

The slide features a light blue background with a dark blue triangular area in the bottom-left corner. A white circle is centered on the page, containing the text 'CHAPTER 2' in a gold, sans-serif font. The circle is surrounded by a light blue ring. Two diagonal lines, one gold and one white, cross the circle from the top-left to the bottom-right.

CHAPTER 2

CHAPTER 2

SOCAL TODAY

MAJOR TRENDS, EXISTING CONDITIONS & CHALLENGES

MAJOR TRENDS

With more than 19 million people, 6 million households, and 8 million jobs, the SCAG region is among the most dynamic metropolitan areas in the world. It encompasses a uniquely diverse mix of industries, urban forms, transportation connectivity, agricultural resources and risks for natural disasters.

In order to plan for 2045 and identify how to best prepare for the uncertainty of the future, we must first understand how our region and its 197 local jurisdictions are changing, what challenges are currently in place and which are emerging.

DEMOGRAPHIC & POPULATION CHANGES

Southern California's most precious resource is our people. In order to understand how changes will impact them, Connect SoCal projects growth in employment, population, and households at the region, county, city, town and neighborhood levels. These projections take into account economic and demographic trends at the global and regional levels, as well as feedback reflecting on-the-ground conditions from SCAG's local partners, stakeholders and working groups. Overall, our population forecast reveals that we are embarking on a new era for Southern California, and in the wake of our recovery from the Great Recession, new and unprecedented demographic trends are beginning.

On a national level, population growth has slowed, with the US Census Bureau projecting a decrease in national annual growth rate from about 0.75 percent in 2016 to approximately 0.40 percent by the 2040s. In the SCAG region, annual growth is similarly slowing down, from about 0.85 percent in 2020 to about 0.45 percent by 2045. These changes are driven by declines in fertility, as women are having fewer children and are doing so later in life. This is exacerbated by high housing costs in economically vibrant mega-regions like Southern California.

While we are growing slower, we are also growing older. From 2000 to 2016, the region's median age increased from 32.3 to 35.8. By 2045, this number is

expected to reach 39.7. Meanwhile, the youngest members of the Baby Boomer generation turned 55 in 2019. This will substantially change the ratio of working-age population to seniors in the future, placing stresses on social services such as healthcare, social security and pensions. As Baby Boomers enter their eighties and beyond, the region and nation are likely to experience a population decline, meaning that in order to create any future population growth, we will need to rely on migration. As such, many demographers have stressed the mutual dependence between the retirees and young immigrants who, together, will characterize a large portion of the region's future population. Future economic success will require effectively integrating new residents into the social and economic structures of Southern California. Similarly, education and workforce development will be even more important for younger generations since their labor will need to support a larger retiree population.

While net foreign immigration to the region has decreased from its highs in the early 1990s, Southern California is historically one of the country's most important immigrant gateways. Today, Southern California ranks behind only the Miami and San Jose regions in its share of foreign-born population. While roughly half of the region's foreign-born population is originally from Latin American countries, an increasing share of newly-arrived immigrants – now nearly 60 percent – are from Asian countries. Compared to the total population, immigrants are generally young or working age, which increases their importance to the regional economy. There are also clear-cut implications for transportation: new immigrants are more likely than their native-born counterparts to take transit, ride in carpools and utilize alternative modes of transportation.

Another “mega-trend” impacting the SCAG region is domestic migration. For most of the last thirty years, the SCAG region has lost more people to other states and regions than it has gained—in each year since 2014, an average of 91,000 more people have left the region for other parts of the country than the number of those who have arrived. While employment growth brings people to the region, high housing costs are often cited as a reason for leaving.

Hidden behind this trend is an exchange that has been referred to as California's “Brain Gain” – meaning that new residents moving to the region who come from other parts of the country (“domestic in-migrants”) tend to have a higher education level than those who leave (“domestic out-migrants”). In 2017, 47 percent of the region's 321,000 domestic in-migrants had at least

Changing Age Demographics in the Region

a four-year degree, compared to 39 percent of the region's 429,000 domestic out-migrants (see the Demographics and Growth Forecast Technical Report). This is a trend which many regional economists believe is part of what it means to be a booming mega-region today. Many U.S. regions expend tremendous effort attracting the highly educated workforce that is moving to our region of its own accord. While this can be a great boost to the region's economy, it is also indicative of some of the challenges faced by middle-class families native to Southern California.

In addition to the region's aging and migration, Connect SoCal is heavily informed by trends surrounding the large cohort of Millennials — the generation born between years 1981 and 1996. Since most Millennials entered adulthood during the recession, difficulties in securing stable employment have caused many of them to lag behind previous generations in building lifetime wealth. During this time, Millennials were less likely than previous generations to form a family, move out of their parents' homes to form a household, or purchase their own homes. This has had the effect of increased demand and higher prices in the rental housing market, since many would-be homeowners lacked the income to buy. Since the Great Recession, the popular perception has been that Millennials prefer urban renting rather than suburban homeownership. This also accompanied a decline in vehicle miles traveled (VMT) during the same period. However, more recent travel survey data and economic research has shown that a large portion of this shift can be explained by the lower incomes Millennials had during the recession rather than a fundamental change in preferences. Thus, as the economy improves and Millennials age, we must be aware that their demonstrated preferences may have been a temporary delay rather than a lasting characteristic¹.

STRUCTURAL ECONOMIC CHANGES

The distribution of income and wealth in Southern California has been changing gradually; but in the long term, future impacts may be profound. Median incomes have increased in the SCAG region since the depths of the Great Recession, but when adjusted for inflation, the median household income in the SCAG region is below what it was in 1989 — validating some

¹ Kurz, Christopher, Geng Li, and Daniel J. Vine (2018). "Are Millennials Different?," Finance and Economics Discussion Series 2018-080. Washington: Board of Governors of the Federal Reserve System



POPULATION AGES
UNDER 15

POPULATION AGES
15-64

POPULATION AGES
65 & OVER

2015

3.7M

12.6M

2.4M

2045

3.9M

14M

4.6M

— BY 2045 —

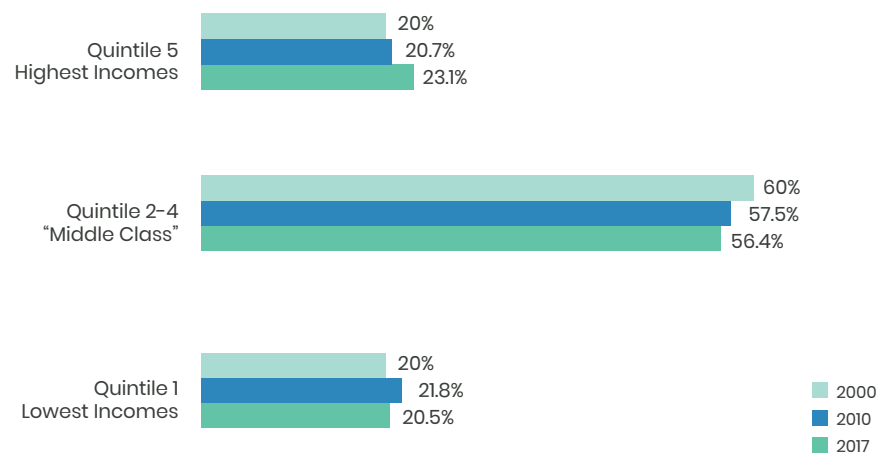
1 IN 5

PEOPLE WILL BE AGE 65+

claims that recovery has been uneven. Indeed, the middle class is measurably shrinking in Southern California. Since 2000, households in the middle income brackets have been declining - first as the recession turned some middle-class households into lower-income households, then as the recovery moved other middle-class households into the highest income group (see **FIGURE 2.1**). Using the “middle 60 percent” of the income distribution in the year 2000 to define the middle class, only 56.4 percent of households would fit that definition today. While the distribution of income remains a challenge, the region has experienced tremendous job growth since 2010, gaining 1.3 million jobs and cresting the pre-recession high of 8.1 million jobs reached in 2007. Meanwhile unemployment has dropped to lows not seen in several decades, from a high of 12.4 percent in 2010 to 4.3 percent in 2018.

Technological changes are also poised to make big impacts on our local economy, both by presenting new challenges and by creating new, previously infeasible solutions. While leaps in technology have always disrupted the established ways of getting things done, they are generally accompanied by

FIGURE 2.1 Income by Quintile

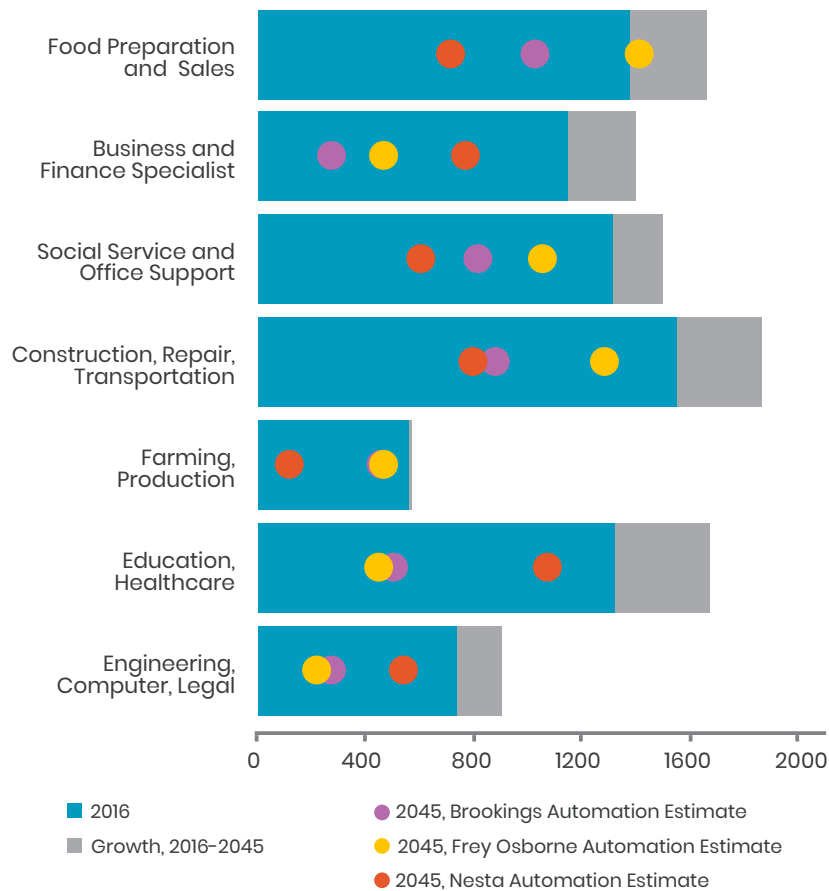


Source: United States Census Bureau and American Community Survey

increases in utility and productivity. New approaches to work have, for some, fostered a shift in the nature of employment away from full-time, long-term, stable jobs. Income sources like ridesourcing, short-term home rentals, and craft production enabled by new technology platforms can have the benefit of more efficiently matching consumers with products and services. But they can also remove important employment benefits and protections, as many of these positions are part-time or filled by independent contractors. Indeed, disruption by some technological platforms has caused serious concerns over displacing workers from stable, full-time jobs or from work altogether—a concern that is heightened when productivity gains are concentrated into smaller shares of the population. While workplace automation has already displaced some manufacturing jobs, services and knowledge-based employment are also increasingly being automated. An estimate of the potential impacts of automation on regional employment by 2045 suggests that construction, repair, transportation, food preparation, sales, social services and office support occupations show some of the highest likelihood of automation. Today these industries together employ over 3 million workers regionwide. **FIGURE 2.2** displays anticipated growth in these sectors, along with the projected number of jobs that will be automated based on three estimates – Brookings, Frey Osborne and Nesta. Looking at the logistics industry alone, changing trade paradigms and the emergence of new market-driven strategies and technologies (e.g., smaller urban fulfillment centers, increased competition for skilled labor, automation, etc.) will challenge the regional workforce. Trade-related jobs once offered few barriers to entry as well as upward career mobility to low- and semi-skilled workers, often allowing them to achieve security and middle-class incomes.

In the years ahead, the region may face significant challenges from technology disruption by reducing opportunities for many regional workers who will not be able to close the skills gap to adequately compete for future jobs in that sphere. This has spurred increasingly popular policy discussions of universal basic income (UBI) as a potential solution to offset the negative impacts of job losses due to technology. Since employment is becoming less necessary for gains in overall economic productivity, UBI models have proposed redistributing the revenues from taxes on businesses utilizing these new platforms to area residents to ensure a minimum living standard without impacting the incentive to work.

FIGURE 2.2 Job Growth (in Thousands) and Automation Potential by Occupation, SCAG Region, 2016–2045



* Figure shows Connect SoCal's anticipated regional jobs and job growth alongside independent estimates of automation potential by occupation. Occupations are aggregations of 2-digit occupation codes covering 95% of regional jobs
 Source: SCAG, Muro, Maxim, and Whiton (2019, Brookings), Frey and Osborne (2017), and Bakhski et al. (2017, Nesta)

Another major economic shift is occurring among consumers, who are now spending less on products and goods than they are on services. Some of this can be correlated with the aging of the population, since older people are less likely to fill a home with goods and more likely to spend on healthcare. As services are generally not subject to local sales tax, this could be problematic for local city and county revenue streams - a major source of funding for public amenities as well as existing and future transportation infrastructure in Southern California.

GLOBALIZATION

As a global crossroads for the movement of people and things, Southern California depends heavily on transportation services for the health of our economy. As a crucial node in global supply chains with a massive volume of trade, as well as an enormous consumer market with extensive transportation infrastructure, it is highly important that SCAG's strategies for the region accommodate growing freight movement. Combined, the region's major trade hubs - including the Ports of Los Angeles and Long Beach, Los Angeles International Airport, and Calexico East - Mexicali II - handled more than \$500 billion of goods in 2018. International containerized trade between the U.S. and Pacific Rim countries and bilateral trade with Mexico have been key factors that helped to drive the region's economy for decades. This has a direct impact on the region, as growth in international containerized trade continues to outpace growth in gross domestic product (GDP) nationally and globally (FIGURE 2.3).

In part due to Southern California's global connectivity - specifically its linkages with Asian countries - the growth of the global middle class also impacts the job and housing markets in the region. The growth rate in the global middle class internationally is at an all-time high, with 140 million new middle-class people annually². In the future, 88 percent of new middle-class residents expected between 2015 and 2030 will live in the Asia Pacific region. This is an approximately 250 percent increase in middle class residents in Asia compared to a modest increase of about six percent in North America. Sharp declines in manufacturing employment in the U.S. and the region indicate that traditional middle-class occupations are being filled by middle-class workers

² Kharas, Homi. (2017) The unprecedented expansion of the global middle class: An update. Brookings, Global Economy & Development Working Paper 100. (February)

in other countries. One impact from both the growth in the middle class in Asia as well as rapid GDP increases in Asian countries, particularly China, is the relationship with the Southern California real estate market. While data on foreign investment in residential real estate are weak, the California Association of Realtors estimates between 5 and 10 percent of California's single-family housing stock is owned by foreign buyers, and 71 percent of foreign buyers in 2017 were from Asia³. An influx of foreign capital in Southern California real estate has the potential to exacerbate regional housing shortages, especially if investment properties are left unoccupied.

REGIONAL GROWTH

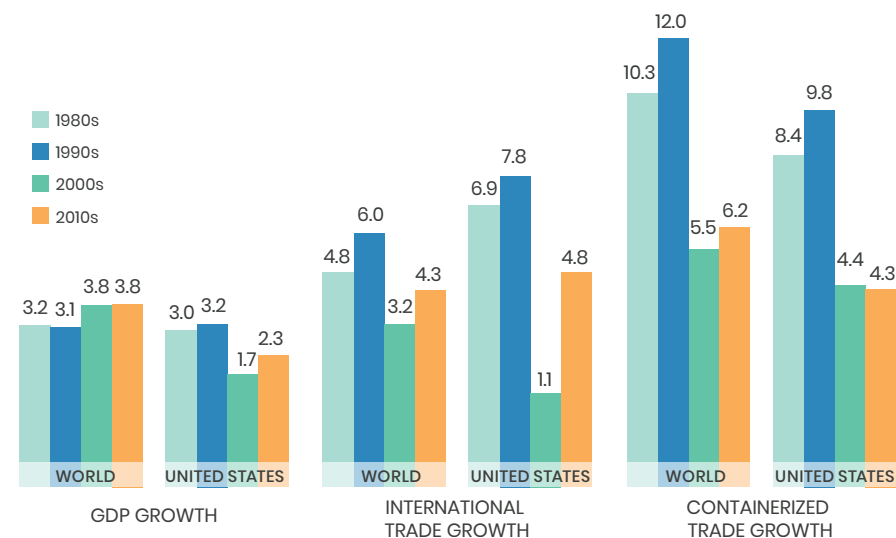
As our regional population and economy continue to grow, the physical footprint of development in our region is growing too. Though Southern California is seen by many as the embodiment of urban sprawl, the region has always challenged the notion of a crisp delineation between “urban” and “suburban.” U.S. Census data have indicated that Los Angeles is the densest urbanized area in the United States. This may seem counterintuitive since much of Southern California's land use is characterized by fairly small-lot single-family homes that are spread across many square miles of the region. By contrast, urban areas that seem more compact like New York or Chicago have very dense cores but a lower level of development across their regions, since suburban and exurban land is often far more spread out in these locales. In Southern California, decades of lower-density development (particularly housing) has occurred farther from employment-rich areas, increasing congestion, automobile dependency, leapfrog development and air pollution, and limiting the effectiveness of public transit.

Recent growth trends show a push-and-pull between new single-family development in traditionally suburban or formerly rural areas and multi-family residential development in higher-density communities. Overall, it is clear that when new residents join our region, existing towns, cities and counties adapt to accommodate and attract growth. From 2006 to 2016, an additional 930,000 people called Southern California home. Riverside County had the largest

share of population growth among the six counties in the SCAG region during this period, adding an additional 360,000 new residents (nearly 40 percent of the region's increase in population). Los Angeles County followed with the next largest share and experienced an increase of 190,000 residents (or 20 percent of the growth).

In meeting these new residents' demand for housing, the region also added about 400,000 units from 2006 to 2016 – 54 percent of which were multi-family units. Comparing to current conditions in 2016, 39 percent of the region's housing units are multi-family and 61 percent are single-family units. Looking at the distribution of these new housing units throughout the region, Riverside County and Los Angeles County again took the highest shares, together comprising two-thirds (66 percent) of Southern California's housing growth from 2006 to 2016. Riverside County added just under 100,000 new units, and Los Angeles County added an additional 164,000 housing units - with 90 percent

FIGURE 2.3 World & US Growth Rates of GDP, International Trade & Containerized Trade



Source: SCAG staff review and process international trade statistics from: U.S. Department of Transportation, Maritime Administration, U.S. Waterborne Foreign Container Trade by U.S. Customs Ports (1997 - 2017), World Development Indicators, World Bank. Update 08/28/2018, Bureau of Economic Analysis

³ Levin, Matt. (2018) "Data dig: Are foreign investors driving up real estate in your California neighborhood?" CalMatters. (March 7)

representing multi-family developments, largely occurring in denser areas that are well served by transit.

Part of Riverside County's expansion is due to new communities that began to emerge during the housing boom. Four additional cities have incorporated since 2006 (Wildomar, Menifee, Eastvale and Jurupa Valley), increasing the total number of local jurisdictions in the SCAG region to 197. Much of this new territory was previously vacant, very low density residential, or used for agricultural purposes. Many areas in Riverside and San Bernardino Counties were appealing for development due to the availability of lower priced land, which attracted new residents looking for larger or lower priced housing. Jobs, however, did not follow in proportion to housing unit growth in these communities. As a result, residents of the Inland Empire had to travel longer distances on average than other Southern Californians to reach their jobs. As wages are often higher in coastal counties than in inland counties, even for the same occupation, many residents also opted for a longer commute due to their preference for homes that were larger or lower-priced. Examining median commute distances for residents of these areas before and after the housing boom shows a sharp uptick from 2002 to 2012, followed by leveling off from 2012 to 2016 (as displayed in the Environmental Justice Technical Report).

From a regional perspective, incorporation of jurisdictions is often driven by an increase in housing density and the associated needs of residents for increased water, sewer, police, and other municipal services. Therefore, the acreage of incorporated towns and cities in our region provides a good indicator of overall regional development trends, as well as the expansion of growth into rural and agricultural areas. From 2006 to 2016, the amount of land within incorporated jurisdictions increased by over 144,000 acres—a 6 percent change during the 10-year period.

Moving towards the future, new housing production has accelerated since the recession with over 40,000 new units permitted each year from 2015 to 2018. While this is above the 15,000 annual permits in 2009 – a historic low for the region during the Great Recession – it is still below the average of 80,000 new units permitted annually during the housing boom from 2002 to 2006.

While the acceleration in new units since the Great Recession has been characterized by a higher share of multi-family units, there is concern that this trend may reverse absent policy intervention, as Millennials seek affordable ownership opportunities which are scarcer in the urban core and in the multi-

family market. For example, 51 percent of all new housing unit permits issued in California for 2018 were for single-family dwellings, making 2018 the first year since 2011 that single-family housing permitting outpaced multi-family homes. The SCAG region's multi-family share of permits have begun to decline from their peak in 2015 (**FIGURE 2.4**). Connect SoCal projects a higher share in multi-family growth and seeks to provide more housing choices in both type and location, while being aware of the transportation, fiscal and environmental benefits of some aspects of denser living.

As our communities continue to expand, vital habitat lands face severe development pressure. The diverse natural and agricultural landscapes of Southern California are a valuable asset to the region and its residents. These lands support a robust economy, provide clean drinking water, protect the air and host countless recreation activities. The region's desert, mountain and coastal habitats have some of the highest concentrations of native plant and animal species on the planet. Southern California is part of the California Floristic Province, one of the planet's top twenty-five biodiversity hotspots⁴. Much of the SCAG region has a rich agricultural history, and crop sales continue to bring billions of dollars into our local economy.

LINKING FUTURE GROWTH WITH MORE TRANSPORTATION CHOICES

Planning for more housing and jobs near transit was a strategy incorporated in SCAG's first Regional Transportation Plan/Sustainable Community Strategy (RTP/SCS) in 2012 and carried forward in the 2016 RTP/SCS with a focus on areas that are well served by transit. Efforts to implement the previous SCSs have been evident both in recently adopted local plans, which increasingly reflect more SCS strategies such as infill development, as well as in the observed data on recent growth. Between 2008 and 2016, over 58 percent of household growth and 45 percent of employment growth occurred within future high quality transit areas (i.e. places within a half mile of a rail or bus rapid transit stops or bus stops/corridors that will have peak headways of 15 minutes or less) (**TABLE 2.1**).

⁴ Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403(6772), 853.

Previous RTP/SCS plans also identified increasingly sophisticated strategies to ensure the preservation of natural lands and farmland. As of 2016, over 70 local jurisdictions have conservation strategies in place, such as development impact fees. Between 2008 and 2016, 11 percent of household growth and 5 percent of employment growth occurred in constrained areas (TABLE 2.1). SCAG continues to support jurisdictions in implementing the SCS through the Sustainable Communities Program which provides resources for local planning efforts.

Since 2008, there has been a substantial concentration and share of growth in high quality transit areas (HQTAs), Transit Priority Areas (TPAs), Specific Plan Areas, job centers, Neighborhood Mobility Areas (NMAs) and Livable Corridors. These areas account for just under four percent of the region’s land area but accommodate the lion’s share of regional growth (TABLE 2.1). While these recent trends are largely the result of existing local policy, demographic trends and market demand, they underscore that in many ways the region is gradually moving towards a more sustainable development pattern. This new growth is supported by the completion of major transportation projects across the region as well as several major urban rail projects under construction such

FIGURE 2.4 Building Permit Activity & Household Size, SCAG Region, 2000–2018



*Population aged 25 and over

Source: CA DOF and Construction Industry Research Board (CIRB). Single-family permits listed here utilize the CIRB definition, which includes attached duplexes and accessory dwelling units.

TABLE 2.1 Recent Growth Trends in SCAG Growth Priority Areas, 2008–2016

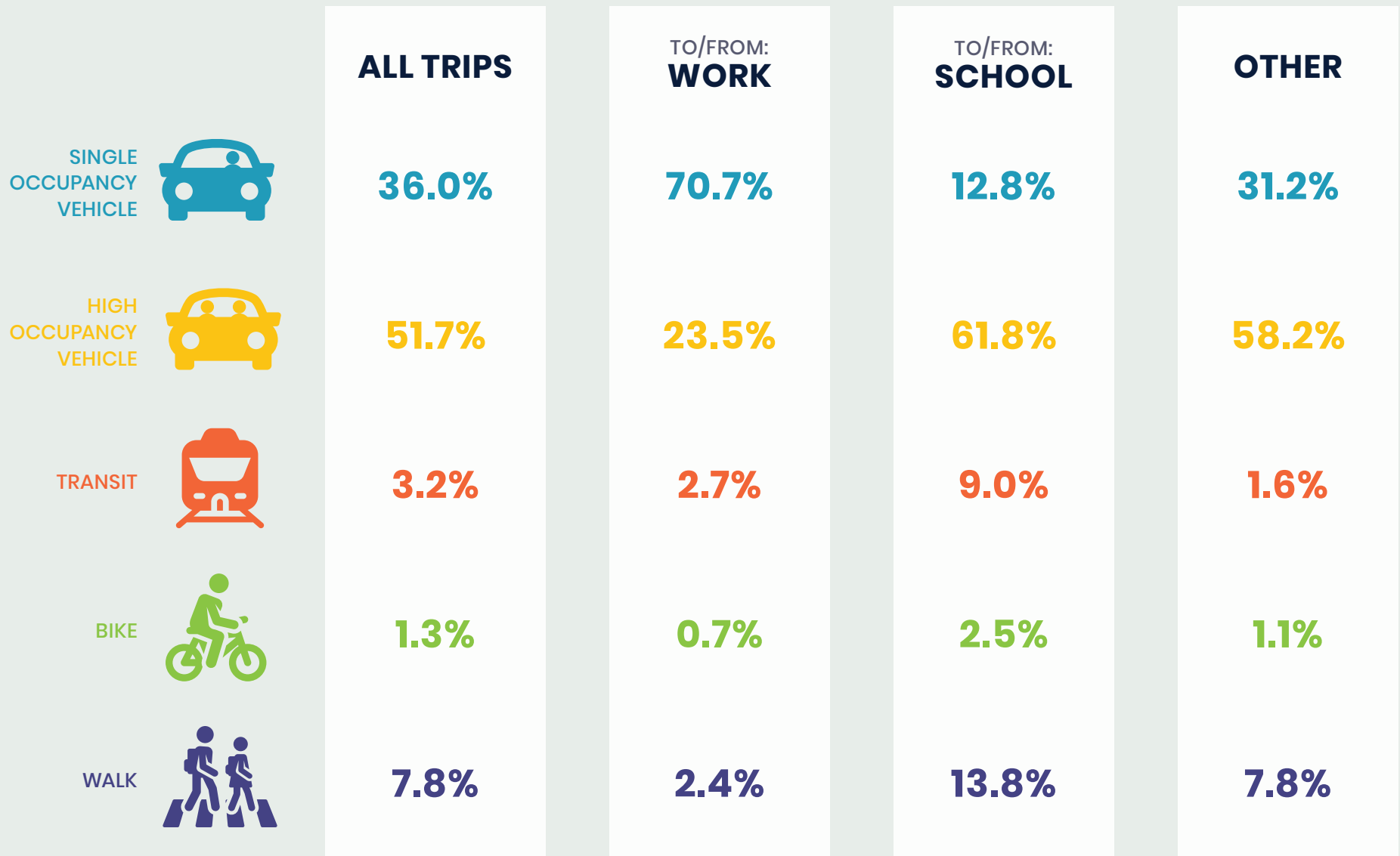
	Land Area		Share of Total Growth (2008–2016)		Annual Growth Rate (2008–2016)	
	Acres	Percent	Households	Employment	Households	Employment
SCAG Region Total	24,717,287				0.42%	1.01%
Priority Growth Areas Total	975,234	3.9%	70.7%	74.6%	0.50%	1.07%
High Quality Transit Areas (HQTAs) ¹	592,286	2.4%	58.2%	45.2%	0.54%	0.85%
Transit Priority Areas (TPA) ²	218,411	0.9%	33.9%	20.9%	0.65%	0.72%
Job Centers ³	202,186	0.8%	24.2%	33.4%	0.90%	1.21%
Neighborhood Mobility Areas ⁴	248,916	1.0%	37.4%	27.6%	0.54%	0.96%
Livable Corridors ⁵	548,451	2.2%	49.6%	53.8%	0.50%	1.13%
Sphere of Influence ⁶	146,017	0.6%	3.0%	2.6%	0.36%	1.31%
Absolute Constrained Areas⁷	20,487,984	82.9%	11.4%	5.0%	0.50%	0.66%
Variable Constrained Areas⁸	17,924,688	72.5%	52.9%	44.9%	0.48%	1.26%

Source: SCAG

Note: Priority Growth and Constrained areas extracted from 2045 plan year data of the final Connect SoCal, 2020-2045 RTP/SCS

1. Generally a walkable transit village or corridor, consistent with the adopted RTP/SCS, and within 1/2-mile of a transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours, excluding freeway transit corridors with no bus stops on the freeway alignment. Additional information is included in the Connect SoCal Sustainable Communities Strategy Technical Report.
2. An area within 1/2-mile of a major transit stop that is existing or planned including an existing rail transit station or bus rapid transit station or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during AM and PM peak commute periods.
3. Areas with significantly higher employment density than surrounding areas which capture density peaks and locally significant job centers throughout all six counties in the region.
4. Areas with high intersection density (generally >= 50 intersections/sqmi.), low to moderate traffic speeds, and robust residential retail connections that can support the use of Neighborhood Electric Vehicles or active transportation modes for short trips.
5. An arterial network subset of HQTAs based on level of transit service and land use planning efforts. Some additional arterials identified through corridor planning studies funded through the Sustainability Planning Grant program.
6. Spheres of Influence (outside of absolute and variable constrained areas) - Existing or planned service areas and within the planning boundary outside of an agency's legal boundary; data accessed by SCAG from each county's Local Agency Formation Commission (LAFCO) in 2016.
7. Including tribal lands, military, open space, conserved lands, sea level rise areas (2 feet) and farmlands in unincorporated areas
8. Including Wildland Urban Interface (WUI), grazing lands, farmlands in incorporated jurisdictions, 500 year flood plains, CalFire Very High Severity Fire Risk (state and local), and Natural Lands and Habitat Corridors (connectivity, habitat quality, habitat type layers).

HOW WE TRAVEL TODAY (2016)



Source: SCAG Activity Based Model

as the OC Streetcar, Metro Rail Regional Connector and Arrow/Redlands Rail. However, there is some very recent data that show increasing rates of single-family housing and vehicle travel, which suggests that in an improving economy the region may require stronger policy intervention and community-building in priority areas to ensure that sustainable trends continue. See Chapter 3’s “Core Vision” and “Key Connections” for more highlights of recent progress and potential solutions for addressing the region’s challenges.

TRANSPORTATION SYSTEM

The SCAG region is a place in motion with more ships, planes, trains, trucks, and automobiles carrying people and goods in, out, and around than anywhere else in the United States. It is also infamous for congestion, network gaps, and lack of adequate maintenance and preservation. By understanding how the current system is utilized, we can implement policies that help address these challenges while preserving and maintaining the system’s longevity.

Our current transportation network is comprised of more than 9,000 miles of public transit (**EXHIBIT 2.1**), 5,000 miles of bikeways (**EXHIBIT 2.2**), over 135,000 lane miles of roadways and 94 miles of express lanes. The Port of Los Angeles and Port of Long Beach, which comprise the largest container complex in the U.S., is one of the many regional gateways that contribute to our expansive regional goods movement system (**EXHIBIT 2.4**). Our aviation system is one of the busiest in the world in terms of air passenger and cargo demand, with more than 110.2 million annual passengers and 3.14 million tons of cargo in 2017. All components of the system are providing economic stimulus throughout the region, while simultaneously connecting our homes to opportunities, including leisure.

Understanding the current infrastructure presents the question of how do Southern Californians utilize the transportation system. **PAGE 28** identifies the current mode choice for trip purposes throughout the SCAG region. Key takeaways include:

- According to SCAG’s activity-based travel demand model (ABM), more than 71 million total unlinked daily trips are made throughout the region, and nearly one third of all trips are work related
- Of those 20 million daily work unlinked trips, nearly 40 percent are greater than 10 miles in distance and over 70 percent are completed

by individuals driving alone in their vehicles. After that, carpooling is the second most popular option, followed distantly by walking, taking transit and bicycling

- Over two-thirds of all regional trips are non-work related; for these purposes, carpooling is the most popular means for residents to reach their destinations, including school, shopping, among many others
- Looking at school trips specifically, nearly 14 percent are made by walking and 9 percent of trips are made by transit

While the system supports a multitude of options for people and cargo to navigate the region, it is not immune to challenges of preservation, maintenance and accessibility. To ensure a more connected 2045, Southern California will need to address many of these obstacles.

PRESENT & FUTURE CHALLENGES

The region is experiencing a range of challenges and anticipating more, including the aging population, income inequality, traffic congestion and the high cost of housing. This section highlights several key land use and transportation challenges which are directly addressed in this plan; additional discussion is also available in the Technical Reports for Connect SoCal.

AFFORDABLE HOUSING








California is in the midst of a long-term structural housing shortage and affordability crisis. As of 2018, California ranks 49th of 50 states in the number of housing units per resident. With many strong indications, high demand for housing and short supply drives up rental and home prices throughout the state. Indeed, seven of the 10 most expensive housing markets in the United States are in California.

SCAG published a housing report in 2016, Mission Impossible: Meeting California’s Housing Challenge, to review the causes and consequences of the housing crisis throughout the state and for the SCAG region. The housing crisis is a two-part problem – a shortage of housing and a lack of affordability. The shortage of housing is a lack of supply since there is not enough housing to meet population needs. Housing supply has not kept up with population growth. In comparison to the last few decades, housing building has significantly decreased.

EXHIBIT 2.1 Existing Transit Network, 2016

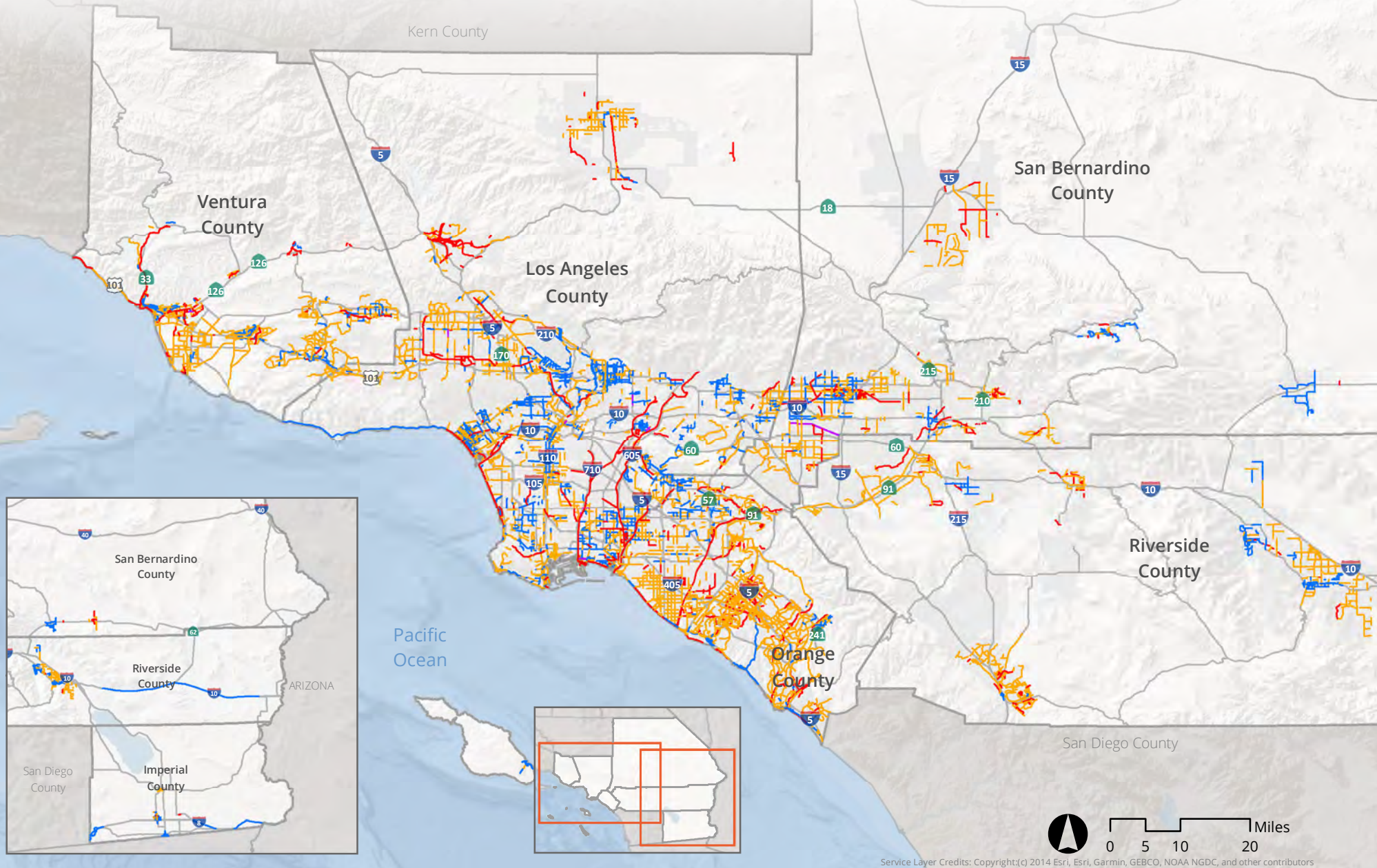


Service Layer Credits: Copyright(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

-  County Boundaries
-  City Boundaries
-  Freeway
-  Metrolink (2016)
-  Urban Rail (2016)
-  Rapid Bus and Bus Rapid Transit (2016)
-  Bus Routes (2016)

Source: SCAG, 2019

EXHIBIT 2.2 Existing Bikeway Network, 2016

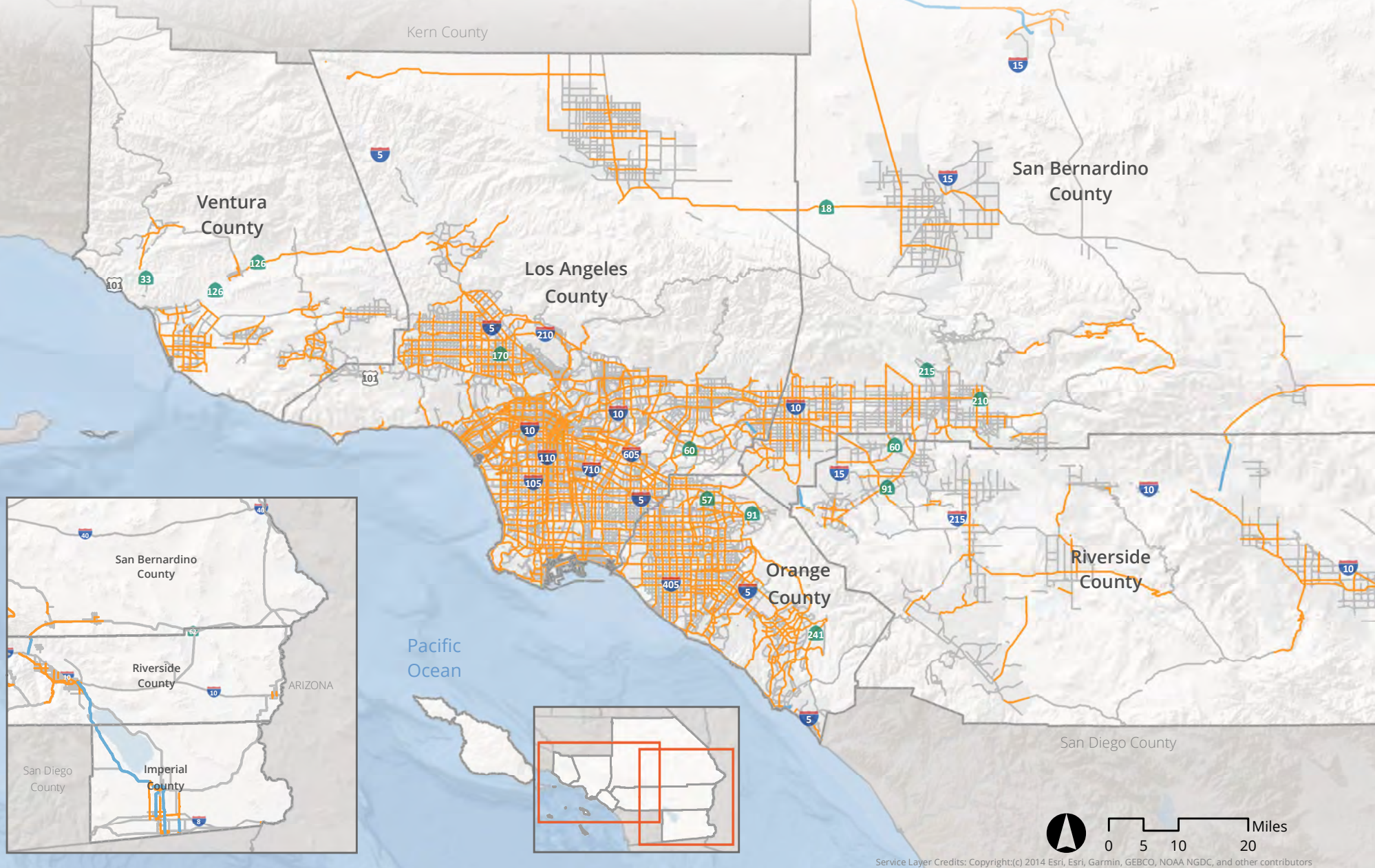


Service Layer Credits: Copyright:(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

- | | | | |
|-------------------|---------|-------------------|-----------|
| County Boundaries | Freeway | Existing Bikeways | |
| City Boundaries | | Class I | Class III |
| | | Class II | Class IV |

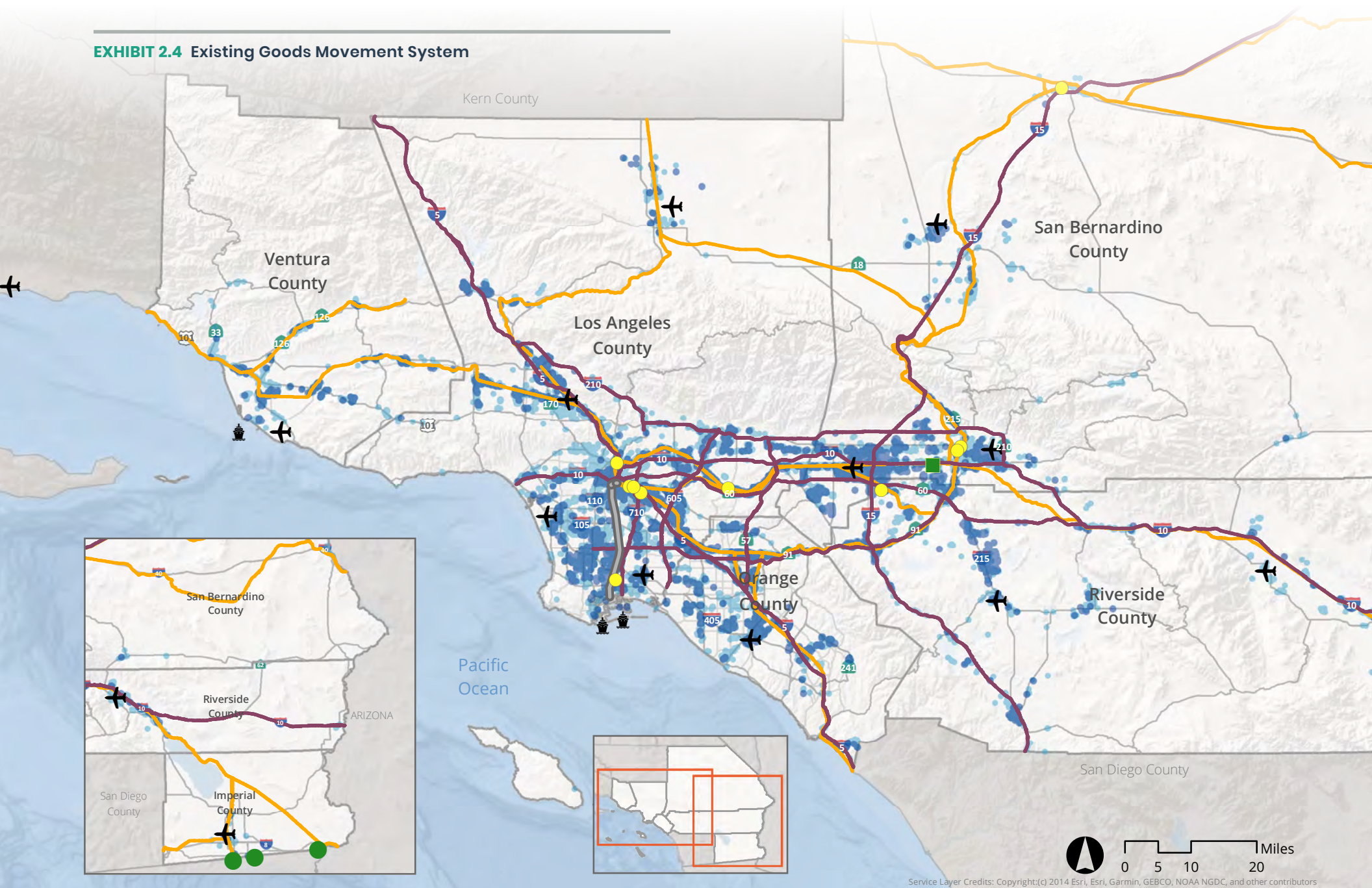
Source: SCAG, 2019

EXHIBIT 2.3 Existing Arterial System, 2016



Expressway / Parkway Principal Arterial Minor Arterial

EXHIBIT 2.4 Existing Goods Movement System

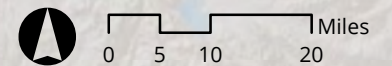


✈ Airport
 🏗 Ports

● Ports of Entry
 ● Intermodal Facilities
 ■ Classification Facilities

🛣 Major Freight Highway Corridors
 🚂 Main Line Rail
 🛤 Alameda Corridor

Warehouses
 ● $\geq 50,000$ sq ft
 ● $< 50,000$ sq ft



Service Layer Credits: Copyright(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

FOCUS REGIONAL AVIATION



AIRPORTS

- 7** COMMERCIAL AIRPORTS
- 7** GOVERNMENT/MILITARY AIR FIELDS
- 30+** RELIEVER AND GENERAL AVIATION AIRPORTS



STATS

110.2 MILLION ANNUAL PASSENGERS IN 2017

200 Destinations, 50 Countries, 40 States

3.1 MILLION TONS OF AIR CARGO IN 2017

114 Destinations, 20+ Countries, 30+ States



TRENDS

GENERAL AVIATION GREW AT AN ANNUAL GROWTH RATE OF **0.12%***

AIR CARGO GREW AT AN ANNUAL GROWTH RATE OF **4.6%***

*From 2012 to 2017



HOW WE GET TO THE AIRPORTS IN THE REGION

*Transportation Network Companies, such as Uber and Lyft

FOCUS

GOODS MOVEMENT

THE SCAG REGION
HAD APPROXIMATELY

5,177 **MILES** of principal arterial roadway, including interstate, other freeway & expressway in 2018



* Not including carload and automobile terminals

IN 2018, THE VALUE OF INTERNATIONAL TRADE THAT MOVED THROUGH THE SCAG REGION WAS OVER

\$562 **BILLION** including total maritime and cross-border trade and air freight

\$1.6 **BILLION**** cost of congestion to the trucking industry in the Los Angeles metropolitan region in 2016

**Source: ATRI



SOUTHERN CALIFORNIA HAS THE LARGEST CONTAINER PORT COMPLEX IN THE UNITED STATES

9th largest container port complex in the world in 2018

NEARLY **1.2** **BILLION** sq. ft. of warehousing & distribution space



AND CLOSE TO **750** **MILLION** facilities >50k sq. ft. in size

Goods Movement dependent industries generated

2.9 **MILLION** JOBS



REGIONAL AIRPORTS HANDLED NEARLY

\$122 **BILLION** in international air cargo in 2018

OVER **300%** **GROWTH**



in VEHICLE HOURS OF DELAY per day at rail-highway grade crossings across the region by 2045

From 2010 to 2018, one unit was built for every 3.32 persons in the SCAG region which is a 47.5 percent decrease compared to the 1.74 persons per unit in 1970 to 1980. There are also many other contributors to the overall housing crisis including barriers caused by land use zoning that prevent new housing development and increasing building and other costs resulting from time delays, environmental litigation, lack of sufficient local funding mechanisms and community resistance to new housing, especially medium and high-density projects. The second problem, lack of affordability, is the mismatch of household incomes to the prices of housing that is available. **EXHIBIT 2.5** highlights SCAG's existing land use as of 2016. One underlying challenge is that middle income job growth has been severely deficient despite an otherwise strong recovery from the Great Recession.

Additionally, population and employment growth in metropolitan areas in California has slowed in recent years because wages cannot compensate for the high cost of housing. From 2000 to 2017, median gross rent and median home price have increased 25.5 percent and 55.7 percent, respectively, while median household income only increased by 2 percent. High housing costs often force residents to live further away from their workplace as affordable options are sparse near their place of work. In surveying the needs and concerns of residents in Southern California, affordable housing and homelessness were the top concerns. The California Legislative Analyst's Office found that for every 10 percent increase in a metropolitan area's median rent, there was a 4.5 percent increase in an individual's commute time⁵. High housing prices contribute to sprawl, add time to regular commutes, make food and healthcare less attainable by constraining household resources, and exacerbate the growing homelessness crisis.

The cumulative impacts of the housing shortage on individuals' everyday lives add up to a significant economic loss for our region. This is in spite of the fact that every dollar spent on new housing construction, including infill development, generates more than an additional dollar (\$1.10) in total economic activity, and each job created through residential construction supports 1.4 additional jobs⁶. These challenges also present an opportunity,

however: Increasing the supply of affordable housing would reduce poverty and homelessness, increase residents' economic mobility and educational attainment and improve health outcomes in vulnerable populations. Several studies that have analyzed the economic relationship between affordable housing and surrounding properties have found that affordable housing development has little to no impact on surrounding property values, and in some cases, surrounding property values have increased.

NATURAL LANDS

A range of local conservation plans, habitat conservation agencies and state/federal park designated areas provide protection for a significant amount of natural and farmland in the SCAG region. Many of these protected lands are in remote desert areas far from incorporated areas (**EXHIBIT 2.6**), leaving a substantial amount of land on the urban and suburban fringe susceptible to development. Protected areas tend to not be distributed evenly across habitat types, leaving some habitat types largely unprotected. Many of the high-biodiversity habitats that play a key role in the region's ecosystem are adjacent to urban and suburban communities and do not have protected status. Furthermore, many habitats, both protected and unprotected, are in need of restoration efforts such as non-native species removal, re-introduction of native species, erosion control and re-connecting fragmented areas.

FARM LAND LOST & AT-RISK

Like natural habitat lands, farm and grazing lands are at risk. According to the California Department of Conservation's most recent data, the SCAG region lost 21 percent of its farmland between 1984 (the year the farmland tracking began) and 2016. Major losses were seen in Los Angeles, San Bernardino and Orange counties, which respectively lost 55, 71 and 78 percent of their farmland (**TABLE 2.2**). This decline of agricultural land has implications for the economy and the environment, especially in the context of climate change. While many farming practices contribute to greenhouse gas (GHG) emissions, emissions from farmlands are far less than those from urban environments. Farm and grazing lands can also provide co-benefits such as wildlife habitats, flood control and groundwater recharge. Productive farm and range lands bring billions of dollars into Southern California's economy, creating jobs and providing food security. Converting these lands to urban development weakens this vital industry and the region's position in the U.S. economy.

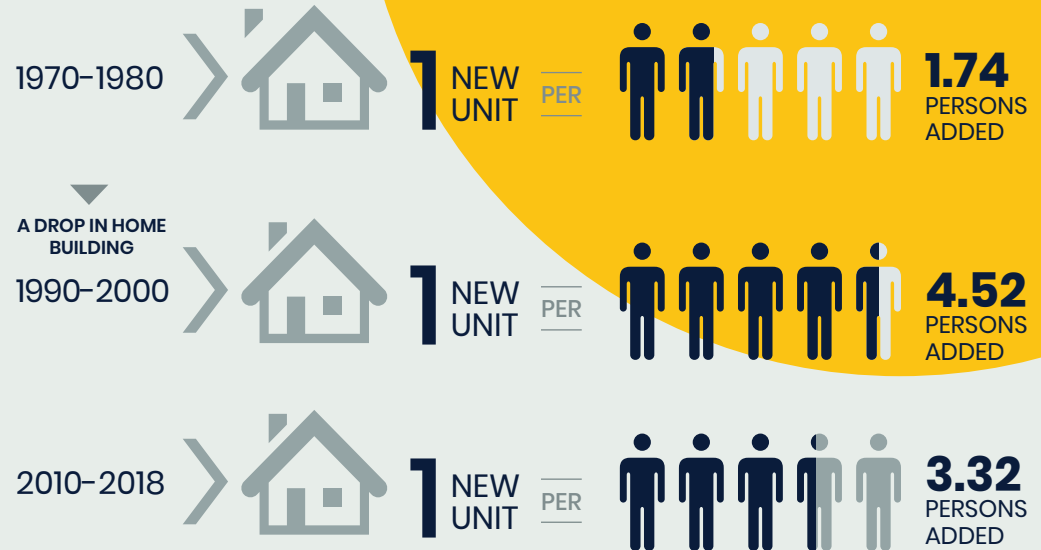
5 Taylor, Mac. (2015). California's High Housing Costs: Causes and Consequences. California Legislative Analysts' Office. 17 March

6 Center for Strategic Economic Research. (2014). The Economic Benefits of Housing in California. September.

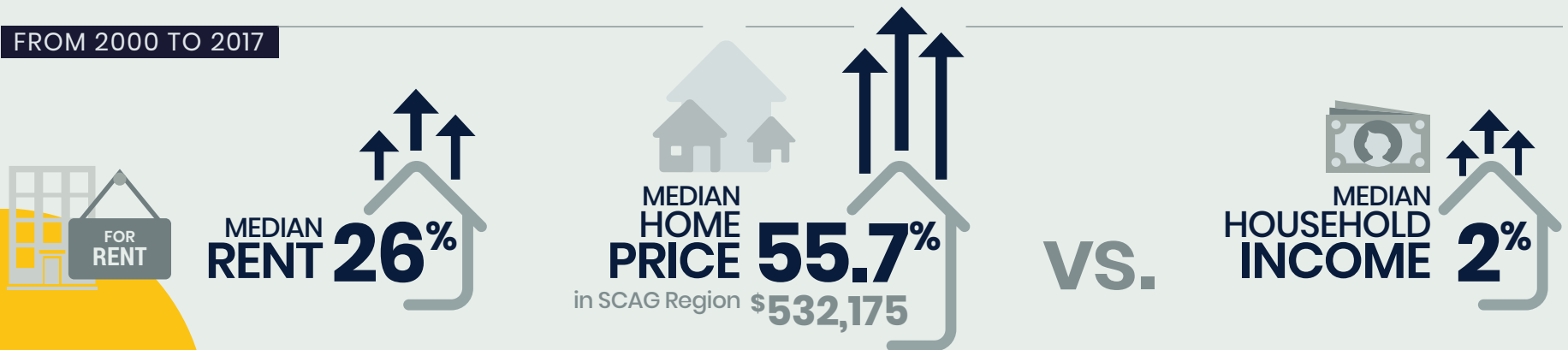
FOCUS AFFORDABLE HOUSING

California is in the midst of a long-term structural housing shortage and affordability crisis. In 2016, SCAG published the report, *Mission Impossible: Meeting California's Housing Challenge*, to review the causes and consequences of the housing crisis throughout the state and for the SCAG region. It found that the lack of supply of housing is due to the fact that housing construction has not kept up with population growth. There are also many other contributors to the overall housing crisis including barriers caused by land use zoning that prevent new housing development and increasing building and other costs resulting from time delays, environmental litigation, lack of sufficient local funding mechanisms, and community resistance to new housing especially medium and high-density projects.

HOME BUILDING HAS NOT KEPT UP WITH POPULATION GROWTH

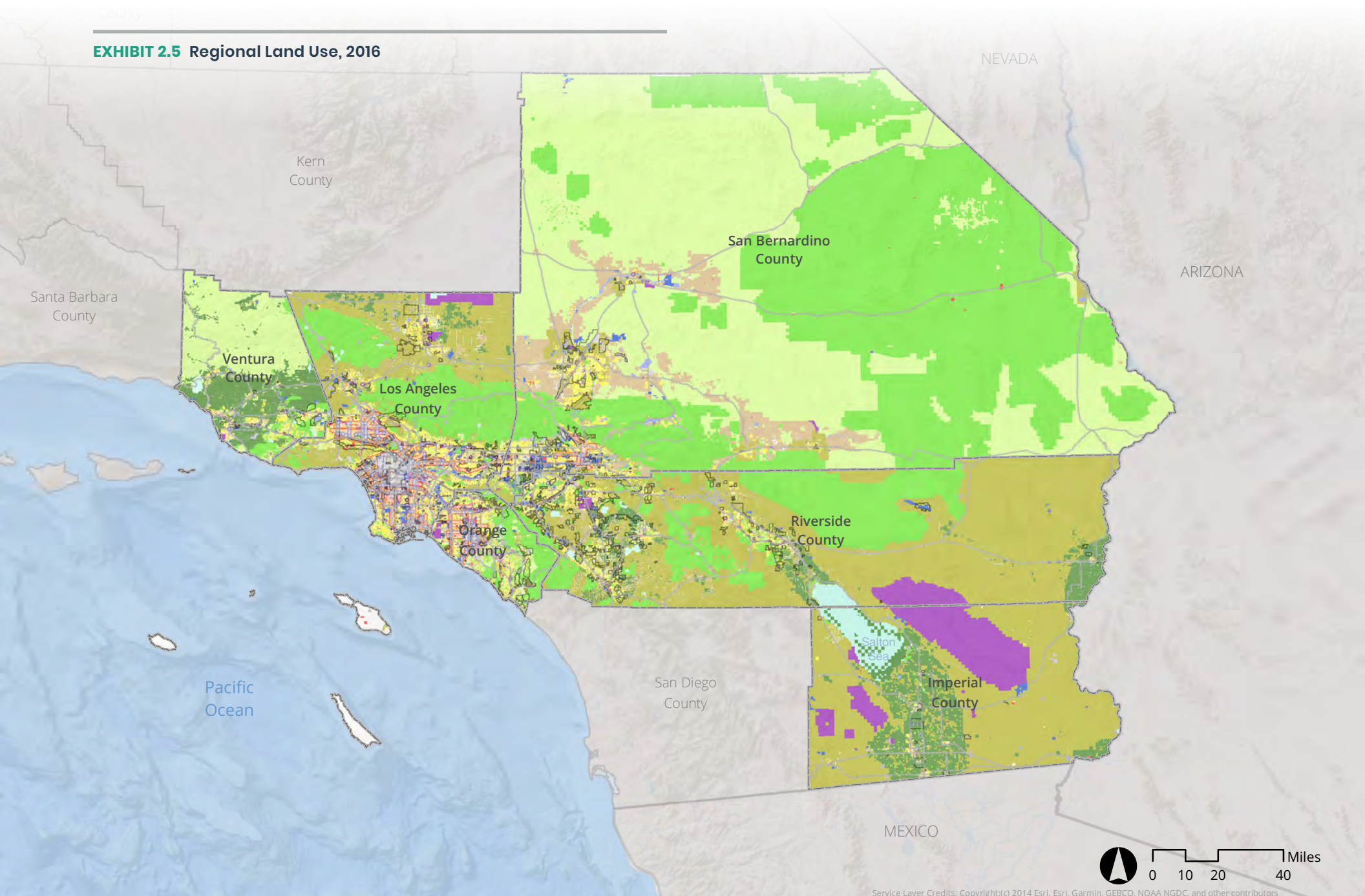


FROM 2000 TO 2017

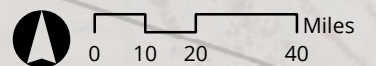


Source: U.S. Census Bureau; Census 2000 Summary File 1, 2017 American Community Survey 1-Year Estimates, and SCAG's 2016 Mission Impossible? Meeting California's Housing Challenge Report.

EXHIBIT 2.5 Regional Land Use, 2016



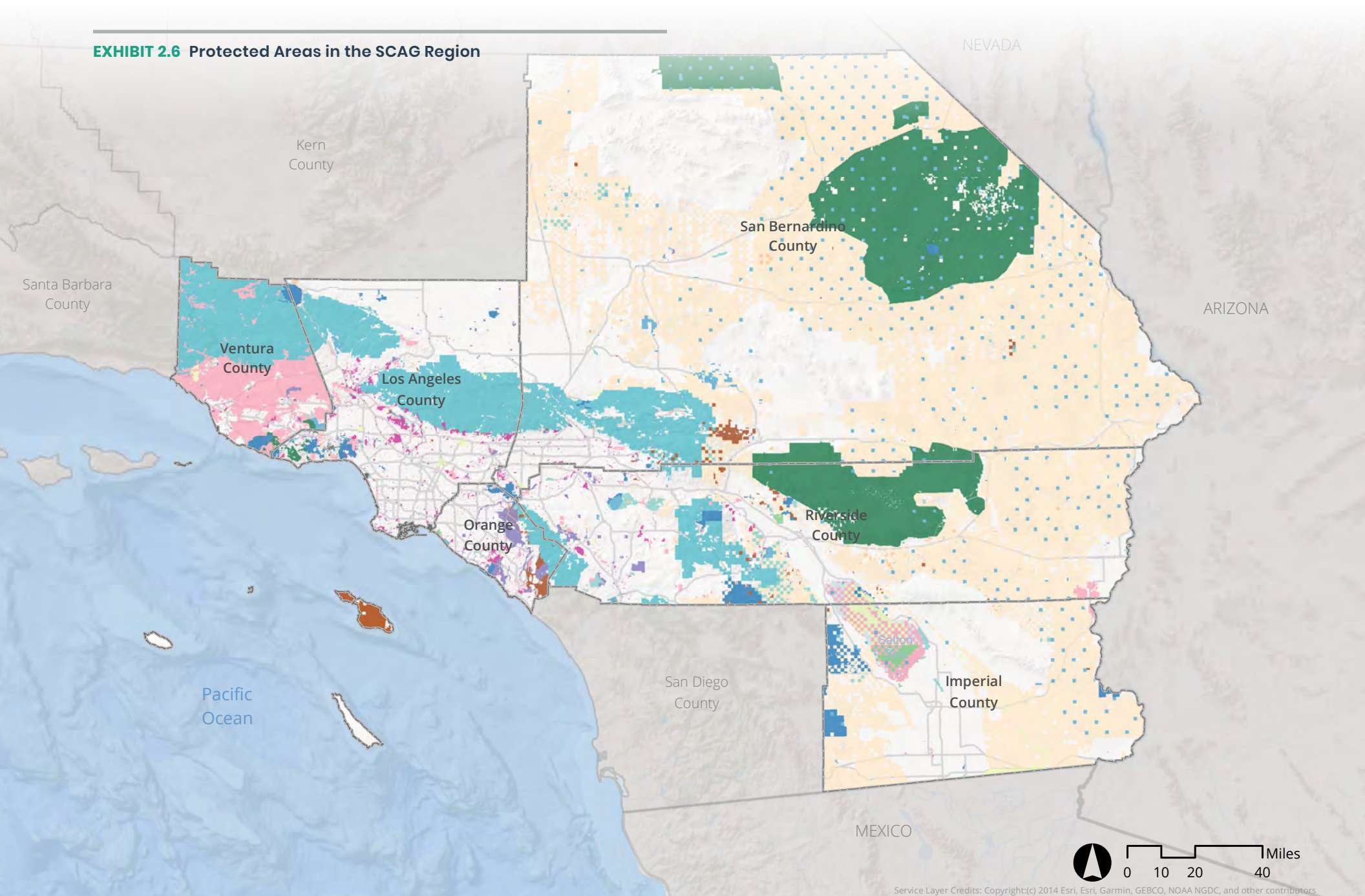
- | | | | | | |
|-------------------|--------------------------------|----------------------------------|---|---------------|---------------|
| Specific Plan | Single Family Residential | General Office | Industrial | Agriculture | Undevelopable |
| TPA (2016) | Multi-Family Residential | Commercial and Services | Transportation, Communications, and Utilities | Vacant | Unknown |
| HQTA (2016) | Mobile Homes and Trailer Parks | Facilities | Mixed Commercial and Industrial | Water | |
| Mixed Residential | Education | Mixed Residential and Commercial | Open Space and Recreation | Specific Plan | |
| Rural Residential | Military Installations | Under Construction | | | |



Service Layer Credits: Copyright:(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Source: SCAG, 2019

EXHIBIT 2.6 Protected Areas in the SCAG Region



Service Layer Credits: Copyright:(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

- | | | | | |
|------------------------------|------------------------------|---|------------------|-------------------------------|
| US Forest Service | US Fish and Wildlife Service | California Department of Parks and Recreation | County | Non Governmental Organization |
| US Bureau of Land Management | US Military/Defense | California Department of Fish and Wildlife | City | Private |
| National Park Service | Other Federal | Other State | Special District | Conservation Easement |

Source: SCAG, California Protected Areas Database, 2017; California Conservation Easement Database, 2016

As population continues to grow, vital habitat and farmlands face severe development pressure. In addition to their respective roles in biodiversity and food production, both natural areas and farmlands help reduce the impacts of climate change by capturing GHGs in the soil, plants, and trees instead of allowing them to concentrate in the atmosphere. Urban, suburban and even rural development on previously undeveloped land results in increased GHG emissions. The conservation of natural area and farmlands on the edges of urban and suburban development is an integral aspect of Connect SoCal as it incentivizes infill development and the concentration of different land uses. This makes it easier to travel shorter distances which reduces GHG emissions. Many counties, cities and conservation groups in Southern California have excelled in their work to protect these vulnerable lands, but few plans or policies have been enacted to preserve habitat and farmlands on a regional scale. With regional population increases, conservation decisions made now can safeguard the endurance of these lands, protecting threatened wildlife and the local

agricultural economy, and reducing carbon emissions, while also contributing to a high quality of life for future generations.

TRANSPORTATION SAFETY

Traffic-related fatalities and serious injuries are a critical and preventable public health and equity issue in the region. Approximately 1,500 people die, more than 5,200 are severely injured, and 136,000 are injured on roadways throughout the SCAG region every year. Collisions are happening in every community in the region, from El Centro in Imperial County to Malibu in Los Angeles County. They are happening to people from all walks of life, to those who drive and to people who walk and bike. Approximately 90 percent of collisions are occurring in urban areas, with most taking place on local roads, not highways. Regionally, 65 percent of fatalities and serious injuries are occurring on less than 1.5 percent of the roadway network. Of particular concern are vulnerable groups such as children, older adults, and users of personal mobility devices such as e-scooters. These roadway users do not have the protections included in automobiles, and collisions involving them have higher fatality rates. Pedestrian and bicycle-related collisions have been steadily increasing since 2012, underscoring the importance of implementing infrastructure improvements that safely accommodate all modes, or reducing speed limits in some areas to reduce the likelihood or severity of higher speed collisions. Unsafe speed is the primary collision factor in the SCAG region, accounting for about 30 percent of collisions. At 50 miles per hour, a pedestrian has only 25 percent chance of survival if struck. In contrast, at about 25 miles per hour, if struck, a pedestrian has a 90 percent chance of survival.

Traffic-related fatalities and serious injuries have significant impacts on the lives of families, friends and community members. They also have economic and environmental impacts. Traffic collisions impact congestion, leading to emergency management costs and additional GHG emissions from bottlenecks. Increasing safety for pedestrians and bicyclists can make transit and active transportation more desirable, thereby motivating mode shifts and reducing GHG emissions. Policies, infrastructure and mode choice impact the safety of everyone who travels throughout the region. Providing a safe transportation network is essential for meeting SCAG's economic, housing, environmental, equity and public health goals, and will require optimizing the existing system to strategically incorporate complete streets while supporting a range of other safety strategies.

TABLE 2.2 Farmland Loss by County in Acres, 1984–2016

County	1984	2016	Percent Change
Imperial	562,132	528,471	-6%
Los Angeles	60,877	27,390	-55%
Orange	26,535	5,715	-78%
Riverside	561,542	419,835	-25%
San Bernardino	69,575	20,293	-71%
Ventura	132,388	118,508	-10%
SCAG Region	1,413,049	1,120,212	-21%

Source: California Department of Conservation Farmland Mapping & Monitoring Program

FOCUS

TRANSPORTATION SAFETY

#1

REASON FOR
ALL COLLISIONS

UNSAFE SPEED

Fatal and Serious Injury collisions have increased in the region since 2012, underscoring the importance of re-evaluating our street designs and speed limits. Approximately 90 percent of collisions occur in urban areas, with most taking place on local roads, not highways. Unsafe speed is the primary collision factor in the SCAG region. About 30 percent of collisions are due to unsafe speed. At 50 miles per hour, a pedestrian has only 25 percent chance of survival if struck. In contrast, at about 25 miles per hour, if struck, a pedestrian has a 90 percent chance of survival.

65% OF FATALITIES & SERIOUS
INJURIES ANNUALLY
OCCUR
IN LESS THAN **1.5%** OF THE REGION'S
ROADWAY NETWORK

ON ROADWAYS IN THE SCAG REGION



136,000
INJURED
ANNUALLY



5,200
SEVERELY INJURED
ANNUALLY



1,500
PEOPLE DIE
ANNUALLY

TRANSPORTATION SECURITY

Catastrophic events like earthquakes, floods, fires, hazardous material incidents, dam failures, civil unrest, transportation accidents, tsunamis and terrorism can occur at any given moment in the SCAG region. The state of California has experienced 323 state proclaimed emergencies and 267 federally proclaimed disasters since the year 1950. While the threat of disasters cannot be eliminated, effective planning can help minimize the impacts from disasters. Disaster incidents in the state were highest between 2000 and 2009 where 59 people died, and 885 people were injured. Despite a tripling of population between 1950 and 2017, the number of deaths resulting from disasters has remained within a relatively narrow range. The two most frequent disasters in the SCAG region are floods (160 incidents since 1950) and fires (138 incidents since 1950).

PUBLIC HEALTH

Across the SCAG region, transportation and land use decisions are shaping neighborhoods, while also influencing the health outcomes of residents. The way a community is designed impacts the likelihood that a person will bike or walk to school, work, or local shops; have access to healthy food or parks; and breathe air that is free of pollutants. Conditions in the places where people are born, live, learn, work and play affect a wide range of health risks and outcomes. These conditions are known as the Social Determinants of Health (SDOH) and they help explain why health outcomes (e.g., rates of asthma or diabetes) vary widely across the region. Depending on where you live in the region, your life expectancy could be as low as 68 years or as high as 93 years. To improve health outcomes and to reduce these inequities, it is critical for public health to be integrated into land use and transportation planning.

Public health outcomes in the 4-year period from 2012 to 2016, the base years of the 2016 RTP/SCS and Connect SoCal, have largely worsened or remained constant across the SCAG region, including asthma (13.8 percent), diabetes (8.9 percent), pre-diabetes (13.7 percent), high blood pressure (27.9 percent), heart disease (5.8 percent) and obesity (29.6 percent). The main chronic diseases accounting for deaths in the region are coronary heart disease, cerebrovascular disease (stroke), chronic lower respiratory disease and diabetes. Chronic diseases carry significant direct treatment-related costs

and indirect costs. Healthcare expenditures continue to be a large burden on the regional economy, with \$18.8 billion spent annually at the base year on just three chronic diseases: type 2 diabetes, high blood pressure, and heart disease. Reducing the prevalence of chronic disease through strategic transportation investments and land use strategies would benefit the region's health and the economy.

The aging of the region's population will also pose new public health challenges. Most senior citizens prefer to age in place rather than move into a smaller dwelling unit or group housing. With an aging population comes greater risks of health complications, and an increased need to plan for walkable and compact urban environments to support older adults choosing to age in place. Through the implementation of Connect SoCal, public health outcomes through transportation investments and land use strategies are expected to improve across each of SCAG's public health focus areas.

SYSTEM PRESERVATION & RESILIENCE

Maintaining the operational efficiency of our transportation system is crucial. Unfortunately, demand on the system has increased over the decades without significant maintenance reinvestment. This has greatly influenced the number of roadways and bridges that have fallen into an unacceptable state of disrepair. Indeed, many residents have expressed concern. One particular resident commented that "Southern California's roads are in horrible condition. There's no infrastructure to support planned development." Part of the challenge is to ensure that life cycle costs such as maintenance and preservation expenses, are considered and planned in the development of infrastructure projects. Until the passage of Senate Bill 1 (SB1) (2017), funding for preservation and improvement of our system was on a dramatic decline. SB 1 provides a much needed funding supplement for system preservation, but we must continue to weigh our options carefully in allocating and investing resources to maximize the productivity of our transportation system. **FIGURE 2.5** displays the conditions of distressed lane miles on the State Highway System. **FIGURE 2.6** reflects bridge conditions in the SCAG region.

ACCESS & MOBILITY

Reaching destinations in a timely manner is a top concern of Southern California residents. In 2016, average trip length to work was over 19 miles and

FOCUS PUBLIC HEALTH

Conditions in the places where people are born, live, learn, work, and play affect a wide range of health risks and outcomes. If a person lives in housing adjacent to a freeway or high traffic road, they may be more likely to develop asthma. If a person lives in a community with an abundance of bikeways, they may be more inclined to bike to work or school. These types of community conditions are known as the Social Determinants of Health (SDOH) and they help explain why health outcomes (e.g., rates of asthma or diabetes, lifespans, etc.) vary widely across the region. Social Determinants of Health are often the result of past transportation and land use planning and policy decisions, and they, along with economic opportunities, play a role in shaping these circumstances and influencing health outcomes.

Since the last plan was adopted, overall public health trends have continued to worsen or stay the same. SCAG analyzes health outcomes affected by the SDOH which include: accessibility to essential services; air quality; affordable housing; climate change; economic opportunity; safety; and physical activity.

\$16.7 BILLION

ANNUAL COST OF TREATING CHRONIC DISEASES:

Heart disease,
high blood pressure
and diabetes.

CHRONIC DISEASES & INJURIES MAKE UP OVER 69% OF ALL CAUSES OF DEATH IN THE REGION:



14% (+2% increase since 2012)
ASTHMA



13% (+4% increase since 2012)
PRE-DIABETES



9% (existing rate 2016)
DIABETES



29% (+10% increase since 2001)
OBESITY



28% (2016)
HIGH BLOOD PRESSURE



6% (2016)
HEART DISEASE

Source: California Health Interview Survey (CHIS), 2012, 2016,
California Public Health Assessment Model (C-PHAM) for the \$16.7 billion figure

14 miles by auto and transit respectively. Yet it took over twice as long by transit (69 min) to make the same trip compared to auto (31 min).

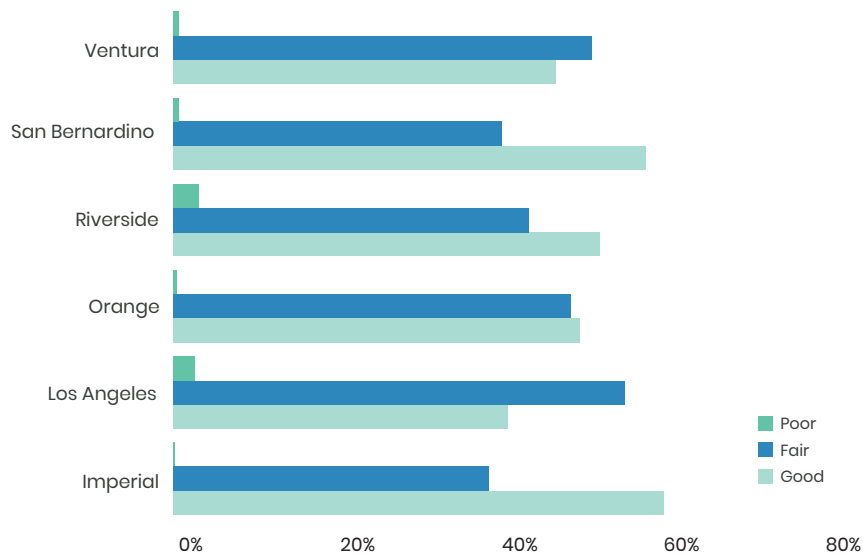
Examining Southern California’s transportation system, it is clear that there are many causes of congestion and challenges for improving accessibility. Paramount among them is a dependence on personal vehicles in our region, which often shapes our built environment to be more suited to cars than people – reducing the attractiveness and viability of transit as an alternative means of getting around. Residents see a lack of transit options as a significant challenge and many express a desire, as one survey respondent put it, for more “...reliable transit outside of the Los Angeles downtown core.”

An imbalance between jobs and housing in many areas presents challenges to access and mobility in Southern California due to the geography and urban sprawl of our region. Many residents continue to move farther and farther inland to reach lower priced housing. Additional factors impacting congestion on roadways and transit accessibility are natural impediments such as mountains and waterways and other challenges.

Another cause of congestion is gaps in the road network and bottlenecks where capacity is reduced at pinch points. SCAG identified the top 100 bottleneck locations in 2016 by annual hours of vehicle delay. Most bottlenecks are active in the morning and/or afternoon peak periods, and all are active at midday. The most active time for bottlenecks is the afternoon peak period. The top three ranked bottlenecks in the SCAG region are all located on the I-405. The top ranked bottleneck, where National Blvd. meets the Santa Monica Freeway (I-10) in Los Angeles, results in over 1.7 million annual hours of vehicle delay. Most bottlenecks are located in Los Angeles County, with 19 in Orange County, three in Riverside County and two in San Bernardino County. More discussion on bottlenecks is included in the Congestion Management Technical Report.

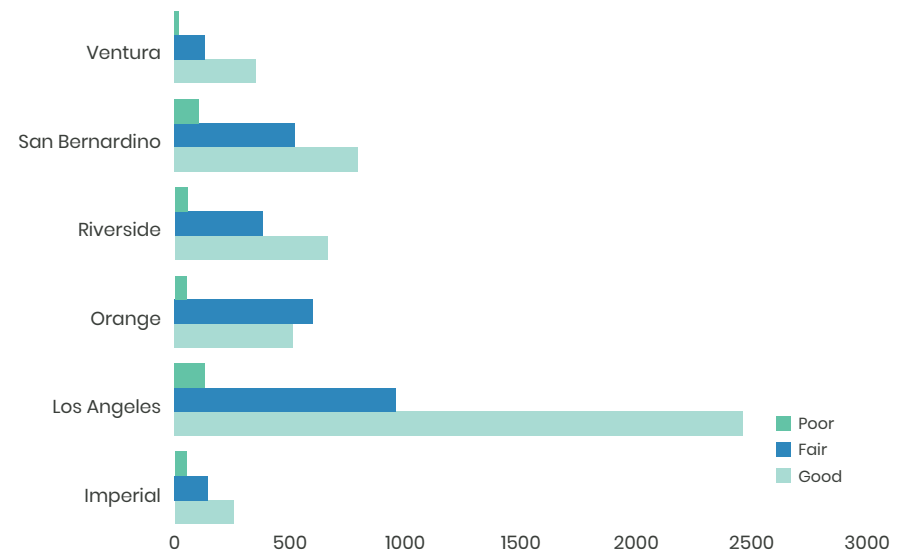
Access to opportunities such as jobs, schools and healthcare is critical to the well-being of all segments of our society. Equitable access to such opportunities still remain a challenges. Minority and low-income populations tend to live in areas that have relatively fewer opportunities and services. At the same time, they tend to be more dependent on public transportation, and/or walking or bicycling due to lower rates of auto ownership, which results in limiting their

FIGURE 2.5 Pavement Condition of State Highway System



Source: Caltrans Automated Pavement Condition Survey 2015-2016

FIGURE 2.6 Bridge Conditions in the SCAG Region, 2015



Source: FHWA Bridge Inventory

access to opportunities, thus putting them at a disadvantage relative to the general population.

FUNDING THE TRANSPORTATION SYSTEM

The cost of a multimodal transportation system that will serve the region's projected growth in population, employment, and demand for travel surpasses the projected revenues expected from existing sources including the gas tax, our historic source of transportation funding. The purchasing power of our gas tax revenues is decreasing and will continue a downward trajectory while transportation costs escalate, fuel efficiency improves, and the number of alternative-fuel vehicles continues to grow.

Despite the recent increase in state revenue through a state gas tax increase and other transportation fees with the passage of SB 1, state sources comprise a small share of total transportation revenues. Additionally, federal sources continue to dwindle as federal fuel tax rates have not been adjusted since 1993. To backfill limited state and federal gas tax revenues, our region has continued to rely on local revenues to meet transportation needs. In fact, 60 percent of the region's core revenues are from local sources. Eight sales tax measures have been adopted throughout the region since the 1980s; the burden of raising tax dollars has shifted significantly to local agencies.

Simultaneously, we need to explore innovative local programs that help meet the challenge of financing and maintaining the transportation system while reflecting the unique needs of the region. Efforts are underway to explore how we can transition from our current system based on fuel taxes to a more direct system based on user fees. In addition to generating revenues, user fees are among the most impactful VMT and GHG reduction strategies for the transportation sector. Yet perceptions about the fairness of user fees often raise public acceptability concerns. A sensible system of user fees can be designed with policies that address equity concerns.

PLANNING FOR DISRUPTION

Emerging technology has the potential to expand transportation choices and equity throughout the region. By providing more options for local and regional trips, emerging technologies may shift trips to less environmentally damaging modes, minimize negative environmental impacts associated with current

vehicle use, increase system efficiency, improve safety, and reduce auto-related collisions and fatalities. However, realizing the potential benefits (and potential negative impacts) is dependent on the rate of technology development and adoption of a wide range of public and private sector innovations. Emerging transportation technologies pose numerous challenges and opportunities for the SCAG region, including:

- An uncertain pace of development and deployment
- Challenges obtaining data from the private sector
- The impact of Transportation Network Companies (TNCs) on transit and active transportation usage
- A lack of permanence in public/private service agreements
- High likelihood of new technology actually increasing VMT
- Finding a balance between regulation and innovation
- Avoiding inequities in accessing new transportation technologies

Emerging technologies vary widely when it comes to their effect on VMT, and therefore GHG emissions. Some of these technologies, such as alternative fuel vehicles, micro-mobility, bikesharing and microtransit, have a mitigating influence on GHG emissions. Others, such as ride-hailing and automated vehicles, will increase VMT and GHG emissions if their business models do not adapt⁷ to eliminate or reduce single-passenger rides and "deadheading," where drivers drive with zero passengers. Therefore, it is vitally important to adopt strategies and policies that ensure pooled or shared rides.

MEETING FEDERAL AIR QUALITY STANDARDS

Although air quality has improved significantly over the past decades, the SCAG region still experiences among the worst air quality in the country. Almost the entire SCAG region fails to meet the health-based federal air quality standards for one or more transportation-related air pollutants. In addition to public health impacts from unhealthy air quality, the challenge of meeting health-based federal air quality standards has serious implications for the RTP/SCS, the Federal Transportation Improvement Program (FTIP) and transportation projects in the SCAG region.

⁷ San Francisco County Transportation Authority, TNCs and Congestion Final Report, October 2018.

A particularly pressing challenge is for the South Coast Region to meet the 2023 statutory deadline of attaining the 1997 ozone standard. Pursuant to the federal Clean Air Act (CAA), a Contingency Measure Plan was recently developed jointly by the South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (ARB) and subsequently submitted to the U.S. Environmental Protection Agency (EPA). The Contingency Measure Plan highlights the critical need for federal regulatory actions and/or funding to address emission sources under federal jurisdiction including aircraft, ships, trains and out-of-state trucks in order to meet the air quality standard. This is in addition to regulatory actions, programs and incentive funding SCAQMD and ARB have developed to achieve emission reductions.

If the U.S. EPA disapproves the air plan, a federal sanctions clock will be triggered which will lead to federal highway sanctions if the underlying deficiency cannot be resolved within 24 months. Highway sanctions restrict federal funding to transportation projects that expand highway capacity, nonexempt project development activities and any other projects that do not explicitly meet exemption criteria. If imposed, highway sanctions have the potential to impact billions of dollars of federal funding and tens of billions of dollars of important transportation projects in the SCAG region.

Transportation, especially the goods movement sectors, contributes to the overwhelming majority of air pollutant emissions causing ozone pollution. A comprehensive and coordinated regional solution including aggressive regulations, advancements in clean technologies, innovative solutions, and integrated land use and transportation planning from all levels of governments and all stakeholders will be required to achieve the needed emission reductions from the goods movement sectors.

Finally, the emission of air pollutants come from a wide range of sources and may be transported upwind. Therefore, a mitigation strategy should be in place to assist impacted communities, even if the emissions are not being locally produced.

MOVING TOWARDS SOLUTIONS

As this region continues to grow in age and population, and in an environment already experiencing significant challenges, it is crucial that land use and transportation strategies are integrated to achieve regional goals. Connect SoCal identifies a number of land use and transportation strategies that will provide residents more choices in how they can reach their destinations reliably and reduce congestion on roadways in our region through 2045 and beyond.

In the following chapter, Connect SoCal showcases an array of investments across all transportation modes and incorporates a range of best practices for increasing transportation choices, reducing dependence on personal automobiles, encouraging growth in walkable/mixed-use communities with ready access to transit infrastructure and employment opportunities, and improving air quality. More and varied housing types and employment opportunities are envisioned within and near job centers, transit stations, and walkable neighborhoods where goods and services are easily accessible via shorter trips.

Strategies in Connect SoCal also recognize the transformative potential of emerging technologies and mobility innovations to provide increased mobility, reduce harmful emissions, generate new revenue streams for regional reinvestment, and opportunities to affect land use to improve quality of life. While no one technology or innovation is likely to solve our regional challenges alone, the combination of and judicious application of their benefits for the region can positively change the way we live, work and travel in Southern California.

