SUSTAINABILITY

SUSTAINABLE COMMUNITIES STRATEGY

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

CONNECT SoCal

TECHNICAL REPORT

ADOPTED ON SEPTEMBER 3, 2020

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SUSTAINABILITY

Sustainable Communities Strategy

INTRODUCTION

In 2008, the California legislature passed the Sustainable Communities and Climate Protection Act of 2008, also known as Senate Bill 375 (SB 375). According to then-Governor Arnold Schwarzenegger, "What this will mean is more environmentally-friendly communities, more sustainable developments, less time people spend in their cars, more alternative transportation options and neighborhoods we can safely and proudly pass on to future generations."

This groundbreaking statute directed the California Air Resources Board (ARB) to develop greenhouse gas reduction targets for metropolitan planning organizations across California, including the Southern California Association of Governments (SCAG). SCAG's current target is to reduce greenhouse gas (GHG) emissions from automobiles and light duty trucks by eight percent per capita by 2020 and 19 percent by 2035 from 2005 emissions levels. SCAG articulates its path to achieving this reduction through the Sustainable Communities Strategy (SCS) as part of the development of the Regional Transportation Plan (RTP).

The SCS details how, through coordination of transportation investments and a regional development pattern, the region can achieve the GHG reduction targets set forth by ARB. More details on the specific requirements of SB 375 can be found in the "Regulatory Framework" section below. As part of developing the SCS, SCAG looks not only at the statutory requirements but, how through better coordination of transportation and development, the region can achieve other goals such as public health improvements and more equitable access to opportunities.

REGIONAL SIGNIFICANCE

POLICY FRAMEWORKS/AREAS

For the Southern California region, achieving the ARB-determined GHG reduction targets requires integrating local and regional transportation infrastructure and investments with a land use and development pattern that offers more opportunities to travel sustainably. Traveling more "sustainably" can vary for each community and individual across the region. It may mean more transit trips, more walking and biking, shorter driving trips, or increased use of electric vehicles. Improving sustainability in how the region connects often provides other co-benefits like reducing the amount of time spent in traffic or reducing the money spent on routine daily travel. When considering the integration of land use and transportation, it is important to understand the policy framework that guides each of these sectors.

LAND USE

Decisions about land use and growth, such as what type of housing, offices or retail gets built and where, rests fundamentally with each local government—sometimes referred to as "local land use authority." A given city or county articulates its land use planning through general plans, specific plans and other documents (such as ordinances or development agreements). These land use decisions can include provisions to incentivize more sustainable development such as infill or mixed uses, as well as strategies for conserving natural lands and farm lands. See Existing Conditions: 2016 RTP/SCS Progress section for more detail on these and other policies that local jurisdictions in the SCAG region are implementing. Decisions made at the local level can have a regional impact on transportation and GHG emissions, such as when growth takes the form of a new regional employment center in one city and incentivizes new travel from distant areas—or when new housing is built far from shopping or job opportunities.

TRANSPORTATION

Transportation decisions are made by many different agencies and stakeholders in Southern California, which may include local jurisdiction departments of transportation, county transportation commissions, transit agencies and Caltrans. These decisions can be based on specific local priorities and evident needs, as well as influence from state and federal funding priorities. More details about the policy framework for different transportation modes can be found in the following Connect SoCal Technical Reports: Transit, Highways and Arterials, Active Transportation, and Passenger Rail.

CHALLENGES AND OPPORTUNITIES

HISTORICAL BACKGROUND OF THE SCAG REGION

Much of the physical frame of Southern California's urbanized region, stretching from Los Angeles to Ventura, Orange, San Bernardino, Riverside and Imperial counties, had been established by the early twentieth century. Well defined centers of many sizes and the region's economy grew in synchrony with rail networks. The development of the regional highway network in the latter part of the twentieth century then allowed for the outward expansion of the region's urban "footprint." This has reinforced the auto-oriented sprawling land use pattern for which the region has become known, with attendant adverse impacts on air quality and environmental resources. Then, at the turn of the twenty-first century, sprawl began to reach its limit, as many remaining areas for urban expansion were open spaces that were given considerable protection by state or federal ownership or otherwise conserved. Although sprawling growth has generally slowed near the Los Angeles area, new development is still occurring on the fringes of the urbanized region.

When SB 375 was passed in 2008, the region had already embarked on a path to consider the intersection between land use and transportation more comprehensively to provide more options to its residents to get around. For example, in the early 1990s the Counties of Riverside, San Bernardino, Los

Angeles, and Orange passed sales tax measures that enabled the opening of Metrolink in 1992. In Los Angeles County, Metro (Los Angeles Metropolitan Transportation Authority) began operation of the blue line in 1990 and has continued expanding its rail network with funding from locally supported sales tax measures.

EXTERNAL CHALLENGES

Today, there are many potential challenges that may make it difficult to implement the SCS and achieve the targeted greenhouse gas emission reductions. External challenges include trends or factors that are outside the control of local and regional policymakers.

ECONOMIC CHANGES

Changes in the economy can impact how and where people travel. Next 10's study, The Net Economic Impact of California's Major Climate Programs in The Inland Empire provided evidence that the state's climate policies have been positive for the local economy. However, economic changes can create challenges in achieving greenhouse gas emission reductions. For example, as the economy recovered after the Great Recession of the early 2000s, Vehicle Miles Traveled (VMT) and related GHG emissions rose as more people took advantage of new employment opportunities. Similarly, decreases in gasoline prices can lead to more VMT as it is less expensive to drive.Similarly, other external economic changes are occurring throughout the nation that have unknown impacts on future travel. One example is the changing nature of work such as the "gig economy," a labor market characterized by the prevalence of short-term contracts or freelance work as opposed to permanent jobs. The impacts of these changes could be beneficial in terms of reducing single occupancy vehicles and related VMT, or they could induce further driving to decentralized destinations.

Another change that is occurring nationally is related to e-commerce and changing consumer patterns. These shifts are impacting the acquisition, delivery and overall movement of goods into and through the region. Some evidence has shown that online shopping can reduce frequent short trips but the full impacts of this shift in consumer behavior have yet to be fully understood.

TECHNOLOGY

New technology offers many opportunities for future GHG reductions, both through vehicle technology such as electrification as well as improved broadband infrastructure that can support more teleworking opportunities. However, technology and unknowns such as the adoption rate and use of automated vehicles in the future could either increase or decrease overall emissions. For example, emerging services such as transportation network companies like Uber and Lyft were initially assumed to reduce VMT but more recent data is painting a more complicated picture.

Similarly, the recent emergence of micro-mobility technology and information platforms, which combine options from different transport providers into a single mobile service (mobility-as-a-service), are influencing travel behavior in ways that are not fully understood.

CLIMATE CHANGE

The changing climate will impact Southern California in several ways, including more days with extreme heat, rising sea level, more frequent wildfires, and shifting precipitation rates. Many of these challenges help frame the inherent adaptive and resilient benefits of center-based development instead of more sprawling patterns at the region's fringe. The change most likely to pose a challenge to implementing SCAG's SCS strategies will be sustained and extreme heat. Studies have shown that extreme heat could both discourage and pose additional health risks to active transportation users and transit riders (Heat exposure during non-motorized travel: Implications for transportation policy under climate change (Karner et al 2015) and Transit system design and vulnerability of riders to heat (Fraser and Chester 2017)).

UNIQUE CHALLENGES AND OPPORTUNITIES IN THE REGION

In contrast to external challenges, there are several specific challenges and opportunities for the Southern California region. These aren't necessarily unique to the SCAG region alone and a few can seem as intractable as external challenges but there are more opportunities to address them by local and regional policymakers.

CHALLENGES

EXISTING DISPERSED DEVELOPMENT PATTERN

The region's existing built environment, with a dispersed low density growth pattern anchored by dozens of dispersed job centers, households and communities leads to varied travel patterns with people crisscrossing the region daily. These diverse daily commute and travel patterns can make it difficult to provide sufficient and coordinated transit service. As a result, more residents of the region are auto-dependent for most of their trips which can consume valuable household resources and time as well as have adverse impacts on air quality and regional congestion.

ORGANIZATIONAL STRUCTURES

SCAG is the nation's largest metropolitan organization, encompassing six counties and 191 cities. The scale can pose an organizational challenge in that there cannot be "one size fits all" solutions that adequately serve the unique needs of every city or county in the region—even when facing common challenges. Also, as discussed in the policy framework section, SCAG lacks direct implementation authority for both key variables of implementing the SCS—land use and transportation. For this reason, SCAG works collaboratively with its many local partners to support local agencies in implementing the SCS.

AFFORDABLE HOUSING

Like many regions across California, affordability is an acute challenge in Southern California. Over 38 percent of households pay more than one-third of their income on housing. There are increased challenges for producing sufficient housing at multiple price ranges to serve very-low, low, and moderate income households in locations that do not induce single occupant vehicle travel and adversely impact resources (e.g., water supply, agricultural lands and critical habitats). Challenges include, but are not limited to, material and labor costs of housing construction, high land prices, as well as public opposition to new development in certain developed and urbanized locations. Building sufficient housing to serve all income levels, as well as preserving existing affordable housing will be critical to avoiding lengthening commutes or displacement. One element of affordability is the combined household housing and transportation cost which can increase due to lengthening commutes and lack of transit options. The U.S. Department of Housing and Urban Development refers to this as the "Location Affordability Index" and provides a tool to help people estimate the combined housing and transportation costs at the neighborhood level.

PUBLIC OPPOSITION

Throughout the region, there has been some local opposition to sustainability strategies such as complete streets and road diets or increased housing development and densification. These opposition movements are often led by local community members. They reflect a growing frustration by what is seen as negative impacts of increased density and active transportation infrastructure—predominately congestion. Some of this opposition reflects what is known as "not-in-my-backyard" or NIMBYism perspectives. Sometimes these perspectives represent a minority opinion but local elected officials are hard-pressed to continue implementing such projects without more vocal support.

OPPORTUNITIES

INTEREST AND SUPPORT FOR LOCAL PLANNING

Many local agencies within the SCAG region had already or have now been incorporating SCS strategies into their local plans. This incorporation is how the broader policies of the SCS can be reflected in local implementation. There is also high demand at the local level for planning resources to further implement sustainability practices. This is evident in that requests for support and resources consistently outpaces the availability of funding for SCAG's resource program. See the Existing Conditions section of this report for more discussion of both local plans and SCAG's resource program.

LOCALLY APPROVED INITIATIVES

In contrast to the public opposition challenge mentioned above, there is also evidence of broader support for SCS implementation strategies of increased transit and agricultural preservation through two recently approved voter initiatives. One, Measure M sales tax in Los Angeles County, was approved by voters in November of 2016 and over 60 percent of the revenues will fund transit operations and infrastructure expansion. In that same year, voters in Ventura County reaffirmed Save Open Space and Agricultural Resources (SOAR) which requires a vote of the people before agricultural or open spaces can be rezoned for development.

REGULATORY FRAMEWORK

STATUTORY REQUIREMENTS

The passage of SB 375 in 2008 requires that a Metropolitan Planning Organization, such as SCAG, prepare and adopt an SCS that sets forth a forecasted regional development pattern which, when integrated with the transportation network, measures and policies, will reduce greenhouse gas emissions from automobiles and light-duty trucks (Govt. Code §65080(b)(2)(B)). The SCS outlines certain land use growth strategies that provide for more integrated land use and transportation planning and maximized transportation investments. The SCS is intended to provide a regional land use policy framework that local governments may consider and build upon.

EXISTING CONDITIONS

PERFORMANCE

Connect SoCal is SCAG's third SCS. As mentioned in the Regional Significance section, the region's progress towards sustainability predates the passage of SB 375. Slow moving variables in creating a more sustainable region such as land use changes are beginning to show evidence of progress.

RECENT GROWTH

Planning for more housing and jobs near transit was a strategy incorporated in SCAG's first 2012 RTP/SCS and carried forward in the 2016 RTP/SCS with the focus on high quality transit areas (HQTA). Between 2008 and 2016, nearly 60 percent of household and 45 percent of employment growth occurred within HQTAs. Additionally, another strategy in the 2012 RTP/SCS was to ensure the preservation of habitat and farmland which was further defined in the 2016 RTP/SCS Natural Lands Appendix. Between 2008 and 2016, less than five percent of household and employment growth occurred as greenfield developments. While these statistics are largely the result of existing local policy and market demand, these recent trends underscore that the region is gradually moving towards a more sustainable development pattern.

HOUSING PERMIT TRENDS

Housing development has begun to pick up pace since the stall due to the Great Recession. However, the number of units being built per person is much lower than in the past. Between 1970 and 1980 an average of one new housing unit was built for every 1.74 persons added to the region. From 2010-2016 there was

TABLE 1 SB 375 Requirements

Required Element	Reference (2020)
California Government Code (CGC) Section 65080(b) (2)(B): Each metropolitan organization shall prepare a sustainable communities strategy, subject to the requirements of Part 450 of Title 23 of, and Part 93 of Title 40 of, the Code of Federal Regulations, including the requirement to utilize the most recent planning assumptions considering local General Plans and other factors.	Connect SoCal Chapter 3 and Technical Reports: Sustainable Communities Strategy; Demographics and Growth Forecast
CGC Section 65080(b) (2)(B)(i): Identify the general location of uses, residential densities, and building intensities within the region	Connect SoCal Chapter 2; Connect SoCal Technical Report: Sustainable Communities Strategy; Demographics and Growth Forecast
CGC Section 65080(b) (2)(B)(ii): Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth	Connect SoCal Technical Report: Sustainable Communities Strategy; Demographics and Growth Forecast
CGC Section 65080(b) (2)(B)(iii): Identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Section 65584	Connect SoCal Technical Report: Sustainable Communities Strategy
CGC Section 65080(b) (2)(B)(iv): Identify a transportation network to service the transportation needs of the region	Connect SoCal Chapter 3
CGC Section 65080(b) (2)(B)(v): Gather and consider the best practically available scientific information regarding resource areas and farmland in the region as defined in subdivisions (a) and (b) of Section 65080.01	Connect SoCal Technical Report: Natural and Farm Lands Conservation
CGC Section 65080(b) (2)(B)(vi): Consider the state housing goals specified in Sections 65580 and 65581	Connect SoCal Chapter 3
CGC Section 65080(b) (2)(B)(vii): Set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the greenhouse gas emissions from automobiles and light trucks to achieve, if there is a feasible way to do so, the greenhouse gas emission reduction targets approved by the state board	Connect SoCal Chapters 3 & 5; Technical Reports: Sustainable Communities Strategy, Transportation Conformity
CGC Section 65080(b) (2)(B)(viii): Allow the regional transportation plan to comply with Section 176 of the federal Clean Air Act (42 U.S.C. Sec. 7506)	Connect SoCal Technical Report: Transportation Conformity
CGC Section 65080(b) (2)(E) The metropolitan planning organization shall conduct at least two informational meetings in each county within the region for members of the board of supervisors and city councils on the sustainable communities strategy and alternative planning strategy.	Connect SoCal Technical Report: Public Participation

TABLE 1 SB 375 Requirements - Continued

Required Element	Reference (2020)
CGC Section 65080(b) (2)(F) Each metropolitan planning organization shall adopt a public participation plan, for development of the sustainable communities strategy and an alternative planning strategy, if any, that includes the following:	Connect SoCal Technical Report: Public Participation
CGC Section 65080(b) (2)(F)(i): Outreach efforts to encourage active participation of a broad range of stakeholder groups in the planning process, consistent with the agency's adopted Federal Public Participation Plan, including, but not limited to, affordable housing advocates, transportation advocates, neighborhood and community groups, environmental advocates, home builder representatives, broad-based business organizations, landowners, commercial property interest, and homeowner associations.	Connect SoCal Technical Report: Public Participation
CGC Section 65080(b) (2)(F)(ii): Consultation with congestion management agencies, transportation agencies, and transportation commissions.	Connect SoCal Technical Report: Public Participation
CGC Section 65080(b) (2)(E)(iii): Workshops throughout the region to provide the public with the information and tools necessary to provide clear understanding of the issues and policy choices. At least one workshop shall be held in each county in the region. For counties with a population greater than 500,000, at least three workshops shall be held. Each workshop, to the extent practicable shall include urban simulation computer modeling to create visual representation of the sustainable communities strategy and the alternative planning strategy.	Connect SoCal Technical Report: Public Participation
CGC Section 65080(b) (2)(F)(v): At least three public hearings on the draft sustainable communities strategy in the regional transportation plan and alternative planning strategy, if one is prepared. If the metropolitan transportation organization consists of a single county, at least two public hearings shall be held. To the maximum extent feasible, the hearings shall be in different parts of the region to maximize the opportunity for participation by members of the public throughout the region.	Connect SoCal Technical Report: Public Participation
CGC Section 65080(b) (2)(F)(vi): A process for enabling members of the public to provide a single request to receive notices, information and updates.	Connect SoCal Technical Report: Public Participation
CGC Section 65080(b) (2)(G) In preparing a sustainable communities strategy, the metropolitan planning organization shall consider spheres of influence that have been adopted by the local agency formation commissions within its region.	Connect SoCal Technical Reports: Demographics and Growth Forecast, Sustaianble Communities Strategy
GC Section 65080(b) (2)(H) Prior to adopting a sustainable communities strategy, the metropolitan planning organization shall quantify the reduction in greenhouse gas emissions projected to be achieved by the sustainable communities strategy and set forth the difference, if any, between the amount of that reduction and the target for the region established by the state board.	Connect SoCal Chapter 5 and Technical Reports: Performance Measures and Sustainable Communities Strategy
CGC Section 65080(b) (2)(K) Neither a sustainable communities strategy nor an alternative planning strategy regulates the use of land, nor, except as provided by subparagraph (J), shall either one be subject to any state approval. Nothing in a sustainable communities strategy shall be interpreted as superseding the exercise of the land use authority of cities and counties within the region. Nothing in this section shall be interpreted to limit the state board's authority under any other provision of law. Nothing in this section shall be interpreted to authorize the abrogation of any vested right whether created by statute or by common law. Nothing in this section shall require a city's or county's land use policies and regulations, including its general plan, to be consistent with the regional transportation plan or an alternative planning strategy. Nothing in this section requires a metropolitan planning organization to approve a sustainable communities strategy that would be consistent with Part 450 of Title 23 of, or Part 93 of Title 40 of, the Code of Federal Regulations and any administrative guidance under those regulations. Nothing in this section relieves a public or private entity or any person from compliance with any other local, state, or federal law.	Connect SoCal Chapter 3 and Sustainable Communities Strategy Technical Report

Source: SCAG

one new unit built for every 3.36 persons added to the region. Another trend of recent housing permitting has been the increased share of multifamily units being developed. Overall, the average share of new multifamily development has been 54 percent of all new housing permits in recent years (Construction Industry Research Board), in comparison to an average of about 22 percent in the mid-1990s (U.S. Department of Housing and Urban Development). However, single-family development remains prevalent in more suburban parts of the region, especially in Riverside County.

EMERGING TRENDS

DEMOGRAPHICS

Between 2016 and the Connect SoCal horizon year of 2045, the region will grow by 3.7 million people. This new population and other anticipated shifts will create a region that looks different in the future than it does today. One aspect of this change is the aging population. Seniors, 65 and older, will comprise nearly 60 percent of the region's increase in population over this period. This growing aging population raises the questions for both how housing needs may change as well as transportation needs and services for this demographic. Another prominent trend emerging in the region is the declining natural population increase due to a decreased birth rate. This means that an increased share of the population growth will occur from domestic and international immigration.

ACCESSORY DWELLING UNITS

Accessory dwelling units (ADUs) is a term used to broadly describe secondary units on single family properties, such as granny flats, in-law units or backyard cottages. In 2017, state legislation took effect which gave local jurisdictions more flexibility for allowing the building of ADUs (Senate Bill 1069, Assembly Bill 2299 and Assembly Bill 2406). ADUs provide an opportunity to increase local affordable housing stock or provide a source of income for homeowners, among other benefits. Local governments adopt ordinances to specify ADU development policy and guidelines such as minimum lot size. Local jurisdictions within Southern California have seen an increase in application for ADU permits. For the development of this Sustainable Communities Strategy, there was not sufficient data to project ADU development trends across the region, but ADUs will likely provide thousands of units within the region over the 25-year time horizon of the plan. It is also not yet known if these ADUs will be located in more walkable, transit served neighborhoods that can help to reduce overall VMT or within more auto-oriented single family housing areas.

PROJECT LEVEL MITIGATION

In 2013, Senate Bill 743 (SB 743) was passed which amends California Environmental Quality Act (CEQA) guidelines to provide an alternative to evaluating projects in California by the impact on level of service (LOS). Subsequent guidance on SB 743 has established VMT metrics for evaluating new projects and goes into effect July 1, 2020. This new evaluation measure will necessitate the use of project level VMT mitigation. Though this is still a relatively new process and the challenges of demonstrating project level VMT mitigation are unknown, this process could create opportunities to avoid regional VMT increases.

Although not directly addressing VMT mitigation, new greenfield developments in Los Angeles County such as Newhall Ranch are planning to implement strategies to reduce project-related greenhouse gas emissions. These strategies include:

- Equip all residences with electric vehicle (EV) charging equipment
- EV purchase subsidies
- Public EV charging spaces
- Full Net Zero Energy (NZE) for all buildings
- Provide subsidies for neighborhood electric vehicles (NEVS) and electric bikes

2016 RTP/SCS PROGRESS

LOCAL PLANNING AND IMPLEMENTATION

Since the 2016 RTP/SCS, several local jurisdictions have updated local policies and adopted new general or specific plans. At least 58 jurisdictions have updated one or more elements of their general plan since 2012.

With the development of each SCS, SCAG engages one-on-one with local jurisdictions early in the planning process to identify on-the-ground conditions related to land use, resource areas, transportation infrastructure and locally anticipated growth.This outreach effort, called SCAG's Bottom-Up Local Input and Envisioning Process, also identifies sustainability best practices and land use policies established by local jurisdictions through a Local Input Survey. For Connect SoCal, over 55 percent of Southern California's 197 local jurisdictions responded to the Local Input Survey. SCAG found that local jurisdictions are incorporating, or are already reflecting SCS strategies within local plans. The information below reflects results from the Local Input Survey as part of the development of the SCS and does not necessarily reflect the progress made by all 197 jurisdictions:

- 80 percent of respondents have adopted General Plans that include SCS Strategies
  - 87 jurisdictions reported that they have implemented Infill Development strategies in their local plans.
- 90 percent of respondents have adopted Zoning Codes with SCS Strategies
  - 91 jurisdictions reported that they have implemented Accessory Dwelling Units strategies.
- 58 percent of respondents offer incentives for infill development
  - 56 jurisdictions offer Density Bonus.
- 75 percent of respondents include sustainable Parking Strategies, like parking maximums
  - 77 jurisdictions have implemented additional Bicycle Parking.
- 94 percent of respondents include sustainable Transportation Strategies
  - 87 jurisdictions have implemented a Bicycle Master Plan.
- 74 percent of respondents have implemented Travel Demand Management strategies
  - 61 jurisdictions offer Ridesharing and Matching Incentives.

MAJOR TRANSPORTATION PROJECTS

There have been a number of notable projects completed since the 2016 RTP/SCS was adopted including but not limited to:

- Los Angeles County: Metro Expo Line Extension added seven additional stops, reaching from Downtown Los Angeles to the City of Santa Monica (2016)
- Riverside County: South Perris Metrolink Extension (2016)
- San Bernardino County: San Bernardino Transit Center (2017)
- Orange County: Two segments of the OC Loop, a 66-mile active transportation network, were completed in the City of Brea (2018) and City of Orange (2017)
- Imperial County: Imperial Transit Park (2019)
- Ventura County: Gold Coast Transit launched mobile ticketing app (2017)

These projects help to provide more alternatives to single occupant vehicle use and can help to reduce regional greenhouse gas emissions. More details on additional projects can be found in the Transit, Passenger Rail and Active Transportation Technical Reports.

TABLE 2 SCAG Sustainable Planning Grants

Program Year	Applicant	County	Project
2016	Anaheim	Orange	Center City Corridors Plan
2016	Baldwin Park	Los Angeles	Go Human Bike-Friendly Business Program
2016	Buena Park	Orange	Go Human
2016	Burbank	Los Angeles	Golden State Implementation Study
2016	Carson	Los Angeles	Neighborhood Mobility Plan
2016	Chino	San Bernardino	Go Human
2016	City of Los Angeles	Los Angeles	Los Angeles Safe Routes to School
2016	Claremont	Los Angeles	Claremont Locally Grown Power
2016	Colton	San Bernardino	South Colton Revitalization Plan
2016	Commerce	Los Angeles	Safe Routes to School Plan/Active TransportationPlan
2016	Corona	Riverside	Climate Action Plan Update
2016	Costa Mesa	Orange	Go Human
2016	Culver City	Los Angeles	Go Human
2016	Duarte	Los Angeles	Town Center Traffic Calming Plan
2016	El Monte	Los Angeles	Ramona Blvd Complete Street Study
2016	El Monte and South El Monte (Greater El Monte)	Los Angeles	Go Human Bike-Friendly Business Program
2016	Fontana	San Bernardino	Urban Greening Landscape Plan
2016	Garden Grove	Orange	Safe Routes to School: Phase I Plan
2016	Gateway Cities Council of Governments	Los Angeles	Climate Action Plan Framework
2016	Glendale	Los Angeles	Streetcar Feasibility Study
2016	Gold Coast Transit	Ventura	Building Transit Communities
2016	Imperial County	Imperial	Safe Routes to School Project
2016	Imperial County Trans Commission	Imperial	Imperial Valley Climate Action Plan
2016	La Canada Flintridge	Los Angeles	Go Human

TABLE 2 SCAG Sustainable Planning Grants - Continued

Program Year	Applicant	County	Project
2016	Long Beach	Los Angeles	Destination Uptown
2016	Long Beach Department of Health and Human Services	Los Angeles	Long Beach Safe Routes to School Program
2016	Los Angeles County	Los Angeles	Vision Zero Action Plan
2016	Los Angeles County Department of Public Works	Los Angeles	Walnut Park Go Human Demonstration Project
2016	Los Angeles County Metro	Los Angeles	Union Station Civic Center District
2016	Los Angeles County Planning	Los Angeles	Climate Action and Adapation Plan
2016	Los Angeles Department of Transportation	Los Angeles	Vision Zero Campaign - Media Development
2016	Los Angeles Department of Transportation	Los Angeles	Vision Zero - Community-Based Outreach
2016	Moreno Valley	Riverside	Nason Street Corridor Phase II
2016	Norwalk	Los Angeles	Firestone Corridor/San Antonio Village Vision
2016	Orange County Transportation Authority	Orange	Partnerships With Police
2016	Ontario	San Bernardino	Go Human
2016	Palmdale	Los Angeles	Sustainable Mobility Element
2016	Perris	Riverside	Healthy Cities Challenge
2016	Placentia	Orange	Green Open Space Connections
2016	Rancho Cucamonga	San Bernardino	Empire Yards Specific Plan
2016	Riverside County Department of Public Health	Riverside	Eastern Coachella Valley Safe Routes to Schools
2016	San Bernardino County	San Bernardino	Morongo Basin Active Transportation Plan
2016	San Bernardino County	San Bernardino	Safe Routes to Schools Program
2016	San Jacinto	Riverside	Envision San Jacinto (Go Human)
2016	Santa Ana	Orange	Pedestrian and Bicyclist Education Campaign
2016	Santa Ana	Orange	Sustainability Vision
2016	San Bernardino County Transportation Authority	San Bernardino	Story Maps ("Dynamic Data Stories")
2016	San Bernardino County Transportation Authority	San Bernardino	Redlands Rail Accessibility Plan
2016	San Bernardino County Transportation Authority	San Bernardino	SB County Regional GHG Reduction Plan Update

TABLE 2 SCAG Sustainable Planning Grants - Continued

Program Year	Applicant	County	Project
2016	San Gabriel Valley Council of Governments	Los Angeles	Greenway Network Implementation Plan
2016	San Gabriel Valley Council of Governments	Los Angeles	Arrow Highway Complete Street Demonstration
2016	South El Monte	Los Angeles	South El Monte Open Streets
2016	South Pasadena	Los Angeles	Climate Action Plan
2016	Thousand Oaks	Ventura	Active Transportation Plan
2016	Ventura County	Ventura	Safe Routes to School Master Plan
2016	Vernon	Los Angeles	Transit Service Feasibility Study
2016	West Covina	Los Angeles	Go Human
2016	Wildomar	Riverside	Active Transportation Plan
2016	Western Riverside Council of Governments	Riverside	SB 743 Implementation
2016	Banning	Riverside	Paseo San Gorgonio Feasibility Analysis
2016	Big Bear Lake	San Bernardino	Mountain Mobility Analysis
2016	Riverside	Riverside	City of Riverside Active Transportation Plan
2016	Costa Mesa	Orange	East-West Connector Trail Implementation Plan
2016	Covina	Los Angeles	First/Last Mile Transit Station Planning
2016	Fullerton	Orange	Downtown Fullerton Active Transportation Plan
2016	Indio	Riverside	Bike Share Plan
2016	Irvine	Orange	Strategic Plan for Active Transportation
2016	Los Alamitos	Orange	Los Alamitos Active Transportation Plan
2016	Paramount	Los Angeles	North Paramount Blvd Gateway Plan
2016	Redlands	San Bernardino	Sustainable Mobility Plan
2016	Rolling Hills Estates	Los Angeles	General Plan Update - Sustainability Element
2016	Santa Monica	Los Angeles	Freeway Cap Project
2016	Torrance	Los Angeles	Signage & Wayfinding Plan
2016	Westminster	Orange	Civic Center Specific Plan

TABLE 2 SCAG Sustainable Planning Grants - Continued

Program Year	Applicant	County	Project
2016	Yucaipa	San Bernardino	Freeway Corridor Specific Plan Update
2017	Beverly Hills/Hermosa Beach	Los Angeles	Bicycle/Pedestrian Awareness Campaign
2017	Hermosa Beach/Beverly Hills	Los Angeles	A Safer Prospect
2017	Montclair	San Bernardino	Safe Routes to School
2017	Montclair	San Bernardino	Active Transportation Plan
2017	Palm Springs	Riverside	Safe Routes to School
2017	San Bernardino	San Bernardino	Active Transportation Plan
2017	San Gabriel and La Puente	Los Angeles	Safe Routes to School
2017	SCAG	N/A	Disadvantaged Communities Active Transporation Plans
2017	Soboba Band of Luiseno Indians	Riverside	Active Transportation Plan
2018	Anaheim	Orange	Anaheim Electric Vehicle Charging Infrastructure Plan
2018	Artesia	Los Angeles	Electric Vehicle Charging Infrastructure Development Plan
2018	Baldwin Park	Los Angeles	Baldwin Park Electric Vehicle Public Use Charging Station Project
2018	Beaumont	Riverside	Parking Strategies
2018	Culver City	Los Angeles	Culver City Infrastructure Plan for Electric Vehicle Supply Equipment
2018	Fullerton	Orange	Walnut/Truslow/Valencia Avenue Strategy
2018	Glendora	Los Angeles	City of Glendora Citywide Electric Vehicle Charging Station Planning Study
2018	Long Beach	Los Angeles	Long Beach Electric Vehicle Charging Infrastructure Plan
2018	Long Beach	Los Angeles	Long Beach Heat Island Reduction Planning
2018	Los Angeles	Los Angeles	Los Angeles Electric Vehicle Charging Infrastructure
2018	Los Angeles Department of Transportation	Los Angeles	Los Angeles Vehicle Miles Travelled Exchange
2018	Pasadena	Los Angeles	Holly Street Urban Greening and Cool Streets Project
2018	Pasadena	Los Angeles	Lincoln Avenue Corridor Urban Greening and Cool Streets Project
2018	Pico Rivera	Los Angeles	Pico Rivera Electric Vehicle Infrastructure Planning Study

TABLE 2 SCAG Sustainable Planning Grants - Continued

Program Year	Applicant	County	Project
2018	Redlands	San Bernardino	Redlands Electric Vehicle Charging Infrastructure Plan
2018	Rosemead	Los Angeles	Electric Vehicle Charging Infrastructure Plan
2018	San Dimas (San Gabriel Valley Council of Governments, Covina, Diamond Bar, La Puente, Monrovia, La Verne, South El Monte, Walnut)	Los Angeles	San Gabriel Valley Regional Electric Vehicle Charging Infrastructure Planning
2018	San Fernando	Los Angeles	San Fernando Citywide Parking Management Master Plan
2018	San Bernardino County Transportation Authority	San Bernardino	San Bernardino County Regional SB 743 Tool Kit
2018	Temecula	Riverside	SB 743 Implementation Assistance

Source: SCAG

SCAG INITIATIVES

LOCAL PLANNING FUNDING

Since the 2016 RTP/SCS, SCAG has awarded over $17 million in funding to local jurisdictions to plan for more sustainable land use and/or transportation. This has been carried out through three (3) project calls in 2016, 2017, and 2018. Each year varied slightly in its focus and is summarized below, with a summary of all funded projects in **TABLE 2**.

The funding program goals are to provide needed planning resources to local jurisdictions for sustainability planning efforts, develop local plans that support the implementation of the 2016 RTP/SCS, and increase the region's competitiveness for federal and state funds.

In 2016, the Sustainable Planning Grants program was an open call for applications and provided awards to projects in the categories of active transportation, integrated land use and green region initiatives.

In 2017, the Regional Active Transportation Program call for projects funded planning and non-infrastructure projects that promote safety and encourage people to walk and bicycle, and to seed active transportation concepts that provide a preliminary step for future applicants.

In 2018, the Sustainable Communities Program funded preselected project types including Active Transportation Regional Corridors Plans, SB 743 Implementation Assistance, Electric Vehicle Charging Infrastructure Planning and others. A full list of project types can be found on the Sustainability page of SCAG's website.

HQTA PILOT STUDY

One strategy in the 2016 RTP/SCS was the directing of new housing and employment growth near HQTAs. HQTAs feature frequent transit service intervals of 15 minutes or less during peak commute periods or major transit stations and are located in communities throughout the SCAG region.

To help implement this strategy, SCAG invited eligible communities to apply for the HQTA Analysis Pilot Project. SCAG then selected five cities and funded five pilot project sites to develop HQTA Vision Plans: Oxnard, El Monte, Riverside, San Bernardino and Santa Clarita.

The Vision Plans integrate land use and transportation strategies, identify active transportation improvements, suggest redevelopment approaches and specify implementation plans that will enable those five communities to take full advantage of their transit stations. An overarching goal has been to develop plans that support reduction of greenhouse gas emissions and Vehicle

Miles Traveled. Other goals include promoting higher-density development and implementation of more active transportation projects within the area surrounding the transit stations.

Each final Vision Plan includes a number of resources to help advance development in the station area and thereby implement the SCS at a local level as well as an "HQTA Toolkit" that can be used to advance the strategy within other areas too.

CONNECT SOCAL SCENARIOS

SCENARIO OUTREACH

To address challenges in the region and formulate strategies to plan for future growth, SCAG relied on input from several different stakeholder groups and outreach efforts. An overview of these efforts can be found below, and further information can be found in the Public Participation and Consultation Technical Report.

ONE-ON-ONE ENGAGEMENT WITH JURISDICTIONS

A key, formative step in the development of Connect SoCal was the generation of a forecast of regional and county level growth in collaboration with expert demographers and economists on Southern California. Early in the Connect SoCal planning process, SCAG hosted a Panel of Experts to determine likely regional and county level growth from 2016 to 2045 in 2017. To develop a base forecast of growth at the town and city levels, SCAG met one-on-one with all 197 local jurisdictions to establish a database of land use, resource areas, locally anticipated growth patterns and transportation conditions as part of the Bottom-Up Local Input and Envisioning Process. This outreach with jurisdictions helped SCAG identify opportunities and barriers to future development. Further, input received on anticipated growth patterns (i.e., "locally envisioned growth") fed directly into the "Existing Plans – Local Input" scenario, and helped the region understand where we are expected to grow based on current local plans and policies. After a year-long engagement effort with all 197 jurisdictions, over 80 percent of SCAG's 197 jurisdictions provided feedback on the forecast of future growth. Overall, 90 percent of jurisdictions provided feedback on one or more data elements, representing about 94 percent of the region's residents. This information, particularly the growth and land use datasets, provides a critical input to the development of SCAG's SCS and is included in the 'Data and GIS maps' section.

One of the major takeaways from this process was that a principal impediment to growth for local jurisdictions is lack of viable space and infrastructure to accommodate new residents. Available land capacity, historical trends, market conditions, and economic constraints also factored into jurisdiction's challenges in accommodating future growth.

SUSTAINABLE COMMUNITIES WORKING GROUP

In May 2018, SCAG launched the Sustainable Communities Working Group as a forum to discuss sustainability policies and strategies with local stakeholders. This group consists of staff from member jurisdictions, transit agencies, planning consultants as well as non-profit advocacy groups and has met four times since May 2018. Feedback from this group and other Connect SoCal Working Groups was used to inform initial scenario development principles and is the foundation for refining land use strategies and policies for inclusion in the plan. Some takeaways from this group include: identification of common barriers to sustainable development such as funding and 'NIMBYism'; the need for more focus on job-housing fit solutions; the need for coordination and support on emerging transportation technologies; support for sustainable development solutions for existing suburban communities; and the challenge of providing sufficient affordable housing.

COMMUNITY BASED ORGANIZATION PARTNERS

SCAG partnered with 18 community based organizations (CBOs) to help increase the diversity of perspectives that are included in the development

of Connect SoCal. In short, these partners helped to promote the public Connect SoCal Workshops as well as convey their own stakeholder's input for focused discussions on the issues and strategies in Connect SoCal. Input resulting from the assistance of these CBO partners indicated that many communities are concerned about housing availability and affordability, limited alternative transportation options, displacement and access to destinations, the effects of increased greenhouse gas emissions, and the risks associated with climate change.

CONNECT SOCAL WORKSHOPS

In May and June of 2019, SCAG held 28 workshops across the region and one telephone town hall to solicit input from the general public about the issues and policy choices facing the region. From this public engagement initiative, residents expressed concern for safety and homelessness in their communities, an overall lack of housing affordability, issues with traffic congestion, a desire for more transit accessibility and service, and concerns on air quality. More details can be found in the Public Participation and Consultation Technical Report. The results from attendees and the survey helped to inform the development of Connect SoCal.

PUBLIC SURVEY

To solicit more specific input for the development of Connect SoCal, staff prepared a survey that examined respondent's current behavior as well as preferences and priorities. The survey was used in multiple settings including the workshops, CBO community meetings, and in-person intercepts. In total, SCAG collected over 4,000 completed surveys that highlighted specific issues and direction for the final SCS development. More details can be found in the Public Participation and Consultation Technical Report. Generally, the results of the survey indicated support for SCAG's direction including more growth near transit and job centers, the need to prioritize infill and redevelopment within existing cities to accommodate future growth, alongside concerns to avoid overcrowding or gentrification within existing communities. This points to the need for nuanced policy to implement more sustainable development in a way that respects and enhances local communities.

SCENARIO DEVELOPMENT METHODOLOGY

SCAG uses scenario planning to develop, evaluate, and consider distinct pathways the region could take to meet the goals of Connect SoCal. Building on early input from stakeholders, SCAG formed five unique scenarios to illustrate alternative representations of the region in 2045. Each scenario is made up of a unique combination of land use and transportation strategies to envision Southern California's potential future. As directed by SCAG's Regional Council in October 2017 (as part of the Bottom-Up Local Input and Envisioning Process Guiding Principles), "SCAG will develop multiple scenarios that explore a range of land use and transportation strategies. These scenarios will illustrate the impact of distinctive policy and investment choices, and will be compared to the "base case" [i.e. local conditions] in order for the Regional Council and Policy Committees to evaluate the merits of regional decisions for the Plan".

This section summarizes the processes utilized in the development and analysis of Connect SoCal's scenarios. It provides an overview of the primary components of each of the five scenarios as well as the primary "rules" and methods used to develop them.

In order to establish comparable scenarios, common assumptions were used for all scenarios of those variables that cannot be influenced by regional investments or strategies, for example:

- Auto Operating Costs
- Regional Household, Population and Jobs growth
- Plan Base Year: 2016
- Plan Horizon Year: 2045

SCAG developed five scenarios that range in approach, including one reflecting "locally envisioned growth" as conveyed by local jurisdictions (referred to as "Existing Plans –Local Input" in the public outreach process) and the "Trend" scenario reflecting a continuation of recent growth patterns. The designs, priority growth areas (PGAs) and constraints were based on initial stakeholder

feedback from SCAG's Sustainable Communities and other working groups, direct interviews with Councils of Governments and feedback from local jurisdictions. The transportation strategies and investments that were paired with each scenario are based on project lists submitted from County Transportation Commissions and other regional initiatives.

SCAG's methodology for the three scenarios not reflecting "locally envisioned growth" or "Trend" conditions included identifying areas within the region where directing future growth could enable GHG reductions by enabling shorter trips or use of alternative modes. There were also areas identified to avoid placement of future growth, including absolute constraints such as preserved land where growth has been reduced and redirected as well as variable constraints where growth could be avoided if possible to meet Connect SoCal goals such as "promote conservation of natural and agricultural lands and restoration of critical habitats." Please see the Natural and Farm Lands Conservation Technical Report for more information.

Once these growth priority areas and growth constraint areas were developed, SCAG identified a number of consistent principles for the scenarios.

These include:

- Include all entitled projects and phasing, as conveyed by jurisdictions.
- Refer to specific plan land use designation, where applicable, for growth allocation.
- In areas without a specific plan, refer to general plan land use for growth allocation.
- Do not exceed general plan or specific plan capacity.
- Maintain jurisdictional control totals for population and household as provided by local input (except to vary by 5-10 percent within the unconstrained scenario, "Accelerated Tomorrow").

The growth allocation then followed this process:

- Apply growth within priority areas.
- Avoid growth in absolute constraint areas.
- Avoid growth in variable constraint areas where possible.
- For all scenarios, the spillover growth (that cannot be allocated in priority areas) should be directed as follows:
  - First, within one mile of park and ride locations
  - Second, spill over into the top 20 percent scoring Neighborhood Mobility Area transportation analysis zones for that county
  - Third, within jurisdictional boundaries, prioritizing vacant or infill locations as verified during the local input process
  - And finally, within spheres of influence, where feasible

SCENARIO DEVELOPMENT PRIORITY GROWTH AREAS

The following PGAs were used during the scenario development and growth allocation process to direct future growth of employment and households. These priority areas were selected and developed based on their ability to support potential mode shift and shortened trip distances.

TRANSIT PRIORITY AREAS (TPAS)

An area within one-half mile of a major transit stop that is existing or planned. This includes an existing rail or bus rapid transit station, a ferry terminal served by 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. (Based on CA Public Resources Code Section 21099 (a)(7) and CA Public Resources Code Section 21064.3)

HIGH QUALITY TRANSIT AREAS (HQTAS)

Generally a walkable transit village or corridor, consistent with the adopted RTP/SCS, and is within one half-mile of a well- serviced transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours. Freeway transit corridors with no bus stops on the freeway alignment do not have a directly associated HQTA. A major transit stop is defined as a site containing 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 (based on CA Public Resource Code Section 21064.3)). A high-quality transit corridor (HQTC) is defined as a corridor with fixed route bus service containing service intervals no longer than 15 minutes during peak commute hours (based on CA Public Resources Code Section 21155(b)). SCAG's methodology for identifying HQTCs is included as an appendix to the Transit Technical Report.

LIVABLE CORRIDORS

This arterial network is a subset of the high quality transit areas based on level of transit service and land use planning efforts, with a few additional arterials identified through corridor planning studies funded through the Sustainability Planning Grant program (currently the Sustainable Communities Program).

NEIGHBORHOOD MOBILITY AREAS (NMAS)

Areas with high intersection density (generally 50 intersections per square mile or more), low to moderate traffic speeds and robust residential retail connections which can support the use of Neighborhood Electric Vehicles or active transportation for short trips.

JOB CENTERS

Areas with significantly higher employment density than surrounding areas. These were identified at fine (1/2 km), medium (1 km) and coarse (2 km) scales to capture locally significant job centers. In total, over 70 subareas throughout the region are identified as having peak job density.

SPHERES OF INFLUENCE

Existing or planned service areas within the planning boundary outside of an agency's legal boundary, and outside of absolute or variable constrained areas (described further in the next section); data for these areas was accessed by SCAG from each county's Local Agency Formation Commission (LAFCO) in 2016.

SCENARIO DEVELOPMENT GROWTH CONSTRAINTS

The growth constraints outlined below are used to articulate where future growth is not encouraged. Absolute constraints reflect areas where growth has been reduced and redirected to achieve Connect SoCal's regional vision. Variable constraints reflect goals of Connect SoCal and were only applied growth when there was not capacity in non-constrained areas per a jurisdictions general plan or specific plans. Although these constraints were used for modeling purposes, for implementation the decision of where to permit growth is determined by each local land use authority.

ABSOLUTE CONSTRAINTS

For the scenario development, growth was not directed into the following areas:

- Military (based on general plan designation, may also be listed as public facility)
- Existing open space (i.e. parks within jurisdictions, designated as "Open Space")
- Conserved land (conservation easements and protected areas)
- Land anticipated to be impacted with a 2 ft. sea level rise
- Tribal Lands
- Unincorporated counties: Agricultural land rated by California Department of Conservation Farmland Mapping and Monitoring Program
  - Prime farmland
  - Farmland of Statewide Importance
  - Unique Farmland
  - Farmland of Local Importance

- No housing in 500 ft. buffer of roadways with more than 100,000 daily vehicles. (This constraint was not carried forward for the final plan development.)
  - Except when overlapping with a TPA, in which case household growth was applied

VARIABLE CONSTRAINTS

Growth will be avoided in following areas, where possible except when constraint conflicts with accommodating the jurisdictional growth total, in the following order:

- Wildland Urban Interface
- Agriculture- Grazing Land
- Agriculture (within incorporated cities)
- 500 year flood plains
- Wildfire prone areas (Calfire Very High Severity: State and Local)
- Natural lands and habitat corridors

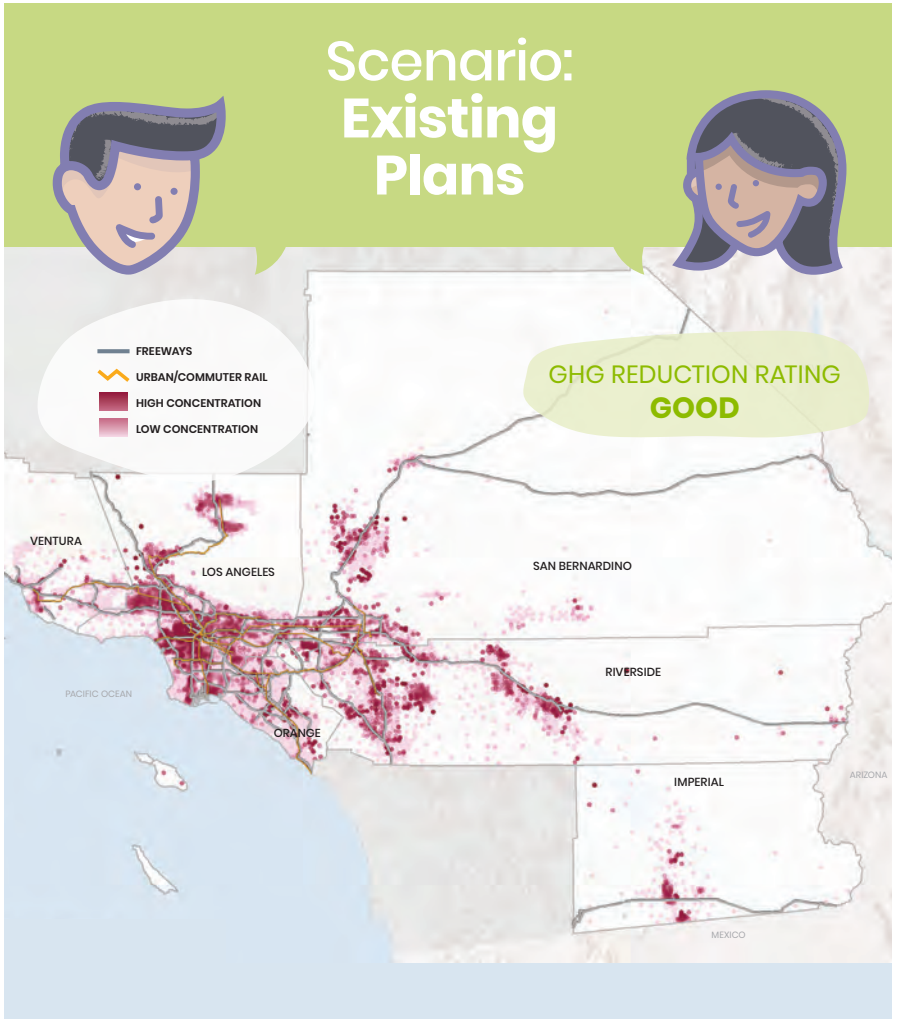
OVERVIEW OF THE SCENARIOS

Each scenario was designed to explore and convey the impact of where the region would grow and how transportation systems would influence that growth. The following are descriptions of the five scenarios that were presented to the regional council, stakeholders, and at public workshops throughout the region in the spring of 2019. The graphics shown herein (**FIGURES 1-4**) were displayed at the public workshops. Comments from those workshops and further technical refinements are reflected in the final Growth Vision for Connect SoCal.

TREND/BASELINE

This scenario reflects current land use trends carried forward into the future and currently funded transportation projects.

FIGURE 1 Regional Growth Distribution for Existing Plans



Source: SCAG

EXISTING PLANS- LOCAL INPUT

This future reflects the land use and growth patterns as submitted to SCAG by local governments for a "bottoms-up approach" to envisioning the region in 2045, as established by the Bottom-Up Local Input and Envisioning Process (**FIGURE 1**). New housing varies throughout the region and includes both lower density single family on the edges of existing communities and increased multifamily development within a few more urban areas. For transportation, this future includes the projects planned by each County Transportation Commission.

NETWORKED DESTINATIONS

In this future, more housing is built near transit stops and new jobs locate in areas with easy access to frequent bus or rail service. Most new homes are duplexes, townhomes, condominiums or apartments, giving families access to more housing options (**FIGURE 2**). Most of the current single-family neighborhoods will remain the same as today. Most people can rely on transit for daily trips, such as getting to school or going to work. People will also have more options to get to and from bus and rail stops, whether they're bicycling, walking or using a ride hailing service like Uber, Lyft or Via. For errands, appointments or trips where transit isn't an option, people will have better access to carshare services like Zipcar, blueLA, or car2go. These services can be a cheaper alternative to owning a car, because users only pay for the vehicle when you need it. For those that still need to drive for most trips, a regional express lane network and increased incentives for carpooling will help reduce congestion.

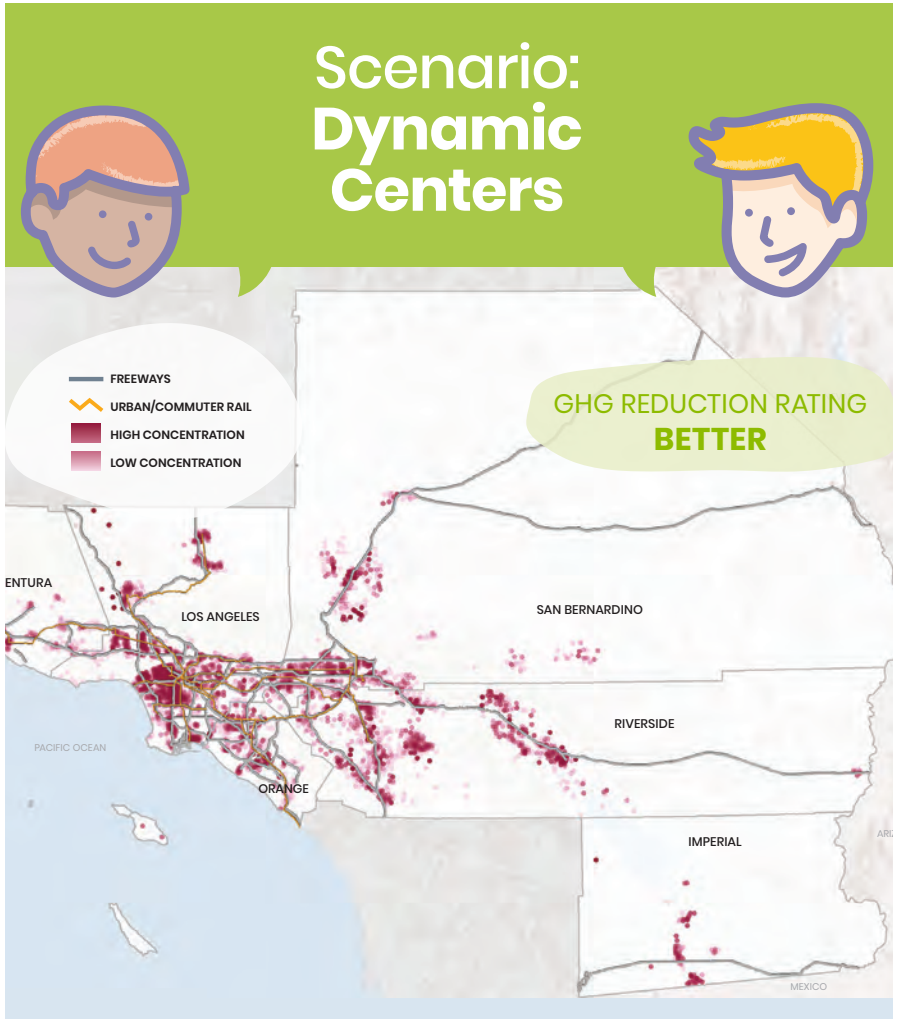
Growth was prioritized as follows:

1. Transit Priority Areas
2. Livable Corridors
3. High Quality Transit Areas
4. Neighborhood Mobility Areas

FIGURE 2 Regional Growth Distribution for Networked Destinations

Source: SCAG

FIGURE 3 Regional Growth Distribution for Dynamic Centers



Source: SCAG

DYNAMIC CENTERS

In this future, we build more housing and locate new jobs in the following areas: existing job centers; near transit stations; and in walkable neighborhoods where homes, jobs, shops, and services are all easily accessible without a car (**FIGURE 3**). Growing in this way can allow for shorter trips because the grocery store, doctors office, or coffee shop is located closer to where people live or work. To get around, people have options beyond driving a personal vehicle. For shorter trips, people will have the choice of using neighborhood bike networks, car share or micromobility services like shared bicycles or scooters. For longer commutes residents will have more incentive to carpool or vanpool thanks to programs offered by your employer. Other longer trips are supported by on-demand services that allow users to hail rides and share vehicles; these services may include microtransit, carshare and citywide partnerships with ride hailing services like Lyft, Via or Uber. For those that choose to drive hot-spots of congestion will be quicker to move through due to cordon pricing and using an electric vehicle will be easier thanks to an expanded regional charging network.

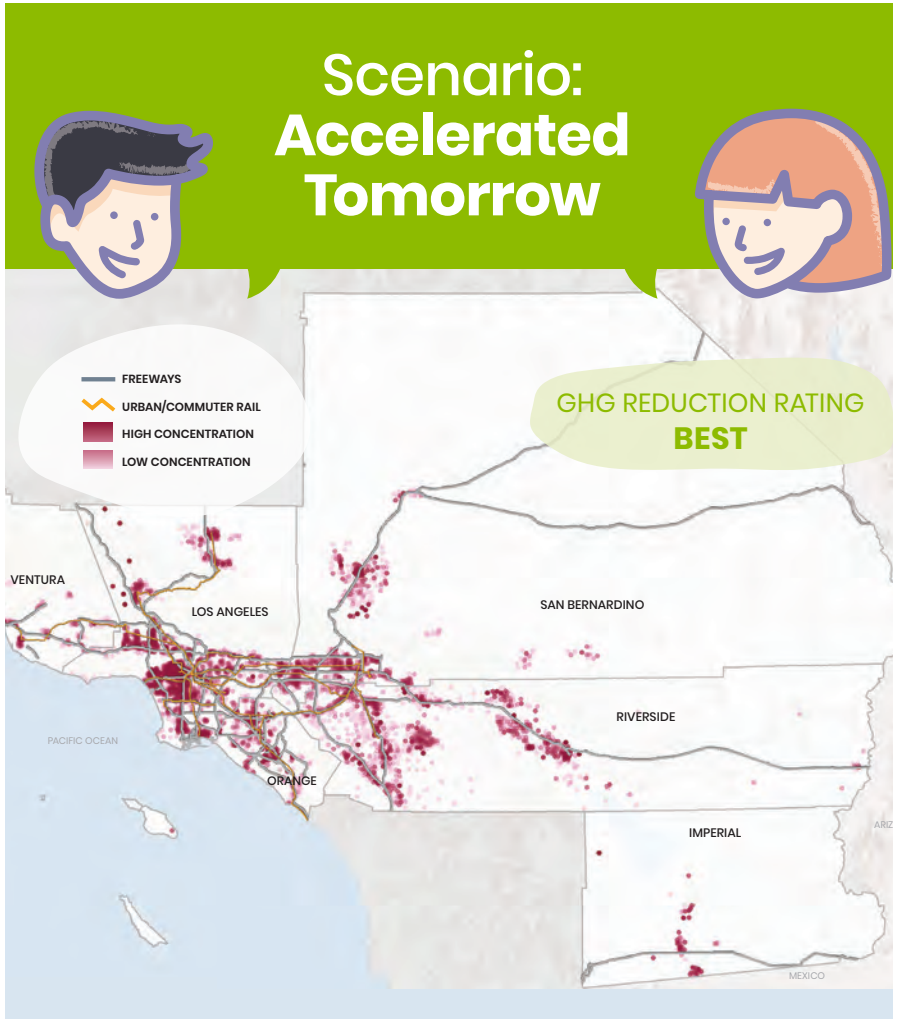
Growth was prioritized as follows:

1. Job Centers
2. Transit Priority Areas
3. Neighborhood Mobility Areas
4. Livable Corridors
5. High Quality Transit Areas

ACCELERATED TOMORROW

In this fiscally unconstrained future, more funding is available to invest in expanded bus and rail networks and there is additional revenue to make existing transit service faster and more reliable (**FIGURE 4**). With the understanding that these investments may make transit areas even more desirable, we deploy a coordinated strategy to help ensure that existing residents benefit from new investments. Growth in these transit-rich areas focuses on providing a variety of housing types that increase the availability of affordable housing options for existing families and newcomers. New

FIGURE 4 Regional Growth Distribution for Accelerated Tomorrow



Source: SCAG

investments in public infrastructure focus on enhancing safety for people walking, bicycling, or rolling, and facilitate community-identified connections between transit, jobs, homes and local destinations. By facilitating growth in a more focused way, pressure to develop on farmland or in open space areas is reduced. More drivers would be able to make the switch to electric vehicles, because additional funding is secured for EV charging infrastructure and local consumer rebates make electric vehicles more accessible.

Growth was prioritized as follows:

1. Transit Priority Areas
2. Livable Corridors
3. Job Centers
4. High Quality Transit Areas
5. Neighborhood Mobility Areas

COMPARATIVE RESULTS OF SCENARIOS

TABLE 3 demonstrates the relative impacts of each of the scenarios.

SUSTAINABLE COMMUNITIES STRATEGIES

Building on these five scenarios and input received from residents through Connect SoCal's outreach engagements, SCAG developed several strategies and tools for Connect SoCal. These policies represent Connect SoCal's Growth Vision and include actions that support GHG reductions and further specify how the SCAG region can implement the plan. The approach for direct GHG reductions is further detailed below. It is important to note that SCAG does not have a direct role in implementing the SCS -- neither through decisions about what type of development goes where, nor what transportation projects are ultimately built. SCAG however works to support local jurisdictions and partnerships in identifying ways to implement the SCS in a way that fits the vision and needs of each local community. Additionally, SCAG can serve as a leader as well as a hub to convene and to find ways to collaborate on broader initiatives.

TABLE 3 Scenario Results Comparison

	Trend/ Baseline	Existing Plans – Local Input	Networked Destinations	Dynamic Centers	Accelerated Tomorrow
Growth Projections	**Projections 2016-2045:** 19% Population Growth, 27% Housing Growth, 20% Job Growth				
	2016 Base Year: 18.8 million population, 6 million households, 8.4 million jobs				
	2016 - 2045 Change: 3.7 million population, 1.6 million households, 1.7 million jobs				
	2045 End State: 22.5 million population, 7.6 million households, 10 million jobs				
Housing Mix	**2016 – 2045 Growth**				
	61% Single Family	45% Single Family	26% Single Family	38% Single Family	23% Single Family
	39% Multifamily	55% Multifamily	74% Multifamily	62% Multifamily	77% Multifamily
	2045 End State				
	56% Single Family	53% Single Family	49% Single Family	51% Single Family	48% Single Family
	44% Multifamily	47% Multifamily	51% Multifamily	49% Multifamily	52% Multifamily
Land Use Pattern Focus	**2016 – 2045 New Housing**				
	8% Urban	9% Urban	8% Urban	9% Urban	8% Urban
	18% Compact	66% Compact	79% Compact	66% Compact	80% Compact
	75% Standard	25% Standard	13% Standard	25% Standard	12% Standard
	2016 – 2045 New Jobs				
	8% Urban	10% Urban	13% Urban	17% Urban	13% Urban
	8% Compact	76% Compact	87% Compact	75% Compact	85% Compact
	75% Standard	25% Standard	13% Standard	25% Standard	12% Standard

TABLE 3 Scenario Results Comparison - Continued

	Trend/ Baseline	Existing Plans - Local Input	Networked Destinations	Dynamic Centers	Accelerated Tomorrow
Fiscal Impacts (cumulative)	Infrastructure Capital				
	$ 29.0 billion	$ 27.4 billion	$ 26.4 billion	$27.1 billion	$26.2 billion
	Operations and Maintenance				
	$ 11.3 billion	$ 10.6 billion	$ 10.0 billion	$ 10.4 billion	$ 10.0 billion
Land Consumption	Greenfield Land				
	100 sq mi	99 sq mi	66 sq mi	62 sq mi	50 sq mi
Building Energy Use (cumulative)	Residential Use				
	9,506 trillion BTU	9,382 trillion BTU	9,359 trillion BTU	9,424 trillion BTU	9,350 trillion BTU
	Commercial Use				
	6,040 trillion BTU	6,035 trillion BTU	6,000 trillion BTU	6,016 trillion BTU	6,001 trillion BTU
Building Water Use (cumulative)	Residential Use				
	56.6 million AF	55.7 million AF	55.3 million AF	55.5 million AF	54.3 million AF
	Commercial Use				
	33.1 million AF	33.0 million AF	33.2 million AF	32.7 million AF	30.8 million AF
Annual Household Costs	Transportation Costs (fuel + auto)				
	$11,461	$11,252	$10,953	$10,951	$10,820
	Utility Costs (energy + water)				
	$2,492	$2,429	$2,417	$2,447	$2,352
Public Health	Respiratory Related Health Costs				
	$ 3,340 million	$ 3,280 million	$ 3,190 million	$ 3,190 million	$ 3,190 million

TABLE 3 Scenario Results Comparison - Continued

	Trend/ Baseline	Existing Plans - Local Input	Networked Destinations	Dynamic Centers	Accelerated Tomorrow
Land Conservation	**Active Farmland and Natural Land Change**				
	- 120,700 acres	- 195,100 acres	- 121,300 acres	- 104,800 acres	- 107,500 acres
	Total Carbon Stock Change*				
	- 589,000 metric tons	- 948,000 metric tons	- 689,000 metric tons	- 573,000 metric tons	- 568,000 metric tons
	Agriculture Production Value Change				
	$ -94.4 million	$ -127.6 million	$ -82.4 million	$ -72.1 million	$ -72.7 million
	High Species Movement Potential Change**				
	- 32,200 acres	- 73,600 acres	- 47,300 acres	- 37,700 acres	- 38,800 acres
	Habitat Degraded***				
	151,080 acres	226,130 acres	141,600 acres	122,940 acres	123,650 acres

**Carbon stock is defined as the quantity of carbon held within a pool (a reservoir of carbon or a system which has the capacity to accumulate or release carbon) and includes both above and below ground*
***Species movement relates to landscape permeability which enables species to move. Changes in landscape type can impact species movement.*
****Sum of acres of habitat degraded for multiple species including amphibians, mammals, birds and others based on the California Wildlife Habitat Relationship system from the California Department of Fish and Wildlife*
Source: SCAG Scenario Planning Model
Note: "Single Family" refers to single family detatched housing units and "Multifamily" refers to single family attached and multifamily housing units

The strategies outlined below were developed through collaboration with regional stakeholders and are intended to be supportive of implementing the SCS. Several are directly tied to supporting related GHG reductions while others support the broader goals of Connect SoCal.

STRATEGIES

FOCUS GROWTH NEAR DESTINATIONS AND MOBILITY OPTIONS

- Emphasize land use patterns that facilitate multimodal access to work, educational and other destinations.
- Focus on a regional jobs-housing balance to reduce commute times and distances, and expand job opportunities near transit and along center-focused main streets.
- Plan for growth near transit investments and support implementation of first/last mile strategies.
- Promote the redevelopment of underperforming retail developments and other outmoded nonresidential uses.
- Prioritize infill and redevelopment of underutilized land to accommodate new growth, increase amenities and connectivity in existing neighborhoods.

- Encourage design and transportation options that reduce the reliance on and number of solo car trips (this could include mixed uses or locating and orienting close to existing destinations).
- Identify ways to "right size" parking requirements and promote alternative parking strategies (e.g. shared parking, smart parking).

PROMOTE DIVERSE HOUSING CHOICES

- Preserve and rehabilitate current affordable housing and prevent displacement.
- Identify funding opportunities for new workforce and affordable housing development.
- Create incentives and reduce regulatory barriers for building context-sensitive accessory dwelling units to increase housing supply.
- Provide support to local jurisdictions to streamline and lessen barriers to housing development that supports reduction of per-capita greenhouse gas emissions.

LEVERAGE TECHNOLOGY INNOVATIONS

- Promote low emission technologies such as neighborhood electric vehicles, shared ride hailing, car sharing, bike sharing and scooters by providing supportive and safe infrastructure such as dedicated lanes, charging and parking/drop-off space.
- Improve access to services through technology- such as telework and telemedicine as well as other incentives such as a mobility wallet.
- Identify ways to incorporate micro-power grids in communities, for example solar energy, hydrogen fuel cell power storage and power generation.

SUPPORT IMPLEMENTATION OF SUSTAINABILITY POLICIES

- Pursue funding opportunities to support local sustainable development implementation projects that reduce greenhouse gas emissions.
- Support statewide legislation that reduces barriers to new construction and that incentivizes development near transit corridors and stations.
- Support local jurisdictions in the establishment of EIFDs, CRIAS, or other tax increment or value capture tools to finance sustainable infrastructure and development projects including parks and open space.
- Work with local jurisdictions/communities to identify opportunities and assess barriers for implementing sustainability strategies.
- Enhance partnerships with other planning organizations to promote resources and best practices in the SCAG region.
- Continue to support long range planning efforts by local jurisdictions.
- Provide educational opportunities to local decisions makers and staff on new tools, best practices and policies related to implementing the Sustainable Communities Strategy.

PROMOTE A GREEN REGION

- Support development of local climate adaptation and hazard mitigation plans as well as project implementation that improves community resiliency to climate change and natural hazards.
- Support local policies for renewable energy production, reduction of urban heat islands and carbon sequestration.
- Integrate local food production into the regional landscape.
- Promote more resource efficient development focused on conservation, recycling and reclamation.
- Preserve, enhance and restore regional wildlife connectivity.
- Reduce consumption of resource areas, including agricultural land.
- Identify ways to improve access to public park space.

GHG REDUCTION APPROACH

ARB must evaluate Connect SoCal's aggregated strategies, measures and policies that help reduce per-capita GHG emissions. The following are the strategies that SCAG has included and quantified in order to demonstrate the region's ability to meet the targets. Please see the noted respective technical report for further details on each.

- Congestion Pricing (Congestion Management Technical Report and Transportation Finance Technical Report)
- Express Lane Pricing (Transportation Finance Technical Report)
- Improved Bike Infrastructure (Active Transportation Technical Report)
- Infill development and increased density near transit infrastructure (Discussed in this Technical Report)
- Mileage-Based User Fee (Transportation Finance Technical Report)
- New Transit Capital Projects (Transit Technical Report)
- Shorter trips through land use strategies such as jobs/housing balance (Discussed in this Technical Report)
- Transportation Demand Management (Congestion Management Technical Report)
- Job Center Parking Strategy (e.g. parking pricing in select centers) (See "Local Road Charge Program" in Transportation Finance Technical Report and discussed in this Technical Report)
- Bike Share and Micromobility (Emerging Technology Technical Report)
- Carshare (Emerging Technology Technical Report)
- Co-working at strategic locations (Congestion Management Technical Report)
- Increased Electric Vehicle Charging Infrastructure (Emerging Technology Technical Report)
- Electric Vehicle Incentives(Emerging Technology Technical Report)
- Improved Pedestrian Infrastructure (Active Transportation Technical Report)
- Multimodal Dedicated Lanes (Transit Technical Report)
- Safe Routes to School (Active Transportation Technical Report)
- Transit/TNC Partnership Program (Emerging Technology Technical Report)
- Increased Average Vehicle Ridership in Job Centers (Congestion Management Technical Report)
- Parking Deregulation in certain Priority Growth Areas (Discussed in this Technical Report)

These strategies, measures and policies collectively result in approximately 14 percent per-capita GHG reductions using the Activity Based Model, and 5 percent reductions using off-model methodologies. SCAG collaborated with ARB throughout 2018 and 2019 as SCS Program and Evaluation Guidelines were updated by ARB in response to more ambitious per-capita GHG reduction targets. This collaboration was essential to ensuring Connect SoCal's Growth Vision aligns with state expectations. The final technical methodology was submitted to ARB after adoption of Connect SoCal.

One aspect of implementing Connect SoCal that can run counter to GHG reduction is the induced demand from new roadway capacity projects. According to the 'Technical Advisory on Evaluating Transportation Impacts in CEQA' report released in 2018 by the Governor's Office of Planning and Research (OPR), induced travel occurs where roadway capacity is expanded in an area of existing or projected future congestion. The report describes that the proper use of a travel demand model may capture the effects of induced travel, including the number of trips, trip length or VMT, and change in mode share for automobiles. With feedback looping procedure, SCAG travel demand model has shown appropriate effects of short-term induced demand.

For long-term induced travel, SCAG applies an elasticity approach based on the framework of "Induced Travel Calculator" developed by UC Davis. Since long-term induced demand from new roadway enhancement is related to residential relocation, SCAG uses the increase of roadway capacity in lane miles between 2016 (base year) and 2025 to estimate long-term effect that will happen in 2035. The induced demand analysis includes interstate freeway (FHWA Class

1), other freeway and expressway (FHWA Class 2), and principle arterial (FHWA Class 3). The increase of toll roads or high-occupancy-toll (HOT) lanes are excluded. The long-term induced demand calculation uses an elasticity of 1.0 for lane additions to the Class 1 facilities, and 0.75 for lane additions to the Class 2 and 3 facilities.

According to the description of Induced Travel Calculator, "these longer-term elasticities account for both short-run shifts in travel (as people take advantage of the increased capacity and travel speed by driving more) and longer-run dispersion of residential and business location and development." Since regional travel demand model has accounted for short-run induced VMT, to avoid double count, longer-run induced VMT should be calculated that is long-term elasticity minus short-run elasticity.

Based on SCAG model sensitivity test, short-run VMT elasticity range w.r.t. freeway capacity is 0.29 – 0.4. SCAG uses average value 0.35 as short-run elasticity for freeway capacity (Class 1 and 2). Based on a test with capacity improvement to principle arterials, short-run VMT elasticity w.r.t. arterial capacity is 0.32-0.48. SCAG uses average value 0.4 as short-run elasticity for arterial (Class 3). As a result, longer- run VMT elasticity is for three facility classes: (a) 1.0 – 0.35 = 0.65 for interstate freeway (Class 1); (b) 0.75 – 0.35 = 0.40 for other freeway (Class 2); (c) and 0.75-0.4 = 0.35 for principle arterial (Class 3). SCAG suggests to lower down the 0.75 long-term elasticity for principle arterial in the future.

The calculation result shows that VMT for light-duty and medium-duty vehicles increases by 2,962,900 in 2035, which leads to the increase of GHG emissions by 1,411.6 tons per day, or a 0.56 percent increase for per capita GHG emission from 2005. This is reflected in the collective GHG emission reduction result calculated above.

GROWTH VISION

Connect SoCal's Growth Vision aims to increase mobility options and reduce the need for residents to drive by locating housing, jobs and transit closer together. To help the region achieve sustainable outcomes, Connect SoCal's Forecasted Development Pattern focuses growth within jurisdictions near destinations and mobility options, in line with the policies and strategies of the Growth Vision. This is reflective of Connect SoCal's Core Vision, built upon and expanding land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth and development pattern.

FORECASTED DEVELOPMENT PATTERN

The Forecasted Regional Development Pattern illustrated in **EXHIBIT 1** carries forth many principles from the initial scenario development and ensures that growth is feasible. The map shows where the majority of growth, 95 percent, would occur during the timeframe of the plan based on the Connect SoCal Regional Growth Forecast. The remaining growth during the timeframe of the plan would occur in unincorporated county areas outside of spheres of influence. Over 60 percent of household growth and 70 percent of employment growth would occur within the PGAs. Following the principles of center-focused placemaking and neighborhood-scale mobility, this forecasted regional development pattern seeks to focus growth in PGAs outlined above including: near existing and planned transit, within existing job centers, in communities with existing and planned infrastructure to support more walkability and use of alternative transportation modes, and in areas identified for jurisdictional expansion (i.e. spheres of influence). Following the scenario development methodology, the Forecasted Regional Development Pattern brings forward data elements provided by jurisdictions in 2018 during the Bottom-Up Local Input and Envisioning Process - including entitled projects and phasing, reflects "locally envisioned" jurisdictional growth totals detailed in the Demographics and Growth Forecast Technical Report and allocates growth within existing planned maximum densities as conveyed by local jurisdictions. To protect our region's natural assets and reduce future risks from a changing climate, growth through 2045 can be reduced in and redirected from constrained areas (e.g. very high severity fire risk areas, farmland, protected open space, wildlife corridors, areas at risk for near-term sea level rise, flood hazard areas, etc.). The anticipated outcomes of this Forecasted Development Pattern can be seen in **TABLE 4**.

IMPLEMENTING CONNECT SOCAL GROWTH VISION

While coordinating land-use and transportation strategies can yield beneficial outcomes, strategy implementation is challenging in a region where authority is divided among multiple agencies. Connect SoCal will ultimately illuminate pathways to achieving regional goals and inspire, rather than dictate, local actions and policies. At the neighborhood and project level, decisions about how growth will occur are made by each local jurisdiction and development activity will reflect local market conditions; Connect SoCal does not supersede local jurisdiction authority or decisions on future development, including entitlements and development agreements. Additionally, every year local jurisdictions update general plans and adopt new specific plans and ordinances that can influence how and where development occurs. SCAG has an opportunity to track the progress of SCS implementation every four years through one-on-one engagement with jurisdictions and assess whether the broad regional strategies have achieved traction at the local level.

Efforts to implement the previous SCSs has been evident in the progress of locally adopted plans, as previously evidenced through SCAG's Local Input Survey which increasingly reflect more SCS strategies. For example, Connect SoCal's Forecasted Development Pattern prioritizes growth near high quality transit (TPA and HQTA) in order to encourage infill development and increase density near transit. The region is already seeing this occur through recent increased growth in these areas and supportive local policies. For example, over 60 jurisdictions offer infill incentives such as density bonuses.

Other SCS land use strategies that enable short trips can occur through a range of methods and scales. Mixed use land use planning enables destinations to be located close to residents such as in Neighborhood Mobility Areas, and regional jobs housing balance enables workers to have shorter daily commutes as by increasing housing development near existing and future Job Centers.

One aspect of land use that influences travel behavior is the availability and cost associated with parking. For example, employees with free parking are much more likely to drive to work alone than those who are charged for parking on a daily basis. "Free" parking actually represents a substantial maintenance and construction cost for businesses and results in higher vehicles miles traveled for employees. Suitably priced parking in a selection of proposed Job Centers could result in neighborhood economic benefits, reduced costs to businesses, as well as an increase in the use of carpool and transit modes. Local jurisdictions have already adopted a range of parking strategies, over 80 jurisdictions have some sort of parking strategy reflected in their local plans. Over 50 jurisdictions have implemented waiving or reducing minimum parking requirements and 14 jurisdictions have implemented parking maximums in designated areas. SCAG's 2018 Sustainable Communities Program provided targeted support to local jurisdictions under the project type "Parking Pricing, Reduction, and Management Strategies". These initial projects will provide lessons learned for other local jurisdictions and provide the initial steps in implementing the parking reduction and pricing related strategies of Connect SoCal.

Complementing Connect SoCal's PGAs are the constrained lands identified in the scenario development stage from which future growth is diverted. These vary in their protection status. Currently, over 60 percent of Local Input Survey responding jurisdictions have conservation strategies in place (e.g. development impact fees) and 15 local jurisdictions reported having mitigation banks. While some absolute constraint areas, like conserved land, have certain protections from future development in place, conserving other areas will be dependent on local policies or voluntary actions. See the Natural and Farm Lands Conservation Technical Report for details on how SCAG and other local jurisdictions and conservation groups are taking action in the region.

SCAG will continue to fund and support cities in updating plans and other projects through the Sustainable Communities Program in order to facilitate the implementation of Connect SoCal. Past funding rounds is discussed above in the "SCAG Initiatives" section. The Core Vision and Key Connections found in Chapter 3 of the Connect SoCal main document highlight the additional ways in which SCAG will be supporting jurisdictions in the implementation of Connect SoCal. These efforts are in addition to the transportation infrastructure and programs documented in the Project List Technical Report.

Beyond land use policy and transportation investments, Connect SoCal also depends on the enactment of policies to further the goals of the plan. For

example, in addition to SCAG's 2018 Transportation Demand Management (TDM) strategic plan, the recent passage of Assembly Bill 2548 authorized Metro to require employers with 50 or more workers to offer employee commute benefits, including transit passes and vanpool charges. This law extended existing TDM requirements to a large portion of the region that had previously only applied to employers of 250 workers or more. Extending similar TDM policies across the region can help to improve the average riders per vehicle in trips to job centers.

Another emerging policy in the SCAG region is congestion pricing. Most recently, the City of Los Angeles Mayor's Executive Directive No. 25 from February 2020 directs the City of Los Angeles's Department of Transportation to coordinate with Metro to develop a congestion pricing pilot in order to improve mobility and air quality and reduction of greenhouse gas emissions. (See the Congestion Management Technical Report and Transportation Finance Technical Report for more discussion on congestion pricing).

TOOLS

CENTER FOCUSED PLACEMAKING

Creating dynamic, connected built environments that support multimodal mobility, reduced reliance on single-occupancy vehicles and reduced GHG emissions is critical throughout the region. Supporting attractive and functional places for all households to live, work and play through center-focused placemaking can be implemented in urban, suburban and rural settings. Connect SoCal places a priority on infill settings, existing/planned service areas and within the planning boundary outside of an agency's legal boundary, otherwise known as "Spheres of Influence." Centers are typically human-scale, compact and pedestrian-oriented, with an increased variety and mix of housing types and affordability levels. Transit oriented development in Transit Priority Areas (TPAs) and High Quality Transit Areas (HQTAs) within centers and in nodes along corridors can play a pivotal role in supporting compact development that is less reliant on single-occupancy vehicles. However, elements of center-focused placemaking can be implemented even when transit service is neither existing nor planned. Center-focused placemaking includes smart locations and linkages; neighborhood patterns and design; and green infrastructure and buildings. Key elements include:

- Increased proximity of housing to job centers, goods and services
- Short, walkable blocks
- Reduced building setbacks
- Compact development footprint
- Connected and open community design
- Range of housing types and affordability
- Access to civic and public space
- Access to existing or potential quality transit
- Transit supportive facilities and infrastructure
- Neighborhood schools
- Mobility hubs that support multimodal transportation options
- Complete streets
- Reduced and shared parking
- Infrastructure supportive of alternative fuel vehicles
- Access to active and passive recreation facilities
- Local food production opportunities
- Continuous shaded streetscapes and community tree canopies
- Habitat restoration and conservation
- Outdoor water use reduction
- Preservation and utilization of native vegetation
- Historic resource preservation and adaptive reuse
- Heat island reduction
- Renewable energy production

Local jurisdictions in urban, suburban and rural settings can support implementation of center focused placemaking in ways that are suited to a particular community by employing a range of options, including but not limited to:

- **Form Based Codes:** Emphasis is placed on physical form over traditional zoning standards to regulate and guide development and implementation of a holistic neighborhood vision. Land uses, such as office or commercial, can adapt based on future demands, and design standards are used instead of rigorous land use requirements. Emphasis is placed on universal design principles for buildings and public spaces that are accessible to people of all ages and abilities, with equity and flexibility in use given priority.
- **Economic Development:** Enhanced Infrastructure Financing Districts (EIFDs), Community Revitalization and Investment Authorities (CRIAs), Neighborhood Infill Finance and Transit Improvements Districts (NIFTIs), and Affordable Housing Authorities (AHAs) are tools that allow local jurisdictions and public agencies to collaborate on achieving sustainability and housing goals by streamlining review of projects and combining funding streams, including tax increment financing (TIF). TIF is an important tool in the creation of sustainable communities, and NIFTIs specifically can fund multifamily affordable housing, transit capital projects, transit-oriented development, complete-streets capital projects, parking, parks and open space, and programs to reduce GHG emissions and VMT within TPAs.
- **Transfer of Development Rights:** This is a planning tool to support growth in locally identified "receiving districts" in lieu of growth in identified "sending districts." Receiving districts typically exhibit future infrastructure capacity to absorb development impacts, whereas sending districts often contain fragile habitats, productive agricultural lands, or other unique community features that a jurisdiction may seek to preserve.
- **Greenbelts and Community Separators:** These contiguous areas can separate multiple jurisdictions to support rural development or land conservation and interrupt continuous urbanization. These areas can be comprised of farmland, floodplains, unique habitats, scenic corridors, viewsheds or other resources considered valuable to communities.
- **Agrihoods:** This form of residential development integrates agriculture and local food production into the fabric of a community. Features can include community gardens, crops, and grazing land. Agrihoods can support improved public health outcomes and provide passive and active recreation opportunities.
- **Accessory Dwelling Units:** ADUs can expand housing stock and facilitate intergenerational living arrangements in areas traditionally zoned for single-family uses while enhancing neighborhood character. They can address both temporary and immediate needs of households while also providing a permanent increase in affordable housing stock.
- **Urban Heat Island (UHI) Reduction:** "Urban heat islands" form when natural land cover--e.g. trees, grasslands, wetlands —are replaced with pavement, buildings and infrastructure. Paved surfaces and other non-reflective surfaces absorb heat during the day and release it at night, inflating overnight temperatures. Urban areas within the region are likely to experience more frequent, more intense and longer heat waves as temperatures continue to rise due to climate change. UHIs limit mobility by inhibiting human-powered modes of transportation such as walking and biking; increase energy demands; raise air pollution levels; and cause heat-related illness. Urban greening, urban forestry, reduced impervious surfaces, cool pavement strategies and investments can help reduce the impacts of UHIs and promote increased walking, biking and other non-motorized transportation modes.

NEIGHBORHOOD SCALE MOBILITY

Encouraging safer, multimodal short trips in existing and planned neighborhoods can reduce exclusive reliance on single occupancy vehicles for convenient access to destinations. This can be supported by robust residential to non-residential land use connections, high roadway intersection densities, and low to moderate traffic speeds. Fundamental to neighborhood

scale mobility in urban, suburban and rural settings is encouraging "walkability," active transportation and short, shared vehicular trips on a connected network through:

- **Density:** increased number of destinations, jobs, households or other similar attributes within a given area.
- **Diversity:** increased mix of land uses and destinations.
- **Design:** building characteristics, such as reduced building setbacks and varied building facades, as well as roadway characteristics including curb ramps, street trees, connected pedestrian paths and connectivity of the street network.
- **Destination accessibility:** enhancing the number and variety of land uses that can be reached within an area
- **Distance to transit:** reducing the length travelled to reach transit, whether existing or potential service.

PLANNING FOR ELECTRIC VEHICLES

Given that the transportation sector remains a major source of GHG emissions in California, and in support of the State's efforts to deploy one and a half million zero-emission vehicles (ZEV) on California's roads by 2030, it is essential to overcome significant barriers to accelerating plug-in electric vehicle (PEV) adoption. Planning for increased home-based charging infrastructure, workplace charging and publicly accessible charging stations can be accomplished at the jurisdictional level by conducting inventories of existing PEV registrations and charging stations at workplaces residences; and evaluating local institutional barriers to PEV charging infrastructure (e.g. permitting, parking requirements). It is also important to identify infrastructure installation sites on public and private property based on existing demand, land use features, and distance to other charging stations or concentration of underserved residents. Curbside charging, retrofits and adaptive reuse of gasoline fueling stations, and incentives for shared infrastructure installation can support broad and sustained deployment of cleaner fuel vehicles. See the Emerging Technology Technical Report for more information on alternative fuel vehicles.

FORECASTED DEVELOPMENT PATTERN PERFORMANCE AND OUTCOMES

This section provides an overview of the Plan's beneficial outcomes for the region in 2045. Please see **TABLE 4** for a comparison of the Connect SoCal performance compared to Trend, or Baseline.

BETTER PLACEMAKING

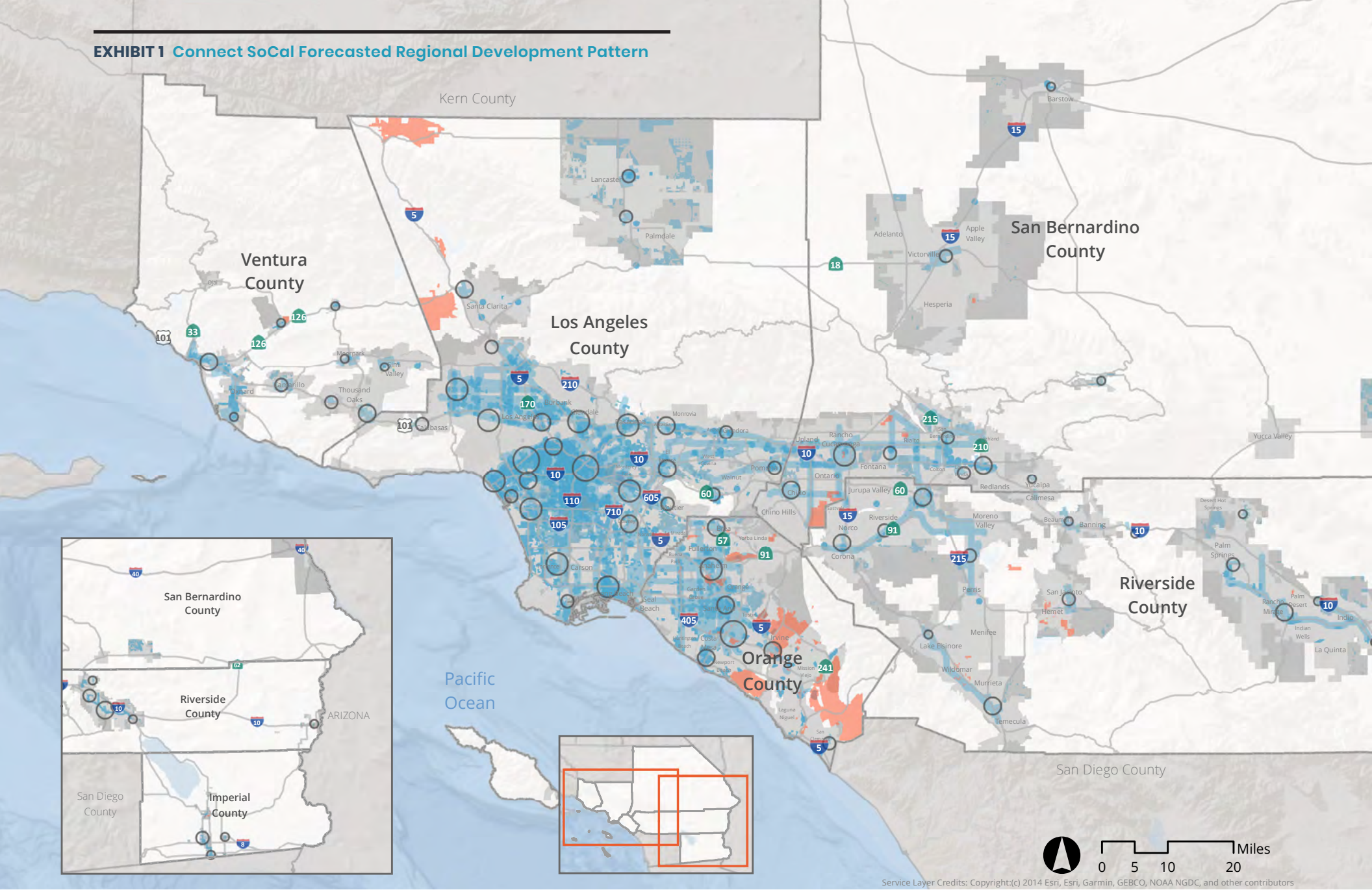
The challenges of traffic congestion and long commutes make the value of including options for better places to live and work even more important. In 2045, the Connect SoCal Plan envisions 64 percent of housing and 74 percent of new jobs to occur in PGAs. This more compact development type pattern, combined with the identified transportation network improvements and strategies, results in improved pedestrian and bicycle access to community amenities, lowers average trip length and reduces Vehicle Miles Traveled. These outcomes not only reduce greenhouse gas emissions, but also support the development of more livable communities that provide more housing choices, conserve natural resources, offer transportation options, and promote a better quality of life.

LOWER COSTS TO TAXPAYERS AND FAMILIES

LOCAL INFRASTRUCTURE CAPITAL AND OPERATIONS AND MAINTENANCE COSTS

Increased land consumption can lead to higher costs for local and subregional infrastructure, as new development in greenfield lands (areas, including agricultural lands, not previously developed) requires significant capital investments such as to extend or build new roads, water and sewer systems, and parks. Conversely, growth focused in urban areas often takes advantage of existing infrastructure and the ability to provide more efficient service to higher concentrations of jobs and housing. This cost difference increases when operations and maintenance (O&M) costs are taken into account. O&M costs include the ongoing jurisdiction expenditures required to operate and

EXHIBIT 1 Connect SoCal Forecasted Regional Development Pattern



Job Centers | Priority Growth Areas | Entitled Projects | Incorporated Areas | Sphere of Influence*

* Priority Growth Areas include Spheres of Influence outside of constrained areas, as discussed further in the SCS Technical Report.

Source: County Transportation Commissions, LAFCO, Local Jurisdictions in SCAG region, SCAG, 2019

TABLE 4 Connect SoCal Forecasted Development Pattern Result

	Trend/Baseline	Connect SoCal
Growth Projections	**Projections 2016-2045:** 20% Population Growth, 27% Housing Growth, 20% Job Growth	
	2016 Base Year: 18.8 million population, 6 million households, 8.4 million jobs	
	2016 - 2045 Change: 3.7 million population, 1.6 million households, 1.7 million jobs	
	2045 End State: 22.5 million population, 7.6 million households, 10 million jobs	
Housing Mix	**2016 – 2045 Growth**	
	61% Single Family	31% Single Family
	39% Multifamily	69% Multifamily
	2045 End State	
	56% Single Family	50% Single Family
	44% Multifamily	50% Multifamily
Development Location	**Priority Growth Areas**	
	57% Homes	64% Homes
	59% Jobs	74% Jobs
Land Use Pattern Focus	**2016 – 2045 New Housing**	
	8% Urban	9% Urban
	18% Compact	76% Compact
	75% Standard	15% Standard
	2016 – 2045 New Jobs	
	8% Urban	13% Urban
	8% Compact	88% Compact
	83% Standard	0% Standard

TABLE 4 Connect SoCal Forecasted Development Pattern Result - Continued

	Trend/Baseline	Connect SoCal
Fiscal Impacts (cumulative)	Infrastructure Capital	
	$29.0 billion	$26.2 billion
	Operations and Maintenance	
	$11.3 billion	$10.2 billion
Land Consumption	Greenfield Land	
	100 sq mi	71 sq mi
Building Energy Use (cumulative)	Residential Use	
	9,506 trillion Btu	9,358 trillion Btu
	Commercial Use	
	6,040 trillion Btu	6,038 trillion Btu
Building Water Use (cumulative)	Residential Use	
	56.6 million AF	55.3 million AF
	Commercial Use	
	33.1 million AF	32.8 million AF
Household Costs	Transportation Costs (Fuel + Auto)	
	$11,461	$10,852
	Utility Costs (Energy + Water)	
	$2,492	$2,420

TABLE 4 Connect SoCal Forecasted Development Pattern Result - Continued

	Trend/Baseline	Connect SoCal
Public Health	Respiratory Related Health Costs	
	$3.34 trillion	$3.16 trillion
Land Conservation	Active Farmland and Natural Land Change	
	- 120,700 acres	-116,000
	Total Carbon Stock Change*	
	- 589,000 metric tons	- 734,000 metric tons
	Agriculture Production Value Change	
	$ -94.4 million	$ -72 million
	High Species Movement Potential Change**	
	- 32,200 acres	- 47,400 acres
	Habitat Degraded***	
	151,800 acres	144,120 acres

**Carbon stock is defined as the quantity of carbon held within a pool (a reservoir of carbon or a system which has the capacity to accumulate or release carbon) and includes both above and below ground*
***Species movement relates to landscape permeability which enables species to move. Changes in landscape type can impact species movement.*
****Sum of acres of habitat degraded for multiple species including amphibians, mammals, birds and others based on the California Wildlife Habitat Relationship system from the California Department of Fish and Wildlife*
Source: SCAG
Note: "Single Family" refers to single family detatched housing units and "Multifamily" refers to single family attached and multifamily housing units

maintain the infrastructure serving new residential growth. More dispersed development, which requires greater lengths of roads and other utilities infrastructure, incurs higher O&M costs to local jurisdictions than more compact development, which capitalizes on shared infrastructure capacity.

The Connect SoCal Plan shows that urban and mixed-use development growth in already developed areas can reduce costs significantly, as demonstrated by adding up capital infrastructure and ongoing O&M costs to 2045. If the development trend of the past decades continues, new growth would require $40.3 billion in capital infrastructure and O&M costs. By contrast, local jurisdictions following the development type pattern included in the Connect SoCal plan leads to $36.4 billion in costs, representing a savings of $3.9 billion.

HOUSEHOLD COSTS

If the development type patterns of the past decades persist, average household costs associated with driving and residential energy and water use will be up to almost $14,000 annually in 2045. By comparison, the Connect SoCal Plan would lead to costs of about $13,300 annually per household, about $700 in annual savings. Over time, the differences in annual expenditures would amount to a significant sum for each household. This increases further when considering the effect of local infrastructure cost burdens that are typically passed on to homeowners and renters in the form of taxes, fees, home prices and assessments.

PROTECT THE ENVIRONMENT AND CONSERVE NATURAL RESOURCES

LAND CONSUMPTION

Land consumption measures the amount of land that has changed from rural or greenfield place types to more intensive and urbanized place types to accommodate new growth. A development pattern with a greater share of urban infill and compact development will consume less greenfield land than one with a greater share of dispersed standard development. A continuation of the development trend of the past few decades would consume about 100 square miles of land. This is about 30 percent more square miles than Connect SoCal's Forecasted Development Pattern, which consumes approximately 71 square miles to accommodate growth through 2045.

NATURAL AND FARM LAND CONSERVATION

As the SCAG region's population continues to grow, vital habitat and farm lands face development pressure. These lands provide many indispensable resources for the region: a clean and healthy watershed, a robust agricultural economy, habitat for unique and diverse wildlife species, and opportunities for recreation. Under the Connect SoCal plan, 27 percent fewer acres of active farm lands (19,000 acres in total) would be developed and annual agricultural production would be $23 million higher compared to the trend. Compared to the trend, Connect SoCal reduces the amount of development on lands important for habitat for endangered species and the integrity of watersheds. For more information about the Connect SoCal's conservation outcomes, please see the Natural and Farm Lands Conservation Technical Report.

RISK AND RESILIENCE

Climate change is expected to intensify the risks and impacts of sea level rise and wildfires. In the context of a changing climate with more incidences of extreme heat, drought, and rising sea levels, Connect SoCal seeks to maximize growth in areas less vulnerable to these risks. Although risk of these events is not completely avoided, implementation of Connect SoCal's Forecasted Development Pattern could reduce growth in areas at a very high risk of wildfire and in areas prone to two-foot rise in sea level. Connect SoCal's Forecasted Development Pattern leads to a total of 18,000 fewer people living in areas at a very high risk of fire and 1,000 fewer dwelling units at risk of a two-foot rise in sea level compared to the trend. While not all communities in the region will be vulnerable to sea level rise and wildfire, Connect SoCal seeks to minimize risks given the region's interconnectedness and potential magnitude of damage and disruption that could occur.

BUILDING ENERGY USE AND COSTS

Building energy use is determined by the mix of housing, commercial types and the proportion of development in temperate climate zones within the SCAG region. A development type pattern that contains more mixed-use/walkable and urban infill development accommodates a higher proportion of growth in more energy-efficient housing types like townhomes, apartments and smaller single-family homes, as well as more compact commercial building types. By contrast, standard suburban development leads to a higher proportion of larger single-family homes, which are typically less energy efficient. Location also comes into play- building in the warmer areas of the region use more energy each year, in part because they require more energy to cool during the summer months.

Differences in development type patterns lead to substantial differences in the amount of electricity and natural gas used. These differences will vary depending on policies regulating how efficient buildings become. Assuming the same efficiency standards for each development pattern, Connect SoCal's Forecasted Development Pattern saves the average household in the SCAG region 2 percent on electric and gas bills compared with a growth pattern that more closely aligns with the past development trend. This reduction in building energy use as a result from developing more compact walkable areas translates to savings in building energy costs. Connect SoCal's Forecasted Development Pattern saves the region $400 million in annual electricity and gas costs, providing each household an average savings of $55 each year.

BUILDING WATER USE AND COSTS

Variations in development type patterns and their related building profiles also lead to substantial differences in building water use and cost. Building water use is a function of both indoor and outdoor water needs, with outdoor use (landscape irrigation) accounting for the majority of the difference among building types. As it pertains to residential, lot size is generally interrelated with a household's overall water consumption since homes with larger yards require more water for landscape irrigation. Therefore, a development type pattern with a greater proportion of standard suburban development, which includes more large-lot single-family homes (greater or equal to 5,500 square feet), requires more water than a development type pattern with a greater proportion of compact and urban infill development, which includes more attached and multifamily homes. And, as is the case for energy use, the location of new development has a significant bearing on water use—homes in warmer areas use more water to maintain lawns and other landscaping.

Water use will vary based on efficiency and conservation policies, which will be increasingly important as California faces future constraints to water supply. Assuming the same modest improvements, the Connect SoCal plan uses approximately 108,000 acre feet less water (3.3 million acre feet annually) when compared with past development trends (3.4 million acre feet annually). This would also result in a reduction of water-related electricity use and carbon emissions of two percent. Saving water also saves on costs, and the Connect SoCal saves about $2.2 billion over the span of the plan, and saves each household in the SCAG region $18 on average on annual water bills.

IMPROVED PUBLIC HEALTH OUTCOMES

A growing body of research has established a significant link between public health outcomes and built environment characteristics. The implementation of Connect SoCal is expected to improve public health outcomes across the region, support the region's economy and improve the quality of life for the residents of Southern California. If current trends remain constant, the region is anticipated to spend $17 billion in 2045 on direct and indirect costs related to diabetes, high blood pressure and heart disease.. With the implementation of Connect SoCal, the region will save $346 million on health direct health care expenditures through built environment investments in the plan. For more information about Connect SoCal's public health outcomes, please see the Public Health Technical Report.

GREATER RESPONSIVENESS TO DEMOGRAPHICS AND THE CHANGING HOUSING MARKET

There is little question that the demographic profile of Southern California is changing, resulting in different housing and transportation needs. The

traditional suburban development pattern that characterizes most of the region is still appropriate for many residents and homeowners, but the increasing demand for small-lot and multifamily housing, walkable environments and shorter commutes calls for more varied housing options located in more compact developments.

Connect SoCal responds to this emerging need through an overall development type pattern that focuses new housing growth in urban centers served by various transportation options, including high-quality transit and active transportation. About 69 percent of this new housing will be multifamily units.

While a majority of the new housing will be multi-family units as part of Connect SoCal, the percentage of multifamily and single-family will not change drastically when compared with the existing housing stock. The housing stock split between single-family and multifamily is currently 55 percent single-family and 45 percent multi-family in the SCAG region. By 2045, the housing stock split is projected to be 50 percent single-family and 50 percent multi-family.

PRESERVING AND BUILDING AFFORDABLE HOUSING

While SCAG does not directly implement Connect SoCal through land use or development decisions, this plan offers a Growth Vision that, if implemented, can offer benefits both to the region as well as to local communities. As mentioned in the "Challenges and Opportunities" section of this report, affordable housing is a persistent issue in the region.

The cost of housing can vary throughout the region. While SCAG's Forecasted Development Pattern is consistent with "locally envisioned" jurisdictional growth totals and therefore does not propose the shifting of growth between jurisdictions, the type and location of growth within jurisdictions can offer cost savings both to households and public agencies in terms of infrastructure. As mentioned above, Connect SoCal would save about $700 annually per household in reduced driving and utility costs as compared to a continuation of existing development trends. In addition, the reduced cumulative capital and operations and maintenance costs of infrastructure, which can be passed through and increase the cost of housing, is reduced by $3.9 billion over the planning period.

Connect SoCal also includes support for local jurisdictions to plan and implement housing supportive infrastructure, particularly water and sewer capacity enhancements as well as parking strategies, which can reduce the overall cost of housing construction and increase housing supply in PGAs. The cost of adding sewer, water, and parking infrastructure for new housing units can range from 10 to 25 percent of total construction costs, increasing the overall cost of housing for consumers. One tool that can be utilized to address funding issues for housing construction is tax increment financing, which provides local jurisdictions resources to construct sustainable infrastructure. To date, the majority of existing tax increment financing districts in the SCAG region have identified sewer and water capacity enhancements as prescribed uses of their funding, with the goal of increasing housing supply in close proximity to future rail transit stations. Tax increment financing can also help with parking costs, including re-evaluating parking strategies in areas that are best served by transit to improve overall housing affordability (and increase transit ridership). Connect SoCal's Housing Supportive Infrastructure Key Connection will provide funding resources to reduce the cost of housing by supporting establishment of innovative self-help financing districts, such as Enhanced Infrastructure Financing Districts (EIFDs), Community Revitalization and Investment Authorities (CRIAs), Neighborhood Infill Finance and Transit Improvements Districts (NIFTIs/NIFTI-2s), and Affordable Housing Authorities (AHAs), as well as SB 743 mitigation plans and implementation plans for Assembly Bill 101 (AB 101)(2019).

As discussed in Chapter 6 of Connect SoCal, recent legislation has increased funding to support regional and local planning for housing. Specifically, under AB 101 legislation, SCAG is eligible for approximately $47 million from the California Department of Housing and Community Development (HCD). These funds will be used to develop a Regional Housing Strategy Framework and provide planning grants and services to jurisdictions to implement their 6th cycle Regional Housing Needs Assessment (RHNA) allocation, which is supportive of Connect SoCal goals and policies. Strategies to preserve existing affordable housing and avert displacement will be essential. This effort balances

housing production strategies well supported by multiple transportation options with the conservation of natural and agricultural lands and restoration of habitats In addition, depending on their population size, local jurisdictions are eligible to receive between $65,000 and $1.5 million individually through AB 101 funding to develop and implement their 6th cycle housing element. Collectively SCAG jurisdictions are eligible for up to $50 million based on this direct funding resource. SCAG is promoting coordination among these funding opportunities to accelerate housing production throughout the region.

Further, the Environmental Justice (EJ) Toolbox detailed in the Environmental Justice Technical Report includes recommended practices and approaches that can be implemented to address EJ impacts to traditionally underserved communities. SCAG's analysis of neighborhood change across the region identifies 40 census tracts where community characteristics related to educational attainment, household income, gross rent and non-white population have been persistently changing across recent decades. (See the Environmental Justice Technical Report for more information). Although, these tracts are not disproportionately located in environmental justice areas, disadvantaged communities, or communities of concern it is still important to avoid future adverse impacts. The recommendations in the EJ Toolbox were identified through a review of literature, recent planning activities and input from stakeholders as part of the EJ outreach process. The 'Healthy, Safe, and Sanitary Housing' section specifically outlines practices and approaches that can address housing related issues including affordability, gentrification and displacement.

SB 375 AND GREENHOUSE GAS EMISSION TARGETS SET BY THE STATE

As previously noted, SB 375 requires SCAG to develop a Sustainable Communities Strategy to reduce per capita greenhouse gas emissions through integrated transportation, land use and housing planning. ARB sets per capita greenhouse gas emission reduction targets from automobiles and light trucks for each of the state's 18 MPOs. For the SCAG region, the targets are set at eight percent by 2020 and 19 percent by 2035 from 2005 emissions levels. Because the transportation sector is the largest contributor to California's greenhouse gas emissions (approximately 37 percent attributable to vehicle tailpipe emissions alone), these targets are more stringent than the targets set for the 2016 RTP/SCS, which were eight percent below 2005 per capita emissions levels by 2020 and 13 percent below 2005 per capita emissions levels by 2035. The Connect SoCal plan achieves per capita greenhouse gas emissions reductions relative to 2005 of eight percent in 2020, and 19 percent in 2035. While this plan is being released in 2020, the same year as the first target date, the achievement is based on modeled results as observed data is not yet available.

REGIONAL HOUSING NEED

SB 375 requires the Sustainable Communities Strategy to "identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth" and to "identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Section 65584" (Government Codes 65080(b)(2)(B)(ii) and 65080(b)(2)(B) (iii)) The second requirement is referred to as the Regional Housing Needs Assessment (RHNA). This section addresses the statutory requirements of SB 375 but does not specifically address the statutory requirements of RHNA.

Legislative changes in 2018 modified the nature of the regional housing need determination for the 6th cycle RHNA. Rather than quantifying the additional housing need resulting from population growth for a specific future period (reflected in factors such as net migration, household formation, and employment growth) which is how the state Department of Housing and Community Development (HCD) has approached the RHNA determination in past cycles, Government Code 65584.01(b) et seq. explicitly added measures of household overcrowding and housing cost burden to the determination of housing need by HCD. These new measures were not incorporated into the Connect SoCal Growth Forecast because they are not direct inputs to a growth forecasting process and are independent of employment and population projections. In contrast, they reflect the latent housing needs of

the current population ("existing need"). Thus, the 6th Cycle RHNA regional housing need total per HCD of 1,341,827 consists of "projected need" intended to accommodate the growth of population during the 6th Cycle RHNA (2021-2029) as well as "existing need"[1]. On January 13, 2020, HCD's finding that SCAG's draft RHNA methodology furthered the statutory objectives of RHNA understood that the determination is separated into "projected need' and "existing need" components.

The "projected need" portion of the 6th Cycle RHNA is derived from the Connect SoCal Growth Forecast (see the Demographics and Growth Forecast Technical Report for more details). Specifically, Connect SoCal projects 469,725 additional households over 2021-2029 (Growth Forecast prorated for the 8.25-year RHNA planning period). After subtracting an estimate of household growth on tribal lands (2,767 units), the remaining 466,958 households represent occupied housing units, to which are added two adjustment factors: vacancy need (14,467 units) and replacement need (23,545 units) to yield the 504,970 housing units reflecting "projected need" for the 6th Cycle RHNA.

Connect SoCal identifies areas within the region sufficient to house all the population in the region including population growth of 3.7 million and household growth of 1.6 million through 2045, the plan horizon year. Households, which this plan demographic and growth forecast projects alongside population and employment, are also commonly referred to as occupied housing units (see, e.g., State of California Department of Finance 2019). Since only occupied housing units generate travel demand, they are the primary focus of Connect SoCal's analysis. However, additional units (to account for vacancy need and replacement need) associated with this household projection are accommodated within the same areas by local jurisdiction. The same areas sufficient to accommodate all the region's household growth (1.6 million households or occupied units) through 2045 will also be sufficient to accommodate the eight-year projection or the "projected need" portion (504,970 units) of the 6th Cycle RHNA (2021-2029).

1 Please see Master Response #1 in the Public Participation and Consultation Technical Report for more information on "existing need" and requirements of the RHNA statute.

TABLE 5 below articulates the amount of household growth forecasted for each county during the timeframe of Connect SoCal. Additionally, **EXHIBIT 1** illustrates the areas throughout the region where this growth is forecasted to occur. In total, the identified areas accommodate 95 percent of the growth through the horizon year of Connect SoCal, 2045. However, the Connect SoCal Forecasted Development Pattern acknowledges that not all growth will occur within PGAs, incorporated cities and SOIs. The remaining five percent of growth through 2045 may occur in unincorporated county areas outside of SOIs. Altogether, these areas are also sufficient to house the eight-year projection of regional housing need because the forecasted regional development pattern articulated in Connect SoCal is equally applicable to development occurring in the early years of the plan as well as the horizon year of the plan. Additionally, over 60 percent of household growth through the horizon year of the plan is forecasted to occur within PGAs which emphasize connectivity to existing and planned transportation infrastructure, including transit and job centers.

ANALYTICAL APPROACH

DATA

SOCIO-ECONOMIC GROWTH FORECAST

The Regional Growth Forecast is used as a key guide for developing regional plans and strategies mandated by federal and state governments such as the RTP/SCS, the Air Quality Management Plan (AQMP) and the Federal Transportation Improvement Program (FTIP). SCAG's regional growth forecasting process began with a Panel of Experts that included demographers and economists from throughout California to forecast growth at the regional and county levels from 2016 to 2045. SCAG's jurisdictional level growth forecast is built through the collaboration with all 197 jurisdictions in the region–including one-on-one meetings with each individual town, city, and county. The regional and county level growth trends for population, household and employment are well reflected in the scenario development for the SCS. For example, maintaining jurisdictional level growth is one of key guiding principles

TABLE 5 Connect SoCal County Level Regional Growth Forecast

	Existing (2016)	Total Forecasted (2045)	Forecasted Growth (2016-2045)
Imperial County	50,000	92,000	42,000
Los Angeles County	3,319,000	4,119,000	800,000
Orange County	1,025,000	1,154,000	130,000
Riverside County	716,000	1,086,000	370,000
San Bernardino County	630,000	875,000	244,000
Ventura County	271,000	306,000	35,000
Total Households, SCAG Region	6,012,000	7,633,000	1,622,000
Total Employment, SCAG Region	8,389,000	10,049,000	1,660,000
Total Population, SCAG Region	18,832,000	22,504,000	3,672,000

Source: California Department of Finance, California Employment Development Department, SCAG
Note: All figures rounded to 1,000. Totals may not sum due to rounding. See Table 13 of the Demographics & Growth Forecast Technical Report for additional detail.

for the scenario development. Additionally, SCAG sought feedback from local jurisdictions on the collective Growth Forecast for distributing population, household and employment growth through 2045 prior to the draft Connect SoCal release. This supplemental peer review helped to refine the Connect SoCal Forecasted Development Pattern through adjustments to technical inputs for the Regional Growth Forecast, and helped to further reflect Connect SoCal's strategies and policies from the Growth Vision. See the Demographics and Growth Forecast Technical Report for more details on SCAG's growth forecasting process.

DATA AND GIS MAPS

To develop the SCS and related development scenarios (discussed in detail above), SCAG relied on several data sources including:

- California Protected Areas Database (Conserved Land)
- California Department of Conservation (Farmland)
- Federal Emergency Management Agency (Flood Data)
- California Department of Fish and Wildlife (Habitat Quality and Connectivity)
- US Geological Survey (Wetlands)
- South Coast Wildlands (Habitat Connectivity)
- National Oceanic and Atmospheric Administration (Sea Level Rise Data)
- California Department of Forestry and Fire Protection (Fire Severity Risk and Wildland Urban Interface)
- Local Datasets
  - Existing land use (2016)
  - General and specific plan land use
  - Zoning
  - Local entitlements and development agreements
  - Spheres of influence

- Locally protected open space
- Bikeways
- Major transit stops and high quality transit corridors

TRANSPORTATION STRATEGIES

In addition to land use strategies, the SCS relies on transportation strategies and related data to demonstrate greenhouse gas reductions. The data for transportation strategies were collected from County Transportation Commissions, local transit agencies, other transportation operators and cities. Please see respective technical reports for a detailed discussion of each transportation mode.

MODEL DATA DEVELOPMENT

The development of socioeconomic data at the transportation analysis zone (TAZ) level is a necessary input to SCAG's transportation model. Future year information at this smaller geographic level also helps many other planning activities in the region. SCAG's recent adoption of an Activity-Based Model (ABM) of travel demand requires both sub-jurisdictional zonal controls as well as individual and household attributes.

The development of the socioeconomic data for the ABM involves the following major processes:

- Development of the three major variables: employment, population, and households
- Development of secondary variables including the socioeconomic attributes of persons, households, and employment by sector
- Development of individual person and household characteristics.

DEVELOPMENT OF MAJOR VARIABLES

SCAG develops the TAZ-level socioeconomic data using diverse public and private sources of data listed above and advanced estimation methods.

The initial TAZ-level household projection starts from the household and employment at the Minimum Planning Unit (MPU) level within each TAZ. Additional variables at the zonal-level include school enrollment, household income, and disaggregated employment categories for 4,109 Tier1 TAZs and 11,267 Tier2 TAZs.

Total population is calculated based on the TAZ household estimates. The two components for the total population are group quarters population and residential population. The average number of persons per household (PPH) is projected using recent estimates and trends. Group quarters population is projected relying on the Census and historical trends.

TAZ-level household and employment projections are controlled to the jurisdictional level projections, meaning that the sum total of households and employment of all the TAZs within a jurisdiction equals the jurisdiction-level growth projections.

An initial distribution of TAZ-level jobs is projected using a constant share method, meaning that the current TAZ's share of jurisdiction-level jobs for each sector will remain constant through the forecast years. By using the constant share method, the TAZ's job growth by sector will be simply determined by sector-specific growth in the jurisdiction. This initial TAZ population, household, and employment forecasts become the basis for SCAG's Bottom-up Local Input and Envisioning (local input) process.

In addition to employment, population, and households, SCAG develops additional attribute variables such as population by age, household by income, and employment by sector. The 2010 Census SF1 (Summary File 1) and 2012-2016 5-year Public Use Microdata Sample (PUMS) data are the basis for developing secondary variables at the TAZ-level. K-12 and college enrollment estimates were collected from California Department of Education for current public and private enrollment by school for students. These secondary variables at the TAZ-level are all controlled to the county-level forecasts. Iterative proportional fitting procedure is the mainly used to develop the set of the TAZ level distributions that are controlled or summarized to the county totals.

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SCENARIO PLANNING MODEL

SCAG's Scenario Planning Model (SPM) is a data management, land use planning and modeling tool built on the open source version of UrbanFootprint platform (UF 1.5), which was originally developed by Calthorpe Analytics in partnership with SCAG and other California Public Agencies. UF1.5 is available and free for public use, downloadable from California Strategic Growth Council's website. SPM enables the creation and organization of local and regional data, plan and policies, facilitates scenario creation and editing and estimates a wide range of potential benefits resulting from alternative transportation and land use strategies. SPM was used to create the Scenario Results Comparison in **TABLE 3** and the Connect SoCal Forecasted Development Pattern Results in **TABLE 4**.

SPM has been deployed as two separate web services: Data Management (DM) tool and Scenario Development and Analysis (SD) tool. SPM-DM provides a common data framework within which local planning efforts can be easily integrated and synched with regional plans. Using a variety of data management and review options, the user (local jurisdictions) can explore data, export attributes and edit configured layers. SPM-DM was released in November 2018 to all 197 local jurisdictions in the SCAG region in support of SCAG's Bottom-Up Local Input and Envisioning Process for the Connect SoCal. To assist cities and counties in using the tool, a total of 21 hands-on training sessions in a classroom setting have been provided throughout the region where we trained many staff members from local jurisdictions. SPM-SD includes a suite of tools and analytic engines that facilitate scenario creation and editing with advanced analytic capabilities and allow meaningful comparison across different land use and transportation options. Starting with the 2016 RTP/SCS, SPM-SD has been used in providing directional and order-of-magnitude regional impacts of local land use and policy decisions that would assist in the development of regional plans and associated scenario analysis.

UTILIZING SPM

Scenario-based planning with SPM starts with a detailed base of land use data, demographic characteristics and other details of the built environment that provides the foundation for analysis by various model engines. SPM normalized all five forecast growth allocations made at the Tier 2 TAZ scale to a standardized data framework and analyzed using the model's analytic modules. Each scenario was assessed for land consumption, land conservation, passenger vehicle travel, greenhouse gas emissions, energy and water use, household costs, public health impacts, risk and resilience and local infrastructure costs.

The following section details the process used to translate the forecast growth allocations into the SPM data framework:

Step 1: Assign Place Types – The SPM employs a series of Place Types to describe the different types of land uses in the region. The Place Types—each comprised of a mix of different building types along with assumptions about characteristics such as the amount of land devoted to streets, parks and civic areas – represent the complete range of development types and patterns that make up a scenario. These Place Types contain a large amount of information relating to the characteristics of the landscape, including jobs and housing density, urban design, mix of land uses and are intended for modeling purposes at the Scenario Planning Zone (SPZ) level. SPZ is the minimum unit of scenario planning and analysis for the SPM. It was developed by grouping parcels of uniform or compatible land uses while maintaining manageable size for capturing local land use benefits on transportation, varied by development density and intensity.

Place Types were assigned by one of two methods, utilizing either a density-based or a rule-based approach. Density classification utilized dwelling unit density, employment density, street intersection density and the proportion of

retail employment to classify a given SPZ to a place type designation. Rule-based place type assignment was used for locations which could not be classified by density, such as parks, civic institutions, universities and military bases. More information on the Place Types, such as summaries and descriptions, can be found in **APPENDIX 1: PLACE TYPES**.

Step 2. Categorize Land Development Categories (LDCs) – Land Development Categories (LDCs)—Urban, Compact and Standard—represent distinct forms of land use, ranging from dense and walkable mixed-use urban areas well served by transit, to lower-intensity, less walkable places where land uses are segregated and most trips are made via automobile. These LDCs are an aggregation of the 35 Place Types and are used to describe the general conditions within a specific area. Following is a list of the three LDCs employed in the Connect SoCal.

- **Urban** – Often found within and directly adjacent to moderate and high density urban centers. Virtually all 'Urban' growth would be considered infill or redevelopment. The majority of housing units are multifamily and attached single family (townhome), which tend to consume less water and energy than the larger types found in greater proportion in less urban locations. These areas are supported by high levels of regional and local transit service. Well-connected street networks and the mix of intensity of uses result in a highly walkable environment. Enhanced access and connectivity for people who choose not to drive or do not have access to a vehicle.
- **Compact** – Less intense than Urban LDC, but highly walkable with rich mix of retail, commercial, residential and civic uses. Most likely to occur as new growth on the urban edge, or large-scale redevelopment. Rich mix of housing, from multifamily and attached single family (townhome) to small- and medium-lot single family homes. Well served by regional and local transit service, but may not benefit from as much service as urban growth, and is less likely to occur around major multimodal hubs. Streets are well connected and walkable, and destinations such as schools, shopping and entertainment areas can typically be reached via a walk, bike, transit or short auto trip.
- **Standard** – Reflects the separate-use auto-oriented development of the American suburban landscape over the past five decades. Densities tend to be lower than in Compact LDC, and land uses are generally not highly mixed and medium—and larger—lot single family homes comprise the majority of this development form. Standard areas are not typically well served by regional transit service and most trips are made via automobile.

Step 3. Establish residential units by type and employment by type – Single family and multifamily households at the SPZ scale were disaggregated into the four residential classifications –-single family large lot, single family small lot, townhome and multifamily- with Population Synthesizer (or PopSyn). Popsyn adjusted household weights, in American Community Survey (ACS) 5 percent Public Use Microdata Sample (PUMS) data, to given controls at the Tier 2 TAZ scale while maintaining General Plan capacity. Employment by the North American Industry Classification System (NAICS) code at the Tier 2 TAZ scale was disaggregated to the SPZ scale through Iterative Professional Fitting (IPF) procedure.

Step 4. Estimate building square feet – for each SPZ, building square footage was estimated using assumptions for square footage by residential type, square footage per employee by employment type and street intersection density (to distinguish urban versus suburban street connectivity and associated building categories). Estimates were generated from a library of building types, calibrated based on a study of building types across California and the west. The building square footage factors are contained in **TABLE 6**.

Step 5. Estimate parcel acreage – parcel acreage was estimated for each SPZ by using a combination of base 2016 parcel-derived acreage, acreage distributions sourced from translated place type attributes, tracking residential, commercial, mixed use and no-use parcel acreage fields through the system.

Step 6. Estimate outdoor irrigated area – irrigated area was estimated using place type derived per household and per employee by type densities at the SPZ scale. Sourced from the place type attribute table, residential irrigated area densities were multiplied by the number of households to estimate the residential portion of SPZ area that was irrigated. Commercial irrigated area was calculated by utilizing the estimated commercial irrigated area densities of a given place type multiplied by the number of employees at the SPZ scale.

TABLE 6 Building Square Footage Factors for Residential Units and Employment by Type

BUILDING TYPE	SUBURBAN SQFT/UNIT	URBAN SQFT/UNIT
RESIDENTIAL		
Small Lot Detached Single Family	2,400	1,650
Large Lot Detached Single Family	3,000	2,100
Attached Single Family	1,800	1,800
Multifamily, 2 to 4 units	2,000	1,850
Multifamily, 5 plus units	1,200	1,200
COMMERCIAL	SUBURBAN SQFT/EMPLOYEE	URBAN SQFT/EMPLOYEE
Retail Services	750	475
Accommodation	2,000	1,850
Restaurant	750	475
Entertainment and Recreation	1,200	900
Other Services	850	650
Office Services	350	280
Education	1,050	900
Medical and Health Services	800	725
Public Administration	700	620
Manufacturing	650	575
Transportation and Warehousing	1,700	1,200
Utilities	350	275
Wholesale	660	600
Construction	400	275

Source: SCAG

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