

CURRENT CONTEXT

DEMOGRAPHICS AND GROWTH FORECAST

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS



TECHNICAL REPORT

ADOPTED ON SEPTEMBER 3, 2020

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Demographics and Growth Forecast

EXECUTIVE SUMMARY

SCAG's 2020 RTP/SCS growth forecast process projects growth in employment, population, and households at the regional, county, jurisdictional, and sub-jurisdictional-levels. SCAG's regional growth forecast underpins the main plan by setting the stage for "who we're planning for."

The regional and county growth forecasts reflect recent and past trends and expert-derived demographic and economic assumptions. As part of the development of the forecast, SCAG met one-on-one with all 197 local jurisdictions to understand each community's vision for the future so that it can be integrated into the outlook for the future of the region. This "best of both worlds" approach ensures the forecast reflects a balance between regional and local expertise as well as a balance between future employment, population and households.

While the region's growth rate is lower than ever, between 2016 and 2045 the SCAG region nonetheless is expected to add 3.7 million people, 1.6 million households and 1.6 million jobs through a combination of natural increase, domestic migration, and immigration. The population of the SCAG region in 2045 will be older, will continue to be among the most diverse in the nation, and will be employed in a shifting set of industries which reflects economic and technological evolution.

Job growth and housing cost have changed the dynamic of domestic migration—the region is a net importer of highly educated residents but loses population to other regions and states. Automation and technological changes

impacting the workplace may displace workers and deserve special attention from policymakers particularly as income and wage inequality grow. Slow growth still results in substantial population increases, which will increase the need for local and regional agencies to look to infill development and existing urbanized areas to house future people and jobs—trends that have already been seen during the recovery from the Great Recession, but which may differ from historical development patterns in Southern California.

INTRODUCTION

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), the Federal Transportation Improvement Program (FTIP), and the Regional Housing Needs Assessment (RHNA). For example, the RHNA plans for housing unit need using growth in households as one input. In addition, SCAG's growth forecast is relied upon by other regional agencies for their long-range planning purposes, such as the Metropolitan Water District of Southern California and local jurisdictions.

The Demographics & Growth Forecast Technical Report to the 2020 RTP/SCS (Connect SoCal) is intended to provide an overview of prevailing demographic trends underpinning the regional growth forecasts and additional technical detail on forecasting methodology, assumptions and outputs. Specifically, this report provides an overview of the growth forecasting process, a review of growth trends, a discussion of forecast methodology and assumptions, growth forecast outputs and a conclusion.

The growth forecast underpins the main plan by setting the stage for “who we’re planning for.” Elements of population growth, demographic change, and the allocation of growth across the region are found in most parts of the plan and other reports including Environmental Justice, Active Transportation, Economic Growth and Job Creation Analysis, Congestion Management and others.

FORECASTING PROCESS OVERVIEW

The regional growth forecast reflects recent and past trends, key demographic and economic assumptions, and local, regional, state, and national policy. SCAG's regional growth forecasting process also emphasizes the participation of local jurisdictions and other stakeholders. **TABLE 1** lists the forecasting timeline and milestones for development of the 2020 RTP/SCS regional growth forecast.

TABLE 1 Forecasting Timeline and Milestones

	Milestone	Date/Period
1	Adoption of the 2016 RTP/SCS jurisdictional-level growth forecast.	April 2016
2	Panel of experts meeting to review outside projections from the U.S. Census Bureau and California Department of Finance (DOF) and to discuss demographic trends and assumptions.	May 30, 2017
3	Develop a recommended preliminary set of regional forecasts for employment, population, and household growth.	June 2017
4	Develop the initial set of small area forecasts at the city and TAZ-level and release to local jurisdictions for comment.	October 2017
5	Meet one-on-one with all 197 local jurisdictions to review draft growth forecast.	October 2017 - July 2018
6	Receive final input from local jurisdictions on draft growth forecast and adjust county and regional forecasts with updated input data.	October 2018
7	Release preliminary local input growth forecast at the regional level.	March 2019
8	Release local input growth forecast and SCS growth scenarios for comment and additional input.	May - June 2019
9	Release of the draft 2020-2045 RTP/SCS.	November 2019
10	Release of the proposed final 2020-2045 RTP/SCS	March 2020

Source: SCAG

The first major milestone for the growth forecast development is the panel of experts meeting. On May 30, 2017, fifteen academic scholars and leading practitioners in demographics and economics were invited to review key input assumptions for the growth forecast including expected job growth, labor force participation, birth rates, immigration and household formation rates.

In July 2017, SCAG staff incorporated the recommendations of the panel of experts into a preliminary range of population, household, and employment growth figures for 2016, 2020, 2030, 2035, and 2045. Draft baseline forecasts were produced at the county level. In addition to a regional baseline, low and high scenarios were also produced.

On October 31, 2017, the preliminary small area (i.e. city and transportation analysis zone, or TAZ) growth forecasts were released to local jurisdictions for their comments and input. This kicked off SCAG's Bottom-Up Local Input and Envisioning Process which provided each local jurisdiction with their growth forecast information as well as several other data elements both produced by SCAG and other agencies which are related to development of the 2020 RTP/SCS. Data map books were generated and provided electronically and in hard copy format and included detailed parcel-level land use data, information on resource areas, farmland, transportation, geographical boundaries and the draft growth forecast. Complete information on the Data map books and the Bottom-Up Local Input and Envisioning Process can be found at SCAG's RTP/SCS website. All data including growth forecasts and land use were also integrated on SCAG's interactive tool - Scenario Planning Model (SPM) where SCAG provided access to all local jurisdictions to review and edit via online. SPM provides a common data framework which local information can be easily integrated and synched with regional data

Between November 2017 and July 2018, SCAG staff conducted one-on-one meetings with all 197 local jurisdictions to explain the methods and assumptions behind the small area growth forecast as well as to provide an opportunity to review, edit and approve the provided maps as well as city and TAZ total figures for population, employment and households for 2016, 2020, 2030, 2035 and 2045. 82 percent of local jurisdictions provided input on SCAG's draft growth forecast, while 91 percent provided input on other data elements

such as GIS maps or surveys. For local jurisdictions not providing input, SCAG's preliminary forecast was integrated into the local input forecast.

Between October 2018 and February 2019, SCAG reviewed and aggregated feedback on the growth forecast and other data map book elements. This aggregated feedback is known as the local input growth forecast. The local input growth forecast was evaluated at the county and regional level for the base year of 2016 and the horizon year of 2045. Findings included:

1. The 2045 local input figures for employment, population and households are all within the low and high scenarios of the draft baseline forecast;
2. The local input forecast projected slightly higher employment growth than the preliminary forecast's baseline, but below the high scenario established by the preliminary forecast.
3. The local input forecast projected slightly lower population and household growth than the preliminary forecast's baseline, but these values were above the low scenario.
4. The local input forecast generates a 2045 regional unemployment rate of 4.7 percent which is reasonable based on past trends. Verifying future unemployment rates ensures that employment and population forecasts are balanced—i.e. there are not too many jobs for the number of anticipated future workers.
5. The local input forecast generates a population-to-household (P:H) ratio of 2.9 in 2045 which is consistent with the preliminary forecast and reflects the expert assumption of future decreases in the P:H ratio. Verifying future P:H ratios ensures that household and population forecasts are balanced—i.e. there are not too many people for the anticipated number of households.

At the regional level, the 2045 local input forecast was found to be technically sound.

In May 2019, SCAG produced the small area local input forecast and further developed three alternative distributions of population, household and

employment growth reflecting different land use scenarios. As part of the SB375's Sustainable Communities Strategy guidelines, SCAG held twenty-seven public outreach meetings to solicit input on these alternatives. The goal of this scenario planning exercise is to maximize the benefits of Greenhouse Gas/ Vehicle Miles Travelled (GHG/VMT) reductions, public health, and other co-benefits from large transportation investments in the region. Following public input and SCAG's analysis of the GHG/VMT benefits of the alternative scenarios, a preferred growth forecast scenario was chosen which prioritizes growth in areas such as job centers and transit priority areas which have regional transportation benefits. See the Sustainable Communities Strategy Technical Report for additional details (see **EXHIBITS 1-9**).

After developing the draft 2020 RTP/SCS between July 2019 and October 2019, SCAG released the draft 2020 RTP/SCS in November 2019. The Regional Council adopted the 2020 RTP/SCS, including the regional growth forecast at the county and jurisdictional-levels.

GROWTH TRENDS

POPULATION

According to the January 1, 2019 population estimates from the California Department of Finance (DOF), the population of the SCAG region is 19,155,405. This represents 5.8 percent of the 328 million people in the United States and 48.0 percent of California's population. The SCAG region is the nation's second-largest combined statistical area (CSA) behind the New York-Newark CSA. If the SCAG region were its own state, it would rank fifth in population just behind New York (19.2 million) and well ahead of Pennsylvania (12.8 million) (**TABLE 2**).

While job growth and unemployment drops have characterized the recovery from the Great Recession, slower population growth is anticipated not just in the SCAG region but across California and nationwide. Historically, the SCAG region's population growth has dramatically outpaced the United States—1.7 percent compared to 1.1 percent for the period from 1970 to 2000. However, since 2000 average annual growth rates in the region have been comparable

with the United States at roughly 0.8 percent annually.

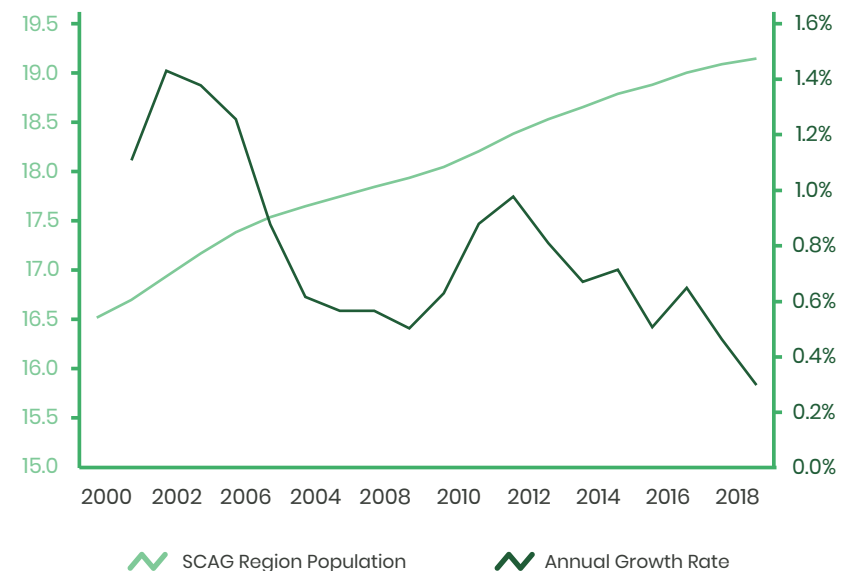
Population growth dipped noticeably during the Great Recession reaching a low of 0.5 percent in 2009 before rebounding to nearly 1.0 percent by 2012 (**FIGURE 1**). Despite this, the annual rate of population growth has continued

TABLE 2 Annual Average Population Growth Rate, 1970–2045

	1970–2000	2000–2016	2016–2045
SCAG Region	1.65%	0.82%	0.61%
California	1.76%	0.93%	0.66%
United States	1.09%	0.86%	0.57%

Source: U.S. Census Bureau, CA DOF, SCAG

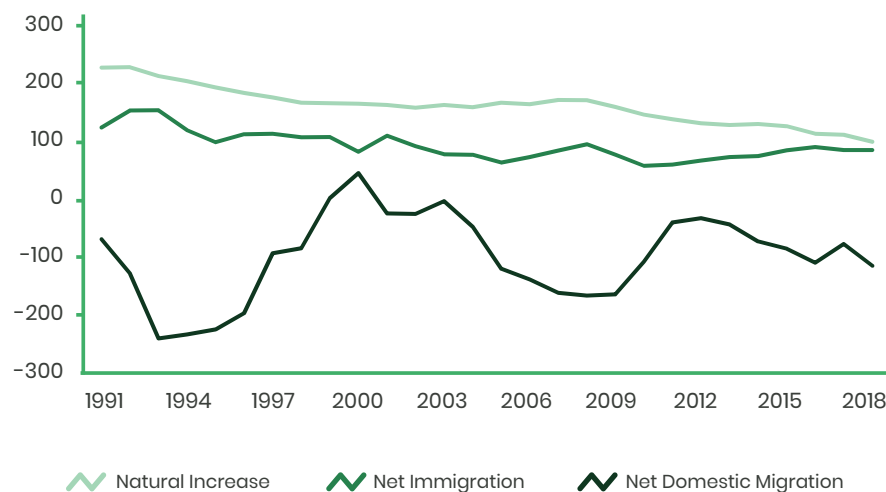
FIGURE 1 SCAG Region Population (in Millions) and Annual Growth Rate, 2000–2019



Source: CA DOF

its decline. Slow growth is expected to continue for the region for the foreseeable future. However, while growth rates are at a historic low, this still results in gradual increases to the total population. In the SCAG region, a 0.6 percent annual growth rate corresponds to about 114,000 new residents annually, or nearly 3 million new residents between 2020 and 2045. The region's population growth is mainly determined by two components: natural increase (births minus deaths) and net migration (net domestic migration plus net immigration) (**FIGURE 2**). In general, trends in natural increase are fairly smooth as they depend on fertility rates, mortality rates, and the age structure of the population. In contrast, trends in domestic migration are heavily economically dependent, with people moving to and from the region for primarily economic reasons such as job growth and the cost of living. Immigration trends are generally more stable than domestic migration since distance and national immigration policy moderate the economic drivers of immigration more than domestic migration.

FIGURE 2 Components of Population Change, SCAG Region, 1990–2018
(in Thousands)



Source: CA DOF

Since the 1990s, the main source of population change in the SCAG region has been natural increase. During the early nineties, natural increase contributed to annual population increases of over 200,000 people. This has dropped precipitously as the number of births has gone down. According to DOF figures, natural increase in the SCAG region caused the population to increase by only 127,000 people in 2015 and a historic low of 100,000 people in 2018. Between 2000 and 2016, fertility rates in the SCAG region have dropped from approximately 2.17 to 1.75 (19 percent). While most demographers no longer anticipate a rebound in fertility rates, the extent to which they will decline in the future is a challenging question.

Net immigration to the region—the number of people moving in from foreign countries minus those leaving the region for another nation—has also decreased from its highs in the early nineties. Southern California is historically one of the country's most important immigrant gateways and today ranks behind only the Miami and San Jose CSAs for the share of its population which was born abroad. From 2015 to 2018, immigration netted the region roughly 87,000 new residents per year. This is slightly below the average rate of 94,000 new residents from net foreign immigration experienced in the region since 1990. Unauthorized immigration has decreased notably in the SCAG region, with a Pew Research Foundation analysis of Census Bureau data showing a 24.6 percent decrease in the total unauthorized immigrant population in the SCAG region between 2007 and 2017 (Passel and Cohn 2019).

While historically California settlers mostly came from other parts of the United States, net domestic migration to the SCAG region has been negative for 26 of the last 28 years. This was particularly acute during the Great Recession years of 2007-2010 where the region saw 148,000 more domestic out-migrants than domestic in-migrants. The region's net population loss to other states and regions slowed substantially over 2011-2015 with an annual net loss of 54,000 in part due to an improving regional economy. However, since 2016 domestic out-migration continued to further outpace domestic in-migration, with net losses cresting 100,000 per year. Further discussion of migration trends by origin and destination can be found in the next section.

Changes to these components of population growth result in changes to the region’s demographic characteristics (**TABLE 3**).

First, the age structure of the region’s population is changing. This is principally the result of fewer births and has several implications:

- The region’s population is becoming older. The median age grew from 32.3 in 2000 to 35.8 in 2016 and is expected to rise to 39.7 by 2045.
- A higher share of the population will be senior citizens (those aged 65 and over). This share has risen from 9.9 percent in 2000 to 13.3 percent in 2016 and is expected to increase to 20.6 percent in 2045.
- As a result, the number of working-age individuals (those aged 16 to 64) per senior citizen decreased from 6.5 in 2000 to 5.0 in 2016 to an expected value of 3.0 in 2045.

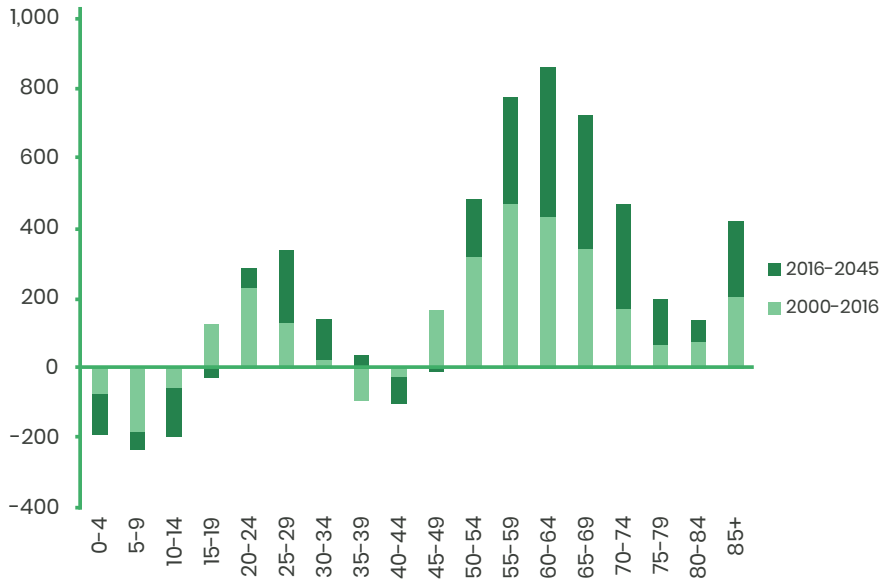
While seniors tend to be more active and self-sufficient than in previous periods, this is expected to increase social services costs (including healthcare costs, pension and retirement liabilities) as well as the amount of future employment in the healthcare industry. Given rapid recent increases in income inequality (see the Historical Demographic Trends section of the Environmental Justice Technical Report for details), having fewer than half as many working-age adults per senior may disproportionately impact seniors who do not have sufficient retirement savings as this can place additional stress on social services provision. **FIGURE 3** compares past growth with future expected growth by age category. The population’s ageing is reflected in very modest increases the below-25 population and tremendous increases in groups above 65, especially the 85 and above population.

Consistent with Southern California’s historic role as an immigrant gateway, the region is one of the most diverse in the nation in race and ethnicity. Race and ethnicity are important for demographers to consider while forecasting since fertility and household formation have strong cultural underpinnings that vary based on these categories. Given the region’s particularly high share of foreign-born population and diversity, race and ethnicity are particularly important inputs for accurate forecasting in Southern California. SCAG’s demographic forecast relies on four common race/ethnicity categories which are reflected in

Census data: (1) white, non-Hispanic, (2) black, non-Hispanic, (3) Asian/Others, non-Hispanic, and (4) Hispanic. The Hispanic and Asian/Other categories have grown substantially since 2000, increasing by 2.6 percent and 5.8 percent, respectively (**TABLE 3**). Meanwhile, the share of white, non-Hispanic and black, non-Hispanic population has decreased by 7.3 percent and 1.0 percent, respectively, since 2000. These trends are expected to continue through 2045, where a majority of the population will be Hispanic and less than one-fourth will be white, non-Hispanic. For comparison, the 2016 share of non-Hispanic whites in the United States was 62 percent.

The normalized entropy index measures diversity across these categories: a value of 1 represents a situation where each group comprises 25 percent of the population while a value of 0 means that the entire population is in a single group. The normalized entropy index for the region has stayed stable at 0.86 from 2000-2016, but is expected to decrease slightly to 0.83 by 2045. For comparison, the nation’s normalized entropy in 2016 was 0.77.

FIGURE 3 Population Growth By Age, 2000–2045



Source: CA DOF, SCAG

TABLE 3 Demographic Characteristics of the Region's Population, 2000–2045

	2000	2010	2016	2045	Past Change (2000–2016)**	Future Change (2016–2045)**
Total Population	16,574,000	18,076,000	18,832,000	22,504,000	0.8% (annual)	0.61% (annual)
Annual Natural Increase*	162,000	163,000	128,000	85,000	-21.0%	-33.6%
Annual Births*	270,000	273,000	248,000	248,000	-8.1%	0.0%
Annual Deaths*	108,000	110,000	120,000	163,000	11.1%	35.8%
Annual Net Migration*	34,000	-42,000	28,000	13,000	-17.6%	-53.6%
Annual Net Domestic Migration*	-81,000	-160,000	-57,000	-82,000	-29.6%	43.9%
Annual Net Immigration*	115,000	118,000	85,000	95,000	-26.1%	11.8%
Components of Population Growth*						
Natural Increase (%)	82.7%	134.7%	82.1%	86.7%	-0.6%	4.7%
Net Migration (%)	17.3%	-34.7%	17.9%	13.3%	0.6%	-4.7%
Age Composition of Population						
Median Age	32.3	34.7	35.8	39.7	3.5	3.9
Persons Under 16 Years Old (%)	25.6	22.4	21.0	18.5	-4.6	-2.5
Persons 16-64 Years Old (%)	64.4	66.6	65.7	60.9	1.3	-4.8
Persons 65 Years Old And Over (%)	9.9	11.0	13.3	20.6	3.4	7.4
Ratio: Working Age per Senior	6.5	6.1	5.0	3.0	-1.5	-2.0
Race/Ethnicity of Population						
White, non-Hispanic (%)	38.8%	33.3%	31.5%	22.0%	-7.3%	-9.5%
Black, non-Hispanic (%)	7.3%	6.5%	6.3%	5.3%	-1.0%	-1.0%
Asian & Others, non-Hispanic (%)	13.3%	14.9%	15.9%	20.6%	2.6%	4.7%
Hispanic (%)	40.6%	45.3%	46.4%	52.0%	5.8%	5.6%
Normalized Entropy Index	0.86	0.86	0.86	0.83	-0.01	-0.02

* Values are 5-year averages corresponding to 2000-2005, 2005-2010, 2015-2020, and 2040-2045. Past change is annualized for these measures only. All figures are rounded to nearest thousand.

Source: CA DOF, SCAG

SPECIAL FOCUS: MIGRATION TO AND FROM THE SCAG REGION

Numerous trends and reports have suggested that Californians are leaving for “greener pastures” in other states, largely due to high housing costs (Schwarm 2018). Meanwhile, the in-migrants who do arrive tend to be higher earning and have higher levels of educational attainment (Johnson, Bohn, and Mejia 2017). Of particular interest are educational attainment rates since annual incomes do not necessarily predict skills development or lifetime earning potential.

This section reviews the Census Bureau’s American Community Survey Public Use Microsample (ACS PUMS) data for 2017 about residents who moved during the previous year, their origins, destinations, and key individual characteristics (**TABLE 4**). While the region tends to lose population (negative net domestic migration), it is important to remember that migration is dynamic: while departures outnumber arrivals, there is still a substantial number of arrivals. Key findings include:

- 12.3 percent of the SCAG region population moved every year, but only 2.4 percent moved across the region’s boundary.
- Departures to other California counties exceeded arrivals by 34,000. However, while 156,000 left the region for other counties, 122,000 arrived from other counties.
- Departures to other states from the SCAG region exceeded arrivals by 74,000, with 272,000 departures and 198,000 arrivals.
- Arrivals from other countries exceeded estimated departures by 85,000.
- Substantial migration occurs within SCAG counties. The top three net county-to-county migration flows all represented moves away from Los Angeles County: 20,000 to San Bernardino County, 12,000 to Orange County, and 11,000 to Riverside County.
- Texas was the top destination for SCAG region out-migrants with 32,000, followed by Arizona with 31,000 and Nevada with 25,000.
- While New York led all other states for the source of SCAG region in-

migrants with 16,000, Texas and Arizona each sent more than 15,000 to the SCAG region illustrating that while the dominant direction is a move from SCAG to those states, there are many people who move from there to the SCAG region as well.

Demographers have long found that peak migration rates occur during two major life stages: young adults in their twenties looking for work or to start a career and seniors over age 65 typically looking for a place to retire (Duncombe, Robbins, and Wolf 2001). **TABLE 5** reviews the age structure and college education rates (the rate of the population over age 25 with a bachelor’s degree or above) of SCAG region in- and out-migrants based on their origin and destination. Key findings include:

- People who migrate into or out of the SCAG region all have higher college education rates than the region as a whole (30.0 percent), suggesting that across-region moves are more common for the highly educated.
- Those coming to the SCAG region from elsewhere have substantially higher college education rates (47.3 percent) than those leaving the region (38.6 percent), indicating that the SCAG region is becoming more highly educated through migration.
- The college education rates of those coming to the SCAG region from other states (51.6 percent) and other countries (49.2 percent) are far higher than those coming to the SCAG from other parts of the California (37.9 percent), suggesting that the region’s “brain gain” is due to people coming to the region from other states and counties.

Since education can be used as a proxy for income and earning power, this suggests that the SCAG region is attracting skilled workers. However, a concern is that lower-skilled individuals may find the region too expensive to live in and prefer to move elsewhere, which can decrease the region’s educational and economic diversity. This regional pattern differs by county (**FIGURE 4**). While Los Angeles and Orange counties have much more highly educated in-migrants than out-migrants, this difference is much smaller for Ventura, Imperial, and Riverside Counties. In San Bernardino County, out-migrants actually have higher college education rates than in-migrants.

TABLE 4 SCAG Region Migration, 2017

		Persons	Percent of Total Population	
SCAG MOVERS	SCAG Population who moved	2,292,756	12.3%	
	Moved within region	1,843,488	9.9%	
	Same county	1,576,656	8.4%	
	Different SCAG county	266,832	1.4%	
INTERREGIONAL MOVERS		Arrivals	Departures*	Net
	Other California counties	122,534	156,679	-34,145
	Other U.S. States & Territories	198,141	272,185	-74,044
	Other Countries	128,593	43,710	84,883
TOP NET COUNTY-TO-COUNTY MOVES (SCAG REGION)	From	To	Net Flow	
	1 Los Angeles	San Bernardino	20,268	
	2 Los Angeles	Orange	12,059	
	3 Los Angeles	Riverside	10,939	
	4 Orange	Riverside	10,653	
	5 Los Angeles	Ventura	2,846	
TOP STATES FOR SCAG REGION MOVERS	Arrivals	Persons	Departures	Persons
	1 New York	15,950	Texas	31,639
	2 Texas	15,804	Arizona	30,562
	3 Arizona	15,167	Nevada	24,683
	4 Nevada	12,451	Washington	17,905
	5 Washington	11,610	Oregon	13,271
	6 Florida	10,487	Florida	10,702
	7 Illinois	9,152	New York	10,127
	8 Colorado	7,157	Colorado	10,025
	9 Massachusetts	5,904	Utah	9,006
	10 Pennsylvania	5,809	North Carolina	7,905

* International departures not available from the American Community Survey. An estimate of departures is derived from SCAG's 2020 RTP/SCS forecast.
Source: 2017 ACS PUMS

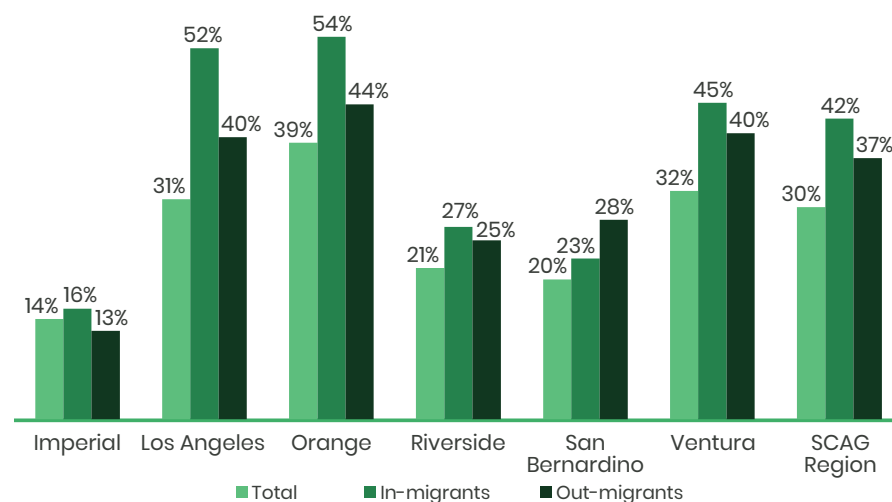
TABLE 5 Characteristics of SCAG Region Migrants, 2017

	Percent with B.A. degree or above*	Percent Aged 20–29	Percent Aged over 65
Region total	30.0%	15.2%	12.7%
SCAG within-region movers	32.8%	24.2%	6.2%
SCAG in-migrants	47.3%	30.3%	8.1%
SCAG out-migrants	38.6%	28.7%	6.6%
SCAG in-migrants from other California regions	37.9%	31.8%	6.6%
SCAG out-migrants to other California regions	37.9%	31.5%	5.6%
SCAG in-migrants from other states	51.6%	32.2%	7.8%
SCAG out-migrants to other states	39.0%	27.0%	7.2%
SCAG international in-migrants	49.2%	26.2%	9.9%

*Population aged 25 and over

Source: 2017 ACS PUMS

FIGURE 4 College Education of SCAG Region Migrants by County, 2017

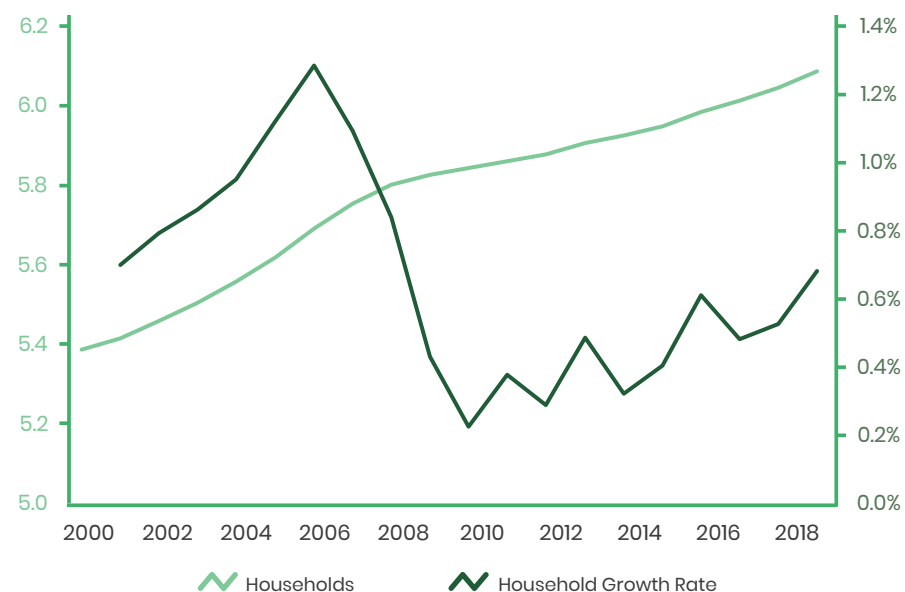


Source: 2017 ACS PUMS

HOUSEHOLDS

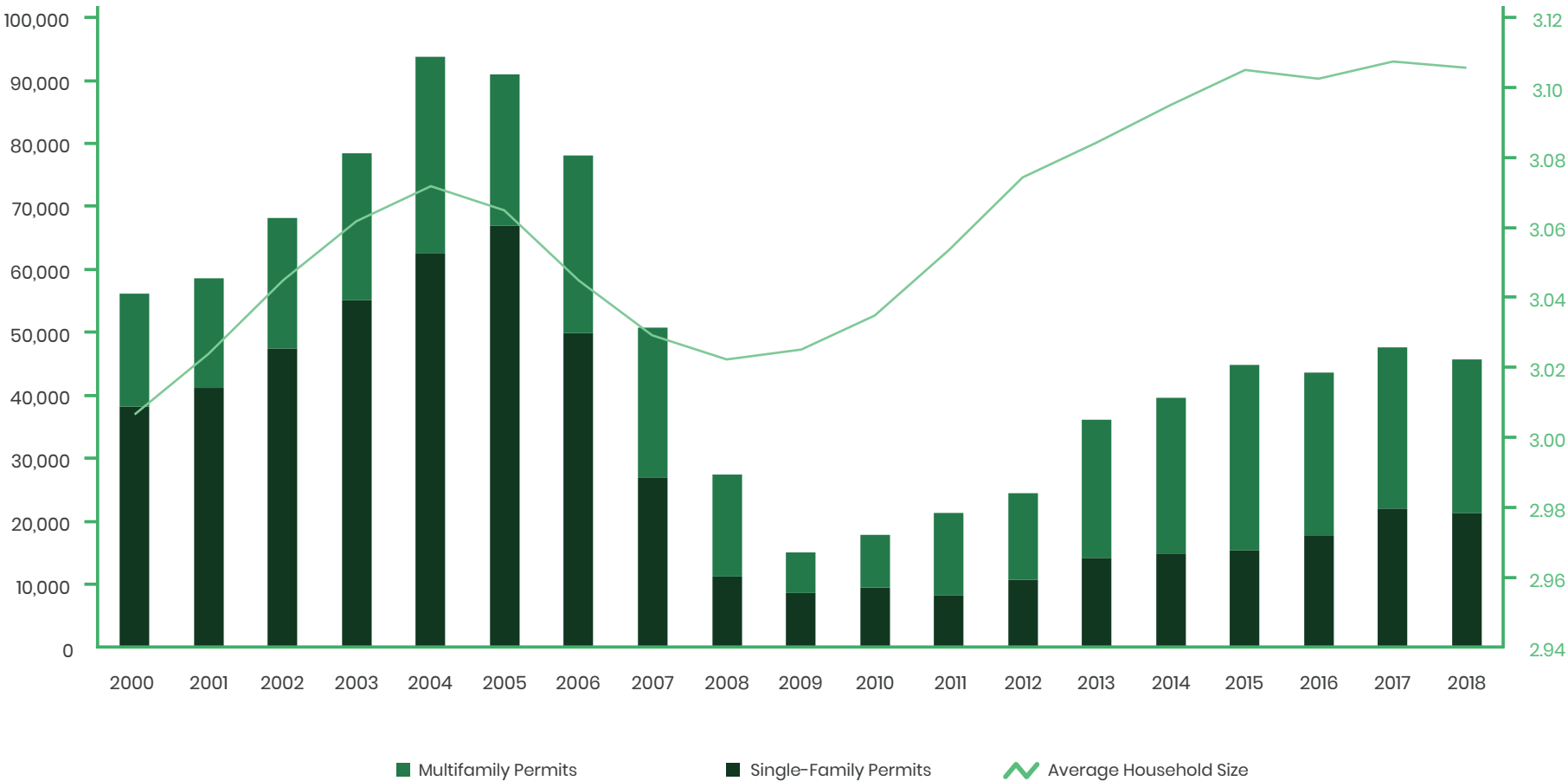
The Great Recession had a lasting impact on the region's households (**FIGURE 5**). While the annual rate of household growth has steadily tracked upward since its low of 0.2 percent in 2010, household growth remains much flatter than before the recession (0.6 percent from 2017–2019). The gradual increase since 2012 has been fueled by slightly more Millennial households forming. Millennials are typically defined as those born between 1981 and 1996 (Dimock 2019) and represent the largest generation in terms of population size. However, many Millennials entered the workforce during the depths of the Great Recession, which had ripple effects on the housing market since many Millennials didn't have the income needed to form households or purchase homes as much as previous generations had during their twenties (**FIGURE 6**). This delayed their household formation compared with previous generations as it became more common for adult children to live with parents

FIGURE 5 SCAG Region Households (in Millions) and Annual Household Growth Rate, 2000–2019



Source: CA DOF Occupied Housing Units

FIGURE 6 Building Permit Activity and Household Size, SCAG Region, 2000–2018



**Population aged 25 and over*

Source: CA DOF and Construction Industry Research Board

or a higher number of roommates. Renewed job growth coupled with gradual housing production increases and less housing market competition from older generations has increased Millennial household formation and homeownership in recent years (Myers 2016).

However, the age structure of heads-of-household has changed greatly since 2000 (**TABLE 6**) with substantial decreases in households headed by 15-24 year olds (-27.9 percent) and more modest decreases amongst 25-34 and 35-44 year olds (-13.9 percent and -11.9 percent, respectively). Meanwhile, older age cohorts saw major increases in the number of households.

These measures reflect both the trends discussed above and the ageing of the population, which have yielded a region with far older heads of household than before. This has also resulted in increases in average household sizes, which increased from 3.02 in 2009 to 3.10 in 2014 but have remained relatively stable through 2019. Rates of household formation by age, also referred to as headship rates, have followed a similar trend in continuing their long-term decline. Headship rates for ages 25-34 dropped from 0.40 in 2000 to 0.33 in 2016, while headship rates for ages 75 and above remained stable going from 0.60 in 2000 to 0.59 in 2016 (**TABLE 9**).

Racial and ethnic differences in household formation behavior are also important for demographers to consider. While average household sizes are anticipated to decrease for all races and ethnicities between 2016 and 2045, they differ substantially today. At 4.04 residents per household, Hispanic household sizes in 2016 are the highest followed by the size of households headed by Asians/Others (3.11), Blacks (2.59), and Whites (2.30) (**TABLE 6**).

While new housing unit construction in the SCAG region has increased from a low of 15,000 units in 2009 to 46,000 units in 2018, this is well off the recent 2004 peak of 94,000. While housing construction follows economic cycles, it also follows demographics. Multifamily housing in particular is responsive to the number of young adults who want new apartments and condos. While construction in the early 2000s was strong, between 2000 and 2005 only 30.2 percent of new housing in the region was multifamily. Increases in young adult population thereafter had a role in the increased share of multifamily housing during the recovery which shot up to 61.2 percent between 2011

and 2015 before decreasing to 53.4 percent in 2018 (**FIGURE 6**). Households, which this forecast projects alongside population and employment, are also commonly referred to as occupied housing units (see, e.g., State of California Department of Finance 2019).

TABLE 6 Characteristics of the Region's Households, 2000–2045

	2000	2010	2016	2045	Past Change (2000–2016)	Future Change (2016–2045)
Total Households	5,350,000	5,848,000	6,012,000	7,633,000	0.73% (annual)	0.92% (annual)
15-24	233,000	190,000	168,000	176,000	-27.9%	4.8%
25-34	1,048,000	933,000	903,000	990,000	-13.8%	9.6%
35-44	1,344,000	1,250,000	1,184,000	1,401,000	-11.9%	18.3%
45-54	1,097,000	1,328,000	1,266,000	1,382,000	15.4%	9.2%
55-64	689,000	1,013,000	1,114,000	1,216,000	61.7%	9.2%
65-74	505,000	599,000	755,000	1,006,000	49.5%	33.2%
75+	433,000	535,000	623,000	1,461,000	43.9%	134.5%
Race/Ethnicity of Householders						
White, non-Hispanic	50.3%	44.4%	41.7%	28.8%	-8.6%	-12.9%
Black, non-Hispanic	7.9%	7.6%	7.2%	6.2%	-0.7%	-1.0%
Asian & Others, non-Hispanic	12.6%	14.3%	15.6%	20.6%	3.0%	5.0%
Hispanic	29.2%	33.8%	35.5%	44.3%	6.3%	8.9%
Average Household Size						
White, non-Hispanic	2.34	2.27	2.30	2.19	-1.8%	-4.8%
Black, non-Hispanic	2.76	2.54	2.59	2.42	-6.2%	-6.6%
Asian & Others, non-Hispanic	3.21	3.16	3.11	2.91	-3.0%	-6.5%
Hispanic	4.26	4.11	4.04	3.43	-5.3%	-15.0%
Total	3.05	3.04	3.10	2.90	1.8%	-6.4%

Source: CA DOF and SCAG

Note: Figures are rounded to nearest thousand

EMPLOYMENT

After losing over 700,000 jobs between 2007 and 2010, the region has experienced tremendous job growth between 2010 and 2019, reaching nearly 8.7 million jobs and cresting the previous high of 8.1 million reached in 2007 (**FIGURE 7**). 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. The unemployment rate is closely correlated to the population-employment (P-E) ratio. The number of people per job in the region rose from 2.20 in 2007 to 2.46 in 2010 and had decreased to its pre-recession level (2.21) by 2019 (**FIGURE 8**).

While short and medium-term employment forecasts reflect business cycles, long-range employment forecasts such as those used in SCAG's 2020 RTP/SCS reflect broader shifts in the nature of the economy—which industries are expected to grow and which are expected to contract. Since 2000, the fastest employment growth was seen in Healthcare and Social Assistance (+55.7 percent) and Accommodation and Food Service (+55.3 percent). These two categories alone accounted for 760,000 new jobs. Strong growth was also seen in Professional, Scientific, and Technical Services (115,000 new jobs), while the smaller Arts, Entertainment, and Recreation category saw substantial growth in percentage terms (+36.9 percent). Transportation and warehousing, long a regional mainstay due to the Ports of Los Angeles and Long Beach and a well-developed warehousing and logistics industry centered in Riverside and San Bernardino Counties, saw a 20.5 percent increase in jobs (**TABLE 7**).

Over the same time period, manufacturing employment saw a precipitous decline of 34.8 percent, leading all categories. This historically middle-class sector led all employment categories in 2000 with more than 1 million jobs region-wide and by 2016 employed just over 650,000 people. Management industries and information industries also saw substantial losses in the region, combining for a decrease of 75,000 jobs.

FIGURE 9 analyzes occupation types by their wage structure, splitting 23 occupational categories into low, medium or high categories based on their average wages in 2001 and 2016. Top low-wage categories included sales and production occupations, top middle-wage categories included office support services and construction, while top high-wage categories included

management and healthcare occupations. A stark contrast emerges in terms of growth before and after the Great Recession, using 2007 as a breakpoint. While before the recession, jobs in middle-wage occupations grew the most, those gains were almost entirely offset with losses following the recession such that growth in middle-wage occupations was a small fraction of total job growth since 2001 (roughly 46,000 out of 643,000 new jobs). Growth in traditionally low-wage and high-wage occupations has raised concerns about the future of the middle class in tomorrow's economy.

FIGURE 7 Employment (in Thousands) and Annual Change in the SCAG Region, 2000-2019



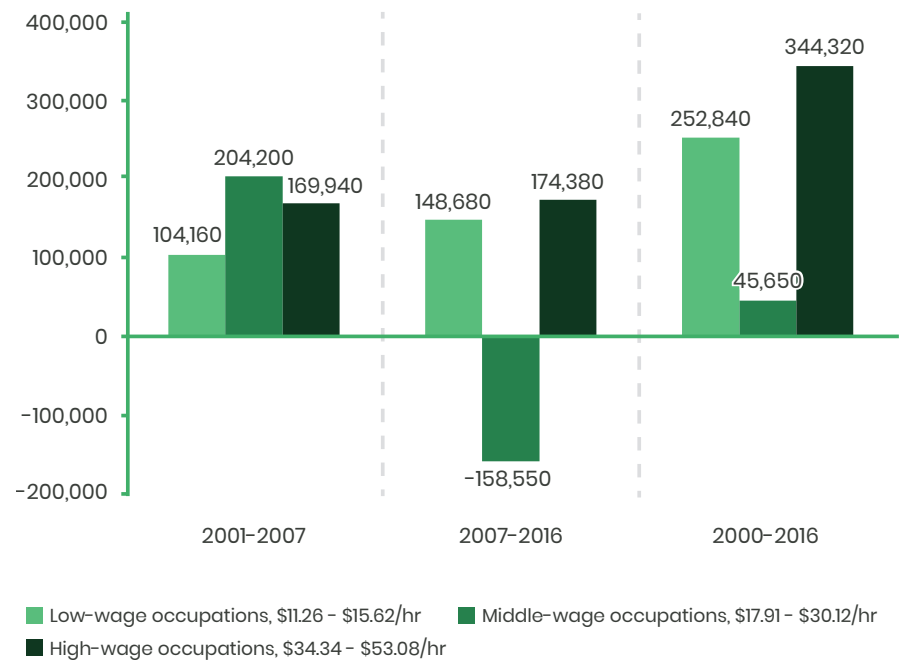
Source: CA EDD, SCAG

FIGURE 8 Unemployment Rate and Population-Employment (P-E) Ratio, SCAG Region, 2000-2018



Source: CA EDD, CA DOF, SCAG

FIGURE 9 Job Growth by Real Wage of Occupation, SCAG Region, 2001-2016



Source: CA EDD

Notes: Job growth calculated by average wage across 23 occupations using 2-digit Standard Occupational Classification (SOC) codes. 8 low-wage, 8 middle-wage, and 7 high-wage occupation categories remain constant across 2001-2016. Wage ranges expressed in 2016 dollars. Wage ranges in 2001 are \$7.57-\$11.14 (low), \$13.04-\$20.24 (mid), and \$23.66-\$39.21 (high).

TABLE 7 Regional Employment by Industry Sectors, 2000–2045

SCAG Region	2000		2016		2045		Past Change (2000–2016)	Future Change (2016–2045)	Average Wage (present-day)
	Jobs (in Thousands)	Percent of Total	Jobs (in Thousands)	Percent of Total	Jobs (in Thousands)	Percent of Total			
Total, All Industries	7,419		8,389		10,049		0.77% (annual)	0.62% (annual)	\$58,838
Total Farm	72	1.0%	60	0.7%	57	0.6%	-17.1%	-4.4%	\$32,826
Natural Resources and Mining	4	0.1%	4	0.1%	5	0.0%	6.4%	1.8%	\$95,425
Utilities	44	0.6%	45	0.5%	45	0.5%	1.8%	0.1%	\$108,203
Construction	365	4.9%	411	4.9%	536	5.3%	12.3%	30.6%	\$63,674
Manufacturing	1,005	13.5%	656	7.8%	514	5.1%	-34.8%	-21.7%	\$71,428
Wholesale Trade	362	4.9%	394	4.7%	403	4.0%	8.6%	2.4%	\$68,954
Retail Trade	745	10.0%	841	10.0%	889	8.9%	12.8%	5.8%	\$34,456
Transportation and Warehousing	317	4.3%	382	4.6%	522	5.2%	20.5%	36.4%	\$54,416
Information	323	4.4%	291	3.5%	299	3.0%	-9.8%	2.5%	\$121,087
Finance and Insurance	268	3.6%	268	3.2%	273	2.7%	0.2%	1.9%	\$113,879
Real Estate and Rental and Leasing	147	2.0%	168	2.0%	190	1.9%	14.3%	12.6%	\$68,475
Professional, Scientific and Technical Services	420	5.7%	535	6.4%	612	6.1%	27.3%	14.4%	\$97,489
Management of Companies and Enterprises	145	2.0%	102	1.2%	104	1.0%	-29.6%	2.3%	\$110,154
Administrative and Support and Waste Services	570	7.7%	610	7.3%	734	7.3%	7.0%	20.3%	\$40,752
Educational Services	632	8.5%	716	8.5%	850	8.5%	13.3%	18.7%	\$55,847
Health Care and Social Assistance	812	10.9%	1,264	15.1%	2,002	19.9%	55.7%	58.4%	\$47,441
Arts, Entertainment, and Recreation	123	1.7%	169	2.0%	230	2.3%	36.9%	36.4%	\$70,026
Accommodation and Food Service	555	7.5%	862	10.3%	1,059	10.5%	55.3%	22.8%	\$23,392
Other Services	295	4.0%	346	4.1%	398	4.0%	17.4%	15.2%	\$40,545
Public Administration	213	2.9%	264	3.2%	327	3.3%	24.4%	23.7%	\$83,380
Entropy Index		0.91		0.90		0.88			

Source: CA EDD, SCAG

SPECIAL FOCUS: WORKPLACE AUTOMATION AND THE GIG ECONOMY

In addition to concerns over increasingly polarized structure of work, increases in workplace automation are replacing not only historically blue-collar jobs but larger portions of knowledge and skill-based employment as well. A recent study reported that 60 percent of occupations have at least 30 percent of their constituent work activities that could be automated (McKinsey 2017). This could have a significant impact on the transportation and warehousing industries which are acutely important to Southern California as robots increasingly support large fulfillment centers and automated vehicles showing increasing viability.

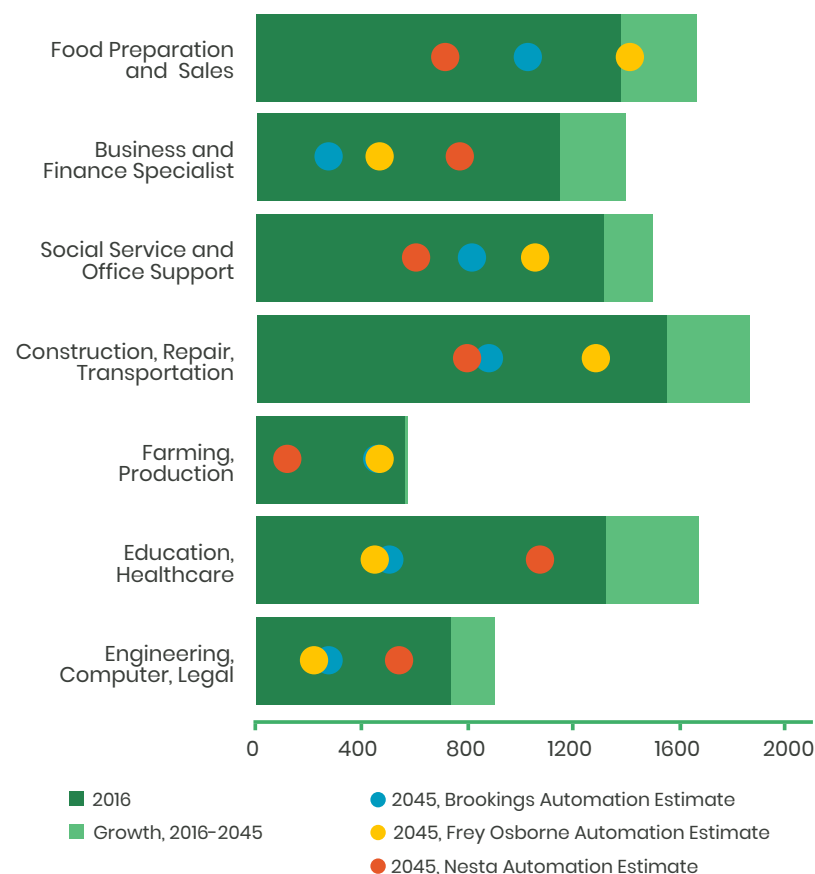
In order to analyze the potential of automation's impact on regional jobs, SCAG reviewed three independent estimates of regional jobs: Muro, Maxim, and Whiton (2019), Frey and Osborne (2017), and Bakhski et al. (2017). The meta-category of construction, repair, and transportation, which together comprise over 1.5 million regional jobs, has an automation potential of between 46 and 68 percent. Food preparation and sales as well as social service and office support each employ over 1.2 million in the region and have consensus automation potentials ranging between 55 and 85 percent. These three categories have the potential to displace millions of workers region-wide. Occupation categories with consensus automation potential between 20 and 30 percent include business and finance specializations, education and healthcare, and engineering, computer, and legal work. These industries combine to employ over 3 million people in the region and represent the kind of cognitive tasks which are less at risk due to technology and automation.

FIGURE 10 compares SCAG's employment growth forecast for 2045 with these three estimates of automation potential to demonstrate the potential impact on these industries. While the regional growth forecast takes into account national job trends and thus is not adjusted by these independent estimates of automation potential, this serves to illustrate the potential additional impact in an alternative scenario.

In addition to automation, changes in the nature of work relationships have resulted in a noticeable but difficult to quantify decrease in the share of workers

who have full-time, long-term stable jobs (see, e.g. Kosanovich 2018, Kane and Clark 2019). The so-called "gig workers" are engaged in non-traditional work arrangements which may have short-term contractual relationships, licensing agreements or revolve around task-based work. Increasingly, gig work is mediated through online platforms such as Uber or Lyft which match drivers

FIGURE 10 Job Growth (in Thousands) and Automation Potential by Occupation, SCAG Region, 2016–2045



* 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)

with riders, AirBNB which matches property owners with short-term renters, or Etsy which matches craft producers with buyers. A subset of gig workers can be referred to as independent workers, which describes those who are generally unaffiliated with a business and work through online platforms and informal agreements with contracting individuals. Labor laws typically have not considered these workers employees, meaning that wage protections and benefits are less likely to apply. However, in September 2019, the California legislature passed Assembly Bill 5, which amended state labor laws to take a broader view of who is considered an employee. While certain occupations are exempt and most impacts of this recent legislation are yet to be seen, employers may need to reclassify many independent contractors as employees who may then be entitled to additional benefits and protections. Gig work is difficult to measure since it is considered a secondary job by some individuals and it may be sporadic or unreported. Estimates include:

- Bureau of Labor Statistics estimates that 10.1 percent of workers had alternative work arrangements (Kosanovich 2018).
- A study by the JP Morgan Chase Institute showing that 4.5 percent of families participated in the online platform economy at some point during 2018 (Farrell, Grieg, and Hamoudi 2018).
- Federal Reserve findings that 31 percent of adults engaged in gig work in 2017, an increase of 4 percent over 2016 (Federal Reserve 2018).

SPECIAL FOCUS: INTEGRATING GROWTH INTO A MATURE REGION

The region has experienced slow but consistent population growth since 2000 at a rate of 0.82 percent annually. Household growth was slightly slower at 0.73 percent, and job growth, reflecting both a recession and recovery, was similar at 0.77 percent. Despite these slow growth rates, the region has added 2.4 million people since 2000—larger than the state of New Mexico and about half the population of Ireland. An increasing challenge in mature regions is where to accommodate growth. While 58 percent of the housing units permitted since 2000 have been single-family (**FIGURE 6**), the prevalence of small single-family lots means that the urbanized areas within the SCAG region are actually some

of the nation's most dense. The region's history of relatively dense, yet single-family growth has posed challenges for where to accommodate growth while also promoting subregional balance between population and employment—one ingredient for ensuring reasonable commutes and decreased congestion. Traditionally, Greenfield development on the urban fringe has been the method of accommodating growth in part due to the costs and complexities of infill development. However, increasingly infill development on vacant urbanized land and redevelopment of land use types is being investigated as a mechanism for accommodating future growth (Kane et al. 2018).

TABLE 8 compares the working-age resident population versus employment at the county level in order to track the evolution of growth across counties. The standard population to employment (P-E) ratio can be used to measure the balance of county population and employment; however, given substantial changes expected in the region's population age structure and the increasing share of seniors, a measure of the working-age resident population (16-64) is better suited (WARP-E ratio). Across the SCAG region, this ratio increased from 1.41 to 1.45 over 2000-2016 as a higher share of the population entered working years, but is expected to decrease to 1.34 as the region's population ages dramatically.

At the county-level, this ratio was lowest in Orange County in 2000 (1.23), suggesting net in-commuting while it was the highest in Riverside County (1.79) suggesting net out-commuting. From 2000-2016, population growth outpaced employment growth in Los Angeles, Riverside, Ventura, and Imperial Counties, while employment growth was slightly faster than population growth in Orange and San Bernardino counties. The ratio changed most dramatically for Riverside County by 2016 (1.96) as its high rate of employment growth was overshadowed by a tremendous increase in working-age resident population.

The Hoover Index of Concentration (HIOC) (Long and Nucci 1997) is a simple measure of the relative concentration of population versus employment across subregional geographies. In this instance, a region-level measure is generated for how harmonized working-age population and employment are across the SCAG region's six counties, with 0 representing equal shares and 100 representing complete concentration in different counties. HIOC therefore is a

TABLE 8 Comparison of Growth Balance Across Counties, 2000–2045

		2000	2016	2045
WORKING-AGE RESIDENT POPULATION (WARP)*	Imperial	81,000	113,000	171,000
	Los Angeles	6,112,000	6,647,000	7,041,000
	Orange	1,856,000	2,074,000	2,103,000
	Riverside	909,000	1,454,000	1,895,000
	San Bernardino	1,039,000	1,354,000	1,696,000
	Ventura	480,000	541,000	551,000
	SCAG Region	10,477,000	12,182,000	13,458,000
TOTAL EMPLOYMENT	Imperial	57,000	67,000	130,000
	Los Angeles	4,448,000	4,743,000	5,382,000
	Orange	1,505,000	1,710,000	1,980,000
	Riverside	509,000	743,000	1,103,000
	San Bernardino	600,000	791,000	1,064,000
	Ventura	301,000	335,000	389,000
	SCAG Region	7,419,000	8,389,000	10,049,000
WARP-E RATIO	Imperial	1.42	1.69	1.32
	Los Angeles	1.37	1.40	1.31
	Orange	1.23	1.21	1.06
	Riverside	1.79	1.96	1.72
	San Bernardino	1.73	1.71	1.59
	Ventura	1.59	1.61	1.42
	SCAG Region	1.41	1.45	1.34
	SCAG Region HIOC	4.18	5.34	5.34

* The working-age resident population is defined as ages 16-64

Source: CA DOF, U.S. Census, SCAG

Note: Figures are rounded to the nearest thousand.

measure of how close each county is to the region's ratio.

SCAG's HIOC increased from 4.19 in 2000 to 5.34 in 2016 in part due to the disproportionate growth patterns referenced above. However, by 2045, the SCAG region's HIOC is expected to remain at 5.34. While Orange County's ratio dips well below the regional ratio, increased employment growth in the Inland Empire and relative population decline in Ventura County will prevent the region's HIOC from increasing further. Some caveats are needed with this analysis. In particular, labor force participation has been decreasing for younger residents and increasing for seniors, which may result in a different definition of "working age" in the future. A more detailed discussion can be found in the Environmental Justice Technical Report section on Jobs-Housing Relationships.

FORECAST METHODOLOGY AND ASSUMPTIONS

SCAG's regional growth forecast includes three major indicators: population, households and employment. SCAG uses the BULA (Balance, Uncertainty, Latest, Adaptive) approach toward developing the regional growth forecast for its long-range regional planning efforts in addition to a collaborative approach with a strong emphasis on local input (SCAG 2012). SCAG's open, transparent and extensive process involves participation from regional experts and stakeholders. SCAG's panel of experts meeting and bottom-up local input and envisioning process (described earlier) as well as the development of a range of growth forecasts are key aspects of this process.

REGIONAL GROWTH FORECAST METHODOLOGY

SCAG initially sets a range of regional growth forecasts of employment, population, and households in this order to address the inherent uncertainty of long-range growth forecasting (Field and MacGregor 1987). First, a range of regional employment forecasts (low, mid, high) is derived using a range of the region's share of national jobs as suggested by the expert panel. Second, assumptions of fertility and mortality are derived and combined with assumptions for domestic migration which are based on the range of regional employment forecasts (e.g. stronger job growth results in more in-migration).

This results in a low, mid and high population forecast. All related economic and demographic assumptions remain unchanged for three different employment levels. Third, the range of regional population forecasts are translated into a range of regional household forecasts using headship rates by age, sex, and race/ethnicity. Substantial evidence regarding future headship rates was reviewed, and deference was given to long-range historical trends.

REGIONAL DEMOGRAPHIC-ECONOMIC ASSUMPTIONS

SCAG projects regional employment using a shift-share model. The shift-share model computes employment comprised of 20 broad industry (NAICS) sectors at a future point in time using a region's share of the nation's employment. The regional employment forecasts are based on a set of national employment forecasts which provide total job projections as well as projections by industrial sector. Regional job projections depend on the total number of jobs in the United States as well as the distribution of these jobs among various industries.

The forecast of total U.S. jobs is based on a forecast of the total population, population by age group, labor force participation rates, assumed unemployment, and the ratio of jobs to workers (employed residents) reflecting assumptions about multiple job holding for individuals. The population by age group and labor force participation rates are especially important assumptions in developing national projections.

SCAG projects regional population using a cohort-component model. The model computes population at a future point in time by adding to the existing population the number of group quarters population, births, and in-migrants during a projection period and subtracting the number deaths and out-migrants. The group quarters population includes any nonresidential population, such as college dormitories, nursing homes, and military installations. Migration patterns are determined by the number of forecasted jobs. Age, sex, and race/ethnicity-specific population forecasts are multiplied by a headship rate assumption to generate households by age, sex, and race/ethnicity.

Demographic and economic assumptions play a decisive role in determining the size of population, households, and employment in the future (**TABLE 9**). Population size is projected by identifying the fertility rate, survival rate and migration rate of each population cohort. SCAG uses 5-year age groups ranging from 0-4 years old to 85 and above. The region's total fertility rate continues its past decrease throughout the 2016-2045 projection period, dropping from 1.86 to 1.69. The region's life expectancy at birth improves at the same rate as the state's life expectancy assumed by the U.S. Census Bureau's most recently available population projection. Domestic migration fluctuates and is directly influenced by labor demand derived from regional employment forecasts. Net immigration is expected to increase from 85,000 per year until 2020 after which it is assumed to remain constant at roughly the long-term historical average of 95,000 per year.

In addition to demographic assumptions, linking regional employment forecasts to regional population forecasts requires assumptions for the labor force participation rate, implied unemployment rate, and multiple jobholding rate. Overall labor force participation is expected to decrease from 63.9 percent at the beginning of the projection period to 60.7 percent by 2045. Given that some workers hold multiple jobs, the double-jobbing rate will be held at 4.5 percent throughout the projection period. Third, the implied unemployment rate will range from 4 percent to 6 percent during the projection and is derived by matching labor supply estimated from population projections with workers estimated from job projections. Finally, SCAG's regional share of national jobs is assumed to remain constant at 5.4 percent.

While headship rates have dropped steadily since 1980 in the region, various evidence suggests increases or decreases may take place in the future. Specifically, an ageing population would suggest higher headship rates; however, unless housing construction increases dramatically through exogenous policy intervention, it is not likely that headship rates will experience substantial rebound. As such, present-day total headship rates were assumed to remain roughly constant, increasing only slightly from 0.41 in 2016 to 0.42 in 2045.

TABLE 9 Regional Demographic-Economic Assumptions

	2015–2020		2040–2045	
Total Fertility Rate	1.86		1.69	
White, non-Hispanic	1.55		1.49	
Black, non-Hispanic	1.89		1.74	
Asian & Others, non-Hispanic	1.53		1.51	
Hispanic	2.06		1.81	
Crude Death Rate - Total	6.4		7.4	
White, non-Hispanic	11.8		13.8	
Black, non-Hispanic	9.4		10.2	
Asian & Others, non-Hispanic	4.4		6	
Hispanic	3.2		5	
Net International Migration	85000		95000	
Labor Force Participation	63.9%		60.7%	
Headship Rate by Age	2000	2010	2016	2045
15-24	0.099	0.071	0.065	0.064
25-34	0.401	0.366	0.331	0.326
35-44	0.504	0.493	0.475	0.475
45-54	0.546	0.534	0.521	0.518
55-64	0.563	0.549	0.537	0.524
65-74	0.585	0.568	0.557	0.523
75+	0.604	0.616	0.592	0.552
Total	0.431	0.418	0.408	0.417

Source: CA DOF and SCAG

TABLE 10 Description of Socioeconomic Variables for TAZ-level Forecast

TAZ-Level Controls for ABM	Variables
POPULATION	Total Population
	Residential Population
HOUSEHOLD	Total Households
INCOME	Median household income
SCHOOL/COLLEGE (BY LOCATION)	K12 (public + private)
	K to 8th grade
	9 to 12th grade
	College Enrollment
EMPLOYMENT	Agriculture & Mining jobs
	Construction jobs
	Manufacture jobs
	Wholesale Trade jobs
	Retail Trade jobs
	Transportation and Warehousing and Utility jobs
	Information jobs
	Financial Activity ("FIRE") jobs
	Professional and Business Services jobs
	Education and Health Services jobs
	Leisure and Hospitality (Art/Entertainment) jobs
	Other Services jobs
	Public/Administration jobs

Source: SCAG

SMALL AREA FORECAST AND ALLOCATION

INTRODUCTION

The regional and county-level growth forecast described previously established controls for further disaggregation to smaller geographic areas. The regional and county employment, population, and household forecast is further allocated into jurisdictions and Traffic Analysis Zones (TAZs). SCAG's growth forecast at the small area level becomes the basis for developing the SCAG's 2020 RTP/SCS as well as supporting a wide range of planning activities across the region.

SCAG's 2020 RTP/SCS growth forecast includes six counties' jurisdictional and TAZ-level employment, population, and households for 2016, 2020, 2030, 2035, and 2045. The development of the small area growth forecast takes place in two phases: jurisdiction-level and TAZ-level.

JURISDICTIONAL GROWTH FORECASTING

The following major data sources are considered and used in the development of the small area growth forecast:

- California Department of Finance (DOF) population and household estimates;
- California Employment Development Department (EDD) jobs report by industry;
- 2015 existing land use and General Plans from local jurisdictions;
- 2010 Census and the latest ACS data (2013-2017 5-year samples);
- County assessor parcel databases;
- 2011 and 2015 business establishment data from InfoGroup; and
- SCAG's 2016 RTP/SCS growth forecast.

Based on the previously-described regional and county growth forecast, SCAG further projects jurisdiction-level employment, population, and households. The latest jurisdictional existing land use and general plan land use data serve

as the basis for future year population and household allocations. Household growth rates and household size are estimated based on historical trends and the developable capacity from each local jurisdiction's general plan. Population projections are calculated based on household growth and household size. Future jurisdiction-level employment is estimated according to the share of the county's employment by sector.

TAZ-LEVEL GROWTH FORECASTING

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:

1. Development of the three major variables: employment, population, and households;
2. Development of secondary variables including the socioeconomic attributes of persons, households, and employment by sector;
3. 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 Tier 1 TAZs and 11,267 smaller Tier 2 TAZs (**TABLE 11**). The 2015 parcel data, the 2010 Census and the 2015 Infogroup firm-based employment data are the key databases used for the initial MPU-level household and employment estimates. The

aggregation of the MPU-level household and employment becomes the first draft of the TAZ-level estimates.

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.

DEVELOPMENT OF SECONDARY VARIABLES

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. An iterative proportional fitting procedure is principally relied upon to develop the set of TAZ-level distributions which sum to the county totals.

DEVELOPMENT OF INDIVIDUAL AND HOUSEHOLD CHARACTERISTICS

TABLE 11 lists detailed variables developed. Individual household and population-based data are specifically designed and developed for the ABM. SCAG uses a population synthesizer (PopSyn) to generate individual person-level and household-level characteristics. Detailed information at this scale is derived from the ACS' PUMS microsample data. PUMS data is built by the Census bureau from hundreds of individual householders' and associated household members' responses to ACS survey questions. This serves as seed data for PopSyn to select and generate simulated individual person characteristics for over 20 million people in the region. Household sample weights from the PUMS are adjusted to match the major variable controls provided externally and at the TAZ-level.

DEVELOPING AND INCORPORATING REGIONAL GROWTH STRATEGIES

SCAG's small area growth forecasting is both a robust technical process and a part of the development of regional policy pursuant to SB 375 (see the Performance Measures and Sustainable Communities Strategy Technical Reports). After the initial growth forecast was developed, SCAG began the Bottom-up Local Input and Envisioning (local input) process described earlier in this report. Staff provided comprehensive jurisdiction and TAZ-level draft forecasts of employment, population, and household growth for 2016, 2020, 2030, 2035 and 2045 to local jurisdictions in the region for review and input. This process provided a platform for jurisdictions to offer their local knowledge and input to inform SCAG's regional datasets and growth opportunities. After meeting one-on-one with all 197 local jurisdictions, 82 percent of jurisdictions provided input on SCAG's draft growth forecast. SCAG evaluated comments received from local jurisdictions and incorporated the adjustments into the population, household, and employment growth distributions. A timeline and additional procedural details can be found in **TABLE 1**.

TABLE 11 Development of Person and Household Characteristics for SCAG's Population Synthesizer

Major Variable	Demographic or Socioeconomic Attribute
HOUSEHOLD	Household type: residential, institutional group quarter, non-institutional group quarter
	Number of people per household (P-H ratio)
	Annual household income
	Housing type: single-family detached, single-family attached, multifamily, other
	Housing tenure: owned with a mortgage or loan, owned free and clear, rented, occupied without payment of rent
INDUSTRY	Agriculture, Farming, Forestry, Fishing, Hunting (NAICS 11)
	Mining, Quarrying, Oil or Gas Drilling Company (NAICS 21)
	Utility Company, Sewage Treatment Facility, Utilities in General (NAICS 22)
	Construction (NAICS 23)
	Manufacturing, Including Bakery, Food Processor, Mill, Manufacturer, Machine Shop (NAICS 31)
	Wholesale Trade (NAICS 42)
	Retail Trade, Including Store, Shop, Dealer (E.G. Auto Dealer) (NAICS 44)
	Transportation, Bus or Train Company, Airline, Postal Service, Warehouse or Storage (NAICS 48)
	Information, Including Publisher, Phone Company, Movie Company, Internet Company (NAICS 51)
	Finance and Insurance such as Bank, Insurance Company, Credit Union, Finance Company (NAICS 52)
	Real Estate Company, Any Rental or Leasing Company Including Auto or Video Rental (NAICS 53)
	Professional Scientific or Technical Services, Including Law, Accounting, Design (NAICS 54)
	Management of Companies and Enterprises (NAICS 55)
	Administrative Support, Including Employment Agency, Travel Agency (NAICS 56)
	Educational Services, Including School, University, Training School (NAICS 61)
	Health Care and Social Assistance, Including Hospital, Doctors Office, Assisted Living Home, Day Care Center (NAICS 62)
	Arts, Entertainment and Recreation, Including Art Gallery, Museum, Theatre, Bowling Alley, Casino (NAICS 71)
	Accommodation or Food Services, Including Hotel, Restaurant (NAICS 72)
	Other Services (Except Public Administration) such as Auto Repair, Hair or Nail Salon (NAICS 81)
	Public Administration, such as Government Agency, City or County Department, Military (NAICS 92)

TABLE 11 Development of Person and Household Characteristics for SCAG's Population Synthesizer – Continued

Major Variable	Demographic or Socioeconomic Attribute	Major Variable	Demographic or Socioeconomic Attribute
OCCUPATION	Management Occupations	PERSON TYPES	Full time worker
	Business Operations Specialists		Part time worker
	Financial Specialists		University student
	Computer and Mathematical Occupations		Non-worker
	Architecture and Engineering Occupations		Retiree
	Life, Physical, and Social Science Occupations		Driving-age school child
	Community and Social Science Occupations		Pre-driving school child
	Legal Occupations		Pre-school child
	Education, Training, and Library Occupations	POPULATION ATTRIBUTES (RESIDENTIAL AND GROUP QUARTERS)	Age
	Arts, Design, Entertainment, Sports, and Media Occupations		Sex
	Healthcare Practitioners and Technical Occupations		Race/Ethnicity
	Healthcare Support Occupations		Employment Status
	Protective Service Occupations		Work by industry and occupation (see above)
	Food Preparation and Serving Occupations		Person type (see above)
	Building and Ground Cleaning and Maintenance Occupations		Educational attainment or student grade level
	Personal Care and Service Occupations		
	Sales Occupations		
	Office and Administrative Support Occupations		
	Farming, Fishing, and Forestry Occupations		
	Construction Trades		
	Extraction Workers		
	Installation, Maintenance, and Repair Workers		
	Production Occupations		
	Transportation and Material Moving Occupations		

Source: SCAG

The resulting local input growth forecast serves as the basis for scenario planning and the initial assessment of SCAG's 2020 RTP/SCS performance. The TAZ-level data is also used as the technical basis for establishing regional policy goals and the scenario development process outlined in SB 375. In particular, a focus is placed on the share of growth to be accommodated in Priority Growth Areas (see **TABLE 15**). These regional policy goals, as part of the SCS, are advisory and non-binding but serve as a useful tool for guiding and tracking progress to implement the SCS at a regional level. More detail can be found in Chapter 6 of the Connect SoCal plan and the Sustainable Communities Strategy Technical Report.

GUIDING PRINCIPLES

The below guiding principles form the basis for developing the plan growth forecast:

1. Connect SoCal will be adopted at the jurisdictional-level, and directly reflects the population, household and employment growth projections that have been reviewed and refined with feedback from local jurisdictions through SCAG's Bottom-Up Local Input and Envisioning Process. The growth forecast maintains these locally informed projected jurisdictional growth totals, meaning future growth is not reallocated from one local jurisdiction to another.
2. Connect SoCal's growth forecast at the Transportation Analysis Zone (TAZ) level is controlled to not exceed the maximum density of local general plans as conveyed by jurisdictions, except in the case of existing entitlements and development agreements. TAZ-level growth projections are utilized by SCAG for regional modeling purposes and are not adopted as part of Connect SoCal nor included as part of the Forecasted Regional Development Pattern. The Forecasted Regional Development Pattern for Connect SoCal reflects the policies and strategies of the Plan and includes existing entitlements and development agreements conveyed by jurisdictions, as depicted in the Connect SoCal Sustainable Communities Technical Report.
3. For the purpose of determining consistency with Connect SoCal

for California Environmental Quality Act (CEQA), grants or other opportunities, lead agencies such as local jurisdictions have the sole discretion in determining a local project's consistency; SCAG may also evaluate consistency for grants and other resource opportunities; consistency should be evaluated utilizing the goals and policies of Connect SoCal and its associated Program Environmental Impact Report (PEIR). However, TAZ-level growth projections for households, employment or population reflected in TAZ Maps may not be utilized to determine consistency or inconsistency with Connect SoCal.¹

4. TAZ-level data or any data at a geography smaller than the jurisdictional-level has been utilized to conduct required modeling analyses and is therefore advisory only and non-binding, given that sub-jurisdictional forecasts are not adopted as part of Connect SoCal. TAZ-level data may be used by jurisdictions in local planning as they deem appropriate, and Connect SoCal does not supersede or otherwise affect local jurisdiction authority or decisions on future development, including entitlements and development agreements. There is no obligation by a jurisdiction to change its land use policies, General Plan, or regulations to be consistent with Connect SoCal.
5. SCAG will maintain communication with agencies that use SCAG's subjurisdictional-level data to ensure that the "advisory and non-binding" nature of the data is appropriately maintained."

SUMMARY

SCAG's county and regional growth forecasts are developed by a comprehensive review of demographic and socioeconomic data and trends, which feeds into and matches the sum totals of the small area forecasts. SCAG's jurisdiction and TAZ-level growth forecasting is a joint effort which combines the mathematical

¹ "TAZ-level growth projections" refer to the disaggregation of the regional and jurisdictional population, household, employment growth forecasts developed as part of the final, adopted Connect SoCal, and is in contrast to other TAZ-level data such as locally envisioned growth projections (i.e., "local input") or the 2016 base-year TAZlevel data developed by SCAG. "TAZ Maps" refer to visualizations in a map format of the TAZ-level growth projections within a TAZ boundary, which may be created by SCAG, and such maps are not developed, included, contained, approved or adopted as part of Connect SoCal.

simulation and allocation processes described above with collaboration and review by local jurisdictions. This combination of expert analysis, advanced mathematical approaches and bottom-up community engagement ensures that SCAG's growth forecasting process is as robust as possible.

A NOTE REGARDING MOUNTAIN-AREA SEASONAL CHARACTERISTICS

Reporting of socioeconomic data and analysis of transportation needs for the mountain areas of San Bernardino County are a challenge given significant seasonal variation due to recreation activities and tourism. SCAG's forecast of future employment, population, and households for purposes of economic, infrastructure and transportation planning are built primarily from U.S. Census and state employment data for a "typical" time of the year. In the San

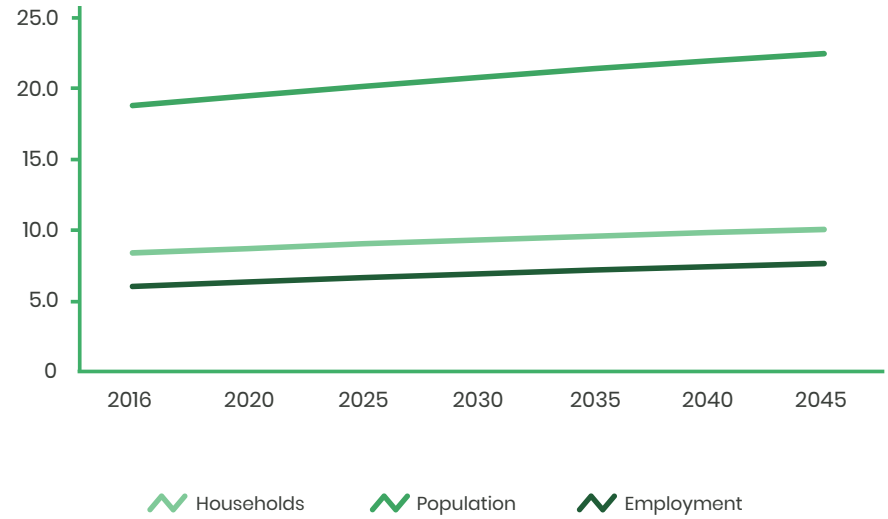
Bernardino mountain communities such as the City of Big Bear Lake or areas like Lake Arrowhead, Crestline, Wrightwood and Running Springs, the full-year population and employment of these areas are relatively low, but significant increases are experienced during the peak winter and summer seasons due to the added seasonal residents and tourists. As a result, standard socioeconomic growth forecasts for these areas tend not to reflect the significant seasonal variations experienced due to visitors/recreational activities. Seasonal characteristics in these mountain areas (as well as some desert resort communities) are not captured by conventional methods that are utilized to forecast growth and analyze transportation needs. Therefore, special attention must be given to these communities to acknowledge the unique demographic conditions and travel needs of these areas (**TABLE 12**).

TABLE 12 Seasonal Comparison of the City of Big Bear Lake

	Population	Households	Employment	Visitors
2016 Off-Peak	4900	2100	4700	10000
2016 Peak			6700	60000
2045 Off-Peak	6600	2800	5800	14000
2045 Peak			7800	76000

Source: SCAG, visitor and peak forecasts provided by SBCTA

FIGURE 11 Population and Employment in the SCAG Region, 2016–2045 (in Millions)



Source: CA DOF, CA EDD, SCAG

TABLE 13 County Forecast of Population, Households, and Employment

		2000	2016	2020	2030	2035	2045
POPULATION	Imperial	143,000	187,000	223,000	249,000	260,000	281,000
	Los Angeles	9,544,000	10,110,000	10,407,000	10,900,000	11,174,000	11,674,000
	Orange	2,854,000	3,180,000	3,268,000	3,441,000	3,499,000	3,535,000
	Riverside	1,557,000	2,364,000	2,493,000	2,853,000	2,996,000	3,252,000
	San Bernardino	1,719,000	2,141,000	2,250,000	2,474,000	2,595,000	2,815,000
	Ventura	757,000	850,000	877,000	906,000	920,000	947,000
	SCAG Region	16,574,000	18,832,000	19,518,000	20,821,000	21,443,000	22,504,000
EMPLOYMENT	Imperial	57,000	67,000	79,000	102,000	110,000	130,000
	Los Angeles	4,448,000	4,743,000	4,838,000	5,060,000	5,172,000	5,382,000
	Orange	1,505,000	1,710,000	1,774,000	1,886,000	1,928,000	1,980,000
	Riverside	509,000	743,000	823,000	961,000	1,009,000	1,103,000
	San Bernardino	600,000	791,000	834,000	926,000	972,000	1,064,000
	Ventura	301,000	335,000	348,000	369,000	376,000	389,000
	SCAG Region	7,419,000	8,389,000	8,695,000	9,304,000	9,566,000	10,049,000
HOUSEHOLDS	Imperial	39,000	50,000	66,000	78,000	83,000	92,000
	Los Angeles	3,134,000	3,319,000	3,472,000	3,749,000	3,885,000	4,119,000
	Orange	935,000	1,025,000	1,065,000	1,104,000	1,125,000	1,154,000
	Riverside	506,000	716,000	785,000	930,000	988,000	1,086,000
	San Bernardino	529,000	630,000	668,000	751,000	793,000	875,000
	Ventura	243,000	271,000	278,000	291,000	296,000	306,000
	SCAG Region	5,386,000	6,012,000	6,333,000	6,903,000	7,170,000	7,633,000

Source: CA DOF, CA EDD, SCAG

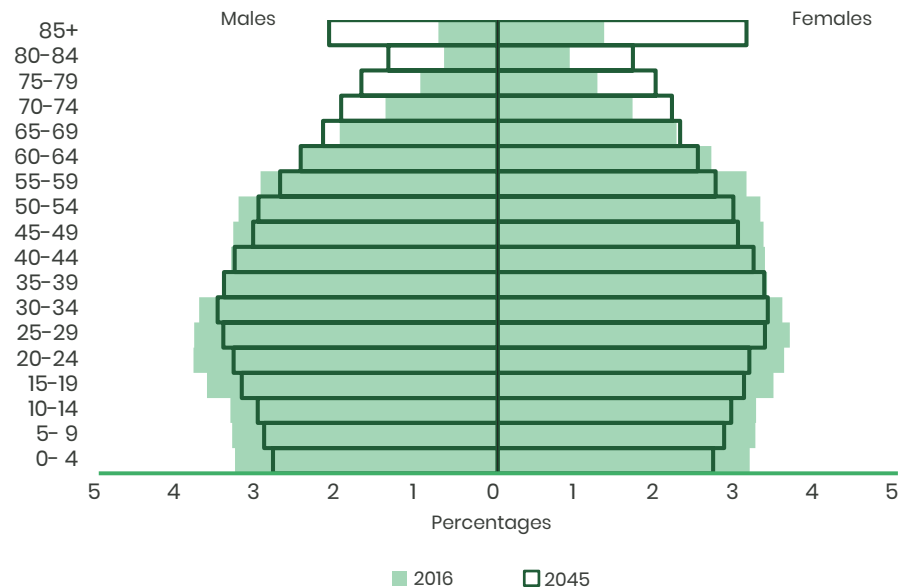
Note: All figures are rounded to the nearest thousand.

SCAG GROWTH FORECAST

REGIONAL GROWTH FORECAST OVERVIEW

SCAG projects that the region will add 3,672,000 people, 1,621,000 households and 1,660,000 jobs over the RTP/SCS planning horizon (2016-2045) (see **TABLE 13** and **FIGURE 11**). Annual household growth (0.83 percent) is expected to outpace both population growth (0.61 percent) and employment growth (0.62 percent). Population growth rates are expected to be slower than the previous period of 2000-2016 (0.82 percent) and substantially slower than historical growth for the region from 1970-2000 (1.65 percent). This projection is slightly below the 2016-2045 anticipated growth rates for the state of California (0.66 percent) but slightly above the anticipated growth rate of the United States (0.57 percent) as reported by the California Department of Finance and U.S. Census Bureau, respectively (**TABLE 2**).

FIGURE 12 Population Pyramids, SCAG Region, 2016 and 2045

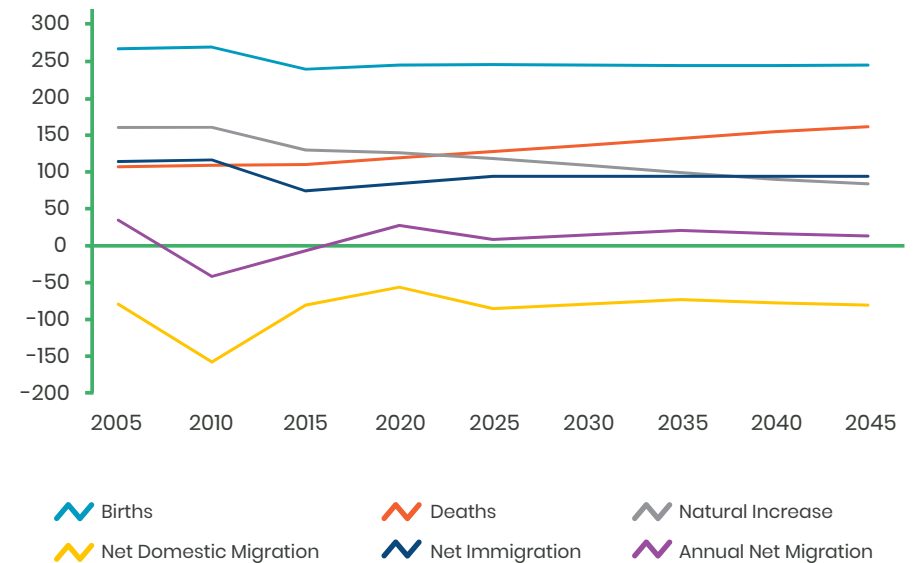


POPULATION

Consistent with historical trends (**FIGURE 2**), the region's population growth will consist mostly of natural increase. However, by 2045, three decades of declining fertility will have increased the age of the population substantially resulting in fewer births and more deaths per year. Thus, natural increase will be adding fewer than 85,000 people to the region per year. This factor more than anything results in the projected population growth rate being higher during the first half of the projection period (0.72 percent from 2016-2030) than the second half of the period (0.52 percent from 2030-2045). Despite gradual increases in life expectancy, by 2030 the oldest members of the large Baby Boomer generation (born 1946-1964) will be 84 years old and experiencing far higher mortality rates thereafter (see **FIGURE 12**).

Between 2016 and 2045, the region is expected to lose 2.2 million more persons to other parts of the country than it will gain. However, 2.7 million residents are

FIGURE 13 Annual Components of Population Change, SCAG Region, 2016-2045 (in Thousands)



expected to be gained through international migration. The highest contributor to future growth is expected to be 3.0 million residents anticipated through natural increase (**FIGURE 13**).

The most noticeable changes in the demographic characteristics of the population will be ageing and continued shifts in racial/ethnic distribution (**TABLE 3** and **FIGURE 3**). In 2019, the youngest members of the Baby Boomer generation will turn 55, contributing to a 3.9 year increase in the region's median age and 7.4 percent increase in the population share which is over 65 over the projection period. While the share of children will decline by 2.5 percent, the share of working age population (aged 16-64) will see the most noticeable decline of 4.8 percent of population share. Importantly, the ratio of seniors to working age population will increase from 1 in 5 to 1 in 3.

Seniors will comprise nearly 60 percent of the region's increase in population. The region's already high racial/ethnic diversity will continue to evolve and will actually decline somewhat with a normalized entropy index decreasing from 0.86 to 0.83. This can be attributed to the high expected numerical growth in the already region-leading Hispanic population share, which will grow to 52 percent of the population by 2045. The share of Asian/Other population will experience the biggest increase in growth rate, comprising more than one-fifth of the region's population by 2045. Meanwhile, the continued aging and higher crude death rate of the white, non-Hispanic population means that 28.2 percent will be over age 65 by 2045. The white, non-Hispanic share of the population is expected to drop from 31.5 percent in 2016 to 22.0 percent in 2045. The region's relatively smaller black population, while younger on the whole, is expected to decline in relative share from 6.3 percent of the population in 2016 to 5.3 percent in 2045.

HOUSEHOLDS

While household sizes have increased since the Great Recession, increases in Millennials' household formation and an anticipation of more housing construction will gradually reduce the region's average household size from 3.10 to 2.90 over the projection period (**TABLE 6**). These decreases are most notable for the Hispanic population whose household size is expected to

decrease 15.0 percent compared with a 4.8 percent decrease for the White, non-Hispanic population. As the region's diverse population ages, the distribution of householders largely mirrors that of the population with the important caveat that the highest headship rates are experienced by older age cohorts and the white, non-Hispanic population. Younger people are more likely to live in larger households while households headed by Hispanic or Asian/Other individuals tend to be larger as well, suggesting a greater prevalence of multi-generational living. While the recent 2000-2016 period saw a decrease in households headed by those aged 15-44 amidst a notable increase in households headed by those 55 and above, future patterns are different. Continued declines in younger age householdership are not projected—in fact, the number of households across all age categories is expected to increase. However, the anticipated increase is substantial for those over 75 with 134.5 percent more householders of this age category projected by 2045. There will be more households headed by someone over 75 (1.5 million) than any other age category. Thus a continued challenge will be the availability of the best housing for middle-aged adults and families with children, as the vast majority of seniors report that they prefer to age in place (Arigoni 2018) and they will outnumber household heads who are in the key 35-44 cohort (1.4 million).

EMPLOYMENT

Employment growth from 2000-2016 was characterized by the Great Recession and a recovery to above pre-recession peak job numbers with an overall annualized growth rate of 0.77 percent (**TABLE 7**). Manufacturing employment was devastated and was principally replaced by gains in healthcare and social assistance as well as accommodation and food service. Job growth is projected to grow modestly but steadily at 0.62 percent for the projection period of 2016-2045. Manufacturing employment is expected to continue to take a hit, dropping to only 5.0 percent of the region's employment base and losing an additional 142,000 jobs. The region's farm sector is the only other employment category expected to see numerical decreases between 2016 and 2045. Already fast growth in healthcare and social assistance is expected to continue, with fully one-fifth of the region's jobs expected in this sector—a testament to the needs of an ageing population. Other sectors that will

experience significant growth are accommodation and food service (+196,000 jobs), transportation and warehousing (+139,000 jobs), educational services (+134,000 jobs), construction (+126,000 jobs), and administrative and support services (+124,000 jobs).

Despite the overall expected increases in employment, the job and wage structure of the region may present significant challenges over coming decades. The wage structure of job growth since the end of the Great Recession has been very polarized (**FIGURE 9**) with the vast majority of gains going to the top-earning and bottom-earning occupations with extreme job losses in middle-paying fields. This phenomenon is also reflected in the region's income distribution (see the Historical Demographic Trends of the Environmental Justice Technical Report for details) which has seen increases in the top and bottom quintiles, but losses for the middle quintiles since 2000. In addition, technological change could play a greater role than expected in displacing labor (**FIGURE 10**). While predicting extreme scenarios is outside the normal purview

TABLE 14 Jurisdiction-Level Growth Forecast

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
Imperial	Brawley city	26,800	41,100	7,700	12,800	8,000	13,600
Imperial	Calexico city	40,800	67,500	10,000	22,300	10,800	20,800
Imperial	Calipatria city	7,500	9,700	1,000	1,700	1,800	3,000
Imperial	El Centro city	45,500	58,800	13,100	20,500	23,200	48,100
Imperial	Holtville city	6,200	7,700	1,800	2,600	1,800	2,800
Imperial	Imperial city	18,400	27,800	5,100	10,100	4,600	11,600
Imperial	Westmorland city	2,300	2,400	600	600	300	300
Imperial	Unincorporated	39,700	66,200	10,700	21,800	16,400	29,900
Los Angeles	Agoura Hills city	21,000	22,400	7,400	7,900	13,600	15,300
Los Angeles	Alhambra city	86,600	91,200	29,900	32,000	37,400	40,600
Los Angeles	Arcadia city	57,300	62,200	19,600	22,400	32,600	36,100
Los Angeles	Artesia city	16,800	17,800	4,500	5,000	6,100	6,600
Los Angeles	Avalon city	3,700	4,100	1,400	2,100	2,600	2,800
Los Angeles	Azusa city	49,600	56,200	13,400	16,400	19,400	21,800
Los Angeles	Baldwin Park city	75,400	81,700	16,900	19,200	24,700	26,500
Los Angeles	Bell city	36,400	37,100	8,900	9,200	12,400	13,200
Los Angeles	Bellflower city	76,700	77,000	23,200	23,400	17,600	18,300
Los Angeles	Bell Gardens city	42,800	44,300	9,700	10,200	9,600	10,300
Los Angeles	Beverly Hills city	34,700	35,800	14,800	15,700	74,600	81,300
Los Angeles	Bradbury city	1,100	1,100	400	400	200	200
Los Angeles	Burbank city	105,000	115,400	41,900	48,600	114,000	138,700
Los Angeles	Calabasas city	24,200	24,900	8,800	9,300	20,500	20,800
Los Angeles	Carson city	93,600	105,200	25,500	30,700	63,400	70,000
Los Angeles	Cerritos city	49,700	50,100	15,500	15,600	39,000	39,200
Los Angeles	Claremont city	36,200	39,800	11,800	13,700	18,800	20,200

TABLE 14 Jurisdiction-Level Growth Forecast – Continued

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
Los Angeles	Commerce city	13,100	13,800	3,400	3,700	53,400	56,000
Los Angeles	Compton city	100,000	103,100	23,500	24,600	28,600	30,200
Los Angeles	Covina city	49,000	50,500	16,000	16,800	26,300	28,900
Los Angeles	Cudahy city	24,400	25,600	5,600	6,100	2,900	3,000
Los Angeles	Culver City city	40,100	41,600	17,000	18,000	59,300	64,100
Los Angeles	Diamond Bar city	57,900	64,700	18,900	22,400	14,600	19,600
Los Angeles	Downey city	113,300	119,200	32,600	34,100	42,900	45,800
Los Angeles	Duarte city	22,000	25,100	7,100	8,100	11,300	15,700
Los Angeles	El Monte city	114,300	137,500	27,500	36,300	30,600	37,100
Los Angeles	El Segundo city	16,700	17,200	7,000	7,300	48,300	52,400
Los Angeles	Gardena city	60,600	65,700	20,800	23,700	29,300	32,100
Los Angeles	Glendale city	201,200	214,100	74,500	82,300	117,000	125,900
Los Angeles	Glendora city	52,300	55,700	17,600	19,500	21,600	23,100
Los Angeles	Hawaiian Gardens city	14,800	15,700	3,600	4,000	7,900	8,500
Los Angeles	Hawthorne city	89,400	92,900	29,700	31,600	28,500	31,700
Los Angeles	Hermosa Beach city	19,700	20,600	9,500	9,900	7,700	10,500
Los Angeles	Hidden Hills city	1,900	2,000	600	700	300	300
Los Angeles	Huntington Park city	59,400	64,000	14,700	16,500	15,900	17,800
Los Angeles	Industry city	400	400	100	100	80,400	80,400
Los Angeles	Inglewood city	114,300	137,100	37,500	47,700	33,800	45,900
Los Angeles	Irwindale city	1,400	1,900	400	500	18,900	20,300
Los Angeles	La Cañada Flintridge city	20,500	21,600	6,800	7,200	7,700	8,700
Los Angeles	La Habra Heights city	5,500	5,800	1,800	2,000	900	1,000
Los Angeles	Lakewood city	79,300	84,500	25,800	28,700	20,900	22,500
Los Angeles	La Mirada city	49,400	52,400	14,700	16,200	18,000	19,600

TABLE 14 Jurisdiction-Level Growth Forecast – Continued

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
Los Angeles	Lancaster city	157,800	213,300	46,900	74,600	56,300	65,500
Los Angeles	La Puente city	40,400	41,600	9,400	9,900	6,600	8,200
Los Angeles	La Verne city	33,100	34,400	11,700	12,400	17,000	18,300
Los Angeles	Lawndale city	33,400	34,400	9,700	10,200	7,400	8,300
Los Angeles	Lomita city	20,400	21,200	8,000	8,500	5,600	6,100
Los Angeles	Long Beach city	470,900	489,600	168,600	198,200	155,900	185,400
Los Angeles	Los Angeles city	3,933,800	4,771,300	1,367,000	1,793,000	1,848,300	2,135,900
Los Angeles	Lynwood city	71,900	76,900	14,900	16,500	12,000	13,100
Los Angeles	Malibu city	12,700	13,000	5,200	5,400	9,900	11,000
Los Angeles	Manhattan Beach city	35,400	35,600	13,900	14,000	22,000	23,600
Los Angeles	Maywood city	28,000	29,000	6,600	7,000	4,000	4,300
Los Angeles	Monrovia city	38,000	42,100	14,000	16,700	22,700	24,800
Los Angeles	Montebello city	63,900	67,800	19,100	21,100	29,300	31,300
Los Angeles	Monterey Park city	61,500	65,600	20,000	22,200	45,500	48,000
Los Angeles	Norwalk city	105,500	107,000	26,700	27,300	25,700	28,100
Los Angeles	Palmdale city	158,600	207,000	43,800	61,800	36,700	45,900
Los Angeles	Palos Verdes Estates city	13,700	14,000	5,100	5,300	3,000	3,300
Los Angeles	Paramount city	55,900	57,500	14,100	14,500	21,400	23,000
Los Angeles	Pasadena city	142,100	155,500	56,300	65,100	116,200	140,200
Los Angeles	Pico Rivera city	63,500	67,400	16,600	18,500	24,900	27,200
Los Angeles	Pomona city	154,700	187,600	39,300	52,800	55,700	63,400
Los Angeles	Rancho Palos Verdes city	42,800	43,000	15,700	15,800	8,000	8,200
Los Angeles	Redondo Beach city	68,200	72,900	29,200	31,100	25,400	28,300
Los Angeles	Rolling Hills city	1,900	2,000	700	700	100	100
Los Angeles	Rolling Hills Estates city	8,100	8,500	2,900	3,200	7,100	7,600

TABLE 14 Jurisdiction-Level Growth Forecast – Continued

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
Los Angeles	Rosemead city	55,000	60,300	14,300	16,500	16,400	18,100
Los Angeles	San Dimas city	34,200	35,000	12,100	12,300	11,500	12,900
Los Angeles	San Fernando city	24,500	27,100	6,100	7,100	11,400	12,500
Los Angeles	San Gabriel city	40,700	45,800	12,600	15,300	14,900	16,700
Los Angeles	San Marino city	13,500	13,600	4,400	4,400	4,400	4,800
Los Angeles	Santa Clarita city	218,200	258,800	71,800	95,200	91,200	105,200
Los Angeles	Santa Fe Springs city	17,700	20,600	5,200	6,500	57,000	61,000
Los Angeles	Santa Monica city	93,600	114,700	48,100	51,400	105,800	105,800
Los Angeles	Sierra Madre city	11,000	11,300	4,800	5,000	2,200	2,400
Los Angeles	Signal Hill city	11,600	12,500	4,300	4,800	16,900	18,400
Los Angeles	South El Monte city	20,800	22,600	4,600	5,300	16,800	17,700
Los Angeles	South Gate city	98,000	112,800	23,700	25,600	22,400	24,600
Los Angeles	South Pasadena city	26,000	27,200	10,400	11,200	11,400	12,100
Los Angeles	Temple City city	35,600	42,300	11,500	15,100	7,400	9,500
Los Angeles	Torrance city	147,100	153,100	55,600	57,300	126,600	133,800
Los Angeles	Vernon city	200	200	100	100	43,300	44,600
Los Angeles	Walnut city	30,100	31,300	8,700	9,200	8,600	9,600
Los Angeles	West Covina city	107,800	118,900	31,500	34,800	31,600	34,600
Los Angeles	West Hollywood city	36,700	42,600	26,000	30,100	21,700	38,100
Los Angeles	Westlake Village city	8,400	8,800	3,200	3,500	17,100	18,700
Los Angeles	Whittier city	87,100	98,900	29,600	33,500	35,900	38,900
Los Angeles	Unincorporated	1,044,500	1,258,000	294,800	419,300	269,100	320,100
Orange	Aliso Viejo city	50,300	52,700	18,700	19,700	23,000	24,200
Orange	Anaheim city	356,700	416,800	101,100	122,700	197,200	250,500
Orange	Brea city	43,900	48,000	15,300	17,000	50,400	54,400

TABLE 14 Jurisdiction-Level Growth Forecast – Continued

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
Orange	Buena Park city	83,400	96,200	24,200	28,600	33,600	38,200
Orange	Costa Mesa city	113,900	123,700	40,500	44,200	95,700	104,000
Orange	Cypress city	49,600	51,300	15,800	16,600	27,500	30,600
Orange	Dana Point city	33,600	35,600	14,300	15,200	11,700	13,500
Orange	Fountain Valley city	56,700	59,000	18,800	19,400	31,600	34,200
Orange	Fullerton city	141,900	158,300	46,400	52,900	63,200	85,400
Orange	Garden Grove city	176,000	185,800	46,300	49,200	57,800	68,200
Orange	Huntington Beach city	196,900	205,300	77,000	80,300	83,400	90,800
Orange	Irvine city	261,600	327,700	93,300	121,700	265,300	330,200
Orange	Laguna Beach city	23,400	23,500	10,900	11,000	5,800	6,100
Orange	Laguna Hills city	31,200	34,000	10,400	11,700	18,300	18,800
Orange	Laguna Niguel city	66,100	69,700	24,800	26,200	19,600	22,200
Orange	Laguna Woods city	16,300	16,500	11,400	11,500	5,400	6,800
Orange	La Habra city	61,900	66,200	19,200	20,600	18,200	19,700
Orange	Lake Forest city	84,100	92,900	27,700	30,800	42,500	48,900
Orange	La Palma city	16,000	16,100	5,100	5,100	15,300	15,700
Orange	Los Alamitos city	11,600	12,300	4,100	4,400	14,800	16,000
Orange	Mission Viejo city	96,600	98,600	33,900	34,200	38,600	38,800
Orange	Newport Beach city	84,900	92,000	38,900	41,800	83,400	84,900
Orange	Orange city	140,900	154,000	43,700	48,700	123,000	131,300
Orange	Placentia city	52,300	58,900	16,600	18,800	19,900	21,500
Orange	Rancho Santa Margarita city	48,600	49,800	16,700	17,000	15,600	18,800
Orange	San Clemente city	65,900	69,600	24,200	25,400	28,600	31,100
Orange	San Juan Capistrano city	36,100	41,900	11,600	13,400	17,200	19,200
Orange	Santa Ana city	340,200	360,100	73,900	80,100	162,900	172,400

TABLE 14 Jurisdiction-Level Growth Forecast – Continued

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
Orange	Seal Beach city	25,000	25,400	13,100	13,300	12,700	13,700
Orange	Stanton city	39,300	44,200	10,800	12,300	9,100	10,300
Orange	Tustin city	82,100	92,600	26,500	30,600	49,200	70,800
Orange	Villa Park city	5,900	6,100	2,000	2,000	2,100	2,300
Orange	Westminster city	93,200	98,300	26,200	27,800	25,900	27,400
Orange	Yorba Linda city	67,800	70,600	22,400	23,300	17,400	19,300
Orange	Unincorporated	125,900	181,000	39,000	56,600	24,300	40,300
Riverside	Banning city	31,000	41,500	10,900	16,100	7,300	11,400
Riverside	Beaumont city	45,500	80,200	14,200	25,100	9,300	15,900
Riverside	Blythe city	19,800	28,600	4,600	6,300	4,800	6,300
Riverside	Calimesa city	8,500	20,600	3,400	10,400	1,600	4,100
Riverside	Canyon Lake city	10,800	11,400	3,900	4,200	1,800	2,600
Riverside	Cathedral City city	54,300	76,300	17,400	28,000	12,300	18,000
Riverside	Coachella city	45,300	129,300	9,600	36,400	8,900	23,500
Riverside	Corona city	165,800	185,100	46,900	52,400	79,200	92,800
Riverside	Desert Hot Springs city	29,000	61,000	9,300	24,700	3,700	8,700
Riverside	Eastvale City	63,900	72,700	16,300	18,500	7,400	21,600
Riverside	Hemet city	81,500	124,000	29,900	53,500	21,700	40,200
Riverside	Indian Wells city	5,400	6,400	2,900	3,400	5,200	6,800
Riverside	Indio city	88,100	129,300	26,000	44,000	26,600	38,300
Riverside	Lake Elsinore city	61,500	111,600	16,900	37,800	14,000	24,900
Riverside	La Quinta city	40,400	47,700	15,400	19,400	16,700	18,700
Riverside	Menifee city	89,600	129,800	30,500	51,200	13,800	29,200
Riverside	Moreno Valley city	205,700	266,800	52,700	76,200	35,500	64,900
Riverside	Murrieta city	113,600	127,700	34,500	42,300	31,300	52,200

TABLE 14 Jurisdiction-Level Growth Forecast – Continued

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
Riverside	Norco city	27,100	27,300	7,100	7,100	15,200	22,100
Riverside	Palm Desert city	50,400	64,100	23,100	32,300	43,300	54,800
Riverside	Palm Springs city	47,100	61,600	23,100	31,300	31,900	42,500
Riverside	Perris city	74,900	121,000	17,200	33,800	16,100	26,400
Riverside	Rancho Mirage city	18,200	25,200	9,000	13,000	16,600	21,200
Riverside	Riverside city	325,300	395,800	94,500	115,100	145,400	188,700
Riverside	San Jacinto city	44,800	69,900	14,000	25,000	6,900	13,100
Riverside	Temecula city	110,300	138,400	33,600	46,400	56,400	71,600
Riverside	Wildomar city	35,400	55,200	10,600	19,600	6,500	11,200
Riverside	Jurupa Valley City	100,100	117,800	25,300	31,800	27,100	31,300
Riverside	Unincorporated	370,500	525,600	113,600	180,900	76,100	139,600
San Bernardino	Adelanto city	33,900	66,600	8,200	19,800	6,100	10,000
San Bernardino	Apple Valley town	74,300	101,400	24,700	37,400	18,000	30,200
San Bernardino	Barstow city	24,200	36,900	8,400	12,800	11,700	18,500
San Bernardino	Big Bear Lake city	4,900	6,600	2,100	2,800	4,700	5,800
San Bernardino	Chino city	86,900	121,300	23,200	33,100	50,400	57,400
San Bernardino	Chino Hills city	79,700	92,800	23,800	28,000	16,400	17,900
San Bernardino	Colton city	53,700	70,700	15,000	21,700	19,500	29,000
San Bernardino	Fontana city	211,000	286,700	51,500	77,800	56,700	75,100
San Bernardino	Grand Terrace city	12,400	14,500	4,400	5,600	3,500	6,100
San Bernardino	Hesperia city	93,700	168,100	26,800	53,200	22,500	46,100
San Bernardino	Highland city	54,200	68,900	15,400	21,400	6,900	11,100
San Bernardino	Loma Linda city	24,500	30,100	9,000	12,000	24,200	28,300
San Bernardino	Montclair city	38,700	49,200	9,900	11,200	19,300	20,900
San Bernardino	Needles city	5,000	5,600	1,900	2,200	1,700	2,100

TABLE 14 Jurisdiction-Level Growth Forecast – Continued

County	Jurisdiction	Population		Households		Employment	
		2016	2045	2016	2045	2016	2045
San Bernardino	Ontario city	172,200	269,100	46,000	74,500	113,900	169,300
San Bernardino	Rancho Cucamonga city	176,500	201,300	56,800	66,400	88,300	105,100
San Bernardino	Redlands city	69,500	80,800	24,400	30,800	42,600	56,300
San Bernardino	Rialto city	99,300	139,100	26,500	37,100	25,500	35,500
San Bernardino	San Bernardino city	216,300	230,500	59,700	68,800	101,300	125,600
San Bernardino	Twentynine Palms city	26,500	33,300	8,400	11,800	4,400	8,600
San Bernardino	Upland city	76,400	93,000	26,100	32,800	35,900	42,200
San Bernardino	Victorville city	123,300	194,500	33,900	61,800	41,200	61,200
San Bernardino	Yucaipa city	53,800	75,200	18,700	26,100	10,800	17,600
San Bernardino	Yucca Valley town	21,400	25,800	8,400	10,900	6,900	10,900
San Bernardino	Unincorporated	308,100	353,100	97,100	115,000	58,800	72,900
Ventura	Camarillo city	68,200	76,100	25,200	28,100	32,700	37,500
Ventura	Fillmore city	15,600	18,600	4,300	5,300	3,000	4,800
Ventura	Moorpark city	36,700	42,200	11,000	13,000	11,300	15,000
Ventura	Ojai city	7,500	7,900	3,100	3,200	5,600	5,800
Ventura	Oxnard city	206,000	238,100	51,200	61,600	61,100	76,100
Ventura	Port Hueneme city	22,000	22,400	6,900	7,100	3,800	4,000
Ventura	San Buenaventura (Ventura) city	108,800	123,900	41,100	46,700	60,800	64,500
Ventura	Santa Paula city	30,700	35,400	8,600	10,300	7,800	11,000
Ventura	Simi Valley city	127,100	137,000	41,600	46,100	46,700	53,800
Ventura	Thousand Oaks city	129,500	144,700	46,000	51,300	70,100	80,000
Ventura	Unincorporated	98,200	101,300	32,200	33,600	31,800	36,900
		18,832,000	22,504,000	6,012,000	7,633,000	8,389,000	10,049,000

Source: SCAG

Note: Jurisdictional-level figures are rounded to the nearest 100.

of regional forecasting, the threat of change and the potential magnitude of displacement is worth taking heed of as it affects the future balance between the region’s employment, population, and households which is a linchpin of SCAG’s 2020 RTP/SCS forecast.

JURISDICTION-LEVEL GROWTH FORECAST OVERVIEW

TABLE 14 presents the jurisdiction-level growth forecast for employment, population, and households, which was derived from the local input process described above.

SPECIAL FOCUS: INTEGRATING GROWTH INTO A MATURE REGION

While the county-level trends analyzed above can indicate how growth trends compare across large subareas within the SCAG region, analyzing growth at smaller spatial scales (e.g. transportation analysis zone, census tract or parcel) can provide better insights into changes in the region’s density and the growth distribution, which ultimately impacts regional transportation demand, congestion and greenhouse gas emissions.

In Southern California, achieving 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. What it means to travel more sustainably can vary for each community across the region or for each individual person’s preference. This may include more transit trips, more walking and biking, shorter driving trips or more 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 to reach destinations. When thinking of integrating land use and transportation it is important to understand the policy framework that guides each of these sectors.

Much of the ability to achieve future sustainability goals comes down to how people and jobs are placed in the region. SCAG’s 2020 RTP/SCS intends to emphasize growth around a variety of priority areas which SCAG’s ABM indicate may have improved performance in the goals listed above. **TABLE 15** compares growth in the SCAG region versus an array of these priority growth areas. Together, these overlays make up 5.4 percent of the region’s land area and include high-quality transit areas (HQTAs), transit priority areas (TPAs), local jurisdictions’ Specific Plans, job centers, neighborhood mobility areas and Liveable Corridors. Growth priority areas are compared against constraint areas, which include open space, farmland, flood hazard areas and wildfire risk areas, which are poorly suited for additional development. Constraint areas make up 76.2 percent of the region’s land area.

From 2008 to 2016, 70.7 percent of household growth and 74.6 percent of employment growth took place in priority areas. The rate of growth of households and employment in priority areas outpaced growth overall during

TABLE 15 Growth Trends in SCAG Priority Growth Areas (2008–2045)

	Land Area		Share of Total Growth (2008–2016)		Annual Growth Rate (2008–2016)		Annual Growth Rate (2016–2045)	
	Acres	Percent	Households	Employment	Households	Employment	Households	Employment
SCAG Region Total	24,717,287				0.42%	1.01%	0.83%	0.62%
Priority Growth Areas Total	975,234	3.9%	70.7%	74.6%	0.50%	1.07%	0.88%	0.65%
High Quality Transit Areas (HQTAs) ¹	592,286	2.4%	58.2%	45.2%	0.54%	0.85%	0.93%	0.69%
Transit Priority Areas (TPA) ²	218,411	0.9%	33.9%	20.9%	0.65%	0.72%	1.09%	0.79%
Job Centers ³	202,186	0.8%	24.2%	33.4%	0.90%	1.21%	1.56%	0.67%
Neighborhood Mobility Areas ⁴	248,916	1.0%	37.4%	27.6%	0.54%	0.96%	0.82%	0.64%
Livable Corridors ⁵	548,451	2.2%	49.6%	53.8%	0.50%	1.13%	0.91%	0.64%
Sphere of Influence ⁶	146,017	0.6%	3.0%	2.6%	0.36%	1.31%	1.03%	0.55%
Absolute Constrained Areas⁷	20,487,984	82.9%	11.4%	5.0%	0.50%	0.66%	0.84%	0.74%
Variable Constrained Areas⁸	17,924,688	72.5%	52.9%	44.9%	0.48%	1.26%	0.85%	0.72%

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 Transit 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).

this period (0.50 percent versus 0.42 percent, and 1.07 percent versus 1.01 percent, respectively). Considering priority areas comprise only 1/20th of the region's land area, this suggests that growth during the recovery from the Great Recession is starting to favor already urbanized areas with existing infrastructure such as infill areas.

In the Connect SoCal growth forecast, population, household, and employment growth in priority areas between 2016 and 2045 continue to outpace growth overall. In particular, the especially high household growth rate in job centers reflects infill development and land use mixing. Both of these are ingredients for reducing travel demand in terms of work commutes and other trip types. Chapter 3 of the Connect SoCal plan and the Sustainable Communities Strategy Technical Report provide additional detail.

CONCLUSIONS

SCAG's 2020 RTP/SCS growth forecast sets the stage for a wide range of SCAG planning activities as well as the long-range planning of other agencies and local jurisdictions in the region. Fundamentally, this technical report addresses "who we're planning for."

This forecast is developed by integrating the latest demographic and economic trend information from expert sources at the regional level to develop a balanced view of future employment, population and households. This forecast uses extensive input and data from local jurisdictions at the small area level in order to harmonize these high-level trends with bottom-up community visions. This simultaneous and collaborative process ensures as accurate and realistic a forecast as possible, taking into account inherent uncertainties in the region's future.

While growth is expected to be slower than past periods, the SCAG region is still expected to add 3.7 million people by 2045. However, the population will be older which can pose several challenges such as caring for an older population and ensuring tax revenues with fewer workers. While the region will continue lose population to other regions and states, natural population increases as well

as foreign immigration will keep the population growing somewhat, alleviating some of these concerns. In-migrants to the region tend to be more highly educated than out-migrants.

While household growth has begun to gradually reverse its dramatic recession-period decline, the household growth rate remains slow even as Millennials rapidly form new households and seek more housing options. Future housing will skew overwhelmingly toward older age cohorts. By 2045, household growth will outpace population growth, resulting in a more balanced future overall.

Employment in the SCAG region has largely recovered since the Great Recession with historically low unemployment rates and stable growth expected over the long-term despite the ageing of the population. Continued manufacturing losses will largely be offset by strong growth in healthcare, accommodation, professional and other jobs. However, the wage structure of future employment may be less conducive to a strong middle-class in the region's future, while technological changes pose an additional risk to workers at lower wage levels.

Recent trends suggest that disproportionately high growth is already beginning to occur in areas within the region such as infill land, job centers and high quality transit areas which have benefits for transportation and environmental goals. Future prioritization of such areas will be of chief importance for achieving a number of social and environmental outcomes.

EXHIBIT 1 2016 Population by Jurisdiction



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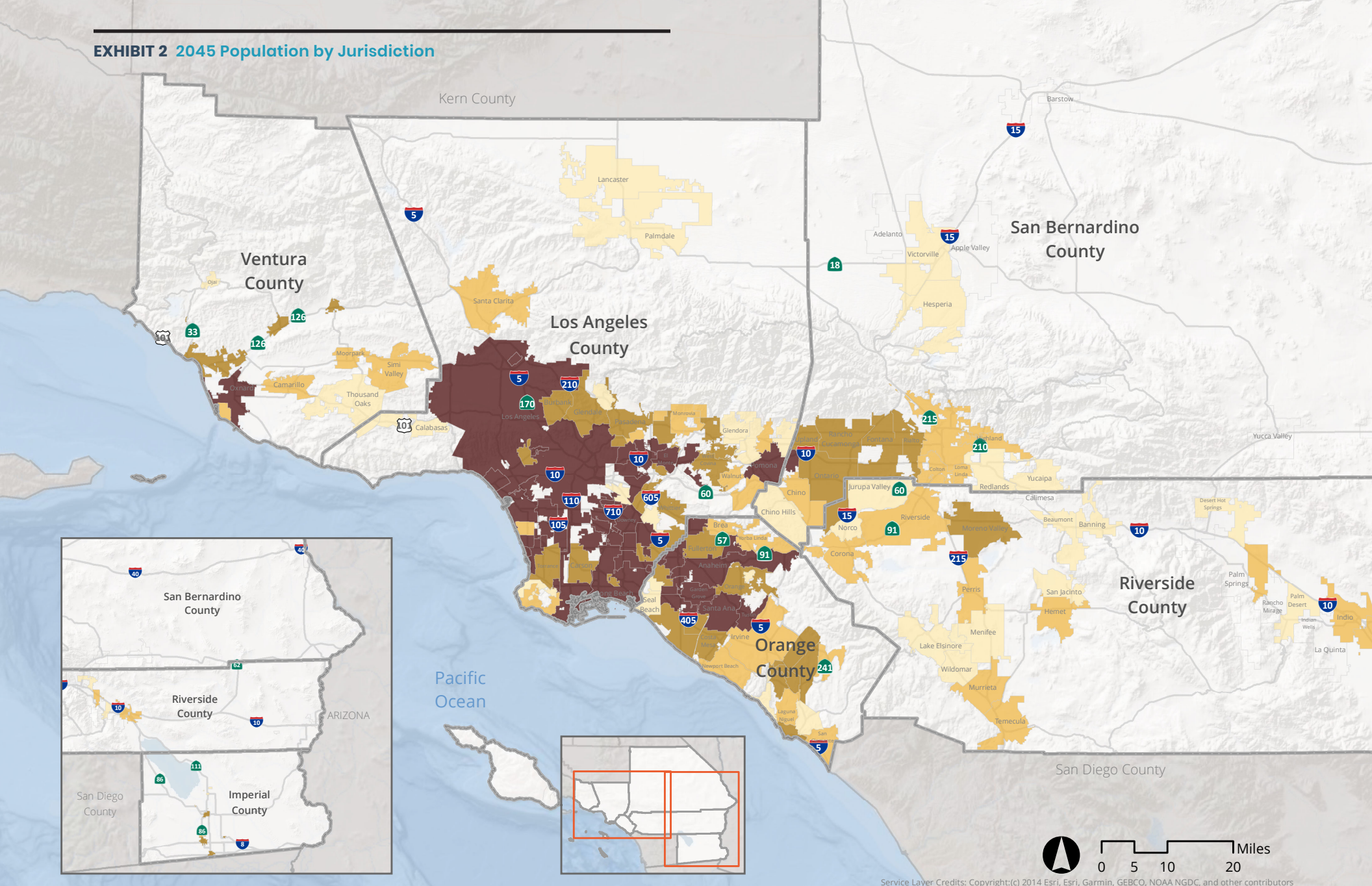
Jurisdiction Population Density in 2016 (Persons per Square Mile)

Less than or Equal to 1,500
 1,501 to 3,000
 3,001 to 5,000
 5,001 to 8,000
 Greater than 8,000

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 2 2045 Population by Jurisdiction



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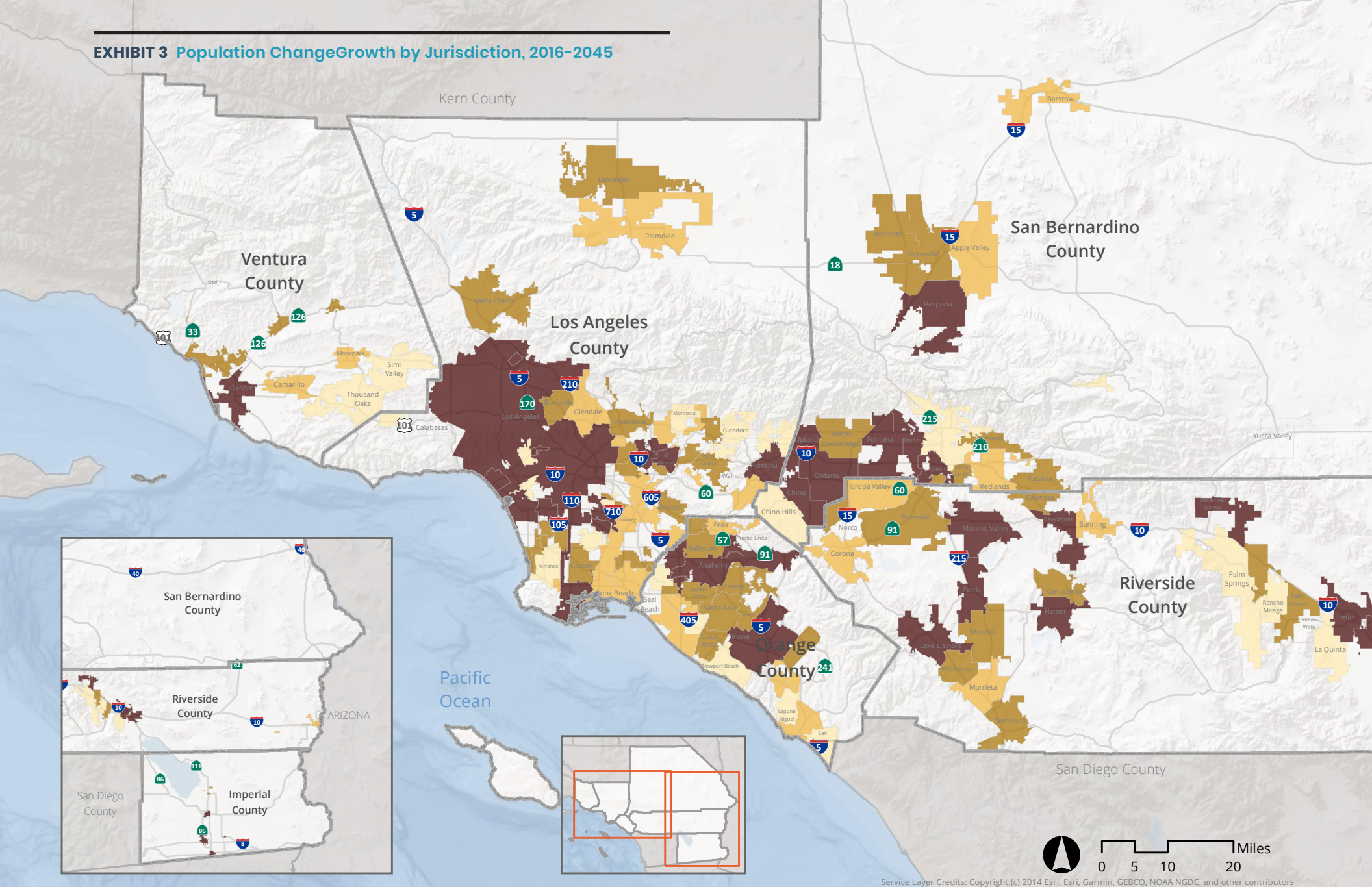
Jurisdiction Population Density in 2045 (Persons per Square Mile)

Less than or Equal to 1,500
 1,501 to 3,000
 3,001 to 5,000
 5,001 to 8,000
 Greater than 8,000

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 3 Population Change Growth by Jurisdiction, 2016–2045



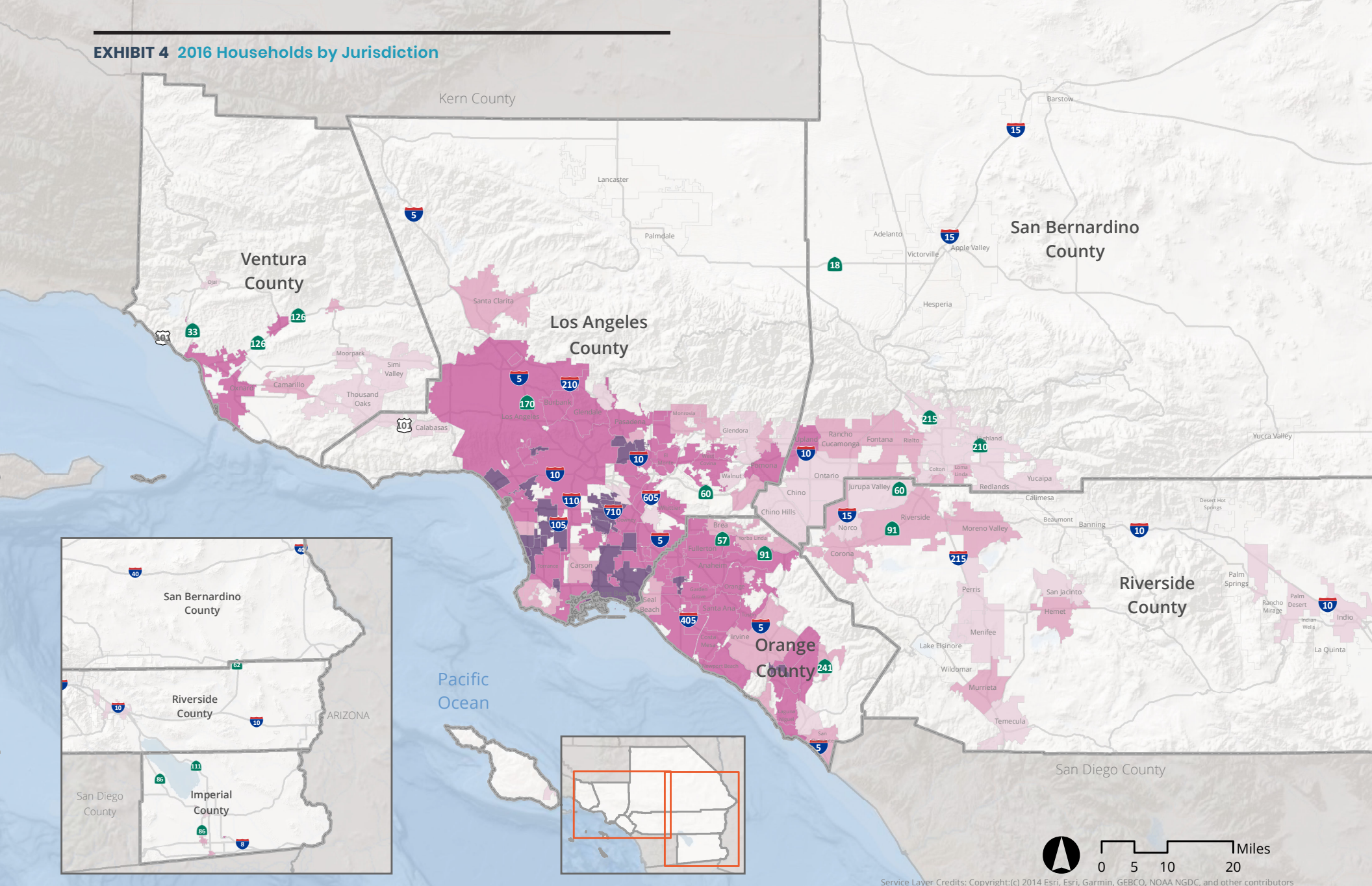
Jurisdiction Population Growth, 2016-2045 (Persons per Square Mile)

Less than or Equal to 150
 151 to 300
 301 to 500
 501 to 1,000
 Greater than 1,000

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 4 2016 Households by Jurisdiction



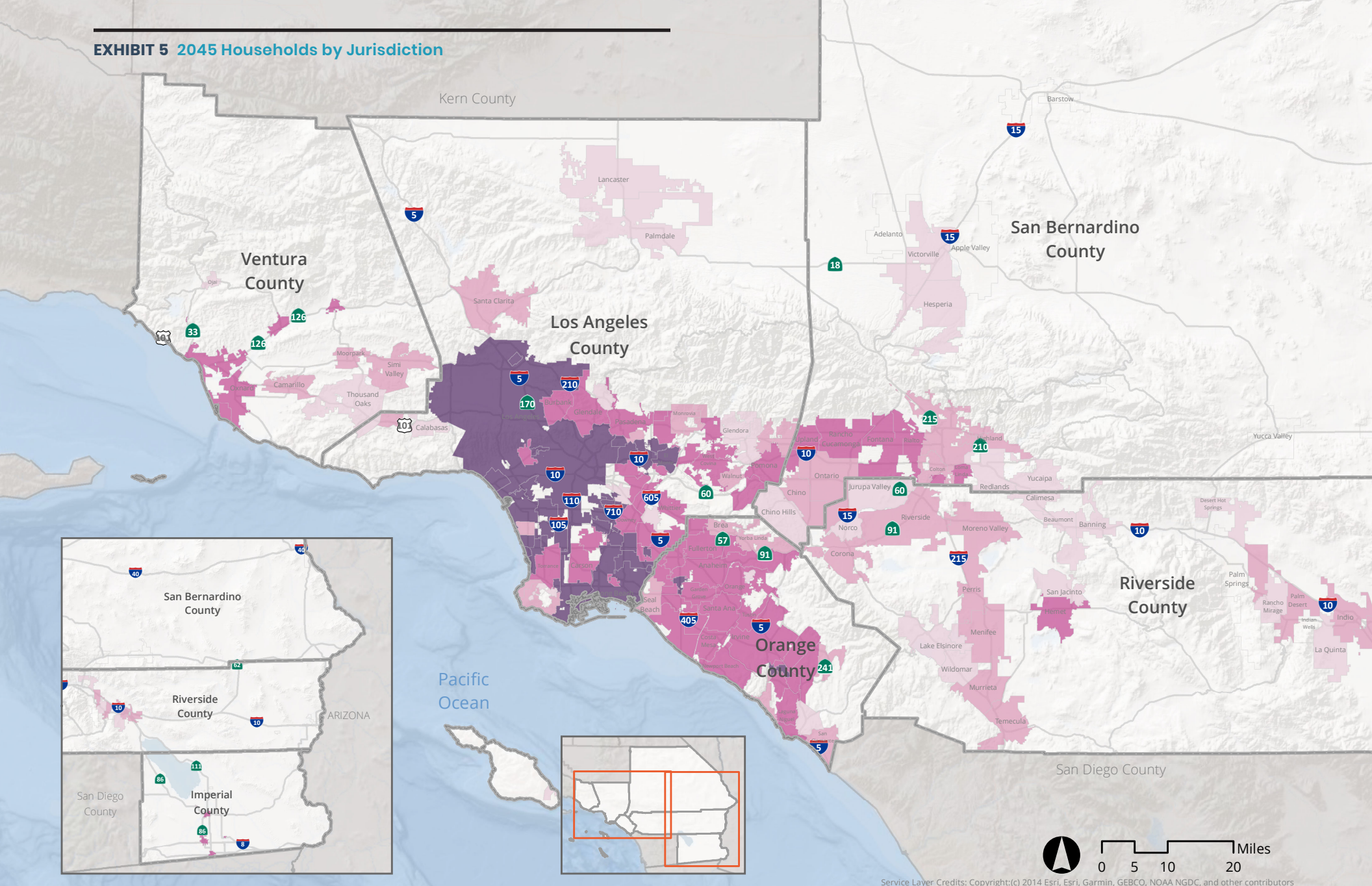
Jurisdiction Household Density in 2016 (Households per Square Mile)

Less than or Equal to 1,000 501 to 1,000 1,001 to 1,500 1,501 to 3,000 Greater than 3,000

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 5 2045 Households by Jurisdiction



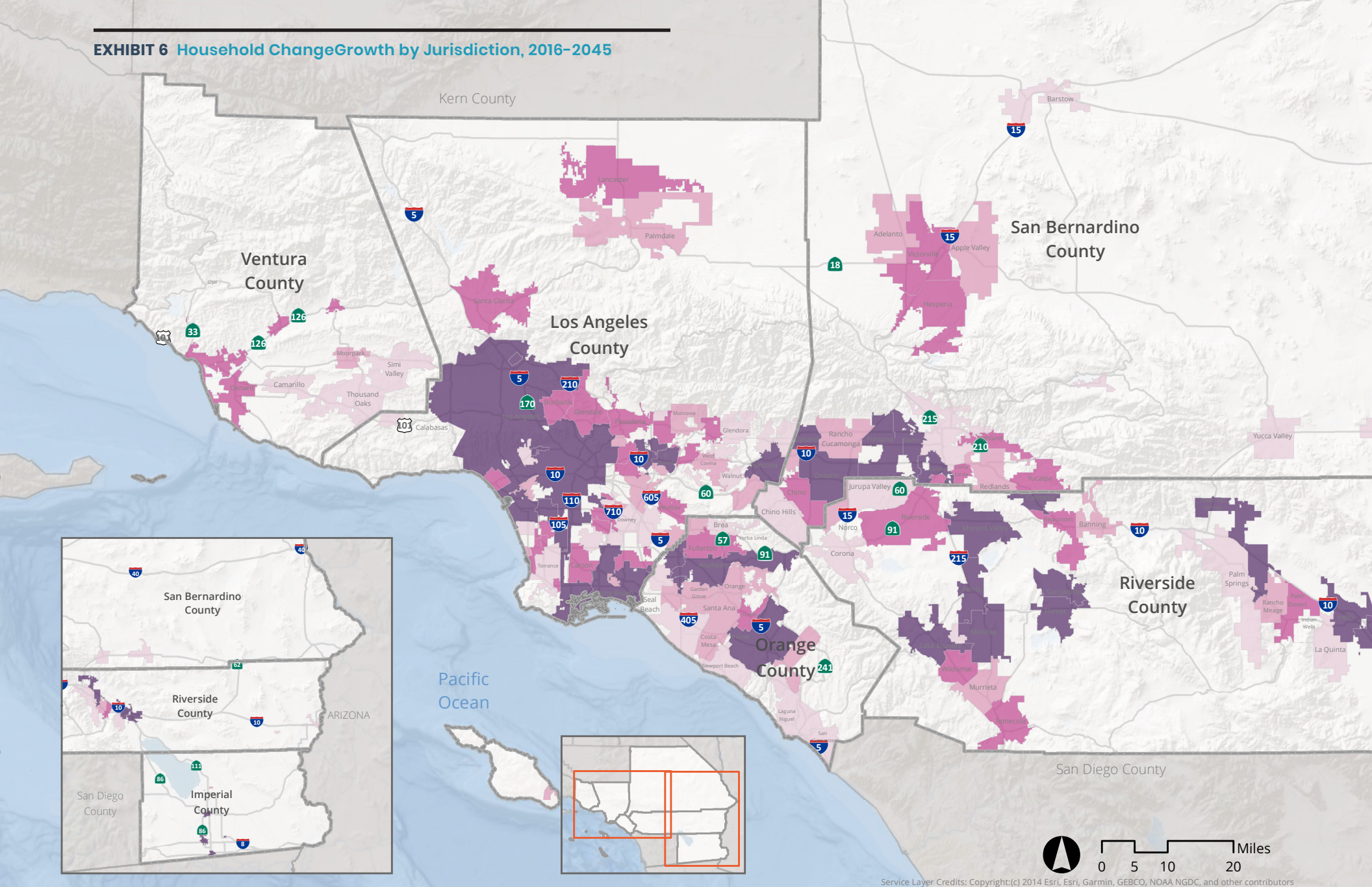
Jurisdiction Household Density in 2045 (Households per Square Mile)

Less than or Equal to 500
 501 to 1,000
 1,001 to 1,500
 1,501 to 3,000
 Greater than 3,000

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 6 Household ChangeGrowth by Jurisdiction, 2016–2045



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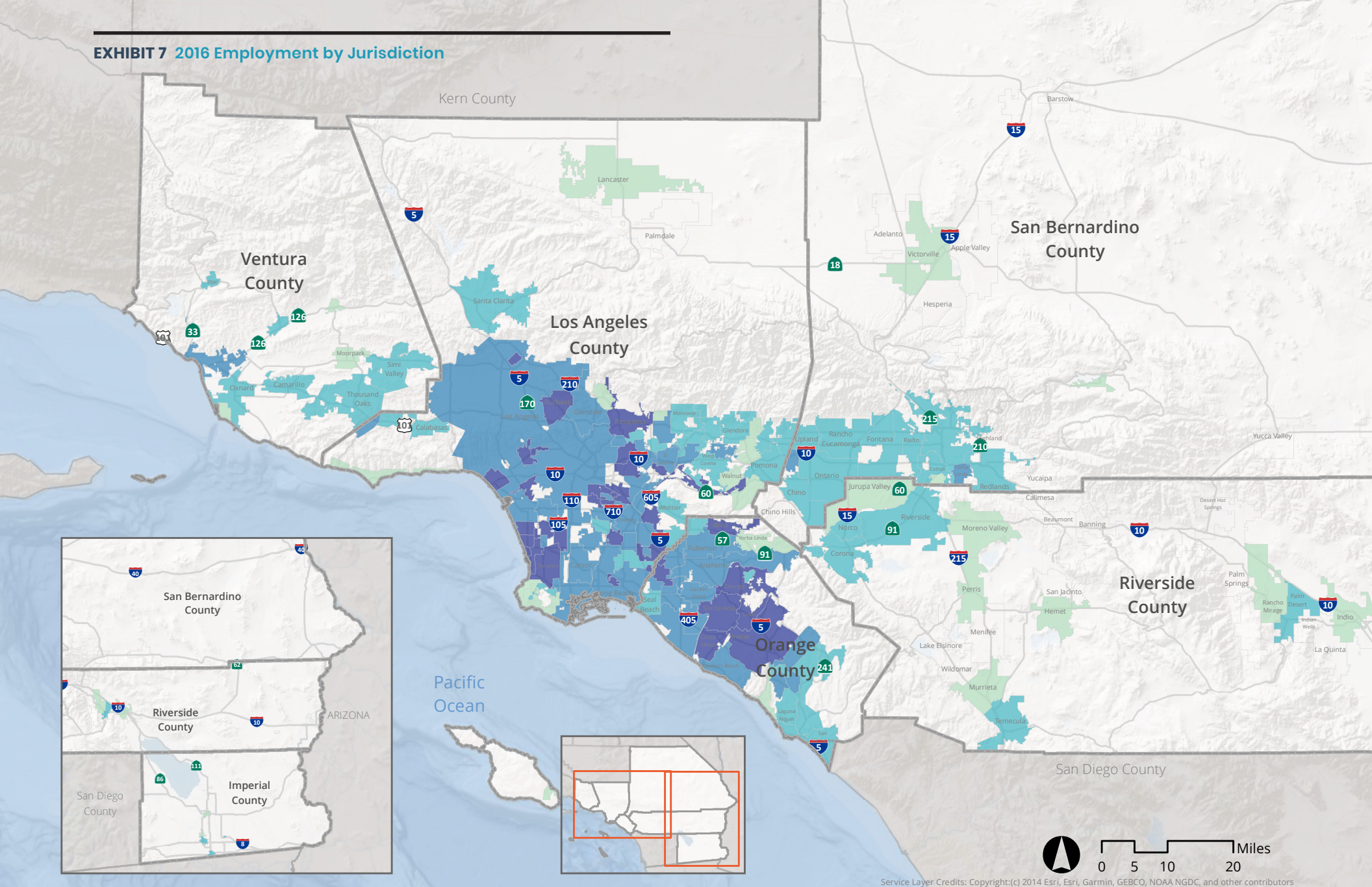
Jurisdiction Household Growth, 2016 - 2045 (Households per Square Mile)

Less than or Equal to 50
 51 to 150
 151 to 250
 251 to 400
 Greater than 400

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 7 2016 Employment by Jurisdiction



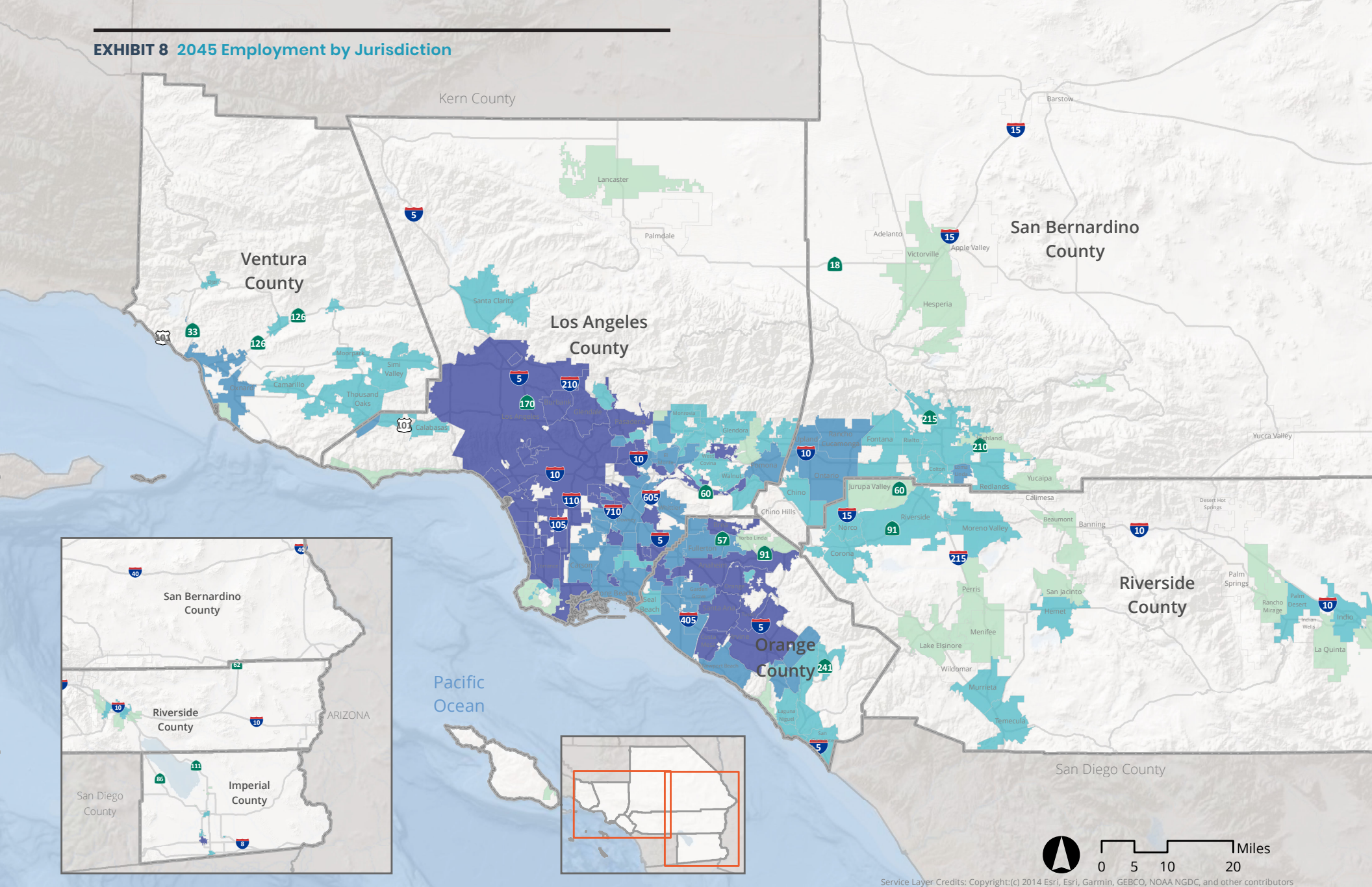
Jurisdiction Employment Density in 2016 (Jobs per Square Mile)

Less than or Equal to 500
 501 to 1,000
 1,001 to 2,500
 2,501 to 4,000
 Greater than 4,000

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 8 2045 Employment by Jurisdiction



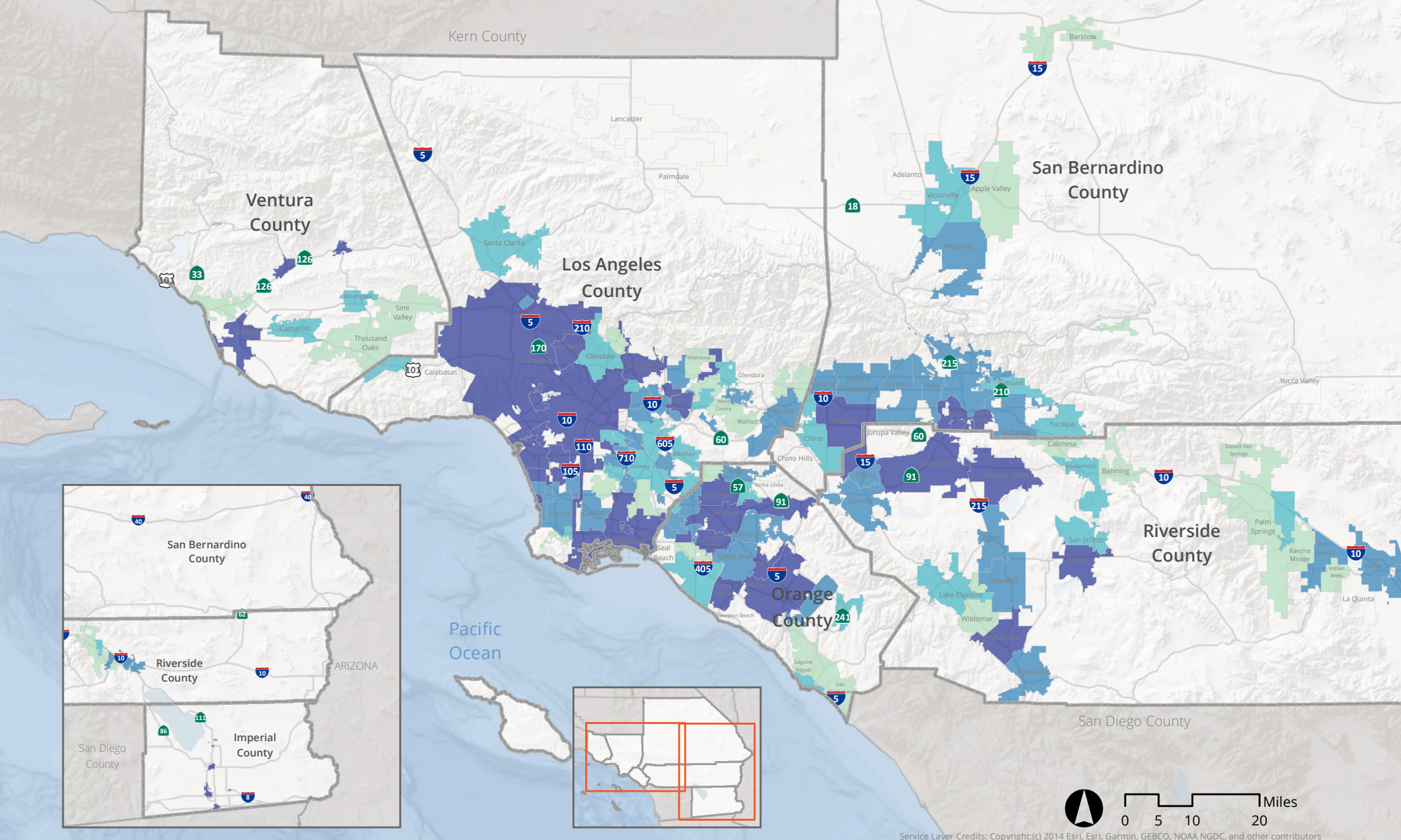
Jurisdiction Employment Density in 2045 (Jobs per Square Mile)

Less than or Equal to 500
 501 to 1,000
 1,001 to 2,500
 2,501 to 4,000
 Greater than 4,000

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

EXHIBIT 9 Employment ChangeGrowth by Jurisdiction, 2016–2045



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Jurisdiction Employment Growth, 2016 - 2045 (Jobs per Square Mile)

Less than or Equal to 100
 101 to 200
 201 to 300
 301 to 500
 Greater than 500

Source: SCAG, 2019

Note: County unincorporated areas excluded from map to improve cartographic display. Please refer to Table 14 for these growth forecast data.

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TECHNICAL REPORT

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