load weights, operational performance requirements, and high incremental costs. However, several reduced-emissions trucks are commercially available now and many zero- and near zero-emissions trucks are under development. Reduced-emissions natural gas trucks already have been deployed at our region's ports and several hundred hybrid electric trucks are on the road due to the Hybrid Truck and Bus Voucher Incentive Project (HVIP) at the California Air Resources Board.

Other promising technologies include plug-in hybrid-electric trucks, which have batteries that are charged through an external power source; battery-electric trucks, which can generate their own power or receive power from an outside source; and hydrogen fuel cell electric trucks. The South Coast Air Quality Management District (SCAQMD) is leading several ongoing demonstration programs, with funding from regional partners and state and federal agencies that are developing prototype zero-emissions trucks. These programs are also accessing the compatibility of these trucks with wayside power charging infrastructure. These demonstration programs rely on partnerships with original equipment manufacturers that can develop truck prototypes and with private sector partners that can test and evaluate prototypes in real world operating conditions.

For more information on the steps toward development and deployment of these technologies and more detail about potential technologies, please see the Goods Movement Appendix.

UNFUNDED OPERATIONAL IMPROVEMENTS

Well-targeted investments to improve our roadways can yield numerous benefits. Adding auxiliary lanes and managed lanes; improving interchanges; deploying on-ramp metering devices and adaptive signals; and other ITS enhancements can make the entire roadway system more efficient, increase capacity and help reduce congestion. Caltrans Corridor System Management Plans (CSMPs) have identified a number of improvements throughout the State Highway System (SHS) to improve productivity. The future development of corridor mobility and sustainability improvement plans (i.e., Corridor Sustainability Studies) for various corridors throughout the SCAG region may also identify future operational improvements not only within the SHS, but for all modes of travel throughout the region.

UNFUNDED CAPITAL IMPROVEMENTS

Regionally significant major corridor improvements and strategies described in the Strategic Plan are identified in [TABLE 9.1](#). A complete list is contained in the 2016 RTP/SCS Project List contained as part of Project List Appendix.

¹ California High Speed Rail Authority. Environmental Fact Sheet, August 2014.

EXPANDING OUR REGION'S HIGH-SPEED TRAIN SYSTEM

CALIFORNIA HIGH-SPEED TRAIN

The California High-Speed Train will provide people with an additional option for traveling within the state, offering an alternative to flying and driving. This will be especially important as highways and airports continue to become more congested and constrained as California's population continues to grow. Phase One of the system, approved by voters, extends from the Kern County line in our region through Palmdale and Burbank to Los Angeles Union Station and Anaheim. Phase Two, extending from downtown Los Angeles to San Diego, will link many urban areas and other destinations within our Southern California region via the San Gabriel Valley and the Inland Empire. This corridor is about 160 miles long and it traverses Los Angeles, Riverside, San Bernardino and San Diego counties. With more than 21 million residents, these four counties make up about 56 percent of the state's current population. And they're projected to grow significantly by 2050.

Upon completion, Phase Two will provide important access to planned and existing regional centers, including Ontario International Airport, the March Inland Port, and potentially San Bernardino International and Corona airports—helping to meet SCAG's long-term goal of regionalizing air travel in Southern California. Eventually, Phase Two is expected to be the basis for further high-speed rail extensions into Nevada and Arizona.

Phase One and Two of the California High-Speed Train will provide excellent regional connectivity to our region by connecting with a robust network of intercity and commuter rail, subway, light rail, modern streetcars and fixed-route transit systems. Integrated planning will allow these regional and local transportation networks to complement the High-Speed Train. Commuter, intercity and interregional rail services and transit serve distinct travel markets, but coordinating their schedules will further increase the region's rail and transit ridership by attracting new and crossover passengers to these different market segments.

XPRESSWEST

In addition to the California High-Speed Train, our region has other important high-speed rail projects in development. XpressWest is a high-speed rail service that will connect Victorville and Las Vegas along the Interstate 15 corridor and connect via the High Desert Corridor to Palmdale and California High-Speed Train Phase One. It will use "steel wheel on steel rail" electric multiple unit train technology, at speeds of up to 150 miles per hour (mph).

TABLE 9.1 MAJOR STRATEGIC PLAN PROJECTS

IMPERIAL COUNTY

SR-111 Corridor Improvements

LOS ANGELES COUNTY

Metro Blue Line Extension to California State University Long Beach

Metro Gold Line Eastside Extension Beyond Phase II Terminus

Metro Green Line Extension to San Pedro, Long Beach and LA/Orange County Line

Metro Orange Line Extension to Burbank Bob Hope Airport

Orangeline High-Speed Transit (Union Station to Santa Clarita)

I-605 HOV lanes from I-10 to I-210

ORANGE COUNTY

Additional Transit Station Improvements to Fullerton Transportation Center and Santa Ana Regional Transportation Center

Fullerton College Connector

SR-133 Multimodal Corridor Improvements

RIVERSIDE COUNTY

Coachella Valley Daily Rail Service between Downtown Los Angeles and Indio

CETAP - Riverside County to Orange County

Perris Valley Line Extension to Temecula

SAN BERNARDINO COUNTY

San Bernardino Mountain-Valley Railway System between San Bernardino/Highland and Big Bear Lake

VENTURA COUNTY

Santa Paula Branch Line

VARIOUS COUNTIES

Cordon Pricing Demonstration Projects (locations to be determined)

California High-Speed Train System Phase 2

California/Nevada Super-Speed Train Anaheim to Las Vegas

Expanded Express Lane Network (beyond Constrained Plan)

Long-Term Goods Movement Emission-Reduction Strategies for Rail and Trucks

Mileage-Based User Fee Demonstration Projects and Implementation Strategy

Additional Metrolink and LOSSAN Improvements (beyond financially constrained plan)

XpressWest High-Speed Rail Between Palmdale-Victorville-Las Vegas

That would result in a trip between Victorville and Las Vegas lasting only 80 minutes. XpressWest has secured federal environmental Records of Decision and authorization to construct and operate. In November 2015, XpressWest was awarded the franchise to construct and operate high-speed rail service within Nevada between Southern California and Las Vegas by the Nevada High Speed Rail Authority.

SOUTHWEST HIGH-SPEED RAIL

In September 2014, the Federal Railroad Administration (FRA) released the *Southwest Multi-State Rail Planning Study*. This study analyzed candidate high-speed rail corridors in several southwest states. California, Nevada and Arizona are included as the “primary” area and New Mexico, Utah and Colorado are included as the “extended” area. The study includes:

1. “Core Express” with top speeds greater than 125 mph
2. “Regional” with top speeds of 90 mph to 125 mph
3. “Emerging/Feeder” with top speeds up to 90 mph

The California High-Speed Train and XpressWest corridors were identified as Core Express corridors in the study. The study also recommended a particular emphasis on the Phoenix to Southern California corridor as a future high-speed rail market to be studied.

EXPANDING OUR REGION’S COMMUTER RAIL SYSTEM

METROLINK AND PACIFIC SURFLINER

Both the Amtrak Pacific Surfliner and Metrolink are forecast to significantly increase their ridership and number of daily trains through 2040. The Constrained Plan of this 2016 RTP/SCS includes funding the first \$1 billion of the Southern California High-Speed Rail Memorandum of Understanding (MOU). However, this \$1 billion investment only funds the top 12 projects on the project list, which contains 74 projects totaling \$4 billion. Metrolink recently completed its long-range Strategic Assessment in 2016 and it forecasts growth in the number of daily trains from 165 current weekday trains today to 240 weekday trains by 2025. In addition, the 2012 Los Angeles–San Diego–San Luis Obispo Rail Corridor (LOSSAN) Strategic Implementation Plan (SIP)

forecasts up to 310 weekday Metrolink trains by 2040. For the Amtrak Pacific Surfliner, the SIP forecasts up to 18 daily round trips between downtown Los Angeles and San Diego, and additional round trips between downtown Los Angeles and Santa Barbara and San Luis Obispo. Additionally, the SIP includes:

- New East Ventura to Santa Barbara commuter service with four round trips per day
- New Los Angeles to San Diego commuter service with five round trips per day (operations split between Metrolink and Coaster)
- New express service with four round trips per day (operations split between Metrolink and the Pacific Surfliner)
- New Metrolink service to San Jacinto with eight round trips per day

Today, the average speed for Metrolink is about 37 mph, and the average speed for the Pacific Surfliner is 46 mph. Average speeds vary by line, and while top speeds are 79 mph (and a segment of 90 mph through Camp Pendleton), predominant one-track operations in our region greatly reduce the average system speed. Even if all 74 of the MOU projects are built, our region will still have large portions of its rail network constrained by one-track operations. This reinforces the need to fund capital projects in order to speed up service and make passenger rail more attractive to the commuter who drives alone. SCAG’s Strategic Plan vision for speed and service improvements to Metrolink and Pacific Surfliner calls for an intensive investment in capital projects to further increase speed and service levels over and above the Constrained Plan. The Strategic Plan results in even more segments of the network operating at speeds of 110 mph or more. These projects include additional double tracking, sidings, station improvements, grade separations and grade crossings. Not only will this benefit commuter rail trips in our region, it will benefit Amtrak intercity and California High-Speed Train interregional trips also, as the three systems feed and complement one another. While these rail networks serve three distinct travel markets, improving all three will encourage people to consider and use all three in their travel decisions, rather than be limited to any single mode of transportation.

In addition to capital improvements, our strategic vision calls for considerably more express trips, regular special event services, and implementation of new Bus Rapid Transit (BRT) services that directly connect with Metrolink and the Pacific Surfliner.

EXPANDING ACTIVE TRANSPORTATION

There is great potential for walking, biking and other forms of active transportation to expand beyond what is proposed in this 2016 RTP/SCS. Policies designed to reduce greenhouse gas emissions will continue to highlight active transportation as a key step toward a more sustainable region. As transit service expands and a wider range of shared-mobility options become available, active transportation will serve regional mobility, ensuring that people can quickly, easily and safely transfer from one mode of transportation to the next. Active transportation also plays a critical role in helping the region to realize its vision for how it uses land, which includes accommodating more people in vibrant, mixed-use communities and urban centers. Sidewalks and active transportation networks contribute to the attractiveness and economic vitality of mixed-use communities. They also play an important role in reducing congestion and increasing mobility.

EXPANDED REGIONAL GREENWAY NETWORK

New active transportation plans by local jurisdictions will aspire beyond what is considered in the 2016 RTP/SCS Constrained Plan, and as a result new innovative strategies will be tested and proven effective throughout our region. One expected innovation is to create greater physical separations between bicyclists and motor vehicles, particularly on higher-speed streets. Separated bikeways and Class 1 bikeways are considerably more expensive options than installing bike lanes or sharrows, but these more expensive options have been shown to increase ridership.² The SCAG region currently has four miles of separated bikeways and these now operate on an “experimental” basis in local jurisdictions such as Long Beach and Redondo Beach. Caltrans is developing guidelines to incorporate separated bikeways into the California Manual for Uniform Traffic Control Devices (MUTCD). Once incorporated, local governments will be able to freely incorporate separated bikeways without incurring liability. In this Strategic Plan, SCAG assumes that our region will have about 230 miles of new separated bikeways converted from bike lanes on arterial streets. As part of the effort to develop separated bikeways, this Strategic Plan envisions greater integration of watershed planning, river rehabilitation, and access for bicyclists and pedestrians. It further envisions the use of open area drainage channels that were once creeks, and the maintenance roads next to them for walking and biking. It envisions greater coordination of rights of way under utility lines.

² Chapter 3: Why Choose Separated Bike Lanes? (2015). In Separated Bike Lane Planning and Design Guide. Federal Highway Administration.

EXPANDED BIKE SHARE

Bike Share, an innovative program in which people can share bicycles, can be expanded beyond the 880 stations regionwide that are envisioned in the Constrained Plan. Because it is such a new service, more local jurisdictions may wish to deploy bike share facilities where they can. This Strategic Plan anticipates an additional 1,084 stations regionwide, should funding become available.

FIRST/LAST MILE

The first/last mile challenge, which deters many people from using transit, can be alleviated as more than 200 high quality transit stations identified in the Strategic Plan Project List increases to nearly 700 stations as urban areas become more developed and more bus routes offer people higher quality transit choices.

LIVABLE CORRIDORS

Pedestrian travel will also increase substantially as a consequence of higher density development. New treatments installed as part of routine roadway maintenance, such as bulb-outs, sanctuary islands and innovative midblock crossing signals such as the high-intensity activated crosswalk beacon (commonly referred to as “HAWK”) will increase pedestrian safety. These treatments will expand livable corridors by 93 percent beyond the 16 areas in the Constrained Plan into new areas focusing on transit growth and new “village” development along new corridors. Funding for some of these treatments will come during the development process, through focused developer fees, or by pursuing other innovative funding strategies. Meanwhile, bicycle treatments such as bike racks and long-term secure bike parking will increase the convenience of biking.

NEIGHBORHOOD MOBILITY AREAS

Utilizing Complete Streets principles and applying them aggressively in the planning and implementation of neighborhood roadway improvements will increase mobility further. Traffic calming, combined with land use changes, will provide more opportunities for bicycling and walking in less urban settings such as local “village areas” with sidewalk café seating and local farmers markets. Connections to these villages will be promoted by strategies that tackle the first/last mile challenge that transit faces. Bicycle boulevards and other lower-speed streets that give bicycles priority have been shown to be effective at calming traffic, while increasing safety and bicyclist connectivity. This Strategic Plan sees local governments increasing the use of Complete Streets principles in their roadway improvements, expanding these areas beyond what is in the

Constrained Plan, increasing bikeway density and improving the quality of life for even more residents.

STRATEGIC FINANCE

VALUE PRICING STRATEGY

Following the adoption of the 2008 RTP, SCAG initiated a comprehensive study of value pricing strategies, which has come to be known as the Express Travel Choices Study. The emerging regional value pricing strategy is structured to help the region meet its transportation demand management and air quality goals, while also providing a reliable and dedicated source of revenue. The value pricing strategy could allow users of the transportation system to know the true cost of their travel, resulting in informed decision-making and a more efficient use of the transportation system. Value pricing strategies evaluated through the Express Travel Choices Study include a regional express lane network, cordon pricing and a mileage-based user fee. Although some of these pricing concepts have been incorporated into the Constrained Plan as elements are pursued as pilot initiatives or are under construction for implementation (e.g., segments of the regional express lane network), these strategies still face a number of significant hurdles before their full benefits can be realized. A second phase of the Express Travel Choices Study, initiated after the adoption of the 2012 RTP/SCS and ongoing, continues to establish an implementation plan for the regional value pricing strategy.

As we discussed in Chapter 6, SCAG will also continue to participate in state and national efforts to address the long-term transition of excise fuel taxes to mileage-based user fees.

OUR REGION BEYOND 2040

TECHNOLOGY AND NEW MOBILITY INNOVATIONS BEYOND 2040

Technological innovations have the potential to make existing transportation choices more widely available and easier to use throughout the region. By providing more options for local and regional trips, technological innovations have the potential to shift travel to less environmentally damaging modes, lessen the negative environmental impacts associated with current vehicle use,

increase system efficiency, improve safety, and reduce auto-related collisions and fatalities. However, realizing the potential benefits (and potential negative impacts) depends on the rate of development and the adoption of a wide range of public and private sector innovations. Although SCAG and its partners should be prepared for the widest possible range of technological advancements related to the transportation system, quantifying the benefits of certain new mobility innovations may be premature due to uncertain fluctuations in future market demand.

Many of these new applications and transportation services are being discussed in the media, and there are some reservations about how long they will last. Although they may have limited applicability in many parts of our region today, there is little doubt that certain technological innovations in transportation will grow significantly during the time frame of the 2016 RTP/SCS and beyond. The population in 2040 will have an entirely different expectation of the role of technology in their everyday lives than generations past. Changing demographics and broad economic trends have led to a demand for more flexible transportation options, the expansion of the sharing economy and calls for communities where people can live, work and play within a small area. This Plan reflects the ever-expanding portfolio of new mobility innovations that advanced technologies can enable and considers their long-term, regional impacts.

Currently, the clean technology industry and application developers outpace government in delivering technological innovation to the transportation sector. In light of this, SCAG continues to research the impacts of transportation innovation in terms of scale and longevity, looking at things such whether a technology or innovation will be amenable to only a small segment of the population and/or last for 10, 15 or 30 years? Or, are we at the outset of a major paradigm shift? Are tipping points just around the corner? Will the longstanding trend of the majority of trips taken by automobile persist?

The 2012 RTP/SCS identified policies to support a number of best practices and technological innovations that were not fully modeled at the time, such as alternative fuel vehicles and neighborhood electric vehicles. This 2016 RTP/SCS addresses new transportation innovations that have been planned and deployed since 2012, such as neighborhood electric vehicles (NEV), car sharing, bike sharing and ridesourcing (identified by the California Public Utilities Commission (CPUC) as Transportation Network Companies). SCAG has developed modeling assumptions and methodologies to analyze these mobility innovations and local land use regulations.

In addition to the new mobility innovations mentioned above, the region can expect to see significant growth in the deployment and use of automated vehicles. By some estimates, automation features being introduced within the next five years could be available in up to 70 percent of the vehicles on the road in 2040. The following are some examples of automated driving features that need to be considered and supported. There are a wide range of demonstration projects that could be pursued by SCAG and its partners, in collaboration with private sector organizations with increased federal, state and local funding:

- **Jam-Assist and Advanced Collision Avoidance:** Combining advanced collision detection and avoidance technology currently in development, vehicles will operate “hands-off” and “feet-off” on highways. These features could also improve operation in low-speed environments. Equipping transit vehicles with jam assist could dramatically improve vehicle throughput in congested transit-only corridors, or in Bus Rapid Transit systems.
- **Semi-Automated Mode Vehicles:** Vehicles will operate without driver input under certain limited conditions, while requiring driver input for most portions of the trip. This is the current state of technology with the Google car. However, safety and traffic benefits will begin to spread throughout the roadway network as this technology advances. Vehicles will be able to operate without driver input, although the driver will need to monitor the vehicle’s operation. These features could be available in both consumer and commercial vehicles as early as 2018–2020 and could represent a sizable minority of the fleet mix as early as 2030–2035.
- **Fully Automated Mode Vehicles:** Vehicles will operate without driver input in certain conditions, requiring driver input for other portions of the trip. Most researchers agree that this will be the mid-term state of vehicle automation. In highway driving conditions, drivers will turn over full control of the vehicle and vehicle systems will communicate with one another. Vehicles will be able to form “platoons” in order to operate at closer distances (less than 1.8 seconds apart in one Japanese study) in order to improve fuel consumption and traffic flows. Freight industry representatives are interested in whether the National Highway Traffic Safety Administration (NHTSA) will waive driver work hour limits for following vehicles under platooning conditions. In low-speed conditions, “platooning” could improve transit bus operations and automation could improve bus/curb alignment. To some researchers, this could facilitate a new business model of mobility—as a service similar to the way cellphone plans are priced, especially in dense urban areas.
- **Fully Automated Vehicles:** Vehicles will operate without driver input, but will still require a driver to monitor the vehicle. The vehicle will navigate trips from beginning to end and possibly self-park within low-speed environments. This technology could potentially be available as early as 2025–2030, but it will not be used in a significant share of vehicles until 2035–2040.
- **Fully Autonomous Vehicles:** Passenger vehicles will operate with or without drivers, resulting in radical changes to urban form. Cars will park themselves, attend to maintenance and refueling, or alter ownership patterns so that they stay in constant circulation. Driverless taxi, freight and transit vehicles could have a dramatic impact on various professional driving careers.

ADDRESSING SUSTAINABILITY AND GREENHOUSE GAS EMISSIONS BEYOND 2040

In addition to Governor Brown’s Executive Order discussed earlier, a number of policy trends are converging that will continue to push the state and region toward increasing de-carbonization of the transportation and energy sectors. Over the past 20 years, the international community has outlined a goal of limiting global warming to two degrees Celsius above pre-industrial levels. In the context of California, these trends include advancing beyond the Governor’s Executive Order goal of reducing greenhouse gas emissions by 80 percent below 1990 levels by 2050 to reducing greenhouse gas emissions by 100 percent later in the century. This could be accomplished in stages through various market and regulatory tools such as the Cap-and-Trade program and updates to the Assembly Bill 32 Scoping Plan. Electrification of the transportation sector over the next few decades is likely to be one outcome of these trends. The California Energy Commission (CEC) is also developing net zero energy building policies. Caltrans has prepared a new state transportation plan to significantly reduce vehicle miles traveled. Through the Senate Bill 375 target setting process, ARB will likely propose higher greenhouse gas reduction targets for metropolitan planning organizations through the continued integration of transportation and land use planning. Finally, Cap-and-Trade Triennial Investment Plans will continue to be updated to fund the implementation of greenhouse reduction goals.

However, the international science community is increasingly concerned that the two degrees Celsius goal is not stringent enough to avoid significant and perhaps irreversible climate damage to the planet, and serious discussions are occurring to reduce the international goal to 1.5 degrees Celsius. Whether

or not a consensus develops to intensify the climate change goals, California policymakers recognize the incredibly significant role of local jurisdictions and regions in taking climate action. Local jurisdictions and regions should expect to face new regulations and targets to significantly reduce greenhouse gas emissions for many decades ahead.

PREPARING THE REGION FOR RESILIENCY AGAINST CLIMATE CHANGE

In addition to creating a low-carbon sustainable future, the state and region will also be facing the human and infrastructure costs of adapting to climate change impacts that already are occurring. These include growing wildfire threats, sea-level rise and coastal flooding, increased mudslides and flooding, extreme heat waves and large reductions in water supplies.

Our region must prepare to confront these changes, and an important objective of this Strategic Plan is to build a region that is more resilient to these and other consequences of climate change. The twin policy goals of mitigation and adaptation will dominate state, regional and local planning for energy, water and transportation for the rest of this century. New collaborative programs and partnerships between businesses, academia, community groups, residents and all levels of government will be required.

Here is a simple but compelling example of how our region can become more resilient to the consequences of climate change: first/last mile strategies call for steps to make it easier for people to get to and from transit stops, such as building sidewalks and bike paths and installing places where people can lock up their bicycles near transit stations. These investments make transit more accessible while helping the region meet its goal of reducing the number of miles that people travel alone in their cars. But to make first/last mile strategies effective as our region faces more frequent days of extreme heat and intense rainstorms, they have to be refined. A more climate resilient strategy would be to design sidewalks and bike paths with native drought tolerant shade trees, as well as adding shade features at transit stations. Also, as pedestrian infrastructure is built, it should include adequate drainage and other storm water management features, to ensure access and safety during heavy rainstorms.

Looking to the state for recommendations on how to mitigate and adapt to climate change is challenging because its policies are evolving. Still, they come with a sense of urgency.³ The State of California recognizes the increasingly significant role that regional planning and local actions can play in meeting the state-level goals related to climate change. SCAG will continue to help the region further develop into a hub for local and regional government innovation, leadership and collaboration. For example, SCAG funded the Green Region Initiative category of projects, as part of the Sustainability Planning Grant Program. These grants provide local governments with technical expertise so they can develop local climate action plans, energy plans, water plans, open space strategies and public health plans. Working to make our region more resilient to the inevitable consequences of continued climate change is a major priority of this Plan, and it will continue to resonate in future updates as we head toward 2040 and well beyond.

CONCLUSION

As our region continues to grow in the coming years, we must ensure that effective strategies are in place toward fulfilling the needs of our growing population. With the understanding that our Constrained Plan can only get us so far, additional strategies must be considered to truly address the diverse needs of everyone who uses the regional transportation network.

The challenges ahead as we strive toward increased mobility, more livable and healthy communities and a more sustainable region are significant. But this Plan, the 2016 RTP/SCS, charts a course toward progress. It serves as a roadmap toward 2040 and a vision for a better future. It is a living document and it will change as circumstances change as we progress toward mid-century.

Above all, our RTP/SCS is a collective and inclusive effort—one that aims for a bright future for all of us.

³ See California State Executive Order B-30-15.