

DEMOGRAPHICS & GROWTH FORECAST

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS



APPENDIX
DRAFT DECEMBER 2015

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APPENDIX

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DRAFT DECEMBER 2015

DEMOGRAPHICS & GROWTH FORECAST

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 Program Environmental Impact Report (PEIR) for the RTP/SCS, the Air Quality Management Plan (AQMP), the Federal Transportation Improvement Program (FTIP) and the Regional Housing Needs Assessment (RHNA).

The Growth Forecast Appendix to 2016-2040 RTP/SCS is intended to provide more details on the development of the regional growth forecasts for 2016-2040 RTP/SCS. The Growth Forecast Appendix is composed of five major sections. Section I summarizes the forecasting process focusing on the forecasting timeline and milestones. Section II provides an overview of the recent trends in the region's growth of population, households and employment. Section III explores the regional growth forecast with its socio-economic characteristics. Section IV discusses the forecast methodology and the major assumptions for the regional growth forecast. Section V describes the small area forecast and allocation.

FORECASTING PROCESS

The regional growth forecast reflects recent and past trends, key demographic and economic assumptions and local, regional, state, or national policies. The SCAG's regional growth forecast also emphasizes the participation of local jurisdictions and other stakeholders in the growth forecast development process. **TABLE 1** lists the forecasting timeline and milestones for the development of the regional growth forecast for the 2016-2040 RTP/SCS.

The first major milestone for the growth forecast development is the SCAG panel of demographic and economic experts meeting. On June 27, 2013, the SCAG panel of demographic and economic experts meeting was held to review SCAG's methodology and assumptions for its population, household, and employment growth forecast for the 2016-2040 RTP/SCS. Twenty (20) academic scholars and leading practitioners were invited to participate on the panel. The panel of experts reviewed demographic and economic trends in the national and regional growth context, discussed the key assumptions underlying the regional and county growth forecast, and provided responses to survey questions on major assumptions (see (1) 2016-2040 regional transportation plan/sustainable communities strategy (RTP/SCS) growth forecast development: information from panel of experts meeting and range of regional growth projections at http://www.scag.ca.gov/committees/CommitteeDocLibrary/cehd080113fullagn_3.pdf; (2) panel survey results and tabulation at <http://www.scag.ca.gov/Documents/SurveyAnswersSummary062713.pdf>).

On September 12, 2013, SCAG incorporated the recommendations of the panel of experts into the refined range of regional growth forecasts, and developed a recommended preliminary set of regional and county growth forecasts for 2012, 2020, 2035, and 2040, reflecting recent trends and updated assumptions.

In November 2013, the preliminary small area (e.g., city and transportation analysis zone) growth forecasts, reflecting recent trends and controlling for the new and updated county controls, were released to local jurisdictions for their comments and input in November 2013. SCAG provided local jurisdictions with the preliminary set of growth forecasts at the city and transportation analysis zone levels.

Between February 2014 and October 2014, SCAG conducted the first round of local review through one-on-one meetings with local jurisdictions. As with the 2012-2035 RTP/SCS, SCAG sought verification of the existing land use, general plan land use, and zoning information; and approval of jurisdictional level population, households, and employment forecasts for the years 2020, 2035, and 2040. Jurisdictions may also elect to submit sub-jurisdictional input (e.g., input at the census tract or transportation analysis zone level). However, sub-jurisdictional level input will only be treated as advisory. SCAG held one-on-one meetings with 195 of the 197 local jurisdictions in the SCAG region to explain the methods and assumptions of how the small area growth forecasts were developed. The local jurisdictions provided SCAG with their input on those growth forecasts along with the proper documentation. SCAG updated the local growth forecasts and revised them as necessary.

There was a SCAG staff assessment of the draft local input growth forecast in September 2014 (<http://www.scag.ca.gov/committees/CommitteeDocLibrary/cehd100214fullagn.pdf>). As of September 2014, 81% of 197 jurisdictions provided input on SCAG's preliminary growth forecasts. The key findings from input data include: 1) All three (3) growth figures are within the preliminary range of growth forecasts; 2) All three (3) growth figures from local jurisdictions are lower than the preliminary mid forecasts, but higher than the preliminary low forecasts, in 2040; and 3) the 2040 regional unemployment rate would be measured at a normal rate, 5.4% for the SCAG region. The population to household ratio is 3.0 and consistent with that of the preliminary growth forecasts. The local input growth forecast at the regional level was found to be technically sound. The local input is primarily existing general plan-based, which is the foundation for SCAG's planning and policy.

In November 2014, SCAG produced the draft small area (e.g., city and transportation analysis zone) growth forecasts reflecting local input, and further developed the alternative growth forecasts reflecting different land use scenarios (trend baseline and three policy scenarios) in subsequent months. As part of the scenario planning exercise, SCAG has developed a policy growth scenario. The goal of this scenario is to maximize the benefits of Greenhouse Gas/Vehicle Miles Traveled (GHG/VMT) reductions, public health and other

co-benefits from the large transportation investments in our region focusing on transit and first/last mile strategies. This is done by identifying opportunity areas with current and/or future transit investments where mixed use and high density housing are mostly likely to occur in the future.

Between June 2015 and July 2015, SCAG conducted a second and last round of local review of both draft local input and draft policy growth forecasts. Subsequently, all the comments received have been incorporated into the draft 2016-2040 RTP/SCS to ensure accuracy and reasonableness.

After developing the draft 2016-2040 RTP/SCS between August 2015 and November 2015, SCAG released the draft 2016-2040 RTP/SCS in December 2015. The Regional Council is scheduled to adopt the 2016-2040 RTP/SCS in April 2016. The regional growth forecast will be adopted at the jurisdictional level as part of the 2016-2040 RTP/SCS.

GROWTH TRENDS

POPULATION

According to the 2015 population estimates from the California Department of Finance, the population of the Southern California region is 18.8 million, which represents 5.8 percent of the 325 million people of the US, and over 48 percent of California's population. With the region's land area of 38,000 square miles, the region's population density is now 490 persons per square mile. The Southern California region is the 5th highest in population among states in the nation, behind New York and ahead of Illinois, and the second largest combined statistical area (CSA) in the nation behind the New York CSA.

TABLE 1 Forecasting Timeline and Milestones

	Milestone	Date/Period	Reference Materials
1	Adopted the 2012 RTP/SCS jurisdictional level growth forecast.	April 2012	http://gisdata.scag.ca.gov/Pages/SocioEconomicLibrary.aspx
2	Developed an initial range of preliminary 2016-2040 RTP/SCS regional growth forecast with major demographic and economic assumptions.	June 2013	http://www.scag.ca.gov/committees/CommitteeDocLibrary/cehd080113fullagn.pdf
3	Held a panel of experts meeting to assess Bureau of Labor Statistics (BLS), US Census Bureau, and California Department of Finance (DOF) projections and to discuss demographic and economic trends and assumptions.	June 2013	http://www.scag.ca.gov/committees/CommitteeDocLibrary/cehd080113fullagn.pdf
4	Developed a recommended preliminary set of region and county growth forecasts.	September 2013	http://www.scag.ca.gov/committees/CommitteeDocLibrary/cehd080113fullagn.pdf
5	Developed the initial draft of the small area forecast at city/TAZ level and released it to local jurisdictions for comments.	November 2013	
6	Started the one-on-one meeting with the local jurisdictions for local review across the region.	February 2014-October 2014	http://www.scag.ca.gov/committees/CommitteeDocLibrary/cehd020614fullagn.pdf
7	Released preliminary draft local input/general plan growth forecast.	November 2014	http://www.scag.ca.gov/Documents/2016DraftGrowthForecastByJurisdiction.pdf
8	Released both draft local input/general plan growth forecast and the draft policy growth forecast for 2016-2040 RTP/SCS for comments and local input.	June 2015-July 2015	
9	Release of the draft 2016-2040 RTP/SCS.	December 2015	
10	Scheduled adoption of the 2016-2040 RTP/SCS.	April 2016	

The recent population growth of the region from 2010-2015 is an extension of the existing slow growth pattern observed during the 2000-2010 period (see [TABLE 2](#)). Although the regional economy has recovered from the great recession by adding 800,000 jobs with the lower unemployment rate, the regional population continues to show slow growth. The annual average growth rate for the 2010-2015 period was only 0.7 percent, which was lower than the 0.9 percent growth rate of the 2000-2010 period.

California and the US have also experienced slow growth over the last 15 years which will continue in the next 25 years. The annual average growth rate of the SCAG region, California, and the US during the 2015-2040 period is consistent with or lower than the growth rate for the 2010-2015 period.

The Great Recession had a significant impact on the regional population growth. The Great Recession resulted in the lowest number (75,000) and the lowest percent change (0.4 percent) in the 2008-2009 annual population growth of the Southern California region since 2000. The number and the percent change in the annual population growth after the Great Recession has steadily increased up to 144,000 and 0.7 percent in 2014-2015 (see [FIGURE 1](#) and [FIGURE 2](#)). The post-recession growth was much lower than that of 2000-2005: the annual growth and the average percent change of population were 144,000 and 0.7 percent in the 2010-2015 period, while population growth and the average percent change of population in the 2000-2005 period were 200,000 and 1.2 percent.

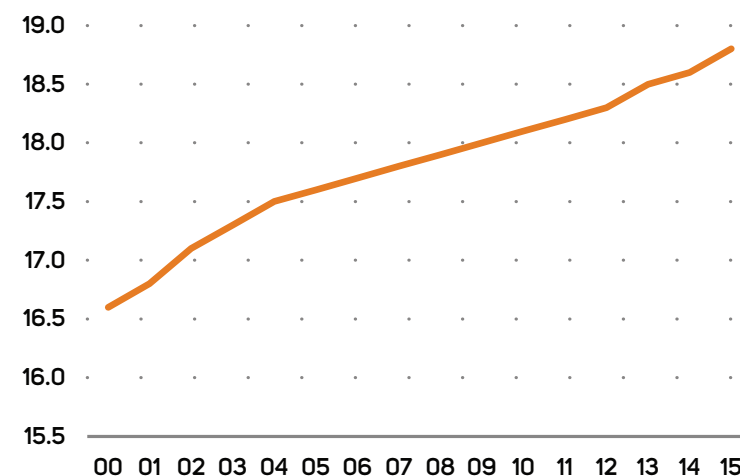
The region's population growth is mainly determined by two major components: natural increase (births-deaths) and net migration (domestic migration and net immigration) (see [FIGURE 3](#)). There was a significant change in net domestic migration and net immigration after the Great Recession (see [FIGURE 4](#) and [FIGURE 5](#)). During the 2007-2010 period, more people moved out of the region than people moved into the region. The annual average number of outmigrants from the region was 150,000 people more than that of inmigrants from the other parts of the country. During the same period, 83,000 legal immigrants and undocumented immigrants from foreign countries immigrated annually to the region. However, only 60,000 people annually left the region to other parts of the nation and 63,000 people immigrated annually to the region between 2010-2015.

TABLE 2 Annual Average Growth Rate of Population, 2000-2040

	2000-2010	2010-2015	2015-2040
SCAG Region	0.9%	0.7%	0.7%
California	1.0%	1.0%	0.9%
United States	1.0%	0.8%	0.8%

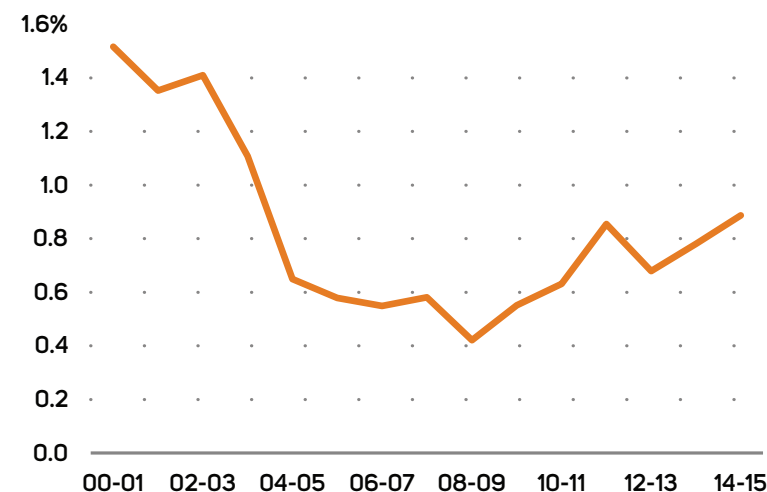
Source: US Census Bureau, CA DOF, SCAG

FIGURE 1 Population Growth, SCAG Region, 2000-2015 (in Millions)



Source: CA DOF

FIGURE 2 Percent Change of Population, SCAG Region, 2000-2015

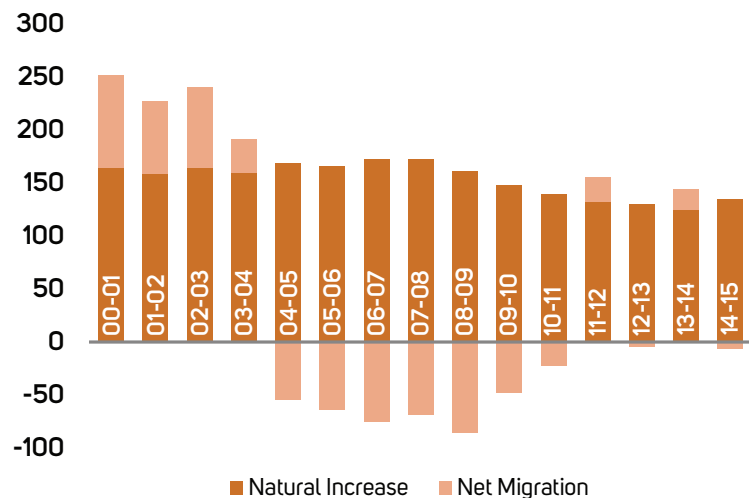


Source: CA DOF

Although more migrants have come into this region after the Great Recession, the number of births has continued to decline in recent years. The annual average number of births decreased from 266,000 during the 2007–2010 period to 243,000 during the 2010–2015 period by 22,000 (see [FIGURE 6](#)). During the same period, the total fertility rate decreased from 2.1 to 1.9. Whether the fertility rate in the future will continue to decline is a challenging question for demographers.

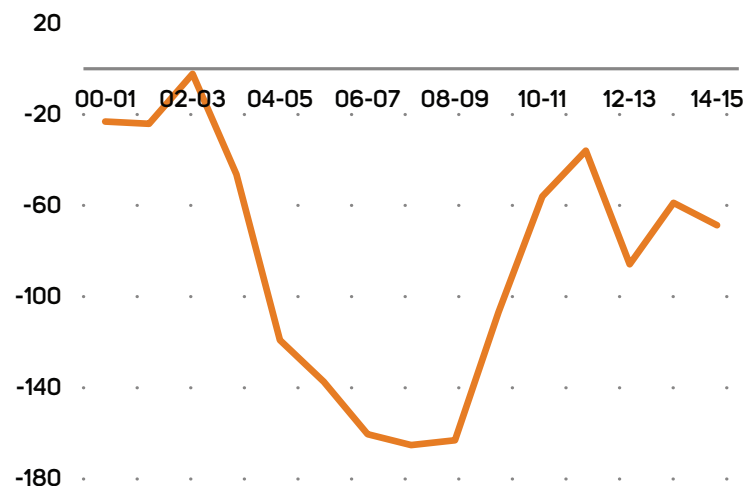
With a changing contribution of growth components (births, domestic migration, immigration) to population growth since 2010, the demographic characteristics of the regional population changed accordingly (see [TABLE 3](#)). First, the region's population has become older. The median age increased from 34.6 in 2010 to 35.4 in 2015. The percentage of the population 65 years old and over increased from 10.9 percent in 2010 to 12.3 percent in 2015, while the percentage of the working-age population of 16–64 years old decreased slightly from 66.7 percent in 2010 to 66.3 percent in 2015. As a result, the old-age dependency ratio increased from 16.4 in 2010 to 18.5 in 2015 by 2.1. The old-age dependency ratio is defined as the ratio of those 65 years old or more to the working-age population—those ages 16–64. It is usually measured as the proportion of dependents per 100 working-age population.

FIGURE 3 Components of Population Change, SCAG Region, 2000–2015 (in Thousands)



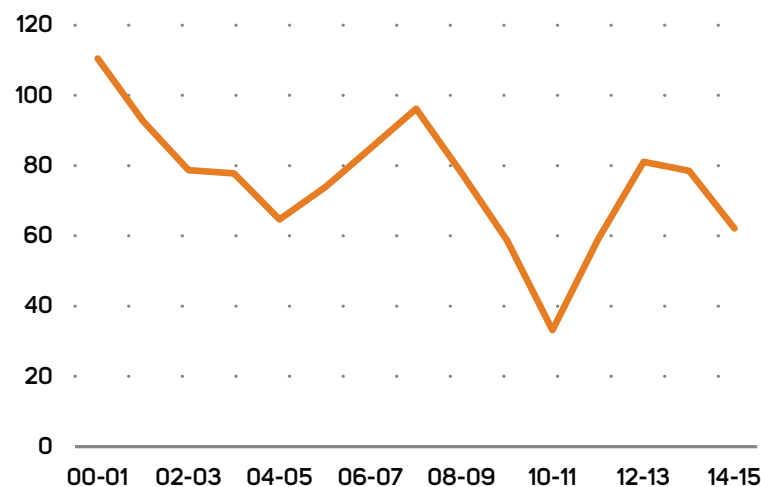
Source: CA DOF

FIGURE 4 Net Domestic Migration, SCAG Region, 2000–2015 (in Thousands)



Source: CA DOF

FIGURE 5 Net Immigration, SCAG Region, 2000–2015 (in Thousands)



Source: CA DOF

TABLE 3 Demographic Characteristics of Regional Population, 2000-2040

	2000	2010	2015	2040	Difference (2010-2015)	Difference (2015-2040)
Total population ('000)	16,574	18,075	18,779	22,105	700 (Annual Average % Change: 0.8%)	3,344 (Annual Average % Change: 0.7%)
Annual Natural Increase (00-10, 10-15, 35-40)		163,260	136,805	110,715	-26,455	-26,090
Annual Births (00-10, 10-15, 35-40)		270,283	247,101	274,493	-23,182	27,392
Annual Deaths (00-10, 10-15, 35-40)		107,023	110,296	163,778	3,273	53,482
Annual Net Migration (00-10, 10-15, 35-40)		-13,128	3,828	15,043	16,956	11,000
Annual Net Immigration		81,628	62,941	95,950	-18,687	33,000
Annual Net Domestic Migration		-94,756	-59,114	-89,907	35,642	-30,000
Components of Population Growth (00-10, 10-15, 35-40)						
Natural Increase (%)		108.7%	99.8%	87.9%	-8.9%	-11.9%
Net Migration (%)		-8.7%	0.2%	12.1%	8.9%	11.9%
Total		100.0%	100.0%	100.0%		
Age Composition of Population						
Persons Under 16 Years Old (%)	25.6%	22.4%	21.4%	19.3%	-1.0%	-2.1%
Persons 16–64 Years Old (%)	64.4%	66.7%	66.3%	62.5%	-0.4%	-3.8%
Persons 65 Years Old And Over (%)	9.9%	10.9%	12.3%	18.2%	1.4%	5.9%
Total	100.0%	100.0%	100.0%	100.0%		
Median Age						
Male	31.3	33.4	34.3	36.9	0.9	2.6
Female	33.3	35.7	36.5	38.9	0.7	2.4
Total	32.3	34.6	35.4	37.9	0.8	2.5
Dependency Ratio						
Child Dependency Ratio*	39.8	33.6	32.3	28.0	-1.3	-4.3
Old-Age Dependency Ratio**	15.4	16.4	18.5	28.2	2.1	9.7
Total Dependency Ratio***	55.2	50.0	50.8	56.2	0.8	5.4
Ethnic Composition of Population						
White (NH) (%)	39.6%	33.6%	31.4%	22.4%	-2.2%	-9.0%
Black (NH) (%)	7.4%	6.6%	6.3%	5.4%	-0.3%	-0.8%
Asian & Others (NH) (%)	12.5%	14.6%	15.6%	19.1%	1.0%	3.5%
Hispanic (%)	40.6%	45.3%	46.7%	53.1%	1.4%	6.4%
Total (%)	100.0%	100.0%	100.0%	100.0%		
Entropy Index (Normalized)****	0.860	0.856	0.853	0.826	-0.003	-0.027

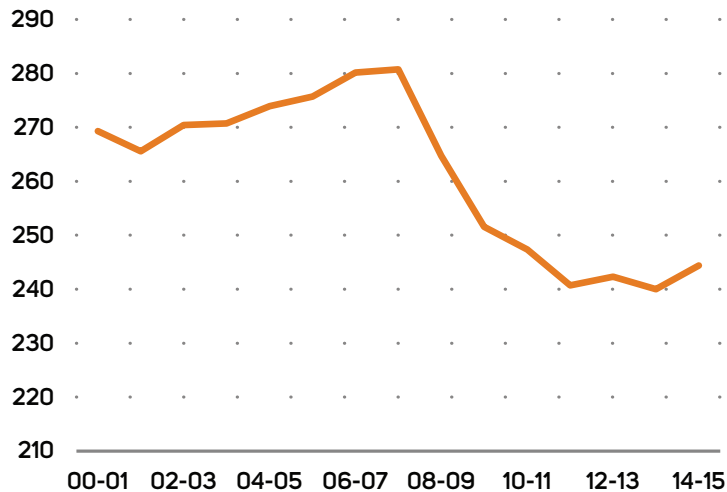
Note: * The number of children per hundred people of working age. ** The number of aged people per hundred people of working age. ***The number of children (age 0-15) and aged persons (age 65 and over) per hundred people of working age (age 16–64).
 **** The entropy index (normalized) ranges from 0 (less diverse) to 1 (more diverse). Source: CA DOF, SCAG

Second, the region is currently one of the most ethnically diverse regions in the nation. Hispanic and Asian/Other populations increased their share from 59.9 percent in 2010 to 62.3 percent in 2015, while White and Black populations decreased their share from 40.2 percent in 2010 to 37.7 percent in 2015. The region's ethnic composition has moved toward more Hispanic and Asian/other populations and less White and Black populations over time. The ethnic diversity remains high. The normalized entropy index was used to measure the ethnic diversity. The normalized entropy index ranges from 0 to 1, and approaches its maximum of 1 when four race/ethnic groups are equally present. The normalized entropy index for the region was 0.855 in 2010 and 0.853 in 2015. The region already reached the highest entropy index of 0.858 in 2001, and was higher than the nation. The normalized entropy index for the nation was 0.748 in 2000.

HOUSEHOLDS

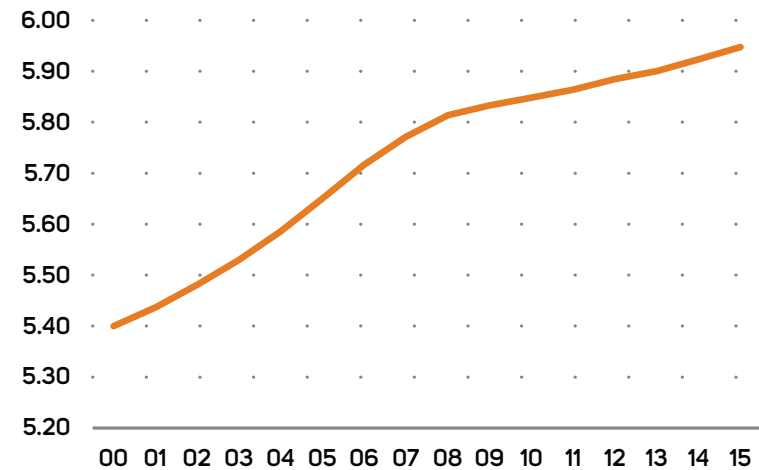
The Great Recession had a more significant impact on regional household growth than population growth. Only 100,000 households (20,000 households per year) were added to the region during the 2010-2015 period, while 700,000 people (140,000 people per year) were added to the region during the 2010-2015 period (see [FIGURE 7](#)). The slower household growth can be explained by demographic factors, including population growth, age composition of population, and household formation. Natural increase was a key driving force of the recent population growth, and most of the immigrants are of Asian and Hispanic population who are showing a lower household formation level. The annual average growth

FIGURE 6 Births, SCAG Region, 2000-2015 (in Thousands)



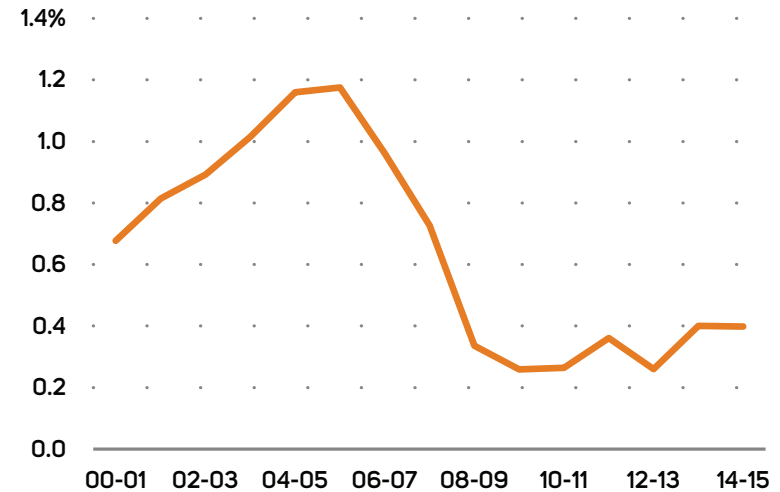
Source: CA DOF

FIGURE 7 Household Growth, SCAG Region, 2000-2015



Source: CA DOF

FIGURE 8 Percent Change of Households, SCAG Region, 2000-2015



Source: CA DOF

rate of households was only 0.3% from 2010-2015 (see [FIGURE 8](#)). As a result of the slower household growth, the average household size increased from 3.0 in 2010 to 3.1 in 2015 due to Asian and Hispanic groups (see [FIGURE 9](#)). The average household size of Hispanics increased from 4.0 in 2010 to 4.1 in 2015, and average household size of Asian and Others increased from 3.1 in 2010 to 3.2 in 2015.

The age and racial/ethnic composition of householders changed according to the changing demographic characteristics of the population between 2010 and 2015. Householders are getting older and remain diverse in 2015. Householders who were 55 years and older increased their share from 35.8 percent in 2010 to 40.2 percent in 2015, while Householders who were 15-54 years old decreased their share from 64.2 percent in 2010 to 59.8 percent in 2015. Householders of Hispanics and Asian/Others increased their share from 48.2 percent in 2010 to 50.6 percent in 2015, White and Black Householders decreased their share from 51.7 percent in 2010 to 49.4 percent in 2015 (see [TABLE 4](#)).

The overall headship rates (the number of people 15 years old and over who are counted as heads of households divided by the number of people 15 years old and over) measuring household formation behavior have declined from 41.3 percent in 2010 to 40.3 percent in 2015. The headship rates continued to decline in the 2010-2015 period as well as between 2000-2010. The greatest decline in the headship rate between 2010-2015 was observed in the 75+ age group (-3.1 percent as a change in percent), while the 25-34 age group showed the greatest decline in the headship rate between 2000-2010 (-3.9 percent as a

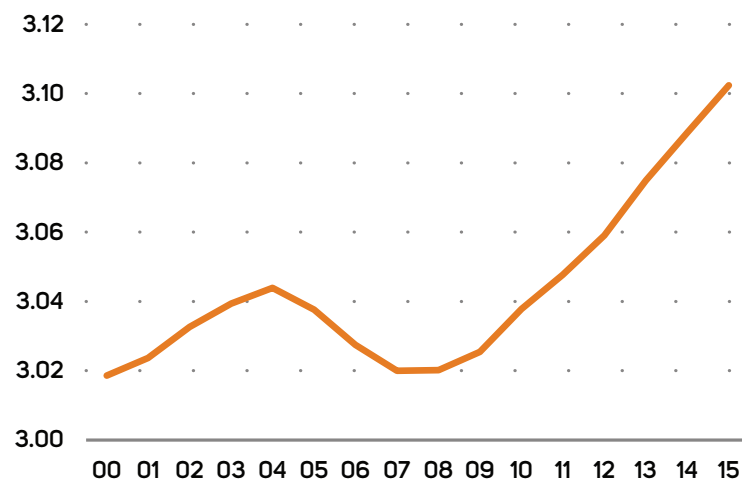
change in percent). The headship rates by sex also extended their historical trends between 2010-2015. During the 2010-2015 period, the male headship rates continued to decline, while the female headship rates continued to increase. The Asian headship rates increased slightly, while the other racial/ethnic headship rates declined during the 2010-2015 period. (See [TABLE 10](#)).

The housing shortage is another major factor contributing to the slower household growth. The housing supply was sluggish from 2010-2014, although there was an increasing pattern of housing production on an annual basis. In 2014, 80,000 residential building permits were approved. This number of building permits is similar to the 2004-2007 period (see [FIGURE 10](#)). In particular, the permits for multiple housing units account for over 60% of total residential building permits from 2010-2015. The share of multiple housing permits in the most recent five years is much higher than that of 2000-2010.

EMPLOYMENT

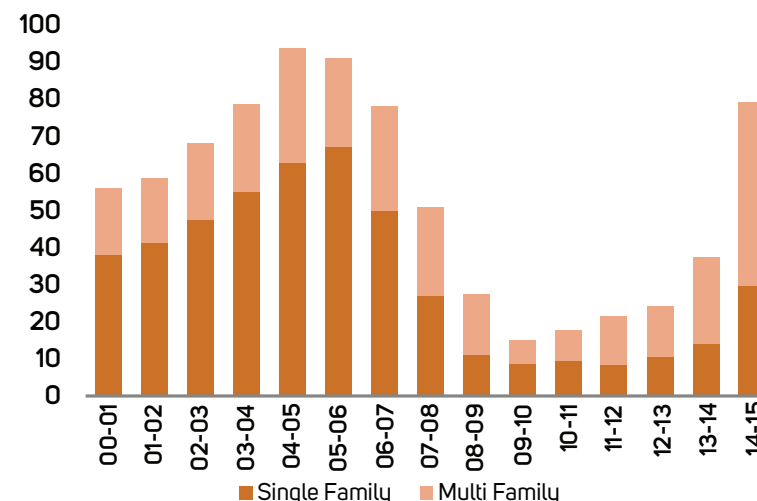
After losing 800,000 jobs between 2007 and 2010, the SCAG region has returned to the pre-recession level of 8 million jobs in 2015 with a much lower unemployment rate of 6.6 percent in 2015 than 12.3 percent in 2010 (see [FIGURE 11](#) and [FIGURE 12](#)). In order to achieve the pre-recession level of jobs, the region needed to add the jobs at an annual growth rate of 2.1 percent starting in 2010 (see [FIGURE 13](#)). The regional share of national jobs increased

FIGURE 9 Average Household Size, SCAG Region, 2000-2015



Source: CA DOF

FIGURE 10 Building Permit by Housing Types, SCAG Region, 2000-2015 (in Thousands)

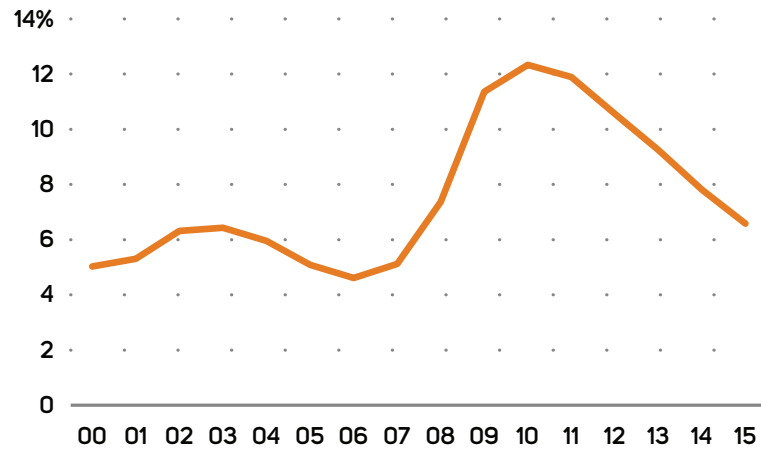


Source: Construction Industry Research Board

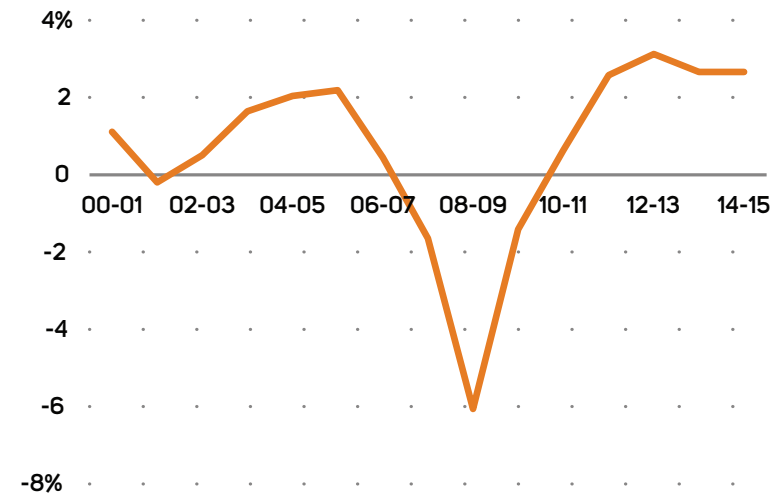
TABLE 4 Characteristics of Regional Households, 2000-2040

		2000	2010	2015	2040	Difference (2010-2015)	Difference (2015-2040)
Total Households (Thousands)		5,400	5,848	5,947	7,415	100	1,468 (% change: 24.7%)
AGE COMPOSITION OF HOUSEHOLDERS	15-24 (%)	4.3%	3.9%	2.9%	2.4%	-0.9%	-0.5%
	25-34 (%)	19.2%	16.4%	15.6%	13.1%	-0.2%	-2.5%
	35-44 (%)	25.6%	21.3%	19.8%	18.1%	-1.3%	-1.8%
	45-54 (%)	20.3%	22.7%	21.5%	18.7%	-1.4%	-2.8%
	55-64 (%)	12.6%	17.0%	18.6%	16.2%	1.4%	-2.4%
	65-74 (%)	9.5%	10.1%	12.4%	14.8%	1.9%	2.5%
	75+ (%)	8.6%	8.7%	9.2%	16.8%	0.5%	7.6%
Total		100.0%	100.0%	100.0%	100.0%		
ETHNIC COMPOSITION OF HOUSEHOLDERS	White (NH) (%)	49.4%	43.7%	41.9%	28.9%	-2.2%	-13.0%
	Black (NH) (%)	8.1%	8.0%	7.5%	6.6%	-0.6%	-0.9%
	Asian & Other (NH) (%)	12.7%	13.7%	15.1%	20.1%	1.8%	5.0%
	Hispanic (%)	28.8%	34.5%	35.5%	44.4%	1.2%	8.9%
Total		100.0%	100.0%	100.0%	100.0%		
AVERAGE HOUSEHOLD SIZE	White (NH)	2.4	2.3	2.3	2.3	0.0	0.0
	Black (NH)	2.7	2.6	2.6	2.5	0.0	-0.1
	Asian & Others (NH)	3.2	3.1	3.2	2.8	0.1	-0.4
	Hispanic	4.3	4.0	4.1	3.6	0.1	-0.5
Total		3.0	3.0	3.1	3.0	0.1	-0.1

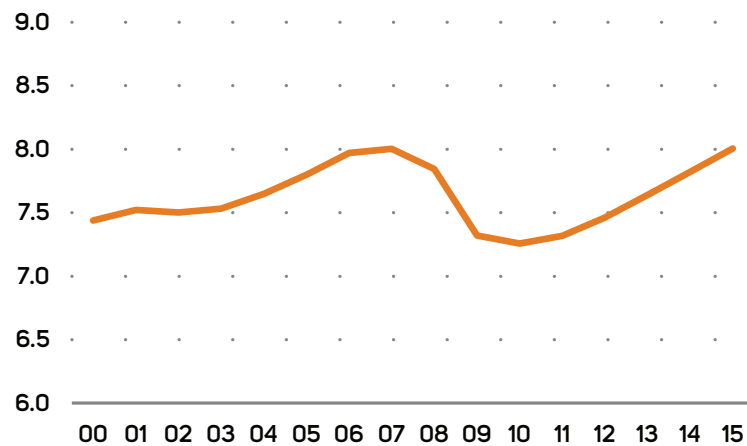
Source: CA DOF, SCAG

FIGURE 11 Unemployment Rate, SCAG Region, 2000-2015

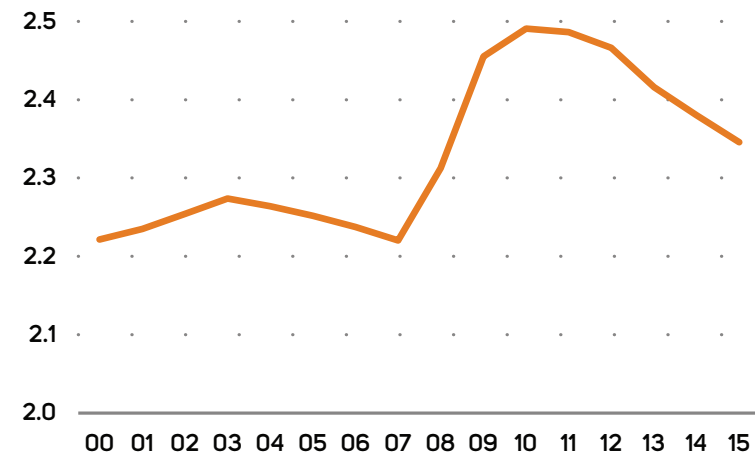
Source: CA EDD

FIGURE 13 Percent Change of Jobs, SCAG Region, 2000-2015

Source: CA EDD, SCAG

FIGURE 12 Job Growth, SCAG Region, 2000-2015

Source: CA EDD, SCAG

FIGURE 14 Population to Employment Ratio, SCAG Region, 2000-2015

Source: CA DOF, CA EDD, SCAG

from 5.1 percent in 2010 to 5.3 percent in 2015. The changing unemployment rate is directly correlated with the change of the population-employment (P-E) ratio. The P-E ratio is high in a recession, while it is low in a better business cycle. The P-E ratio was highest at 2.5 in 2010, and moved toward the lower level of 2.4 in 2015.

The Great Recession greatly influenced all of the industrial sectors and contributed to the fast restructuring of the industrial sectors (see [TABLE 5](#)). Eighteen major industrial sectors except two major industrial sectors (accommodation and food service, and public administration) experienced a loss of jobs from 2007-2010 due to the Great Recession. In particular, both the construction and manufacturing sectors were heavily affected during the Great Recession, and accounted for 40 percent of the total job losses that occurred during the Great Recession. The construction sector lost 170,000 jobs (36 percent of 470,000 in 2007) and the manufacturing sector lost 150,000 jobs (18 percent of 810,000 jobs in 2007). Other heavily affected sectors during the same period were: retail trade (–100,000 jobs), administrative support and support services (–90,000 jobs), professional, scientific and technical services (–70,000 jobs), finance and insurance (–60,000 jobs). The wage level of seriously impacted industrial sectors were relatively high: construction, manufacturing, the professional, scientific and technical services sectors. With such a loss in the higher wage sector jobs, the economic quality of the region’s residents was negatively affected.

Two industrial sectors accounted for nearly 30% of the total job growth (of 800,000) from 2010-2015: health care and social assistance (+130,000 jobs) and professional, scientific and technical services (+100,000 jobs). Other industrial sectors adding a significant number of jobs were: accommodation and food service (+80,000), construction (+70,000 jobs), retail trade (+70,000 jobs), and administrative and support and waste services (+70,000 jobs).

As a result of job growth by industrial sectors, the industrial structure remained service-oriented. There was an increase in the share of professional, scientific and technical services from 6.6 percent to 7.2 percent, followed by health care from 12.3 percent to 12.8 percent, and construction from 4.2 percent to 4.6 percent. There was also a decline in the share of industrial sectors including manufacturing from 9.1 percent in 2010 to 8.4 percent in 2015, and educational services from 9.5 percent in 2010 to 8.9 percent in 2015.

SUBURBAN GROWTH

The region continued its slow population growth in the post-recession period, adding only 700,000 people, while experiencing rapid employment growth, adding 800,000 jobs since 2010. Although suburbanization of population and employment continued, there was a little change in the county distribution of the regional population and employment during the same period (see [TABLE 8](#)). The Hoover Index of Concentration (HIOC) (Plane and Rogerson, 1994) was used to measure the concentration of intra-regional population

and employment distribution using the county in the region as a unit of analysis. If HIOC equals 0, then population and employment are perfectly deconcentrated across the region. If HIOC equals 1, then population and employment are concentrated into one county in the region. Considering the suburbanization of population and employment in the region, the historical pattern of the HIOC tends to move toward the lower level, which means more deconcentration. The SCAG region showed a downward trend of HIOC from 62.09 in 2000 to 58.34 in 2010 to 58.19 in 2015 for population, and from 67.41 in 2000 to 64.91 in 2010 to 63.43 in 2015 for employment. The suburbanization of population and employment (in particular, population) in the post-recession period has slowed down compared to the 2000-2010 period.

While there has been a downward change in HIOC along with spatial changes in population and employment in the region, the gap of HIOC between population and employment became smaller after the recession compared to the 2000-2010 period. The Index of Divergence (IOD) was used to measure the gap of HIOC between population and employment. If IOD equals 0, then there is no gap between two HIOCs. This means that the county distribution of both population and employment is more balanced and there is a convergence of the county distribution of population and employment. For example, the share of both Riverside and San Bernardino Counties’ population increased from 23.4 percent in 2010 to 23.5 percent in 2015 by 0.1 percent, while the share of both Riverside and San Bernardino Counties’ employment increased from 17.2 percent in 2010 to 18.4 percent in 2015 by 1.2 percent. The county distribution of population and employment indicates that faster growth of employment in Riverside and San Bernardino Counties, and Imperial County reduced the gap in the suburbanization level of population and employment observed in 2010. The IOD decreased from 0.066 in 2010 to 0.052 in 2015. This change will have a positive implication for regional transportation and air quality.

The population to employment (P-E) ratio was used to measure the balance of county population and employment. All counties in the region experienced a decline in P-E ratio between 2007 and 2010. The regional P-E ratio declined from 2.5 to 2.3 during the same period. Riverside, Imperial, and San Bernardino Counties experienced a faster decline in the P-E ratio than other counties: 3.7 in 2010 to 3.1 in 2015 for Riverside County; 3.1 in 2010 to 2.4 in 2015 for Imperial County; 3.1 in 2010 to 2.9 in 2015 for San Bernardino County.

TABLE 5 Regional Employment by Industry Sectors, 2007-2040

Jobs by 2 Digit NAICS Sector	2007		2010		2015		2040		Difference (2010-2015)	Difference (2015-2040)	2013 Wage Level (\$)
	Number (1,000)	%	Number (1,000)	%	Number (1,000)	%	Number (1,000)	%			
Total	8,002	100%	7,257	100%	8,006	100%	9,872	100%			52,126
Total Farm	69	0.9%	62	0.9%	65	0.8%	57	0.6%	0.0%	-0.2%	27,811
Natural Resources and Mining	8	0.1%	7	0.1%	7	0.1%	5	0.1%	0.0%	0.0%	126,750
Utilities	49	0.6%	47	0.6%	48	0.6%	45	0.5%	0.0%	-0.1%	99,700
Construction	470	5.9%	302	4.2%	369	4.6%	582	5.9%	0.5%	1.3%	55,585
Manufacturing	810	10.1%	658	9.1%	673	8.4%	638	6.5%	-0.7%	-1.9%	62,157
Wholesale Trade	410	5.1%	364	5.0%	397	5.0%	483	4.9%	-0.1%	-0.1%	61,782
Retail Trade	874	10.9%	775	10.7%	846	10.6%	967	9.8%	-0.1%	-0.7%	31,405
Transportation and Warehousing	316	3.9%	300	4.1%	326	4.1%	379	3.8%	-0.1%	-0.2%	51,539
Information	278	3.5%	254	3.5%	269	3.4%	308	3.1%	-0.1%	-0.2%	93,022
Finance and Insurance	322	4.0%	265	3.7%	284	3.5%	320	3.2%	-0.1%	-0.3%	95,719
Real Estate and Rental and Leasing	172	2.1%	154	2.1%	166	2.1%	204	2.1%	-0.1%	0.0%	57,418
Professional, Scientific and Technical Services	544	6.8%	477	6.6%	598	7.5%	864	8.8%	0.9%	1.3%	83,006
Management of Companies and Enterprises	103	1.3%	87	1.2%	96	1.2%	107	1.1%	0.0%	-0.1%	94,986
Administrative and Support and Waste Services	622	7.8%	532	7.3%	598	7.5%	712	7.2%	0.1%	-0.2%	35,515
Educational Services	692	8.6%	688	9.5%	715	8.9%	867	8.8%	-0.6%	-0.1%	49,719
Health Care and Social Assistance	910	11.4%	891	12.3%	1,021	12.8%	1,512	15.4%	0.5%	2.6%	43,678
Arts, Entertainment, and Recreation	159	2.0%	134	1.8%	152	1.9%	194	2.0%	0.1%	0.1%	63,060
Accommodation and Food Service	635	7.9%	690	9.5%	766	9.6%	875	8.9%	0.1%	-0.7%	19,784
Other Services	314	3.9%	304	4.2%	340	4.2%	419	4.3%	0.1%	0.0%	33,415
Public Administration	246	3.1%	267	3.7%	270	3.4%	308	3.1%	-0.3%	-0.3%	74,118
Entropy Index (Normalized)		0.914		0.910		0.909		0.899			

Source: CA EDD, SCAG

REGIONAL GROWTH FORECAST

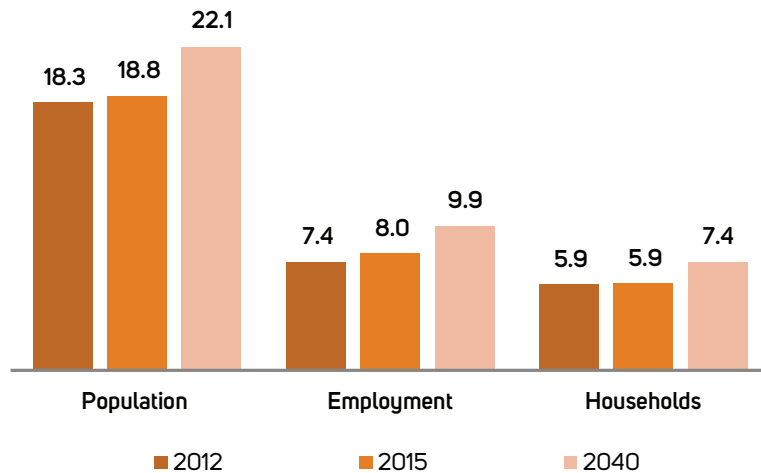
REGIONAL GROWTH FORECAST

SCAG projects that the region will add 3.8 million residents, 1.5 million households, and 2.4 million jobs over the RTP/SCS planning horizon (2012-2040) (see [FIGURE 15](#) and [FIGURE 16](#)). Population and households are projected to grow at the annual average growth rate of 0.7% during the same period, while employment grows faster at 2 percent until 2020, and then stabilizes at 0.7 percent. (see [FIGURE 17](#)). The SCAG region's population is projected to grow slower than that of the previous years. The slow growth pattern is not present only in the SCAG region, but is also observed from US and California population projections by US Census Bureau and California DOF, respectively (see [TABLE 2](#)).

POPULATION

The slow population growth pattern experienced in the post-recession period is expected to continue into the future. Between 2015 and 2040, the annual population growth rate will be only 0.7 percent, which is similar to the post-recession period, but much lower than that experienced between 2000-2010. The region will grow mainly through natural increase (see [TABLE 3](#) and [FIGURE 19](#) and [FIGURE 21](#)). Nearly nine-tenths of the population growth will be due to natural increase (e.g., births minus deaths) in the region rather than net migration (e.g., immigration minus outmigration) (see [FIGURE 20](#)). The average number of babies per woman

FIGURE 15 Population, Employment, and Households, SCAG Region, 2012, 2015 and 2040 (in Millions)



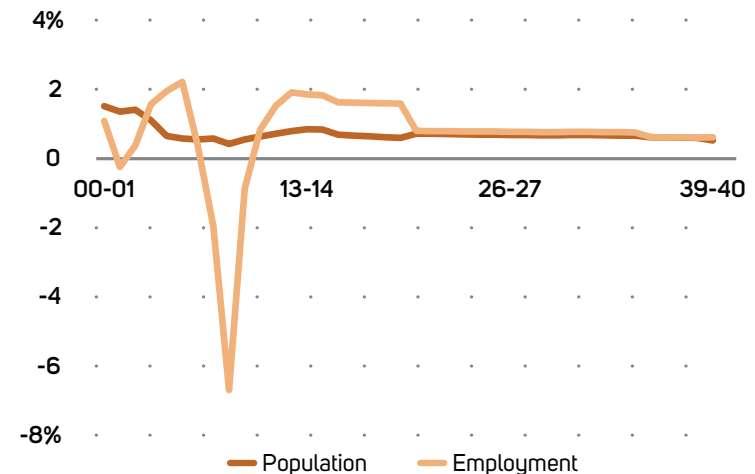
Source: CA DOF, CA EDD, SCAG

FIGURE 16 Population, Employment, and Household Growth, SCAG Region, 2000-2040



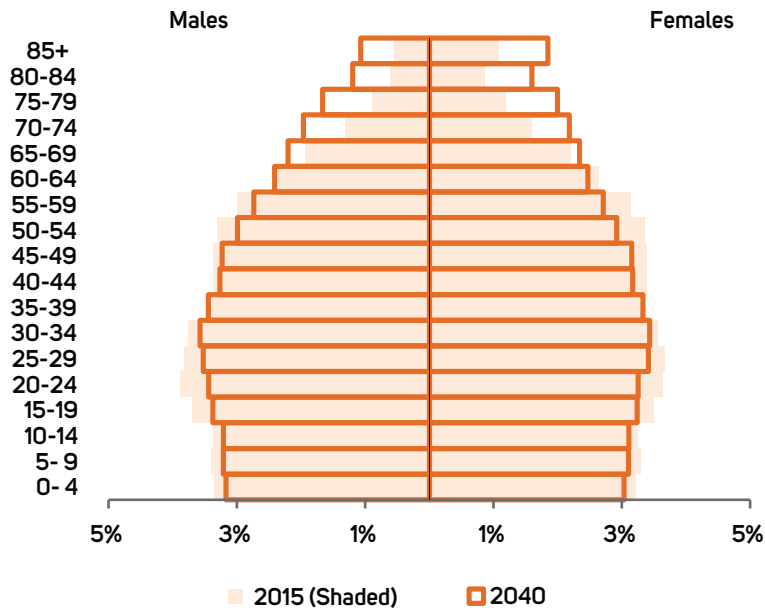
Source: CA DOF, CA EDD, SCAG

FIGURE 17 Annual Percent Change of Population and Employment, SCAG Region, 2000-2040



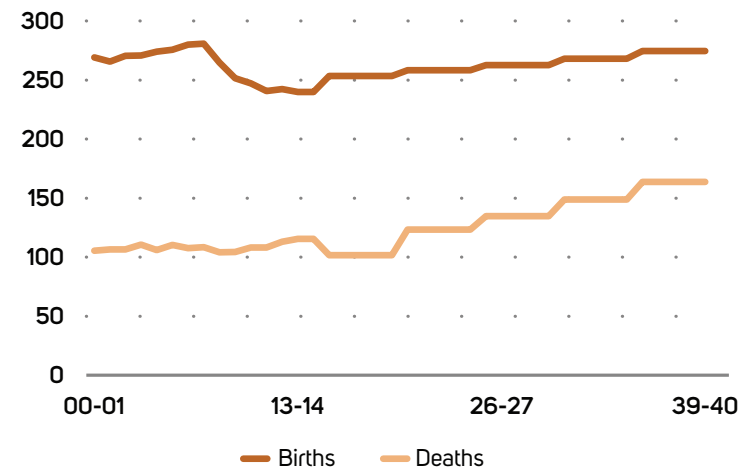
Source: CA DOF, CA EDD, SCAG

FIGURE 18 Population Pyramids, SCAG Region, 2015 and 2040



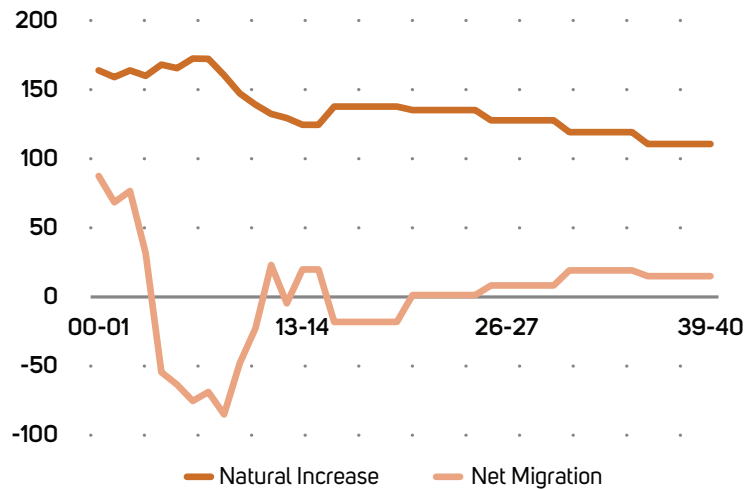
Source: SCAG

FIGURE 20 Births and Deaths, SCAG Region, 2000-2040 (in Thousands)



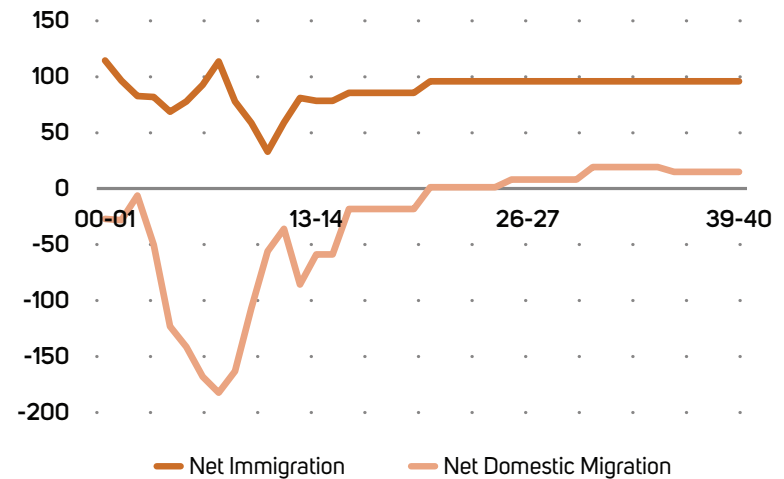
Source: CA DOF, SCAG

FIGURE 19 Components of Population Change, SCAG Region, 2000-2040 (in Thousands)



Source: CA DOF, SCAG

FIGURE 21 Net Immigration and Net Domestic Migration, SCAG Region, 2000-2040 (in Thousands)



Source: CA DOF, SCAG

of child bearing age remains the same at 1.9 in both 2015 and 2040. The life expectancy of people in the region is expected to increase. International migration also plays an important role in population growth. Seven of ten additional new residents will be arriving at the region through international migration. 2.2 million more persons leave the region for the rest of the nation than persons migrating to the region between 2015–2040.

The most noticeable demographic characteristics of the projected population in the region will be the aging of population and shifts in the racial/ethnic distribution (see [TABLE 3](#) and [FIGURE 18](#)). First, the region's median age is 35.4 in 2015 and younger than the nation's median age by 1.4 years. The region's population is aging due to the aging of the baby boomer generation (born between 1946 and 1964). The median age of the population is projected to increase to 37.9 in 2040 by 2.5 years. The share of the population 65 years old and over is projected to increase from 12 percent in 2015 to 18 percent in 2040, while the share of the population of 64 years old or less decreases from 88 percent in 2010 to 82 percent in 2035. In particular, both children 15 years old or less and the working age population of 16–64 years old have shown a decline from 21 percent to 19 percent, and from 66 percent to 63 percent, respectively, during the projection period. The decline of the working age population may result in a potential shortage of workers and slower job growth unless the older population extends their retirement age. With the increasing share of the older population and the decreasing share of the working age population, the old-age dependency ratio is projected to increase from 19 percent in 2015 to 28 percent in 2040 by 9 percent. The older population will grow over six and half times faster than that of working age groups (16–64) during the same period. The older population, mainly composed of the baby boomer generation, will constitute 51 percent of total population growth between 2015 and 2040.

The region's already high racial/ethnic diversity evolves over time during the projection horizon (see [TABLE 3](#)). The Hispanic population will become the majority ethnic group in the region around 2027, and will continue to show the greatest growth due to the births and immigration. Hispanic population will increase its share of the population by 6.4 percent from 46.7 percent in 2015 to 53.1 percent in 2040. NH Asians/Others including the multiple racial groups will have the fastest growth mainly through immigration. The share of NH Asians/ Others increases from 15.6 percent in 2015 to 19.1 percent in 2040 by 3.5 percent. However, the NH White population will experience a net decline of 940,000 from 5.9 million in 2015 to 5 million in 2040. The share of NH White population will decrease from 31.4 percent in 2015 to 22.4 percent in 2040 by 9 percent. NH Black population will also experience the smaller share of population growth (6.3 percent in 2015 vs. 5.4 percent in 2040). As a result of the changing racial/ethnic composition, the normalized entropy index will decline from 0.853 in 2015 to 0.826 in 2040.

HOUSEHOLDS

As the population ages and remains diverse in the region during the projection period, the householders are also aging and showing the change in the racial/ethnic distribution (see [TABLE 4](#)). Given the cohort size of the baby boomer generation, the effect of aging population on the number of households is enormous. The number of households will reach more than 7.4 million in 2040 with the net addition of over 1.4 million households in the next 25 years. Older householders (65 years and older) will account for 75 percent of the projected household growth in the region and will increase their share from 21.6 percent in 2015 to 31.6 percent in 2040 by 10 percent. However, the share of householders of 15–64 years old will decline from 78.4 percent to 68.4 percent. In particular, householders 15–24 years old will show the smallest increase among all age groups.

Following the changing dynamics of population projections, the region's householders also experience a shift in the racial/ethnic composition during the projection horizon (see [TABLE 4](#)). Hispanic householders will be the largest ethnic group in the region in 2040, and will continue to show the most growth among four racial/ethnic groups during the projection period. Hispanic householders will increase its share of total householders by 8.9 percent from 35.5 percent in 2015 to 44.4 percent in 2040. NH Asians/Other Householders will have the fastest growth mainly through immigration. The share of NH Asians/Other householders increases by 5.2 percent from 15.1 percent in 2015 to 20.1 percent in 2040. However, NH White householders will experience a net decline of 335,000 from 2.5 million in 2015 to 2.1 million in 2040. The share of White householders will go down by 13 percent from 41.9 percent in 2015 to 28.9 percent in 2040. NH Black householders will also experience the smaller share of household growth (7.5 percent in 2015 vs. 6.6 percent in 2040). In contrast to the normalized entropy index for population, the normalized entropy index for householders will slightly increase from 0.875 in 2015 to 0.879 in 2040.

There was an increase in the average household size from 3.0 in 2010 to 3.1 in 2015, but the household size will eventually decline from 3.1 in 2015 to 3.0 in 2040 as a result of the increase in the older householders and the increased headship rates of Hispanic and Asian/ Other population. A smaller household size of both Hispanic and Asian/other population were made possible with an assumption that Hispanic and Asian/other immigrants will have higher headship rates as they live in the US for a longer period of time.

EMPLOYMENT

With an increase in jobs in the post-recession period, the SCAG region's economy returned to normal with an unemployment rate of 6.6 percent in 2015. The region is expected to add 1.9 million jobs, from 8 million in 2015 to 9.9 million in 2040.

The region's industrial mix, however, will experience continuous change over time due to the region's relative competitiveness and globalization (see [TABLE 5](#)). The region's relative competitiveness comes from the diversity of jobs in the region. The normalized entropy index for measuring the region's job diversity is 0.909 in 2015. The region's selected jobs are relatively competitive compared to the national level. The location quotient (LQ) is used to measure the relative competitiveness (see [TABLE 6](#)). The region includes competitive high wage jobs such as (1) information, (2) manufacturing, (3) professional, scientific and technical services, (4) wholesale trade and (5) arts, entertainment, and recreation. The region also shows a strong competitiveness in low wage jobs including (1) accommodation and food service, (2) administrative and support and waste services and (3) transportation and warehousing.

The employment in the manufacturing sector is losing ground in the region as well as in the U.S. Globalization plays an important role in transforming the industrial structure of the region. It is clear that the region's industrial structure evolves from production-oriented industries to service-oriented industries. For example, the share of employment in the manufacturing sector will continue to decrease from 8.6 percent in 2015 to 6.4 percent in 2040.

A few selected sectors are expected to have rapid growth. The construction sector will regain its normal share by increasing from 4.6 percent in 2015 to 5.9 percent in 2040. This growth translates into 213,000 jobs from 2015-2040. The following four industrial sectors: (1) health care and social assistance (+491,000 jobs), (2) professional and business services (+266,000 jobs), (3) construction (+213,000) and (4) education services (+152,000) are key industrial sectors that are projected to add over 1.1 million jobs by 2040 and account for 61 percent of total job growth from 2015-2040. The four industrial sectors increase their share from 34 percent in 2015 to 39 percent in 2040. While many service jobs require minimal skills and pay low wages, service jobs also include high-paying high-skill work, such as investment banking and computer operations. This changing composition of industrial sectors requires diverse skill needs for our industries.

With a transformation of the region's industrial structure, the economic quality of life of the region's residents is severely affected. The distribution of jobs by wage level indicates that the region will increase the share of jobs in the lower 25 percent category, while there is a decrease in the share of jobs in the other job categories (note: the wage level is categorized into four levels: (1) bottom 25 percent, (2) lower 25 percent, (3) upper 25 percent, (4) top 25 percent). The jobs in the lower 25 percent category include (1) construction, (2) transportation and warehousing, (3) real estate and rental and leasing, (4) educational services, and (5) health care and social assistance. The share of the jobs in the bottom 50 percent category increases from 65.2 percent in 2015 to 67.1 percent in 2040, while the share of the jobs in the top 50 percent category decreases from 34.8 percent to 33 percent in 2040. The economic and job creation analysis appendix documents an analysis of the economic impacts of the 2016-2040 RTP/SCS.

SUBURBAN GROWTH

The region continued slow population growth in the post-recession period, adding only 3.3 million people, while having fast jobs growth, adding nearly 1.9 million jobs from 2015-2040. The HIOC, a measure of concentration, shows a decline from 58.19 in 2015 to 55.00 in 2040 for population, and from 63.43 in 2015 to 59.53 in 2040 for employment (see [TABLE 8](#)).

The declining HIOC indicates that there will be a deconcentration trend toward more growth of population and employment in Riverside and San Bernardino Counties. The share of both Riverside and San Bernardino Counties' population increased from 23.5 percent in 2015 to 26.6 percent in 2040 by 3.1 percent, while the share of both Riverside and San Bernardino Counties' employment increased from 18.4 percent in 2015 to 22.2 percent in 2040 by 3.8 percent. The fast growth of population and employment and the faster growth of employment than population in these two counties made a major contribution to a downward change in the HIOC of the region from 2015-2040. The gap of HIOC between

TABLE 6 Regional Employment by Wage Level, 2015 and 2040

2013 Wage Level (1=top25%, 4=bottom25%)	2007	2010	2015	2040	Difference (2010-2015)	Difference (2015-2040)
1	9.5%	9.1%	8.8%	7.9%	-0.3%	-0.9%
2	27.1%	26.2%	26.0%	25.1%	-0.2%	-0.9%
3	32.0%	32.2%	32.5%	36.2%	0.3%	3.7%
4	31.4%	32.6%	32.7%	30.9%	0.2%	-1.8%

Note: 1 = (1) Natural Resources and Mining, (2) Utilities, (3) Information, (4) Finance and Insurance, (5) Management of Companies and Enterprises; 2 = (1) Manufacturing, (2) Wholesale Trade, (3) Professional, Scientific and Technical Services, (4) Arts, Entertainment, and Recreation, (5) Public Administration; 3 = (1) Construction, (2) Transportation and Warehousing, (3) Real Estate and Rental and Leasing, (4) Educational Services, (5) Health Care and Social Assistance; 4 = (1) Total Farm, (2) Retail Trade, (3) Administrative and Support and Waste Services, (4) Accommodation and Food Service, (5) Other Services.

population and employment becomes smaller in 2040 than in 2015. The IOD decreased from 0.052 in 2015 to 0.045 in 2040.

All counties in the region experienced a decline in P-E ratio from 2015-2040. The regional P-E ratio declined from 2.3 to 2.2. Riverside and San Bernardino Counties experienced a faster decline in the P-E ratio than other counties: 3.1 in 2015 to 2.7 in 2040 for Riverside County; 2.9 in 2015 to 2.7 in 2040 for San Bernardino County.

If the region continues to experience faster employment growth in Riverside and San Bernardino Counties, where an abundant labor force is available, the region's serious

transportation and air quality problems may be reduced due to more balanced county distribution of population and employment.

FORECAST METHODOLOGY AND ASSUMPTIONS

GROWTH FORECAST APPROACH

SCAG's Regional Growth Forecast includes three major indicators: population, households, and employment. As past practice, SCAG uses the BULA (Balance, Uncertainty, Latest, and

TABLE 7 Regional Location Quotients for Industry Sectors, 2007-2040

Jobs by 2 digit NAICS sector	2007	2010	2015	2040	Difference (2010-2015)	Difference (2015-2040)
Total Farm	0.635	0.565	0.591	0.591	0.026	0.000
Natural Resources and Mining	0.210	0.198	0.182	0.127	-0.016	-0.055
Utilities	1.130	1.111	1.139	1.173	0.028	0.034
Construction	0.925	0.813	0.855	1.064	0.042	0.210
Manufacturing	1.068	1.084	1.100	1.150	0.016	0.050
Wholesale Trade	1.237	1.263	1.256	1.312	-0.007	0.056
Retail Trade	0.996	0.992	0.996	0.992	0.004	-0.004
Transportation and Warehousing	0.992	1.069	1.056	1.035	-0.013	-0.021
Information	1.646	1.737	1.737	1.869	0.000	0.132
Finance and Insurance	0.933	0.871	0.862	0.840	-0.009	-0.022
Real Estate and Rental and Leasing	1.213	1.282	1.262	1.327	-0.020	0.065
Professional, Scientific and Technical Services	1.156	1.093	1.129	1.169	0.036	0.040
Management of Companies and Enterprises	1.032	0.915	0.951	0.922	0.036	-0.029
Administrative and Support and Waste Services	1.256	1.248	1.241	1.142	-0.007	-0.099
Educational Services	0.965	0.976	0.927	0.881	-0.049	-0.046
Health Care and Social Assistance	0.986	0.948	0.915	0.887	-0.033	-0.028
Arts, Entertainment, and Recreation	1.253	1.139	1.165	1.169	0.027	0.004
Accommodation and Food Service	1.013	1.186	1.229	1.172	0.043	-0.057
Other Services	0.801	0.837	0.854	0.881	0.017	0.026
Public Administration	0.480	0.526	0.509	0.514	-0.017	0.005

Source: US Bureau of Labor Statistics, CA EDD, SCAG

Adaptive) and Collaborative approach toward developing the regional growth forecast for 2016 RTP/SCS (SCAG, 2012). SCAG's growth forecast process has been open, transparent and extensive. Such inclusive process involves broad participation from experts and stakeholders specifically. The following three major activities (panel of experts meeting, range of regional growth forecasts, and local input) were essential in developing regional growth forecast with demographic-economic assumptions.

PANEL OF EXPERTS MEETING (2013)

The collective expert opinion could be a useful reference to reduce the short term and long term projection errors. SCAG held the 2013 SCAG panel of demographic and economic experts meeting on June 27, 2013 to review SCAG's methodology and assumptions for its population, household, and employment growth forecast for the 2016-2040 RTP/SCS. Twenty (20) academic scholars and leading practitioners were invited to participate on the panel. The panel of experts reviewed demographic and economic trends in the national and regional growth context, discussed the key assumptions underlying the regional and county growth forecast, and provided responses to survey questions on major assumptions.

A RANGE OF REGIONAL GROWTH FORECASTS

SCAG initially sets a range of regional growth forecasts (population, employment, and households) to address the uncertainty of a certain set of growth forecasts. A set of regional growth forecasts are developed in the following order: employment, population, and households (Field and MacGregor, 1987). The regional employment forecast is initially developed, and followed by the population forecast, and then by the household forecast. First, a range of the regional employment forecasts (low, mid, high) is derived using a range of the regional shares of the national jobs as suggested by the expert panel. Second, a range of regional employment forecasts is translated into a range of the regional population forecasts (low, mid, high) using a set of demographic assumptions. All related economic and demographic assumptions (e.g., unemployment rates, labor force participation rates, immigration level, fertility rates, and survival rates, etc.) remain unchanged for three different employment levels. Third, a range of the regional population forecasts are translated into a range of the regional household forecasts using a mid-trend method to convert population into households. It is based on the trend extrapolation of headship rates by age, sex and race/ethnicity with a consideration of the assimilation assumptions of the Hispanic and Asian headship rates.

LOCAL INPUT

The initial mid-range regional growth forecast was further disaggregated into the small area level. SCAG provided local jurisdictions with the SCAG's multi-level small area growth forecast for their review and comments. SCAG's staff conducted one-on-one meetings with 197 jurisdictions to review the forecast and to receive local input. This local input process provided an opportunity for jurisdictions to offer their local knowledge and input to inform SCAG's regional datasets. After SCAG received input from local jurisdictions, SCAG assessed the reasonableness of the local input data at the regional level by using the unemployment rate, and SCAG also evaluated the comments and incorporated the adjustments into the population, household, and employment growth distributions. The resulting final local input growth forecast serves as a basis for further developing the policy growth forecast. Additional refinements to the final local input growth forecast were made to reflect land use-transportation coordination through the scenario planning process in the development of the policy growth forecast (see [EXHIBITS 1-9](#)).

GROWTH FORECAST METHODOLOGY

The regional growth forecast for the 2016-2040 RTP/SCS was developed using the regional forecast methodology used in the development of the 2012 RTP growth forecast and updated demographic-economic assumptions (see SCAG's growth forecast report for 2012 RTP/SCS: http://rtpscs.scag.ca.gov/Documents/2012/final/SR/2012fRTP_GrowthForecast.pdf). The following is the methodology for developing the regional growth forecast for the 2016-2040 RTP/SCS.

SCAG projects regional employment using a shift-share model. The shift-share model computes employment comprised of 20 broad NAICS sectors, at a future point in time using a regional share of the nation's employment. The regional employment forecasts are based on a set of national employment forecasts. The national employment forecasts have two components: 1) forecasts of the number of total jobs and 2) forecasts of jobs by industry sector. The regional job projections depend both on the number of total jobs in the U.S. and the distribution of these jobs among industry sectors.

The forecast of total U.S. jobs is based on a forecast of 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 rate forecasts are quantitatively more important than the other assumptions in developing national projections of total jobs.

TABLE 8 Regional Population and Employment by County, 2000-2040

		2000		2010		2015		2040		Difference (2010-2015)		Difference (2015-2040)	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
POPULATION	Imperial	143,151	0.9%	175,594	1.0%	182,390	1.0%	282,024	1.3%	6,796	0.0%	99,634	0.3%
	Los Angeles	9,543,983	57.6%	9,827,070	54.4%	10,158,776	54.1%	11,513,435	52.0%	331,706	-0.3%	1,354,659	-2.0%
	Orange	2,853,893	17.2%	3,017,089	16.7%	3,157,074	16.8%	3,464,487	15.7%	139,985	0.1%	307,413	-1.2%
	Riverside	1,557,271	9.4%	2,191,800	12.1%	2,316,438	12.3%	3,167,584	14.3%	124,638	0.2%	851,146	2.0%
	San Bernardino	1,719,190	10.4%	2,038,771	11.3%	2,111,258	11.2%	2,731,321	12.3%	72,487	0.0%	620,063	1.1%
	Ventura	756,902	4.6%	825,378	4.6%	853,188	4.5%	965,210	4.4%	27,810	0.0%	112,022	-0.2%
	SCAG Region	16,574,390	100.0%	18,075,702	100.0%	18,779,123	100.0%	22,124,061	100.0%	703,421		3,344,938	
	HIOC*	62.09		58.34		58.19		55.00		-0.1		-3.2	
EMPLOYMENT	Imperial	54,080	0.7%	56,480	0.8%	76,000	0.9%	124,609	1.3%	19,520	0.2%	48,609	0.4%
	Los Angeles	4,444,600	59.7%	4,140,040	57.1%	4,463,010	55.7%	5,225,707	52.9%	322,970	-1.3%	762,697	-2.4%
	Orange	1,516,770	20.4%	1,492,940	20.6%	1,633,000	20.4%	1,898,685	19.2%	140,060	-0.2%	265,685	-1.1%
	Riverside	513,740	6.9%	591,850	8.2%	742,000	9.3%	1,174,500	11.9%	150,150	1.1%	432,500	2.5%
	San Bernardino	587,340	7.9%	652,830	9.0%	729,020	9.1%	1,028,132	10.4%	76,190	0.1%	299,112	1.3%
	Ventura	323,200	4.3%	322,560	4.4%	363,000	4.5%	419,808	4.3%	40,440	0.1%	56,808	-0.2%
	SCAG Region	7,439,730	100.0%	7,256,700	100.0%	8,006,030	100.0%	9,871,441	100.0%	749,330		1,865,411	
	HIOC*	67.41		64.91		63.43		59.53		-1.48		-3.9	
P-E RATIO	IOD**	0.054		0.066		0.052		0.045		-0.013		-0.007	
	Imperial	2.6		3.1		2.4		2.3		-0.7		-0.1	
	Los Angeles	2.1		2.4		2.3		2.2		-0.1		-0.1	
	Orange	1.9		2.0		1.9		1.8		-0.1		-0.1	
	Riverside	3.0		3.7		3.1		2.7		-0.6		-0.4	
	San Bernardino	2.9		3.1		2.9		2.7		-0.2		-0.2	
	Ventura	2.3		2.6		2.4		2.3		-0.2		-0.1	
	SCAG Region	2.2		2.5		2.3		2.2		-0.1		-0.1	

Note: * HIOC (Hoover Index of Concentration) measures the distribution of population and employment. If HIOC equals 0, then population and employment are perfectly de-concentrated. If HIOC equals 100, then the county's share in comparison with the entire SCAG region's population or employment would be concentrated to a single county of the SCAG region. However, if the HIOC drops to 0, then each county's share would be equal. **IOD (Index of Divergence) measures the intra-regional segregation of population and employment. If IOD equals 1, then the population and employment of a county are unbalanced. If IOD equals 0, then the population and the employment of a county are spatially proportioned.

Source: CA DOF, CA EDD, SCAG

SCAG projects regional population using the 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 persons moving into the region during a projection period, and by subtracting the number of deaths and the number of persons moving out of the region. The patterns of migration into and out of the region are determined by the number of forecasted jobs.

Households are forecasts by multiplying the projected residential population by projected headship rates. The headship rate is the proportion of a population cohort that forms the household. Age-sex-racial/ethnic specific household formation levels are used to translate projected residential population into projected households.

The regional growth forecast is further disaggregated to the county and the smaller geographies. The preliminary county level growth forecast was derived using the county share of the regional growth forecast from 2012 RTP/SCS county growth forecast, and was later refined as a result of local input.

REGIONAL DEMOGRAPHIC-ECONOMIC ASSUMPTIONS

Demographic and economic assumptions play a decisive role in determining the size of population, households, and employment in the future (see [TABLE 9](#)). Population size is projected by identifying the demographic rates (e.g., fertility rate, survival rate, migration rate) of the population cohort. The region's total fertility rate remains at 1.9, which is lower than the replacement level of 2.1, during the projection period. The region's life expectancy at birth improves at the same rate as that of the nation's life expectancy improvement as assumed by the US Census Bureau's 2014 population projection. Domestic migration fluctuates and is directly influenced by labor demand derived from regional employment forecasts. International net immigration will be 63,000 per year until it increases to 96,000 per year in 2020. The share of Hispanic and Asian migrants in the nation will increase along with the increasing Hispanic and Asian population size.

In addition to demographic assumptions, three translation factors are needed to link regional employment forecasts to regional population forecasts. They are labor force participation rates, the implied unemployment rates, and multiple jobholding rates. First, labor force participation rates play an important role in translating the labor force demand into labor force supply. The projected pattern of national labor force participation rates developed by Pitkin and Myers in 2013 was used to project SCAG region's labor force participation rates. The overall labor force participation rate is projected to decline from 64.5 percent in 2010 to 62.2 percent in 2040. Second, some workers may keep two or more jobs. The double jobholding rate will be 4.5 percent of the workers during the projection period. Third, the implied unemployment rate will range from 5 percent to 8 percent during the projection period. The implied unemployment rate is derived by matching labor supply estimated

TABLE 9 Regional Demographic-Economic Assumptions

		2010-2015	2015-2040	Difference (2015-2040)
TOTAL FERTILITY RATE	White (NH*)	1.5	1.5	0
	Black (NH)	1.7	1.7	0
	Asian & Other (NH)	1.6	1.6	0
	Hispanic	2.1	2.1	0
	Total	1.9	1.9	0
CRUDE DEATH RATE	White (NH)	11.4	11.9	0.5
	Black (NH)	9.1	9.4	0.3
	Asian & Other (NH)	2.6	4.0	1.4
	Hispanic	2.8	3.5	0.7
	Total	6.2	6.4	0.2
INTERNATIONAL MIGRATION	Annual Average	62,941	95,950	33,000
	White (NH)	11%	11%	0%
	Black (NH)	3%	3%	0%
	Asian & Other (NH)	19%	19%	0%
	Hispanic	68%	68%	0%
	Total	100%	100%	0%
LABOR FORCE PARTICIPATION RATE	White (NH)	63.5%	60.7%	-2.8%
	Black (NH)	59.6%	56.7%	-2.9%
	Asian & Other (NH)	63.3%	59.8%	-3.5%
	Hispanic	66.4%	64.4%	-3.0%
	Total	64.5%	62.2%	-2.3%

Source: CA DOF and SCAG

Note:*NH refers to Non-Hispanic

from population projections with workers estimated from job projections. Finally, the most important consideration is the reasonable regional share of national jobs. The SCAG region's share of the national jobs in 2040 is assumed to remain 5.3 percent observed in 2015.

TABLE 10 shows the projected headship rates by age, sex, and race/ethnicity between 2015 and 2040, which are the basis for deriving the household forecast. The headship rate projections were developed using the trend extrapolation of headship rates with an assumption of the assimilation of Hispanic and Asian headship rates. The overall headship rates will increase from 40.3 percent in 2015 to 41.3 percent in 2040 (see **TABLE 10**). As a result of the assimilation of Hispanic and Asian headship rates, Hispanic headship rates

increase from 33.1 percent in 2015 to 36.2 percent in 2040 by 3.1 percent, and Asian headship rates increase from 38.3 percent in 2015 to 42.7 percent in 2040 by 4.5 percent. The female headship rates also increase due to the higher labor force participation, marriage postponement, and longer life expectancy.

TABLE 10 Headship Rates by Age, Sex, and Race/Ethnicity, 2000-2040

		2000	2010	2015	2040	Difference (2010-2015)	Difference (2015-2040)
AGE	15-24	9.9%	7.1%	6.4%	6.3%	-0.4%	-0.1%
	25-34	40.1%	36.2%	34.3%	33.2%	-1.0%	-1.1%
	35-44	50.4%	48.8%	47.5%	46.9%	-1.4%	-0.6%
	45-54	54.6%	52.8%	51.2%	50.3%	-1.7%	-0.9%
	55-64	56.3%	54.3%	52.3%	50.9%	-1.8%	-1.4%
	65-74	58.5%	56.2%	55.3%	53.6%	-1.9%	-1.7%
	75+	60.4%	60.9%	57.8%	55.1%	-2.2%	-2.7%
SEX	Male	58.3%	45.6%	42.7%	42.9%	-1.1%	0.2%
	Female	28.5%	37.2%	37.9%	39.7%	-0.7%	1.8%
RACE/ ETHNICITY	White (NH)	51.2%	50.5%	49.4%	49.7%	-0.9%	0.3%
	Black (NH)	49.1%	48.6%	47.2%	48.4%	-0.4%	1.2%
	Asian & Others (NH)	38.7%	38.4%	38.5%	42.5%	-0.1%	4.0%
	Hispanic	34.2%	33.3%	32.7%	36.0%	-0.2%	3.3%
Total		43.1%	41.3%	40.3%	41.3%	-0.8%	1.0%

Note: *2015 headship rates were derived using 2010 Census and 2014 Annual ACS data. **The 2040 Asian and Hispanic headship rates reflect an assumption of assimilation. A headship rate assumption with assimilation is developed in the following way, Asian headship rates are reduced by 50 percent of the difference from 2010 White headship rates by 2050; Hispanic headship rates are reduced by 25 percent of the difference from 2010 White headship rates by 2050. Source: US Census Bureau, SCAG

SMALL AREA FORECAST AND ALLOCATION

A critical input driving SCAG's planning process is the Regional Growth Forecast. The Regional Growth Forecast at jurisdictional and TAZ level is the basis for developing the Regional Transportation Plan (RTP), Sustainable Communities Strategy (SCS), Program Environmental Impact Report (PEIR), and the Regional Housing Needs Assessment (RHNA). SCAG's 2016-2040 RTP/SCS growth forecast includes six counties' jurisdictional level population, household, and employment for years 2012, 2020, 2035, and 2040.

JURISDICTIONAL GROWTH FORECASTING

Based on the growth forecast at the regional level described in the previous charters, SCAG further projects jurisdictional level population, household, and employment. The latest jurisdictions' existing and general plan land use 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 the local jurisdiction's general plan. Population projections are calculated based on household growth and household size. Future jurisdictional employment is estimated based on the share of the county's employment by sector. It is further adjusted to account for population serving jobs, such as Retail and Service, which are highly correlated with population growth.

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

- California Department of Finance (DOF) population and household estimates;
- California Employment Development Department (EDD) jobs report by industry;
- Regional Housing Needs Assessment (RHNA) growth projections for years 2014 through 2021;
- 2012 existing land use and General Plans from local jurisdictions;
- 2010 Census and the latest American Community Survey (ACS) data; and
- 2011 Business Installment data from InfoGroup.

After the initial growth forecast was developed, SCAG's staff conducted one-on-one meetings with 197 jurisdictions in the region to review the forecast and receive local input. This local input process provided an opportunity for jurisdictions to offer their local knowledge and input to inform SCAG's regional datasets. SCAG evaluated the comments and incorporated the adjustments into the population, household, and employment growth distributions. The resulting Draft 2016 RTP/SCS growth forecast served as the basis for the initial 2016 RTP/SCS evaluation.

Below are the guiding principles, which are the basis for developing the draft Policy Growth Forecast (PGF):

- **Principle #1:** The draft PGF for the 2016-2040 RTP/SCS shall be adopted by the Regional Council at the jurisdictional level, thus directly reflecting the population, household and employment growth projections derived from the local input and previously reviewed and approved by SCAG's local jurisdictions. The draft PGF maintains these projected jurisdictional growth totals, meaning future growth is not reallocated from one local jurisdiction to another.
- **Principle #2:** The draft PGF at the TAZ level is controlled to be within the density ranges of local general plans or input received from local jurisdictions in this most recent round of review.
- **Principle #3:** For the purpose of determining consistency for California Environmental Quality Act (CEQA) streamlining, lead agencies such as local jurisdictions have the sole discretion in determining a local project's consistency with the 2016 RTP/SCS.
- **Principle #4:** Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF only to conduct the required modeling analysis and is therefore, only advisory and non-binding because SCAG's sub-jurisdictional forecasts are not to be adopted as part of the 2016-2040 RTP/SCS. After SCAG's adoption of the PGF at the jurisdictional level, the TAZ level data may be used by jurisdictions in local planning as it deems appropriate and there is no obligation by a jurisdiction to change its land use policies, General Plan, or regulations to be consistent with the RTP/SCS. SCAG staff plans to monitor the use of this data after the adoption of the RTP/SCS to encourage appropriate use.
- **Principle #5:** SCAG staff continues to communicate with other agencies who use SCAG subjurisdictional level data to ensure that the "advisory & non-binding" nature of the dataset is appropriately maintained. (See Attachment 1 for information regarding SCAG's communications with SCAQMD and ARB about the use of SCAG's sub-jurisdictional level data)

LOCAL INPUT PROCESS

Local input plays an important role in developing a reasonable growth forecast for the 2016-2040 RTP/SCS. SCAG's Bottom-Up Local Input Process began in March 2013 and has been designed to engage local jurisdictions in establishing the base geographic and socioeconomic projections including population, household, and employment.

- **March 2013:** Each jurisdiction was contacted individually and was requested to provide their base general plan land use and zoning data to SCAG.
- **June 2013:** With approval from SCAG's Community Economic Human Development (CEHD) Committee, the protocol for local jurisdictions to provide input and approval of SCAG's geographic and socioeconomic datasets was established.
- **October 2013:** Based on guidance from the CEHD, the Technical Working Group (TWG), and our subregional partners, SCAG staff distributed the schedule, protocol, and summary descriptions of SCAG's base datasets in a letter to all regional city managers, planning directors, city clerks (for forwarding to all elected officials), subregional executive directors, and subregional coordinators.
- **November 2013 through January 2014:** With input from the CEHD, TWG, and subregional staff, SCAG staff rolled-out the draft growth forecast including Population, Household, and Employment.
- **December 2013 through August 2014:** With support from our subregional partners and oversight from the CEHD, staff met with 99% of SCAG's 197 jurisdictions one-on-one and received feedback from 93% of jurisdictions on all or a portion of our information requests.
- **June 2015 through July 2015:** SCAG distributed the draft policy growth forecast to the local jurisdictions again to seek additional feedbacks.
- During the following month, SCAG staff incorporated all the comments received in the draft policy growth forecast as part of the graft plan.

The close collaboration enables us to form the growth projection which reflects the locals' visions. The [TABLE 11](#) presents the local input based jurisdictional level growth forecast.

TABLE 11 City Forecast 2040

County	City Name	2012 Population	2040 Population	2012 Household	2040 Household	2012 Employment	2040 Employment
Imperial	Brawley City	25,800	42,900	7,600	15,000	8,000	16,800
Imperial	Calexico City	40,200	62,200	10,200	19,300	8,300	17,500
Imperial	Calipatria City	7,600	9,600	1,000	1,600	1,300	2,200
Imperial	El Centro City	44,100	61,000	13,100	19,900	20,300	43,800
Imperial	Holtville City	6,100	8,000	1,800	2,500	1,000	2,000
Imperial	Imperial City	15,800	25,400	4,600	8,800	3,400	9,500
Imperial	Westmorland City	2,300	2,700	600	700	300	500
Imperial	Unincorporated	37,700	70,300	10,400	24,700	16,400	32,300
Los Angeles	Agoura Hills City	20,500	22,700	7,300	8,200	12,500	15,300
Los Angeles	Alhambra City	84,000	88,800	29,300	31,900	28,000	33,500
Los Angeles	Arcadia City	56,700	65,900	19,600	22,900	28,900	34,400
Los Angeles	Artesia City	16,600	18,000	4,500	5,000	5,000	5,800
Los Angeles	Avalon City	3,800	5,100	1,500	2,100	2,500	3,000
Los Angeles	Azusa City	47,100	55,000	12,800	15,600	16,600	20,600
Los Angeles	Baldwin Park City	76,100	83,600	17,200	19,300	16,500	19,500
Los Angeles	Bell City	35,700	36,900	8,900	9,200	12,400	13,700
Los Angeles	Bellflower City	77,100	79,600	23,700	24,400	13,600	14,700
Los Angeles	Bell Gardens City	42,300	44,000	9,700	10,100	9,400	10,500
Los Angeles	Beverly Hills City	34,400	37,200	14,900	16,200	57,700	68,900
Los Angeles	Bradbury City	1,100	1,200	400	400	100	200
Los Angeles	Burbank City	103,300	118,700	42,500	48,400	106,800	145,000
Los Angeles	Calabasas City	23,800	24,500	8,700	9,100	16,700	17,300
Los Angeles	Carson City	92,000	107,900	25,300	30,800	58,500	69,700
Los Angeles	Cerritos City	49,300	50,900	15,500	16,000	30,400	33,700
Los Angeles	Claremont City	35,500	39,400	11,700	13,200	17,400	19,700
Los Angeles	Commerce City	12,900	13,500	3,400	3,600	44,600	49,100
Los Angeles	Compton City	97,300	100,900	23,100	24,000	25,400	28,200
Los Angeles	Covina City	48,200	51,600	15,900	17,200	25,300	29,500
Los Angeles	Cudahy City	23,800	23,800	5,600	5,600	2,900	2,900
Los Angeles	Culver City City	39,100	40,700	16,800	17,500	44,100	53,000
Los Angeles	Diamond Bar City	56,000	63,900	17,900	21,200	15,400	19,300
Los Angeles	Downey City	112,500	121,700	33,900	37,300	47,500	53,000

Table 11 City Forecast 2040 Continued

County	City Name	2012 Population	2040 Population	2012 Household	2040 Household	2012 Employment	2040 Employment
Los Angeles	Duarte City	21,500	24,300	7,000	8,200	10,100	11,900
Los Angeles	El Monte City	114,200	137,200	27,800	34,700	28,000	35,700
Los Angeles	El Segundo City	16,700	17,300	7,100	7,400	38,400	45,400
Los Angeles	Gardena City	59,400	68,700	20,600	24,200	28,900	33,500
Los Angeles	Glendale City	193,200	214,000	72,400	81,100	111,300	127,000
Los Angeles	Glendora City	50,500	54,300	17,200	18,900	20,000	23,000
Los Angeles	Hawaiian Gardens City	14,300	15,900	3,600	4,000	4,800	5,600
Los Angeles	Hawthorne City	85,300	87,000	28,600	30,000	27,200	32,100
Los Angeles	Hermosa Beach City	19,600	20,400	9,500	9,800	7,400	10,000
Los Angeles	Hidden Hills City	1,900	2,000	600	600	300	300
Los Angeles	Huntington Park City	58,500	67,400	14,600	17,400	15,600	18,600
Los Angeles	Industry City	500	500	100	100	67,700	74,700
Los Angeles	Inglewood City	110,900	129,000	36,600	43,300	31,100	37,400
Los Angeles	Irwindale City	1,400	2,000	400	500	18,800	21,500
Los Angeles	La Cañada Flintridge City	20,400	21,600	6,900	7,300	6,500	8,300
Los Angeles	La Habra Heights City	5,400	6,200	1,800	1,900	200	400
Los Angeles	Lakewood City	80,600	84,700	26,600	28,200	18,900	21,400
Los Angeles	La Mirada City	48,800	52,100	14,700	15,800	17,400	20,200
Los Angeles	Lancaster City	158,300	209,900	47,400	65,300	45,800	59,600
Los Angeles	La Puente City	40,100	50,200	9,500	12,400	6,300	8,700
Los Angeles	La Verne City	31,800	32,900	11,400	12,100	12,200	14,300
Los Angeles	Lawndale City	33,000	33,900	9,700	10,100	6,700	8,200
Los Angeles	Lomita City	20,500	21,200	8,100	8,400	4,600	5,400
Los Angeles	Long Beach City	466,300	484,500	163,800	175,500	153,200	181,700
Los Angeles	Los Angeles City	3,845,500	4,609,400	1,325,500	1,690,300	1,696,400	2,169,100
Los Angeles	Lynwood City	70,300	76,100	14,700	16,200	9,200	10,900
Los Angeles	Malibu City	12,700	14,100	5,300	5,600	8,500	10,300
Los Angeles	Manhattan Beach City	35,300	37,100	14,000	14,800	18,000	20,700
Los Angeles	Maywood City	27,500	28,900	6,600	6,900	3,600	4,000
Los Angeles	Monrovia City	36,800	40,300	13,800	15,300	19,700	23,300
Los Angeles	Montebello City	63,000	67,300	19,100	21,000	27,500	30,800

Table 11 City Forecast 2040 Continued

County	City Name	2012 Population	2040 Population	2012 Household	2040 Household	2012 Employment	2040 Employment
Los Angeles	Monterey Park City	61,300	65,000	20,200	21,500	32,500	36,500
Los Angeles	Norwalk City	105,900	106,300	27,100	27,200	24,100	27,300
Los Angeles	Palmdale City	154,200	201,500	43,100	59,300	29,300	40,300
Los Angeles	Palos Verdes Estates City	13,600	13,900	5,100	5,200	2,300	2,900
Los Angeles	Paramount City	54,500	58,000	13,900	14,800	19,600	22,300
Los Angeles	Pasadena City	140,300	150,700	58,900	62,400	111,000	144,800
Los Angeles	Pico Rivera City	63,400	69,100	16,600	18,400	18,900	22,400
Los Angeles	Pomona City	150,500	190,400	38,600	51,100	55,100	67,200
Los Angeles	Rancho Palos Verdes City	42,000	42,300	15,600	15,700	5,800	6,200
Los Angeles	Redondo Beach City	67,200	74,400	29,000	33,000	24,000	29,800
Los Angeles	Rolling Hills City	1,900	2,000	700	700	100	100
Los Angeles	Rolling Hills Estates City	8,100	8,600	3,000	3,100	5,900	6,800
Los Angeles	Rosemead City	54,300	60,800	14,300	16,400	13,700	16,200
Los Angeles	San Dimas City	33,600	34,500	12,000	12,400	11,200	12,700
Los Angeles	San Fernando City	23,900	26,900	6,000	7,000	10,900	12,700
Los Angeles	San Gabriel City	40,100	46,900	12,600	15,300	14,100	16,800
Los Angeles	San Marino City	13,200	13,300	4,300	4,400	3,600	4,200
Los Angeles	Santa Clarita City	202,000	262,200	67,300	90,300	73,500	95,900
Los Angeles	Santa Fe Springs City	16,600	21,700	4,800	6,500	54,600	62,000
Los Angeles	Santa Monica City	90,700	103,400	47,100	53,900	89,600	103,700
Los Angeles	Sierra Madre City	11,000	11,200	4,800	5,000	1,900	2,100
Los Angeles	Signal Hill City	11,200	12,000	4,200	4,600	13,800	16,500
Los Angeles	South El Monte City	20,300	22,500	4,600	5,200	15,700	17,800
Los Angeles	South Gate City	94,700	111,800	23,200	28,300	20,400	24,000
Los Angeles	South Pasadena City	25,800	27,100	10,500	11,100	9,300	10,500
Los Angeles	Temple City	35,900	40,600	11,600	13,500	6,900	8,400
Los Angeles	Torrance City	146,500	159,800	56,100	62,000	102,300	117,600
Los Angeles	Vernon City	100	300	0	100	43,200	46,100
Los Angeles	Walnut City	29,800	33,800	8,700	10,400	8,400	9,900
Los Angeles	West Covina City	107,000	116,700	31,700	35,000	29,500	34,300

Table 11 City Forecast 2040 Continued

County	City Name	2012 Population	2040 Population	2012 Household	2040 Household	2012 Employment	2040 Employment
Los Angeles	West Hollywood City	34,800	41,800	22,600	27,800	29,800	37,300
Los Angeles	Westlake Village City	8,300	8,800	3,300	3,500	13,300	15,900
Los Angeles	Whittier City	85,900	96,900	28,300	32,600	26,900	31,700
Los Angeles	Unincorporated	1,040,700	1,273,700	292,700	392,400	222,900	288,400
Orange	Aliso Viejo City	49,300	51,000	18,500	19,400	18,900	20,900
Orange	Anaheim City	345,300	403,400	99,200	122,600	177,900	245,600
Orange	Brea City	41,100	50,600	14,500	18,100	46,700	53,700
Orange	Buena Park City	81,800	92,500	24,000	27,900	34,300	39,800
Orange	Costa Mesa City	111,200	116,400	40,000	42,500	84,400	93,200
Orange	Cypress City	48,500	49,700	15,700	16,300	22,100	27,700
Orange	Dana Point City	33,800	35,800	14,200	15,300	11,900	14,100
Orange	Fountain Valley City	56,000	59,300	18,700	19,900	30,400	34,900
Orange	Fullerton City	138,000	160,500	45,500	55,200	60,800	94,100
Orange	Garden Grove City	172,900	178,200	46,200	48,200	51,700	58,500
Orange	Huntington Beach City	193,200	207,100	74,900	81,200	75,800	87,000
Orange	Irvine City	227,100	327,300	81,800	123,400	224,400	320,000
Orange	Laguna Beach City	23,100	23,100	10,800	11,000	12,100	14,100
Orange	Laguna Hills City	30,600	31,500	10,400	10,900	18,500	19,400
Orange	Laguna Niguel City	63,900	72,000	24,300	27,700	18,300	22,100
Orange	Laguna Woods City	16,500	17,100	11,400	11,700	4,400	6,500
Orange	La Habra City	61,100	68,500	19,000	21,700	17,300	19,900
Orange	Lake Forest City	78,500	90,700	26,300	30,500	39,200	49,000
Orange	La Palma City	15,800	15,800	5,100	5,100	7,700	8,500
Orange	Los Alamitos City	11,600	12,100	4,100	4,200	14,200	15,600
Orange	Mission Viejo City	94,500	96,600	33,200	34,100	37,100	39,100
Orange	Newport Beach City	86,300	92,700	38,800	41,700	76,000	79,100
Orange	Orange City	138,500	153,000	43,600	49,300	94,100	105,500
Orange	Placentia City	51,500	58,400	16,600	18,900	19,000	23,500
Orange	Rancho Santa Margarita City	48,500	48,700	16,700	16,800	17,200	19,500
Orange	San Clemente City	64,400	68,000	24,000	25,300	24,800	29,500
Orange	San Juan Capistrano City	35,200	39,500	11,500	13,300	14,700	17,900

Table 11 City Forecast 2040 Continued

County	City Name	2012 Population	2040 Population	2012 Household	2040 Household	2012 Employment	2040 Employment
Orange	Santa Ana City	329,200	343,100	73,300	78,000	154,800	166,000
Orange	Seal Beach City	24,400	24,800	13,000	13,300	11,000	12,300
Orange	Stanton City	38,700	41,600	10,700	11,800	7,200	8,500
Orange	Tustin City	77,300	83,000	25,600	27,900	37,600	66,400
Orange	Villa Park City	5,900	6,100	2,000	2,000	1,500	1,700
Orange	Westminster City	91,000	92,800	26,200	26,800	24,200	26,400
Orange	Yorba Linda City	66,200	70,500	21,900	23,400	15,600	17,700
Orange	Unincorporated	120,700	180,100	37,800	56,900	20,700	41,200
Riverside	Banning City	30,100	37,600	10,800	14,000	7,300	14,200
Riverside	Beaumont City	39,400	80,600	12,400	27,200	5,900	18,000
Riverside	Blythe City	20,000	24,600	4,500	6,200	3,700	6,600
Riverside	Calimesa City	8,100	24,800	3,300	10,900	1,300	5,900
Riverside	Canyon Lake City	10,700	11,300	3,900	4,100	1,200	2,700
Riverside	Cathedral City City	52,200	68,100	17,100	26,000	10,800	21,200
Riverside	Coachella City	42,400	146,300	9,200	40,100	8,500	34,400
Riverside	Corona City	156,000	172,300	45,300	52,000	66,400	88,400
Riverside	Desert Hot Springs City	27,800	58,900	9,100	21,900	3,700	12,900
Riverside	Eastvale City	56,500	65,400	14,100	16,500	4,300	9,800
Riverside	Hemet City	80,800	126,500	30,300	52,200	21,000	45,500
Riverside	Indian Wells City	5,100	7,200	2,800	4,400	4,000	7,000
Riverside	Indio City	78,800	123,300	23,800	39,300	16,000	36,800
Riverside	Lake Elsinore City	54,100	111,400	15,200	35,000	11,800	31,700
Riverside	La Quinta City	38,300	47,700	14,900	19,100	12,400	21,500
Riverside	Menifee City	81,600	121,100	28,400	48,100	10,300	23,500
Riverside	Moreno Valley City	197,600	256,600	51,800	73,000	31,400	83,200
Riverside	Murrieta City	105,600	129,800	32,800	43,500	23,200	45,100
Riverside	Norco City	26,900	32,100	7,000	9,200	13,200	25,700
Riverside	Palm Desert City	49,800	61,700	23,400	31,400	36,900	53,600
Riverside	Palm Springs City	45,600	56,900	22,900	31,300	26,300	45,800
Riverside	Perris City	70,700	116,700	16,600	32,700	15,100	32,200
Riverside	Rancho Mirage City	17,600	25,000	8,900	13,600	12,300	20,500
Riverside	Riverside City	310,700	386,600	92,400	118,600	120,000	200,500

Table 11 City Forecast 2040 Continued

County	City Name	2012 Population	2040 Population	2012 Household	2040 Household	2012 Employment	2040 Employment
Riverside	San Jacinto City	45,100	79,900	13,200	27,600	5,900	17,800
Riverside	Temecula City	104,100	137,400	32,500	42,900	43,000	63,500
Riverside	Wildomar City	33,000	56,200	10,100	18,100	5,000	13,500
Riverside	Jurupa Valley City	97,000	114,500	25,000	30,400	24,500	32,600
Riverside	Unincorporated	359,500	487,500	112,700	159,200	71,300	160,200
San Bernardino	Adelanto City	31,100	70,000	7,900	18,100	3,900	7,800
San Bernardino	Apple Valley Town	70,200	100,600	23,700	34,800	15,400	27,600
San Bernardino	Barstow City	23,100	35,100	8,100	12,900	8,100	16,800
San Bernardino	Big Bear Lake City	5,100	6,900	2,200	3,000	3,800	5,400
San Bernardino	Chino City	79,400	120,400	21,000	34,000	42,600	50,600
San Bernardino	Chino Hills City	75,800	94,900	23,000	28,300	11,500	18,600
San Bernardino	Colton City	52,800	69,100	15,000	20,800	16,800	29,200
San Bernardino	Fontana City	200,200	280,900	49,600	74,000	47,000	70,800
San Bernardino	Grand Terrace City	12,200	14,200	4,400	5,700	2,200	5,300
San Bernardino	Hesperia City	91,100	129,100	26,400	39,100	14,900	28,300
San Bernardino	Highland City	53,700	66,900	15,500	20,600	5,500	10,200
San Bernardino	Loma Linda City	23,400	29,300	8,800	11,800	16,700	21,100
San Bernardino	Montclair City	37,200	42,700	9,600	11,600	16,500	19,000
San Bernardino	Needles City	4,900	7,000	1,900	2,800	2,200	3,800
San Bernardino	Ontario City	166,300	258,600	45,100	75,300	103,300	175,400
San Bernardino	Rancho Cucamonga City	170,100	204,300	55,400	73,100	69,900	104,600
San Bernardino	Redlands City	69,600	85,500	24,800	32,400	31,700	53,400
San Bernardino	Rialto City	100,800	112,000	25,400	31,500	21,100	30,500
San Bernardino	San Bernardino City	211,900	257,400	59,300	77,100	88,900	128,900
San Bernardino	Twentynine Palms City	25,900	37,300	8,300	11,400	4,300	8,500
San Bernardino	Upland City	74,700	81,700	25,900	28,900	31,700	43,500
San Bernardino	Victorville City	119,600	184,500	33,100	55,400	29,800	52,700
San Bernardino	Yucaipa City	52,300	72,500	18,400	28,200	8,200	15,000
San Bernardino	Yucca Valley Town	21,000	26,300	8,300	12,200	6,100	10,000
San Bernardino	Unincorporated	295,600	344,100	94,200	111,300	57,400	91,100
Ventura	Camarillo City	66,300	79,900	24,800	30,200	35,800	47,300

Table 11 City Forecast 2040 Continued

County	City Name	2012 Population	2040 Population	2012 Household	2040 Household	2012 Employment	2040 Employment
Ventura	Fillmore City	18,800	21,800	5,200	6,300	3,000	5,300
Ventura	Moorpark City	34,800	43,000	10,600	13,100	11,300	16,600
Ventura	Ojai City	7,500	8,400	3,100	3,300	5,100	5,300
Ventura	Oxnard City	200,100	237,300	50,100	60,100	58,100	79,200
Ventura	Port Hueneme City	21,800	22,400	7,100	7,300	6,400	6,700
Ventura	San Buenaventura (Ventura) City	106,700	125,300	40,700	48,400	60,700	66,000
Ventura	Santa Paula City	29,800	39,600	8,500	11,500	7,800	11,700
Ventura	Simi Valley City	125,100	142,400	41,300	47,400	44,000	61,100
Ventura	Thousand Oaks City	127,800	131,700	45,900	47,200	68,200	81,900
Ventura	Unincorporated	96,700	113,600	32,100	37,500	31,800	38,700

Note: All figures are rounded to the nearest 100.

TAZ LEVEL PROJECTIONS

The socioeconomic input data for the transportation model are processed at the Transportation Analysis Zone (TAZ) level in two different formats:

1. The marginal total of person and household attributes and
2. The joint distributes of person and household attributes. TAZ is often referred to as TIER 2, are generally equivalent to Census block groups, and there are 11,267 TAZs in the region.

A total of 65 socioeconomic variables and 8 joint tables are developed as input for the transportation demand model (see [TABLE 12](#) and [TABLE 13](#)). These variables include population, households by types, household income by categories, employment by sectors, etc. The 8 Joint tables, each with two or more dimensional attributions are required by SCAG's enhanced transportation demand model. One of these joint distributions is number of households by household income, household size, the number of workers, and the type of dwelling units, at the TAZ level.

SCAG develops the marginal and joint distributes of socioeconomic attributions at the TAZ level using diverse public and private sources of data and advanced estimation methods. The major data sources include the 2000 and 2010 Census, 2006-2010 Census Transportation Planning Package (CTPP), American Community Survey (ACS), California Department of Finance (DOF), California Employment Development Department (EDD), Firm based info Group 2011, Existing Land Use, 2012 County Assessor's Parcel Database, and jurisdictional general plans.

The development of the TAZ level socioeconomic input involves three major processes:

1. Development of three major variables: population, households, and employment;
2. Development of secondary variables: socioeconomic attributes of persons, households, and employment sectors;
3. Development of joint distributions of selected attributes.

The TAZ level projections are all consistent to the local general plan capacity.

DEVELOPMENT OF MAJOR VARIABLES

The initial TAZ level household projections started from the household and employment estimates at the Minimum Planning Unit (MPU) level within the TAZ. The MPU is the smallest geographic computing unit our calculations can take place. In general, the MPUs are equivalent to parcels. The 2012 parcel data, the 2010 Census and the 2011 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 became the first cut of the TAZ level estimate.

Total population is calculated based on the TAZ household forecast. Two components for the total population are group quarter population and residential population. The average number of persons per household is projected using the recent estimates and trends, and is constrained by the updated city PPH. Group quarters population is projected relying on the censuses and historical trends.

TAZ level household and employment projections are controlled to the city level projections. Which means the sum of TAZ level household and employment within a city are the same as this city's growth projections.

The initial TAZ level jobs are projected using a constant-share method. The current TAZ's share to city jobs for each sector will remain constant during the forecast years. By using the constant share method, the TAZ's job growth by sector will be simply determined by the different growth of the specific sector by city. The initial TAZ population, household, and employment forecasts become a basis for the local review process.

DEVELOPMENT OF SOCIAL ECONOMIC VARIABLES FOR TRANSPORTATION MODELS

SCAG develops additional attribute variables such as population by age, household by income ranges, employment by sectors, and etc. Please refer to [TABLE 12](#) for entire variable list. The joint distributions of household are developed into joint distribution of selected secondary variables using the Population Synthesis (PopSyn). It generates synthetic population and households with attribute distributions, which become the basis for computing the joint distributions. SCAG uses the 2010 Census SF1 (Summary File 1) driven aggregated data at TAZ level and 2007-2011 five-year PUMS (Public Use Microdata Sample) based individual data at the PUMA (Public Use Microdata Areas) level as seed data to produce synthetic population and households at the TAZ level.

TABLE 12 Description of Socioeconomic Variables

Variables	Description of Variables
POPULATION (8 VARIABLES)	Total Population (1 variable): total number of people living within a zone. Total population is composed of residential population and group quarters population.
	Group Quarters (Non-Institutional) Population (1 variable): is primarily comprised of students residing in dormitories, military personnel living in barracks, and individuals staying in homeless shelters. Group quarters (non-institutional) population does NOT include persons residing in institutions.
	Residential Population (1 variable): the number of residents NOT living in "group quarters."
	Group Quarters Population living in student dormitories (1 variable): Population living in college dormitories (includes college quarters off campus).
	Population by Age (4 variables): the number of population for different age groups: 5-17, 18-24, 16-64, and 65+.
HOUSEHOLDS (26 VARIABLES)	Total Households (1 variable): Household refers to all of the people who occupy a housing unit. By definition there is only one household in an occupied housing unit.
	Households by Household Size (4 variables): the number of one-person households, two-person households, three-person households, and four or more person households.
	Households by Age of Householder (4 variables): the number of households with age of householder between 18 and 24 years old, 25 and 44, 45 and 64, and 65 or older.
	Households by Number of Workers (4 variables): the number of households with no worker, with one worker, with two workers.
	Households by Household Income (4 variables): the number of households with annual household income (in 2011 dollars) of less than \$35,000 \$35,000-74,999, 75,000- 149,999, and 150,000 or more.
	Households by Type of Dwelling Unit (2 variables): the number of households living in single-family detached housing, and living in other housing.
	Households by Number of College Students (3 variables): the number of households with no college student, with one college student, with two college students or more.
	Households by Number of Children age 5-17 (4 variables): the number of households with no child, with one child, with two children, and three children or more.
SCHOOL ENROLLMENT (2 VARIABLES)	K-12 School Enrollment (1 variable): the total number of K-12 (kindergarten through 12th grade) students enrolled in all public and private schools located within a zone. All elementary, middle (junior high), and high school students are included. This variable represents "students by place of attendance".
	College/University Enrollment (1 variable): the total number of students enrolled in any public or private post-secondary school (college or university) that grant an associate degree or higher, located within a zone. This variable also represents "students by place of attendance".

TABLE 12 Description of Socioeconomic Variables Continued

Variables	Description of Variables
WORKERS (4 VARIABLES):	Total Workers (1 variable): total number of civilian workers residing in a zone. Workers are estimated by the place of residence.
	Workers by earning level (3 variables): the number of workers with earnings of less than \$35,000, \$35,000-\$74,999, and \$75,000 or more.
MEDIAN HOUSEHOLD INCOME (5 VARIABLES):	Median Household Income (1 variable): median household income is the median value of household income for all households within a zone. Household Income includes the income, from all sources, for all persons aged 15 years or older within a household.
	Median Household Income by Income Categories (4 variables): the median income is estimated for each of four different income categories: less than \$35,000, \$35,000-\$74,999, \$75,000-\$149,999, and \$150,000 or more.
EMPLOYMENT (17 VARIABLES)	Total Employment (1 variable): total number of jobs within a zone. The employment variables represent all jobs located within a zone (i.e., employment by place of work). Jobs are composed of wage and salary jobs and self-employed jobs. Jobs are categorized into 13 sectors based on the North American Industry Classification System (NAICS) code definition.
	Employment by 13 Industries (13 variables): the number of total jobs for 1) agriculture & mining, 2) construction, 3) manufacturing, 4) wholesale trade, 5) retail trade, 6) transportation, warehousing, and utilities, 7) information, 8) financial activities, 9) professional and business services, 10) education and health services, 11) leisure and hospitality services, 12) other services, and 13) public administration.
	Employment sector for) transportation, warehousing, and utilities: 1. Light/General warehouse area 2. High cube warehouse area 3. Light/General warehouse employment 4. High cube warehouse employment Employment by wage level (3 variables): total number of jobs by three wage levels: of less than \$35,000, \$35,000 to \$74,999, \$75,000 or more.

TABLE 13 Joint Distributions of Population, Households, and Workers by Selected Demographic Attributes

Major Variables	Demographic Attributes
HOUSEHOLD 1	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Household size (1,2,3,4 or more persons in household)
	Number of workers (0,1,2,3 or more workers in household)
	Type of dwelling unit (single-family detached, other)
HOUSEHOLD 2	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Number of workers (0,1,2,3 more workers in household)
	Age of head of household (18-24, 25-44, 45-66, 65 or more years old).
HOUSEHOLD 3	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Household size (1,2,3,4 more persons in household)
HOUSEHOLD 4	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Number of college students (0, 1, 2 or more)
HOUSEHOLD 5	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Number of children age 5-17 (0,1,2,3 or more)

TABLE 13 Joint Distributions of Population, Households, and Workers by Selected Demographic Attributes Continued

Major Variables	Demographic Attributes
HOUSEHOLD 6	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Population Age (0-4, 5-17, 18-24, 25 or more)
HOUSEHOLD 7	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Worker's earnings (less than \$24,999, \$25,000-\$49,999, \$50,000 or more)
HOUSEHOLD 8	Household income (less than \$35,000, \$35,000 to \$74,999, \$75,000 to \$149,999, \$150,000 or more)
	Household size (1,2,3,4 or more persons in household)
	Number of workers (0,1,2,3 or more workers in household)
	Type of dwelling unit (single-family detached, other)
	Age of head of household (18-24, 25-44, 45-66, 65 or more years old)

A NOTE FOR THE MOUNTAIN AREA SEASONAL CHARACTERISTICS

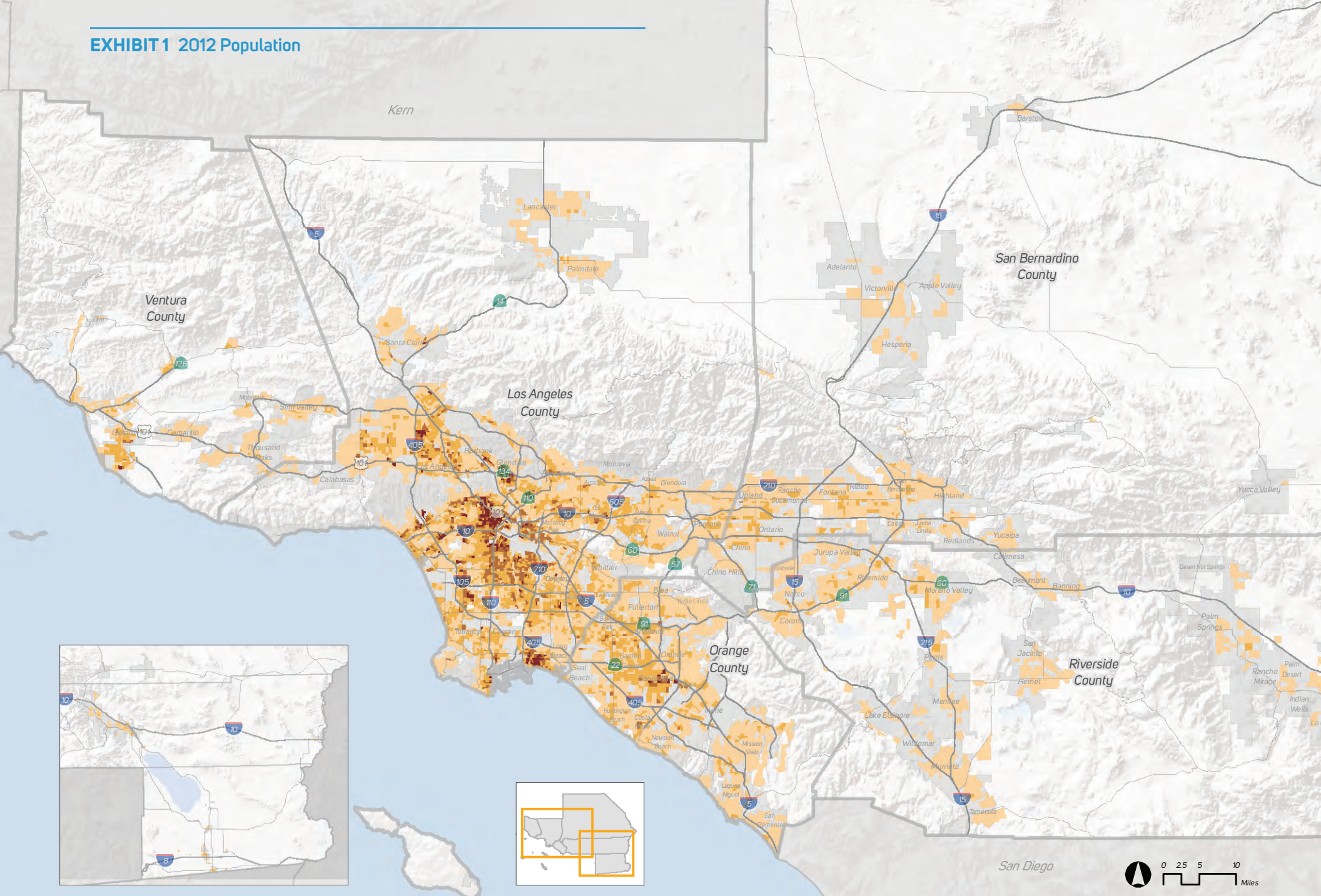
Reporting of socio-economic data and analysis of transportation needs for the mountain areas of San Bernardino County are a challenge given significant seasonal variation due to recreation activities and tourism. SCAG's forecast of future population, households, and employment for purposes of economic, infrastructure and transportation planning are built primarily from U.S. Census and state employment data for a "typical" season 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-time population and employment of the area are relatively low, but significant increases are experienced during the peak winter and summer seasons due to the added seasonal residents and tourism. As a result, standard socio-economic growth forecasts for these areas tend not to reflect the significant seasonal variations experienced due to visitor/recreational activities. Seasonal characteristics in mountain and some desert 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. As an example, **TABLE 14** presents peak seasonal characteristics for the City of Big Bear Lake, illustrating the impact of seasonal fluctuations. For transportation planning and facility design in these areas, special consideration and studies are required to ensure seasonal impacts are properly captured.

TABLE 14 Seasonal Comparison of Activity in the City of Big Bear Lake

	Population	Households	Employment	Visitors
2012 Off-Peak	5,100	2,200	3,800	10,000
2012 Peak	---	---	5,800	60,000
2040 Off-Peak	7,000	3,000	5,400	14,000
2040 Peak	---	---	7,400	76,000

Note: Visitors and Peak Season forecasts provided by City of Big Bear Lake Planning Staff

EXHIBIT 1 2012 Population



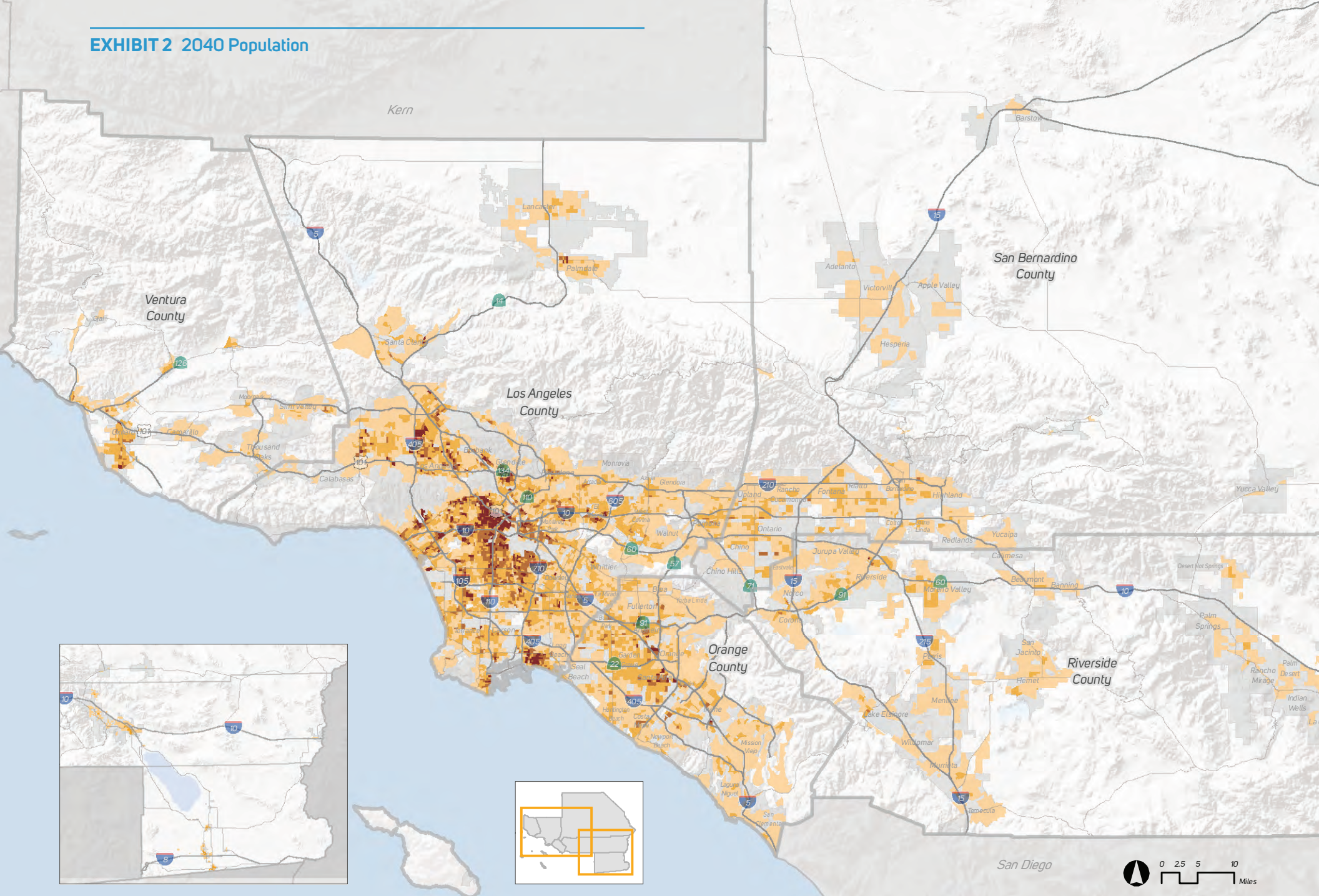
Population Density in 2012 (Persons per Square Mile)



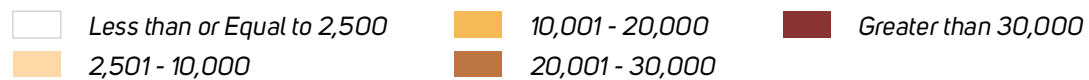
(Source: SCAG, 2015)

Note: Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF for regional modeling purpose only, and is advisory and non-binding.

EXHIBIT 2 2040 Population



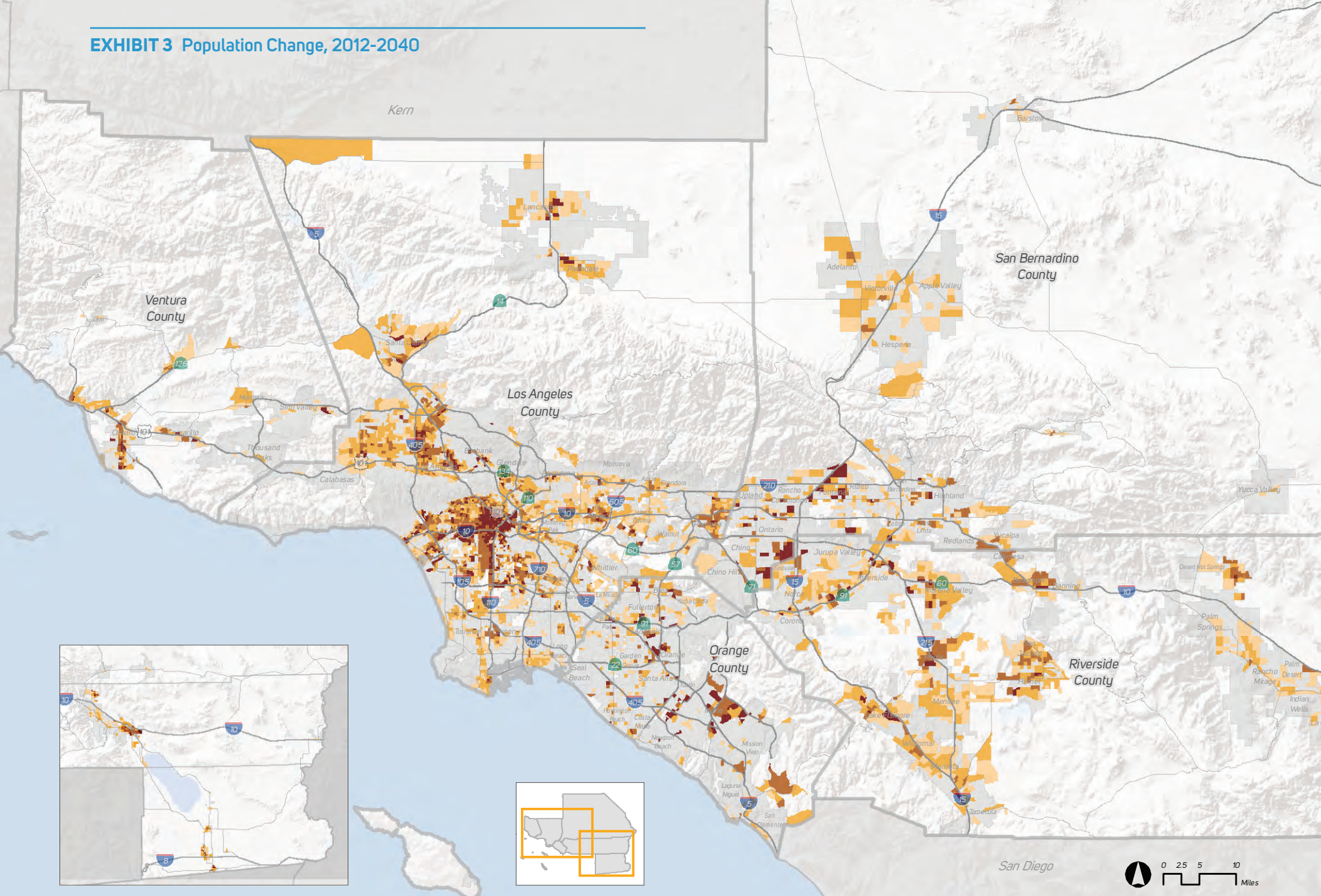
Population Density in 2040 (Persons per Square Mile)



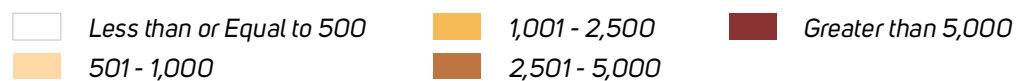
(Source: SCAG, 2015)

Note: Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF for regional modeling purpose only, and is advisory and non-binding.

EXHIBIT 3 Population Change, 2012-2040



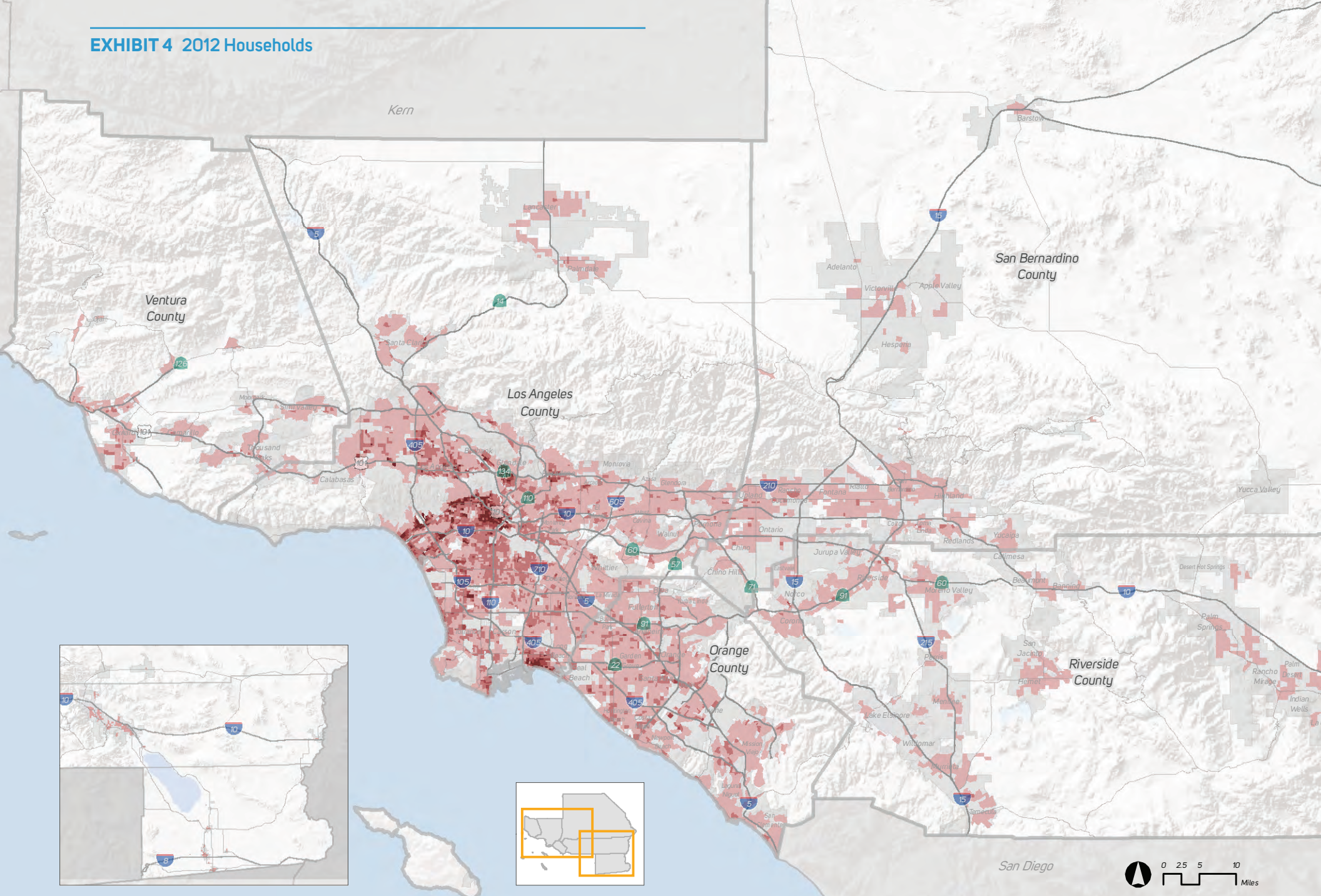
Population Growth, 2012 - 2040 (Persons per Square Mile)



(Source: SCAG, 2015)

Note: Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF for regional modeling purpose only, and is advisory and non-binding.

EXHIBIT 4 2012 Households



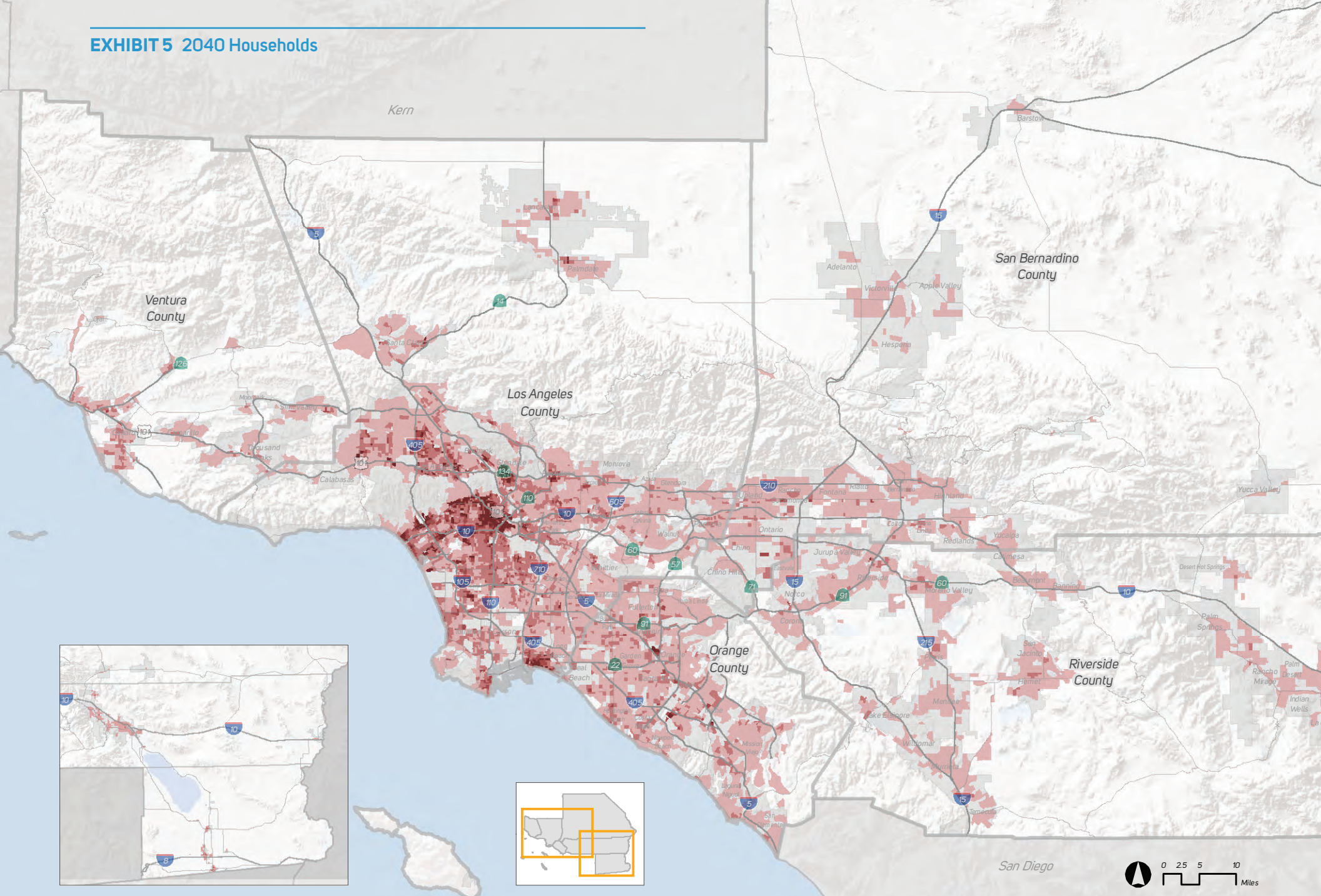
Household Density in 2012 (Households per Square Mile)



(Source: SCAG, 2015)

Note: Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF for regional modeling purpose only, and is advisory and non-binding.

EXHIBIT 5 2040 Households



Household Density in 2040 (Households per Square Mile)



(Source: SCAG, 2015)

Note: Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF for regional modeling purpose only, and is advisory and non-binding.

EXHIBIT 6 Household Change, 2012-2040

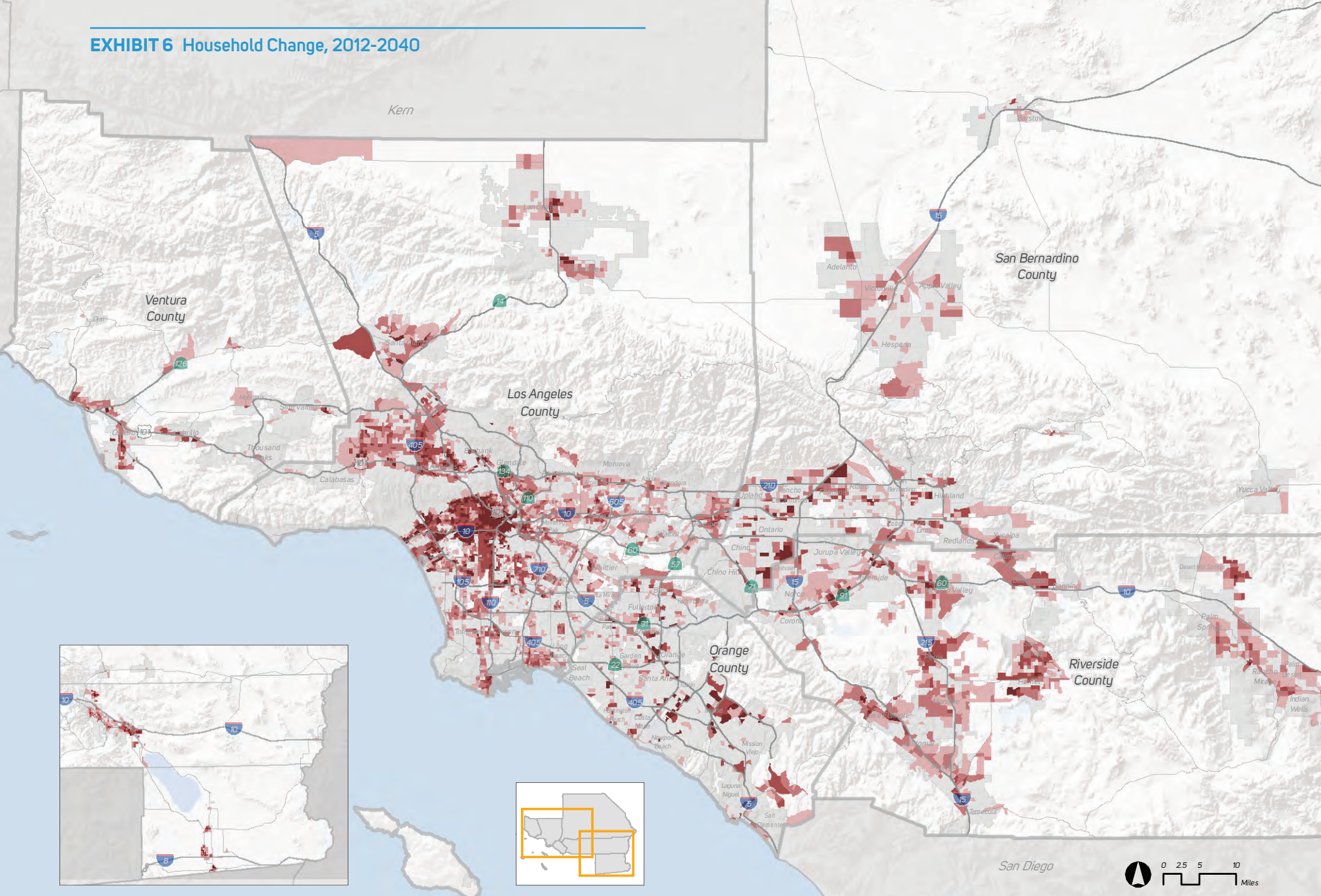


EXHIBIT 7 2012 Employment

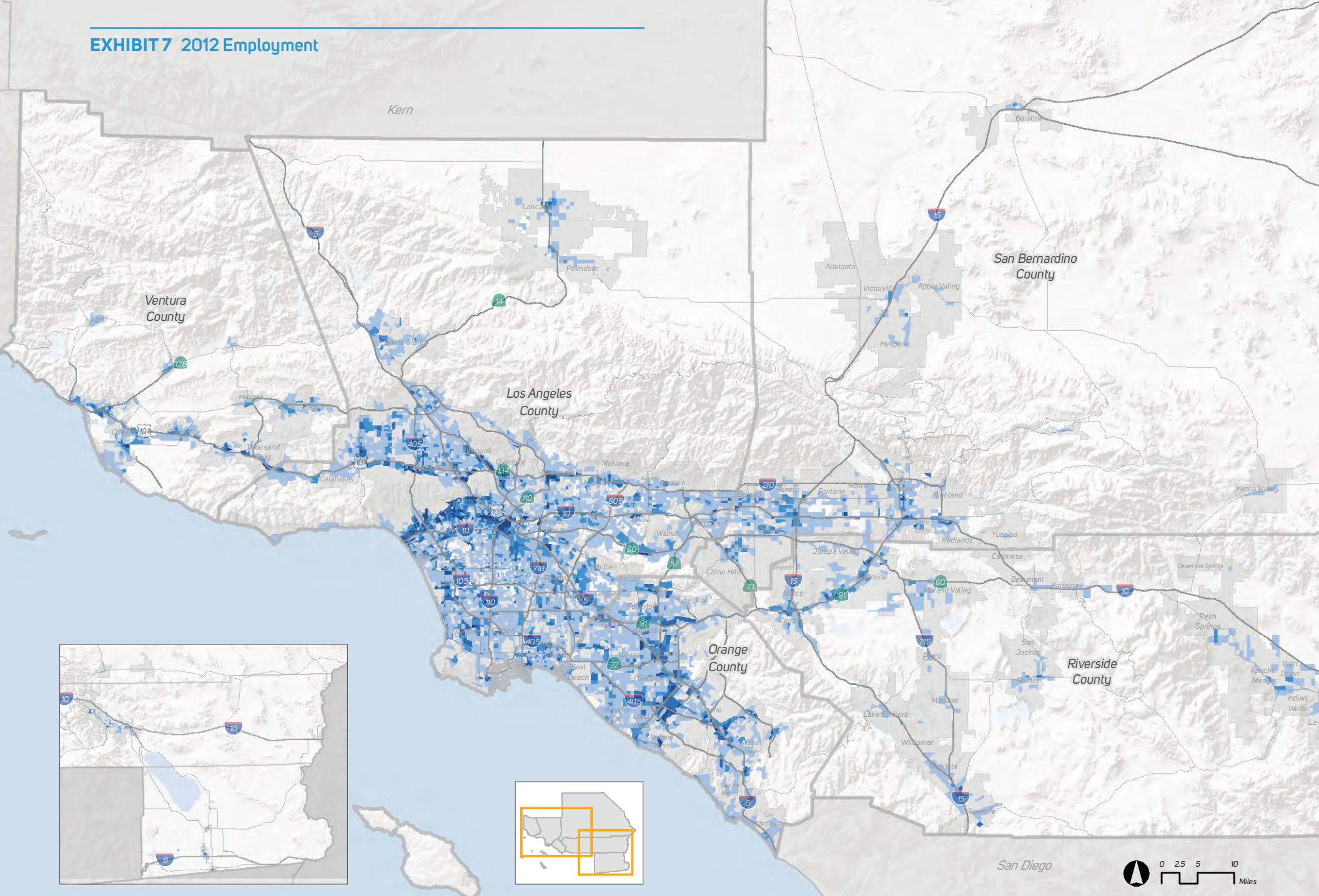
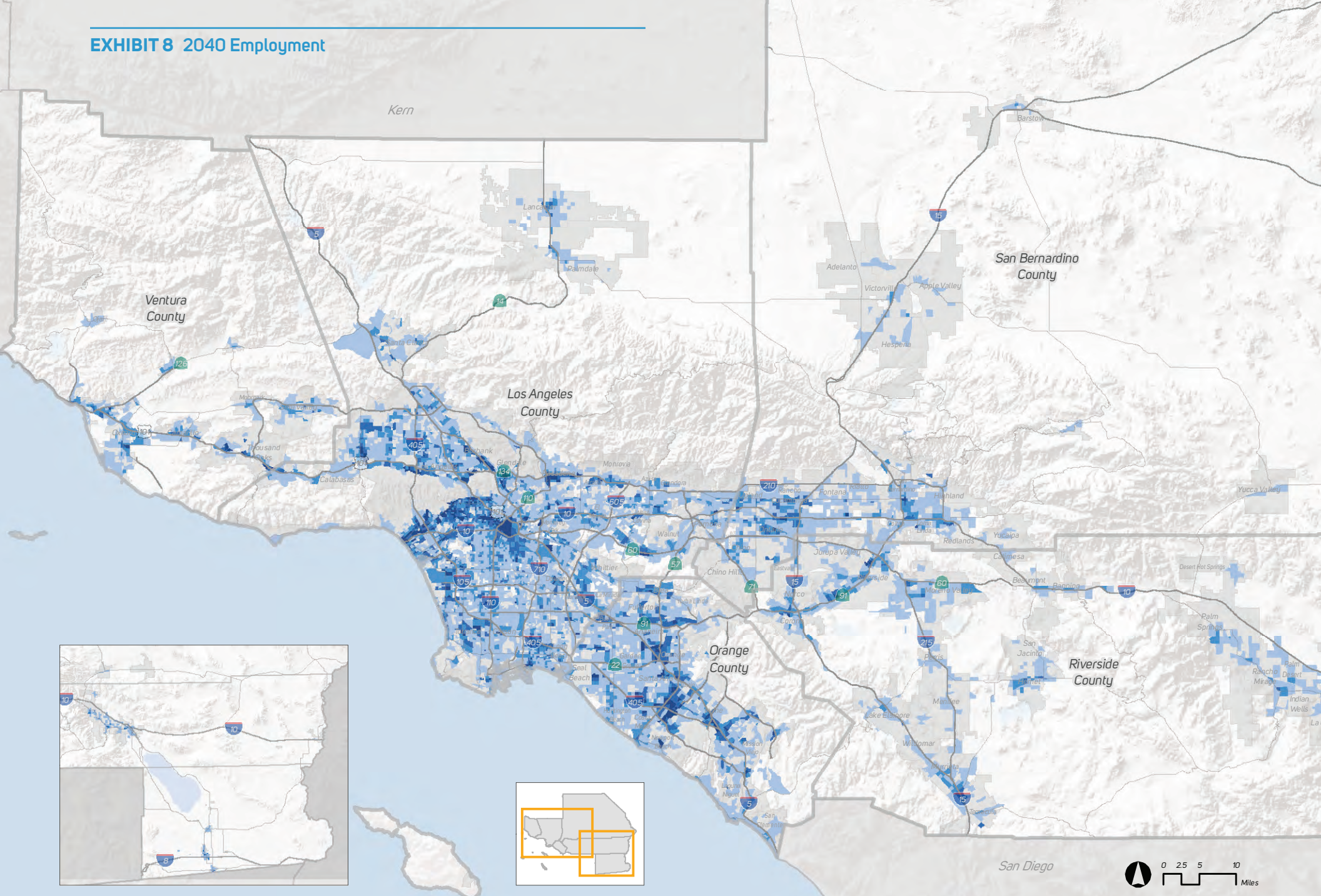
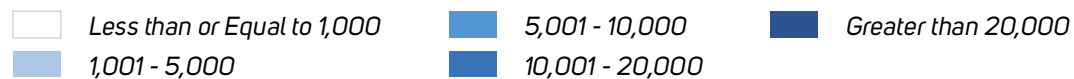


EXHIBIT 8 2040 Employment



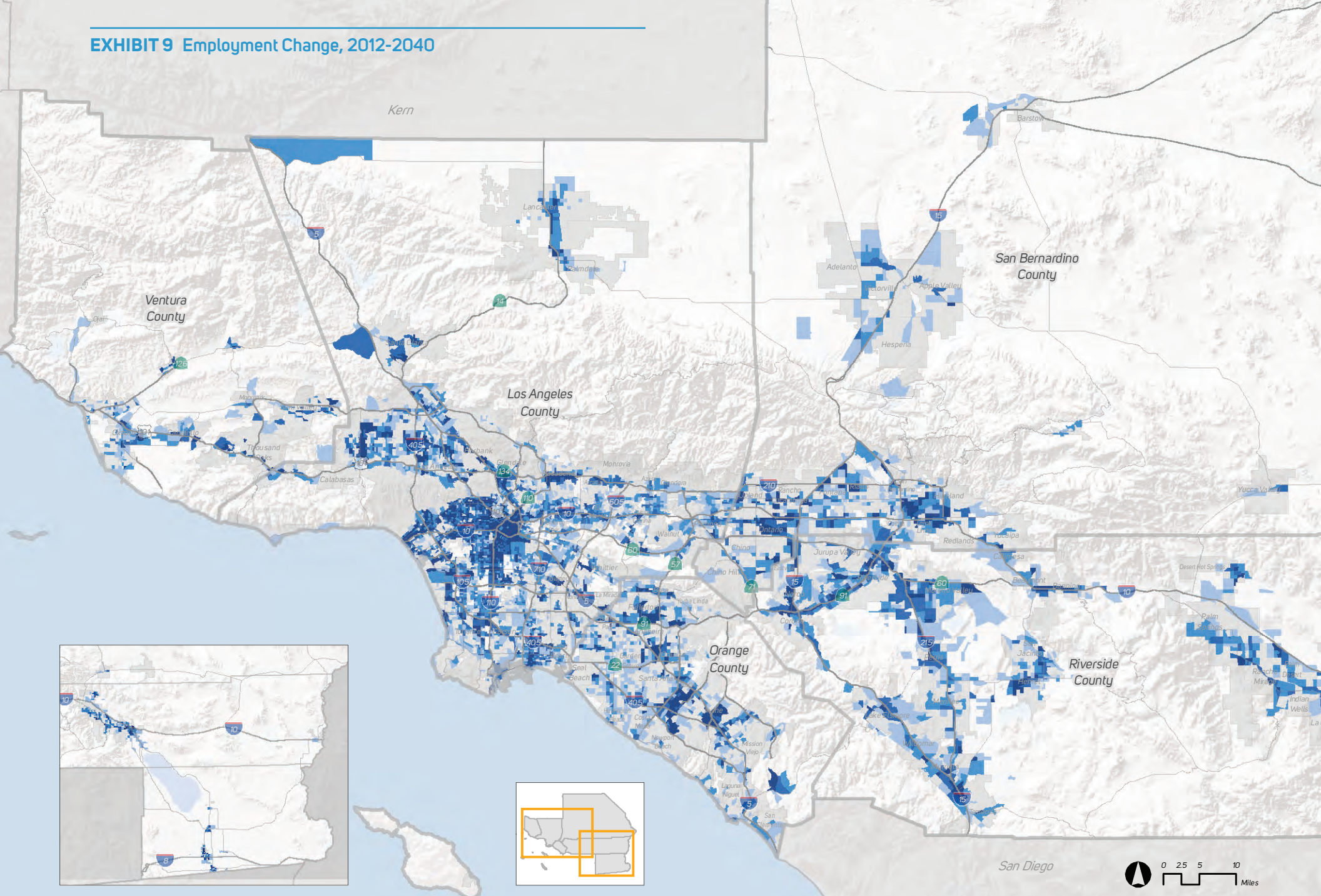
Employment Density in 2040 (Jobs per Square Mile)



(Source: SCAG, 2015)

Note: Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF for regional modeling purpose only, and is advisory and non-binding.

EXHIBIT 9 Employment Change, 2012-2040



Employment Growth, 2012 - 2040 (Jobs per Square Mile)



(Source: SCAG, 2015)

Note: Transportation Analysis Zone (TAZ) level data or any data at a geography smaller than the jurisdictional level is included in the draft PGF for regional modeling purpose only, and is advisory and non-binding.

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**SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS**

MAIN OFFICE

818 West 7th Street, 12th Floor
Los Angeles, CA 90017
(213) 236-1800

www.scag.ca.gov

REGIONAL OFFICES

Imperial County
1405 North Imperial Avenue, Suite 1
El Centro, CA 92243
Phone: (760) 353-7800
Fax: (760) 353-1877

Orange County
OCTA Building
600 South Main Street, Suite 906
Orange, CA 92868
Phone: (714) 542-3687
Fax: (714) 560-5089

Riverside County
3403 10th Street, Suite 805
Riverside, CA 92501
Phone: (951) 784-1513
Fax: (951) 784-3925

San Bernardino County
Santa Fe Depot
1170 West 3rd Street, Suite 140
San Bernardino, CA 92410
Phone: (909) 806-3556
Fax: (909) 806-3572

Ventura County
950 County Square Drive, Suite 101
Ventura, CA 93003
Phone: (805) 642-2800
Fax: (805) 642-2260



APPENDIX

CURRENT CONTEXT | DEMOGRAPHICS & GROWTH FORECAST

DRAFT DECEMBER 2015

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