SUSTAINABILITY

SUSTAINABLE COMMUNITIES STRATEGY

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

CONNECT SoCal

TECHNICAL REPORT

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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 (CARB) 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 emissions from light duty passenger vehicles by eight percent by 2020 and 19 percent by 2035 from 2005 emissions levels. SCAG articulates its path to achieving this reduction by developing the Sustainable Communities Strategy (SCS) as part of the development of the Regional Transportation Plan (RTP).

The SCS details how, through a coordination of transportation investments and a regional development pattern, the region can achieve greenhouse gas emission reduction targets set forth by CARB. 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 CARB-determined greenhouse gas 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. Travelling more "sustainably" can vary for each community across the region and for each individual. 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 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 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 greenhouse gas 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 being influenced by state and federal funding priorities. More details about the policy framework for different transportation modes can be found in the following Technical Reports: Transit, Active Transportation, Highways and Arterials 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 myriad sizes and scales and the region's economy grew in synchrony with rail networks. The development of the regional highway network in the later 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 had been built upon and open spaces that remained 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 and 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 began operation of the blue line in 1990 and has continued expanding its rail network with support from locally supported sales tax measures.

EXTERNAL CHALLENGES

Today, there are a number of 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 policy makers.

ECONOMIC CHANGES

Changes in the economy can impact how and where people travel. For example, as the economy recovered after the Great Recession of the early 2000s, vehicle miles travelled (VMT) and related greenhouse gas 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. While there is evidence that the state's climate policies have been positive for the local economy (Jones, Betony et. Al, 2017), and environmental policy is not at odds with robust economic growth, the two examples above highlight the challenges that economic changes can have in achieving greenhouse gas emission reductions.

Similarly, there are other external economic changes 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 ecommerce 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 greenhouse gas 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 originally 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 a number of 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 in lieu 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, and studies have shown that it could both discourage and pose additional health risks to active transportation users and transit riders (Karner, Hondula & Vanos, 2015; Fraser & 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 by local and regional policy makers.

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 transit service (than if there were fewer centralized business districts). 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. This 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 SCAG member 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 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.

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 and 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 of 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 cities 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 a great demand at the local level for planning resources to further implement more sustainable 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 below 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 California Senate Bill 375 (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 50 percent of household and employment growth occurred within high quality transit areas (47.1 percent and 47.8 percent respectively). 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 in greenfield developments (4.3 percent and 1.4 percent respectively). 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 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 57 percent of all new housing permits in recent years (Construction Industry Research Board), in comparison to an average of about 22 percent in

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 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; Demographics and Growth Forecast
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 Lands
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

the mid-1990s (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 3.6 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. From 2015-2030, 65 percent of the population growth will be over the age of 65. This growing aging population raises the questions for both how housing needs may change as well as the transportation needs and services for this demographic. Another prominent trend emerging in the region is the declining natural 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 unit (ADU) is a term used to broadly describe secondary units 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 accessory dwelling units (Senate Bill 1069, Assembly Bill 2299 and Assembly Bill 2406). ADUs provide an opportunity to increase local affordable housing stock and/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. Cities 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 it is likely that it will provide thousands of units within the region over the 25-year time horizon of the plan. It is also not yet known if the location of these ADUs will be 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 (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 cities 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.

As part of the local input process, SCAG surveyed local jurisdictions on

several topics including land use policies. A total of 112 out of 197 local jurisdictions provided responses 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 what was submitted through the local input survey as part of the development of the SCS and does not necessarily reflect the progress made by all 197 jurisdictions.

- General Plans with SCS Strategies (80 percent [91 respondents]):
  - 95 percent of respondents (87 jurisdictions) have implemented Infill Development.
- Zoning Code with SCS Strategies (90 percent [101 respondents]):
  - 90 percent of respondents (91 jurisdictions) have implemented Accessory Dwelling Units.
- Infill Incentives (58 percent [65 respondents]):
  - 86 percent (56 jurisdictions) of respondents offer Density Bonus.
- Parking Strategies (75 percent [85 respondents]):
  - 90 percent (77 jurisdictions) have implemented additional Bicycle Parking.
- Transportation Strategies (94 percent [105 respondents]):
  - 82 percent (87 jurisdictions) have implemented a Bicycle Master Plan
- Travel Demand Management (74 percent [83 respondents]):
  - 73 percent (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 Public Transportation and Active Transportation Technical Reports.

SCAG INITIATIVES

LOCAL PLANNING FUNDING

Since the 2016 Regional Transportation Plan/Sustainable Communities Strategy, 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 2016-2040 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.

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
2016	Long Beach	Los Angeles	Destination Uptown

TABLE 2 **SCAG Sustainable Planning Grants - Continued**

Program Year	Applicant	County	Project
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
2016	San Gabriel Valley Council of Governments	Los Angeles	Greenway Network Implementation Plan

TABLE 2 SCAG Sustainable Planning Grants - Continued

Program Year	Applicant	County	Project
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
2016	Yucaipa	San Bernardino	Freeway Corridor Specific Plan Update

TABLE 2 SCAG Sustainable Planning Grants - Continued

Program Year	Applicant	County	Project
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

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 and Electric Vehicle Charging Infrastructure Planning. 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 high quality transit areas (HQTAs). HQTAs feature frequent transit service 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

OVERVIEW OF THE SCENARIOS

To develop Connect SoCal, SCAG developed five unique scenarios (including Trend/Baseline described below) to illustrate alternative representations of the region in 2045. More specifically, each scenario was designed to explore and convey the impact of where the region would grow, to what extent the growth would be focused within existing cities and towns, and how it would grow – the shape and style of the neighborhoods and transportation systems that would shape growth over the period. The following are descriptions of the five scenarios that were presented to the regional council, stakeholders, and at workshops throughout the region. More information about the how the scenarios were developed and the outreach process can be found in this Report's Scenario Development Methodology and Outreach sections.

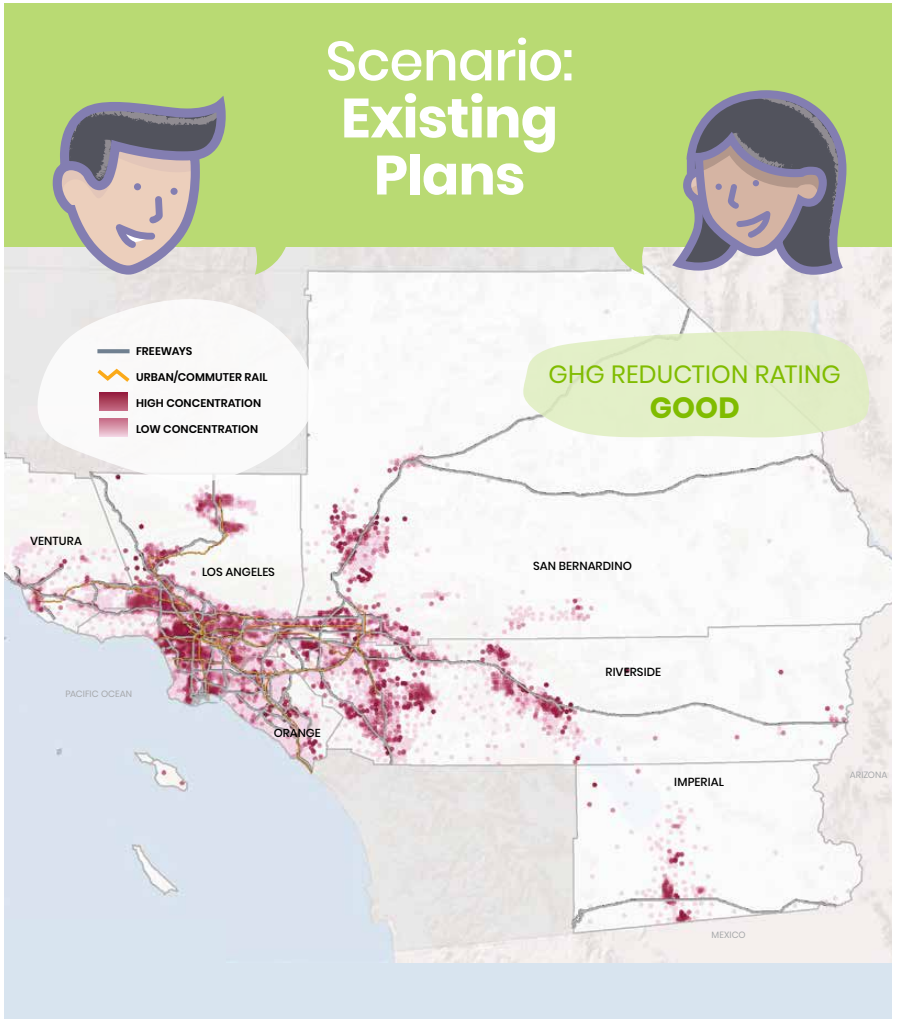
TREND/BASELINE

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

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. 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 anticipates the projects planned by each County Transportation

FIGURE 1 Regional Growth Distribution for Existing Plans



Source: SCAG

FIGURE 2 Regional Growth Distribution for Networked Destinations

Source: SCAG

Commission please see **FIGURE 1**.

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.

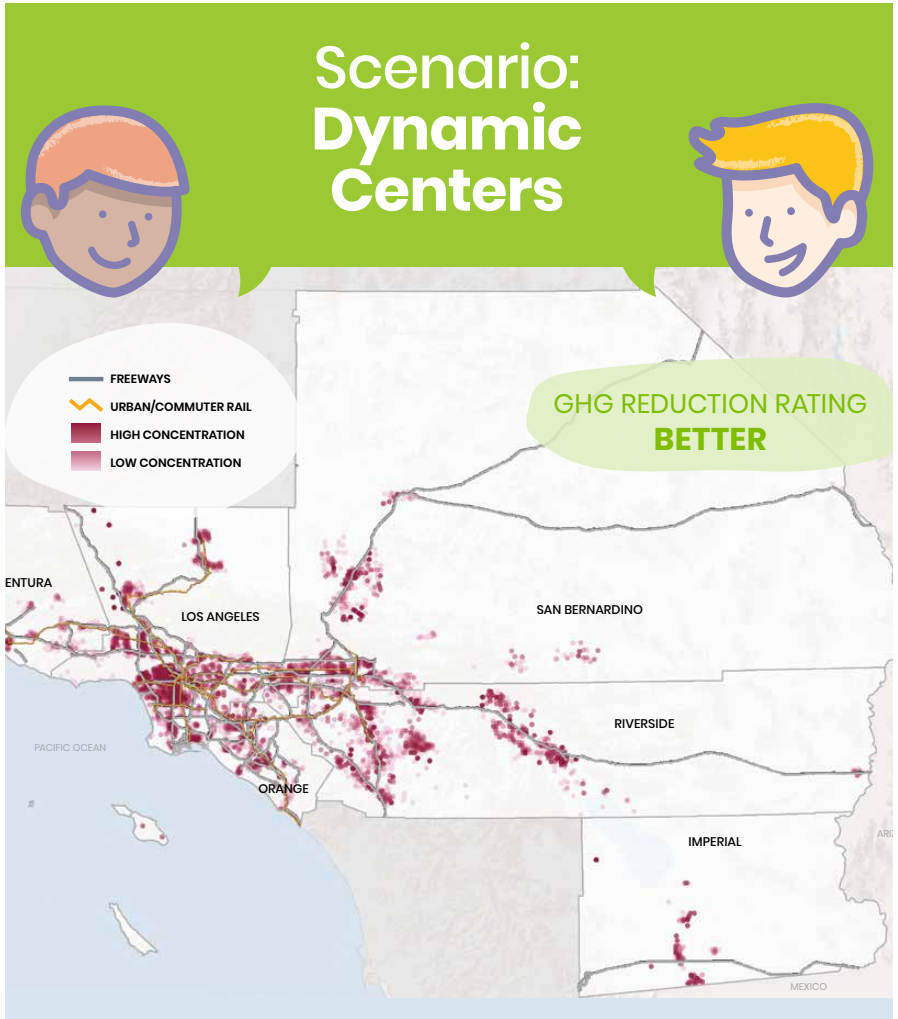
Growth was prioritized as follows:

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

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

FIGURE 3 Regional Growth Distribution for Dynamic Centers



Source: SCAG

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.

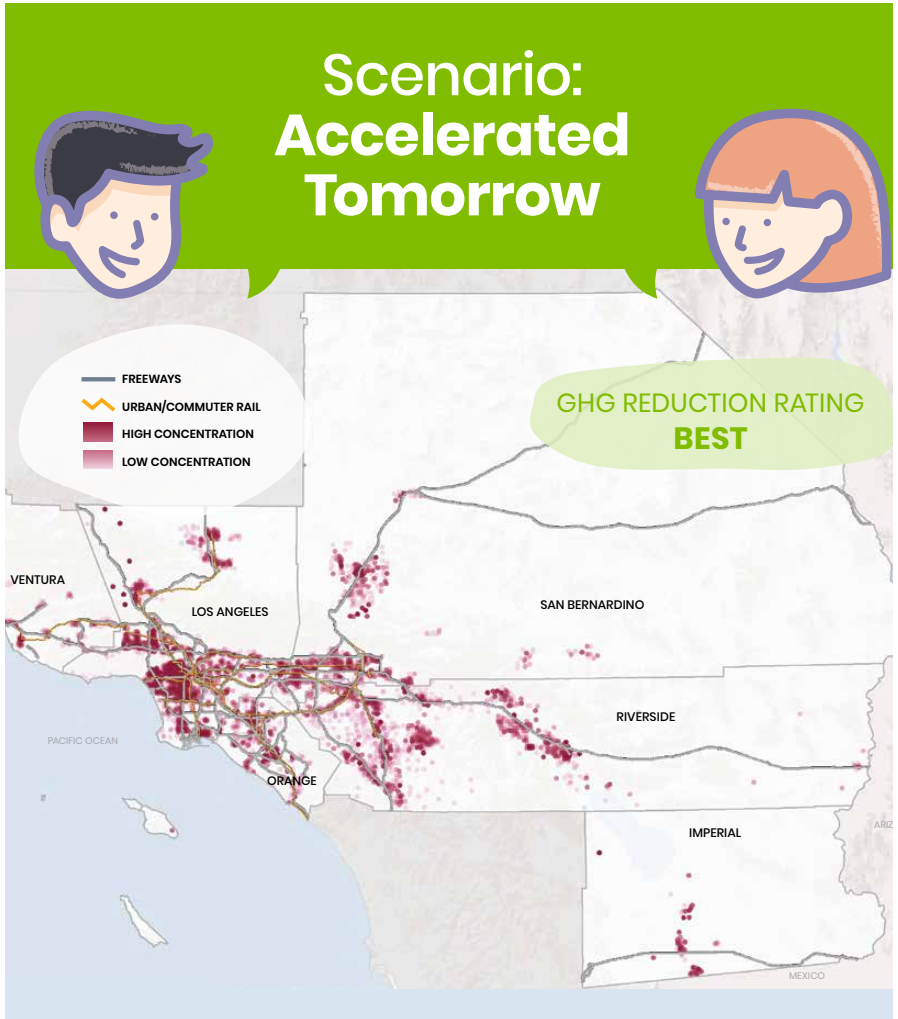
Growth was prioritized as follows:

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

ACCELERATED TOMORROW

In this 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 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.

FIGURE 4 Regional Growth Distribution for Accelerated Tomorrow



Source: SCAG

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.

OUTREACH

SCAG's development of the five scenarios and Sustainable Communities Strategies 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 Technical Report.

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.

TABLE 3 Scenario Results Comparison

	Trend/ Baseline	Existing Plans - Local Input	Networked Destinations	Dynamic Centers	Accelerated Tomorrow
Growth Projections	**Projections 2016-2045:** 20% Population Growth, 29% Housing Growth, 19% Job Growth				
	2016 Base Year: 18.9 million population, 6 million households, 8.5 million jobs				
	2016 - 2045 Change: 3.7 million population, 1.7 million households, 1.6 million jobs				
	2045 End State: 22.6 million population, 7.7 million households, 10 million jobs				
Housing Mix	**2016 - 2045 Growth**				
	61% Single Family	45% Single Family	27% Single Family	39% Single Family	24% Single Family
	39% Multifamily	55% Multifamily	73% Multifamily	61% Multifamily	76% 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
Development Location	**Priority Growth Areas**				
	58% Homes	57% Homes	59% Homes	60% Homes	60% Homes
	70% Jobs	70% Jobs	73 Jobs	74% Jobs	74% Jobs
Land Use Pattern Focus	**2016 - 2045 New Housing**				
	9% Urban	4% Urban	2% Urban	2% Urban	16% Urban
	18% Compact	69% Compact	77% Compact	73% Compact	60 % Compact
	73% Standard	27% Standard	21% Standard	25% Standard	25% Standard
	2016 - 2045 New Job				
	8% Urban	4% Urban	3% Urban	4% Urban	20% Urban
	9% Compact	61% Compact	81% Compact	66% Compact	56% Compact
	84% Standard	36% Standard	21% Standard	30% Standard	25% Standard

TABLE 3 Scenario Results Comparison - Continued

	Trend/ Baseline	Existing Plans - Local Input	Networked Destinations	Dynamic Centers	Accelerated Tomorrow
Fiscal Impacts (cumulative)	Infrastructure Capital				
	$ 28.6 billion	$ 27.5 billion	$ 26.6 billion	$ 27.2 billion	$ 26.0 billion
	Operations and Maintenance				
	$ 11.3 billion	$ 10.6 billion	$ 10.1 billion	$ 10.4 billion	$ 10.0 billion
Land Consumption	Greenfield Land				
	101 sq mi	85 sq mi	58 sq mi	50 sq mi	50 sq mi
Building Energy Use (cumulative)	Residential Use				
	9,458 trillion Btu	9.401 trillion Btu	9,319 trillion Btu	9,354 trillion Btu	9,282 trillion Btu
	Commercial Use				
	6,211 trillion Btu	6,191 trillion Btu	6,170 trillion Btu	6,189 trillion Btu	6,174 trillion Btu
Building Water Use (cumulative)	Residential Use				
	55.3 million AF	54.9 million AF	54.5 million AF	54.4 million AF	54.3 million AF
	Commercial Use				
	30.4 million AF	30.3 million AF	30.8 million AF	30.1 million AF	30.7 million AF
Household Costs	Transportation Costs (fuel + auto)				
	$11,300	$11,100	$10,800	$10,800	$10,800
	Utility Costs (energy + water)				
	$2,430	$2,400	$2,370	$2,380	$2,350
Public Health	Respiratory Related Health Costs				
	$3,336 million	$ 3,276 million	$ 3,188 million	$ 3,188 million	$ 3,179 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				
	- 60,550 acres	- 72,730 acres	- 67,970 acres	- 52,510 acres	- 54,410 acres
	Total Carbon Stock Change				
	- 305,890 metric tons	- 461,300 metric tons	- 352,850 metric tons	- 225,630 metric tons	- 224,700 metric tons
	Agriculture Production Value Change				
	$ -50.1 million	$ -71.3 million	$ -46.6 million	$ -36.7 million	$ -37.8 million
	High Species Movement Potential Change				
	- 36,460 acres	- 56,090 acres	- 42,300 acres	- 35,420 acres	- 37,240 acres
	Habitat Degraded				
	87,330 acres	120,930 acres	89,210 acres	70,400 acres	71,720 acres

Source: SCAG

COMMUNITY BASED ORGANIZATION PARTNERS

SCAG partnered with 18 community based organizations (CBO) to help increase the diversity of perspectives that are included in the development of Connect SoCal. A detailed report on this participation can be found in the Public Participation Technical Report. 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.

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. More details can be found in the Public Participation Technical Report. The results from attendees and the survey helped to inform the development of Connect SoCal.

SURVEY

In order to solicit more specific input for the development of Connect SoCal, staff prepared a survey which 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 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.

FINAL GROWTH VISION

SCAG used the performance of each scenario as well as input gathered through the public workshops to develop a final growth vision for the plan. The growth vision and the forecasted regional development pattern illustrated in **EXHIBIT 1** carries forth many principles from the initial scenario development to ensure that growth is feasible in terms of existing land use planning. It is important to remember that the growth pattern that SCAG sets forth as part of its SCS is meant to demonstrate the regional opportunity for more sustainable communities. At the neighborhood and project level, decisions about how growth will actually occur are up to each local jurisdiction. Additionally, every year cities update general plans, adopt new specific plans and ordinances that can influence how and where development actually occurs. SCAG has an opportunity to track the progress of SCS implementation every four years through the local input process and assess whether the broad regional strategies have traction at the local level.

FORECASTED DEVELOPMENT PATTERN PERFORMANCE AND OUTCOMES

This section provides an overview of the Plan's beneficial outcomes for the region in 2045.

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 48 percent of housing and 59 percent of jobs in areas served by high quality transit (i.e., HQTAs). This does not account for housing and jobs in other opportunity areas in existing main streets, downtowns and along corridors where infrastructure already exists. 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.

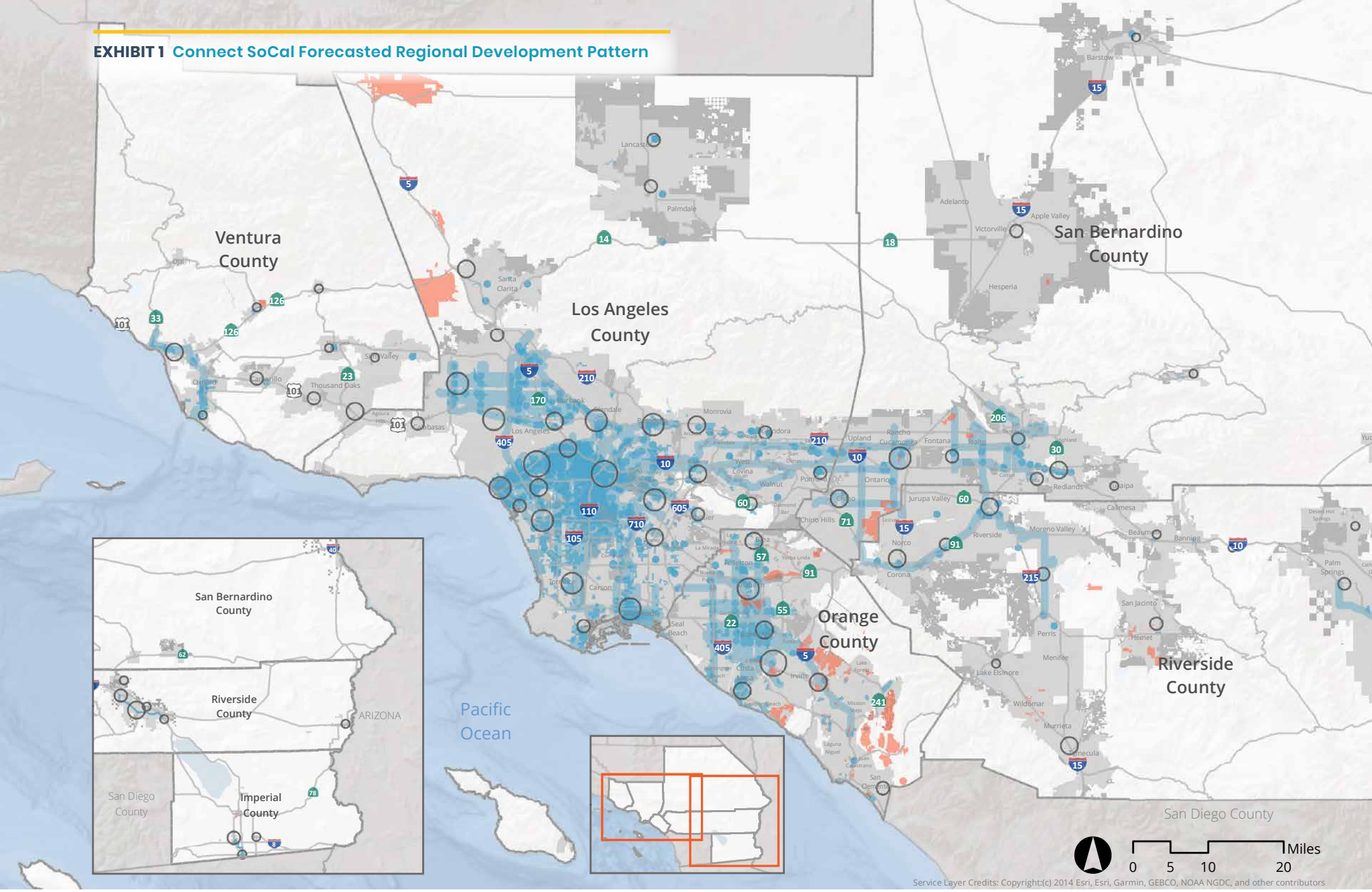
LOWER COSTS TO TAXPAYERS AND FAMILIES

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 to extend or build new local roads, water and sewer systems, and parks. Conversely, growth focused in urban areas often takes advantage of existing infrastructure and 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 maintain the infrastructure serving new residential growth. More dispersed development, which requires greater lengths of roads and sewer pipes, incurs higher O&M costs to local jurisdictions than more compact development, which capitalizes on shared infrastructure capacity.

The Connect SoCal Plan shows that growth in urban and mixed-use developments 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 $39.9 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 $36.1 billion in costs, representing a savings of $3.8 billion.

EXHIBIT 1 Connect SoCal Forecasted Regional Development Pattern



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

*Excludes absolute constrained areas

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

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 $13,800 annually in 2045. By comparison, the Connect SoCal Plan would lead to costs of $13,200 annually per household. Over time, the differences in annual expenditures would amount to a significant sum for each household, which increases further if the effect of local infrastructure cost burdens, which are typically passed on to homeowners and renters in the form of taxes, fees, home prices and assessments is considered.

PROTECT THE ENVIRONMENT AND CONSERVE NATURAL RESOURCES

LAND CONSUMPTION

Land consumption measures the amount of land that has changed from rural or greenfield to more intensive development patterns to accommodate new growth. A development type pattern with a greater share of urban infill and compact development will consume less greenfield land overall. By contrast, a pattern that places a greater share of new growth in dispersed standard development patterns consumes more greenfield land. The development trend of the past decades would consume about 101 square miles of land, about 36 percent more square miles than Connect SoCal's growth vision, which consumes approximately 65 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, 33% fewer acres of active farm lands (4,800 acres in total) would be developed and annual agricultural production would be $17.9 million higher compared to the trend. Connect SoCal reduces the amount of development on lands important for habitat for endangered species and the integrity of watersheds compared to the trend. 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 growth vision 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 growth vision leads to a total of 35,600 fewer people living in areas at a very high risk of fire and 1,400 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, Connect SoCal's growth vision saves the average household in the SCAG region 2 percent on electric and gas bills compared with a development type 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 growth vision saves the region $400 million in annual electricity and gas costs, providing each household an average savings of $50 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, homes with larger yards require more water for landscape irrigation, lot size is generally interrelated with a household's overall water consumption. Therefore, a development type pattern with a greater proportion of standard suburban development, which includes more large-lot single-family homes, 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 68,000 acre feet less water (3.1 million acre annually) when compared with past development trends (3.2 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 $1.4 billion over the span of the plan, and saves each household in the SCAG region $14 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 $31 billion in 2045 on direct and indirect costs related to diabetes, high blood pressure, heart disease, and obesity. With the implementation of Connect SoCal, the region will save $370 million on health direct health care expenditures through built environment investments in the plan, and $115 million indirectly through gains in productivity from a healthier workforce. 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.

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. The Air Resources Board (ARB) sets per capita greenhouse gas emission reduction targets from passenger vehicles 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.

SUSTAINABLE COMMUNITIES STRATEGIES

To ensure the plan's performance and achieve the outcomes described in the previous section, SCAG has developed the following strategies and tools. These policies further specify how the SCAG region can implement the plan and achieve related GHG reductions. 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.

STRATEGIES

FOCUS GROWTH NEAR DESTINATIONS AND MOBILITY OPTIONS

- Emphasize land use patterns that facilitate multimodal access to work, educational and other destinations.
- Focus on 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 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 commuter 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 cities in the establishment of EIFDs, CRIAS, or other tax increment or value capture tools to finance sustainable infrastructure and development projects.
- 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 achieve a regional growth vision and reduce per-capita GHG emissions; these include but are not limited to:

- Infill development and increased density near transit infrastructure
- Congestion Pricing
- Express Lane Pricing
- Mileage-Based User Fee
- Transportation Demand Management
- Job Center Parking Strategy (e.g. parking pricing in select centers)
- Parking Deregulation in certain Priority Growth Areas
- Increased Average Vehicle Ridership in Job Centers
- Co-working at strategic locations
- Increased Electric Vehicle Charging Infrastructure
- Electric Vehicle Incentives

- Improved Pedestrian Infrastructure
- Multimodal Dedicated Lanes
- Car Share
- Improved Bike Infrastructure
- Bike Share and Micromobility
- Safe Routes to School
- Transit/TNC Partnership Program
- Telemedicine
- Online Shopping/E-commerce

These strategies, measures and policies collectively result in approximately 13% per-capita GHG reductions using the Activity Based Model, and 6% reductions using off-model methodologies. SCAG collaborated with ARB throughout 2018 and 2019 as SCS Program and Evaluation Guidelines were updated by the State 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 estimating GHG emission reductions will be submitted to CARB after adoption of Connect SoCal.

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, with priority placed 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, 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 avert unchecked urbanization. These areas can comprise 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 public health 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 needs of households with immediate resource needs, 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

Robust residential to non-residential land use connections, high roadway intersection densities, and low to moderate traffic speeds can encourage safer,

multimodal short trips in existing and planned neighborhoods that reduce exclusive reliance of single occupancy vehicles for gaining convenient access to destinations. 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 latent 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.

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. Each scenario is made up of a unique combination of land use and transportation strategies. 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
- Technology: Horizon year for Automated Vehicle (AV) penetration
- Plan Base Year: 2016
- Plan Horizon Year: 2045

SCAG developed three scenarios in addition to the Local Input "Base Case" scenario (referred to as 'Existing Plans' in the public outreach process) and the trend scenario for a total of five scenarios. The designs, priority growth areas and constraints were based on initial stakeholder feedback from SCAG's Sustainable Communities and other working groups, direct interviews with Councils of Governments and a limited number of 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 additional scenarios included identifying areas within the region where directing future growth could enable greenhouse gas reductions by enabling shorter trips or use of alternative modes. There were also areas identified to avoid placement of future growth, including absolute constraints where growth cannot occur such as preserved land 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.
- 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

SCENARIO DEVELOPMENT GROWTH PRIORITY AREAS

The following five growth priority areas 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 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)

Areas within one-half mile of a major transit stop or high-quality transit corridor. A major transit stop is defined as a site containing a rail 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 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)).

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. Over 60 subareas throughout the region are identified as having peak job density. These are identified at fine, medium and coarse scales to capture locally significant job centers within the region.

SCENARIO DEVELOPMENT GROWTH CONSTRAINTS

The growth constraints outlined below were used to articulate where future growth cannot or should not occur. The absolute constraints reflect areas where growth was excluded from the scenario development growth allocation. The variable constraints reflect goals such as of Connect SoCal and were only used when there was capacity for growth in the rest of the jurisdiction general plan capacity.

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
- Land anticipated to be impacted with a 2 ft. sea level rise
- 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 scenario development.)[1]
  - Except when overlaps with TPA

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

[1]This constraint was not carried forward for the final scenario development

FINAL GROWTH VISION DEVELOPMENT

Once the five initial scenarios were developed, they were each modeled to evaluate their relative performance. Four of the scenarios (all except for "trend") were presented to the public at the Connect SoCal Workshops. SCAG staff then used both the modeling results and public feedback to develop the final growth vision.

ANALYTICAL APPROACH

DATA

LOCAL INPUT

Beginning in Fall 2017, local jurisdictions were surveyed on their local growth forecasts, existing and planned land use data sets and surveyed on a host of planning and sustainability efforts. This process continued through the fall of 2018. This information, particularly the land use datasets, provides a critical input to the development of SCAG's SCS. See the Public Participation Plan Technical Report for more details on this process. The collected information is included in the 'Data and GIS maps' section below.

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 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), the Air Quality Management Plan (AQMP) and the Federal Transportation Improvement Program (FTIP). SCAG's regional growth forecasting process also emphasizes the participation of local jurisdictions and other stakeholders.

SCAG's jurisdictional level growth forecast is built through the collaboration with all 197 jurisdictions in the region. The regional and county level growth trends for population, household and employment are well reflected in the scenario development for the SCS as detailed below. For example, maintaining jurisdictional level growth is one of key guiding principles for the scenario development. 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 below), 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 input datasets
  - Existing land use (2016)
  - General and specific plan land use
  - Zoning
  - Local entitlements and development agreements
  - Sphere 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 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 tier1s and 11,267 tier2s.

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 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 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 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 Transportation Analysis Zone (TAZ) scale to 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). The building square footage factors are contained in **TABLE 4**.

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 place type look-up of irrigated area per employee multiplied by the number of employees at the SPZ scale.

TABLE 4 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		
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

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TECHNICAL REPORT

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