12.27.2013

The San Bernardino County Economy

Economic Trends and Forecasts
Quarter 1- Quarter 3 2013

This report details the macroeconomic conditions in the nation and the state of California over next 2 years. It examines the Inland Empire's economy and industries for their ability to drive job growth. It also identifies those occupations that may become a supply-constraint to future job creation.

Prepared for Workforce Investment Board of San Bernardino County

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CHMURAECONOMICS&ANALYTICS

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I. Background

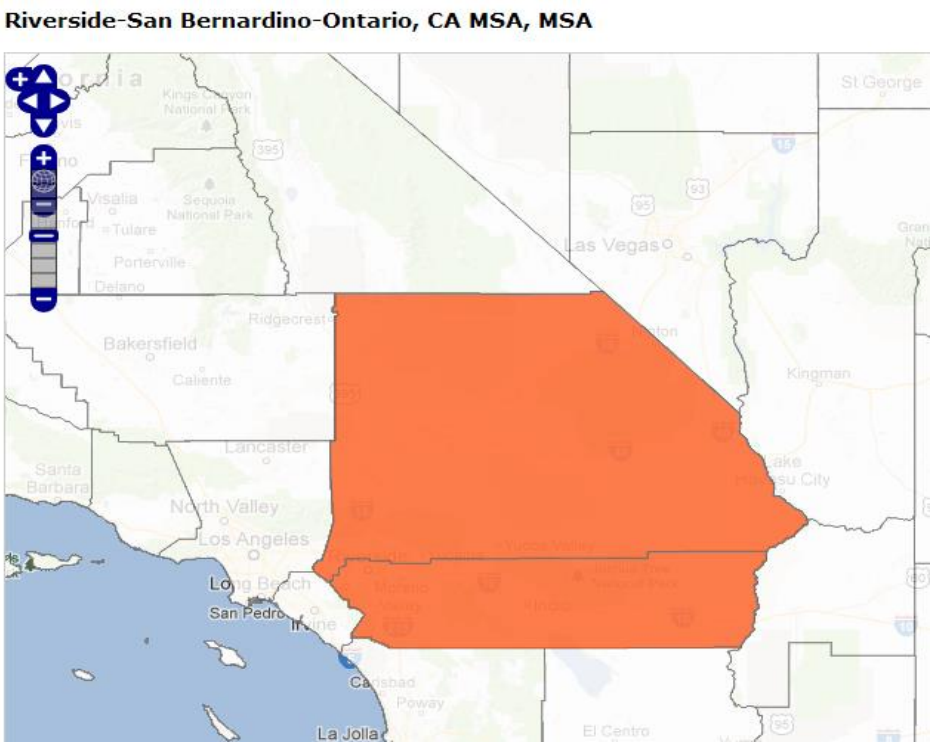
The County of San Bernardino Workforce Investment Board (WIB) requested labor market information that covers the Inland Empire region of California, via a written report and presentation twice per year. Chmura Economics & Analytics (Chmura) was retained to provide this economic analysis and its interim report covering the economic developments from quarter 1 to quarter 3, 2013 regarding the local, state, and national economic outlook as well as analysis of the region's strongest industry clusters in terms of job creation and which occupations could be in short supply in the region. Specifically, the WIB asked to include the following topics in this analysis:

- Demographics - population characteristics of the Inland Empire area
- Economic characteristics of the population in the Inland Empire
- Description of the local labor market, i.e., make-up of the labor market
- Commercial and residential real estate market characteristics
- Employment forecast and occupational analysis in the Inland Empire

Geography and Labor Shed

While the San Bernardino County WIB contracted this research, it is generally recognized that its economy and natural labor shed includes neighboring Riverside County. Together these two counties comprise the "Inland Empire" region (San Bernardino and Riverside counties) which is equivalent to the Riverside-San Bernardino-Ontario, California Metropolitan Statistical Area (MSA). Throughout this report, the Riverside-San Bernardino-Ontario, California MSA is considered the primary labor shed. This report also references data at the state level, as well as for the nation as a whole.

Figure 1: Riverside-San Bernardino-Ontario, California MSA



II. National & Regional Economic Outlook

Growth in real gross domestic product (GDP) improved in the third quarter of 2013, increasing an annualized 4.1%, compared with 2.5% annualized growth in the second quarter of 2013. Payroll growth continued at a moderate pace with 502,000 nonfarm jobs added over the quarter, while the unemployment rate continued to decline, from 7.6% in the second quarter to 7.2% in the third quarter. Home prices continue to appreciate, but the realization that the Federal Reserve will begin to wind down its bond buying program has driven mortgage rates higher; higher borrowing costs coupled with rising home prices have slowed the recovery in the housing sector.

National Outlook, 2013-2014

Our forecast indicates that real GDP will grow at an annualized pace of 1.9% in the fourth quarter of 2013 and 1.8% for the entire year. With the recovery continuing, albeit slower after spending cuts due to sequestration and the government shutdown, labor market conditions have been slowly improving. The real estate market continues to show positive signs and improvement. In this environment of continued modest growth and elevated unemployment, the federal funds rate target is expected to remain in the current range of 0% to 0.25% through the middle of 2015.

For the third quarter of 2013, real GDP grew an annualized 4.1%, after increasing 2.5% in the second quarter. The labor market continued to add jobs in the third quarter of 2013 following moderate employment growth in the second quarter. Nonfarm private payroll growth for the first quarter expanded at a 1.7% annualized pace after also expanding 1.7% in the second quarter of 2013. The national unemployment rate was down at 7.2% in September 2013, from 7.6% in June. Home sales continue to improve from severely depressed levels, and the Federal Housing Finance Agency's House Price Index for the third quarter shows prices have increased on a year-over-year basis in every state. The housing sector was a positive contributor to GDP growth in 2012 and in the first three quarters of 2013, a trend which Chmura expects to continue. The U.S. stock market has weathered concerns about the Federal Reserve tapering its bond-buying program and jumped after the announcement at the December Federal Open Market Committee meeting that the program will be gradually reduced beginning in January. Our most-likely forecast assumptions reflect a slowly recovering economy and no lasting effects from a government shutdown. The results are steady but moderate GDP growth and job creation. Our alternative scenario assumes consumer confidence and employment are depressed following a government shutdown.

The most-likely scenario assumes the price of oil averages $98 a barrel in 2013 before advancing to $104 per barrel in 2014 due to higher demand. The alternative scenario assumes that sanctions are reinstated on Iran, driving oil prices higher; prices rise from $101 in 2013 to $122 per barrel in 2014. The labor market is expected to continue to improve in both scenarios. The unemployment rate is likely to average 7.4% in 2013 and fall to 6.8% in 2014 according to the most-likely scenario. According to the alternative scenario, the unemployment rate is forecast to fall from 7.4% in 2013 to 7.1% in 2014. The Federal Open Market Committee (FOMC) is expected to keep its historically low federal funds rate target through the end of 2014 under the likely scenario, and later in 2015 under the alternative scenario as slower growth leads the Federal Reserve Bank to start the tightening later.

Figure 2: National Macro Forecast, 2013-2014

Forecasts	2012	2013	2014
Real GDP	2.8%	1.8%	2.7%
Unemployment Rate	8.1%	7.4%	6.8%
Real Non-Residential Investment	7.3%	2.5%	5.3%
Real Consumer Spending	2.2%	1.8%	2.0%
Key Assumptions			
Oil Prices	$94	$98	$104
Federal Funds Rate	0.1%	0.1%	0.2%
10-Year Treasury	1.8%	2.3%	2.8%

Source: Chmura Economics & Analytics

Changes from Previous Forecast

Chmura's 3rd quarter, 2013 overall growth forecast for 2013 and 2014 is relatively unchanged from our original estimate in the first quarter of 2013, however we have revised downward our estimate of real non-residential investment (the first quarter, 2013 forecast was for a 6.1% increase), which now stands at 2.5%, while we have revised slightly upward our estimate for real consumer spending (the first quarter, 2013 forecast was 1.6% in 2013), which is now 1.8% for 2013. Oil prices—West Texas Intermediate Crude—have also remained in the $90 to $110 range rather than declining in 2013 toward $80 a barrel, as Chmura anticipated early in the year.

National Economy Nears Recovery

In terms of the labor market, the recovery from the 2007-2009 recession has been the slowest of all post-World War II recoveries. After six years, however, the U.S. economy is approaching the recovery phase in terms of reaching the level of employment—typically gauged by seasonally adjusted non-farm payroll—that the economy had at its previous peak in January 2008. Based on recent growth trends, Chmura estimates the U.S. economy will likely regain its previous peak in the third quarter of 2014.

This recovery, in contrast to many recoveries from previous recessions has been very mixed in terms of the experience of individual states. In past recoveries, particularly in early 1990s and the mid-2000s, most states saw steady gains in employment and wages and sustained drops in unemployment claims and the unemployment rate, this recovery has been quite different. Many states—including California—have seen much less strength in their labor market as evidenced by their unemployment rates, claims data, and overall job growth. Meanwhile, some states, such as Texas and Utah, have charted new records in employment.

Another feature of this recovery has been the preponderance of job growth that has occurred among lower paid jobs. This is not without historic precedence as research by the Atlanta Federal Reserve has found that "low wage" jobs typically account for 40% to 50% of the jobs created in recoveries dating back to the 1970s.[1] In California, the jobs in the lowest decile—lowest 10% of jobs by average annual salaries—accounted for about 42% of jobs created

[1] "Myth and Reality: The Low-Wage Job Machine" David Altig, Federal Reserve Bank of Atlanta, macroblog 9-Aug-2013 http://macroblog.typepad.com/macroblog/2013/08/myth-and-reality-the-low-wage-job-machine.html

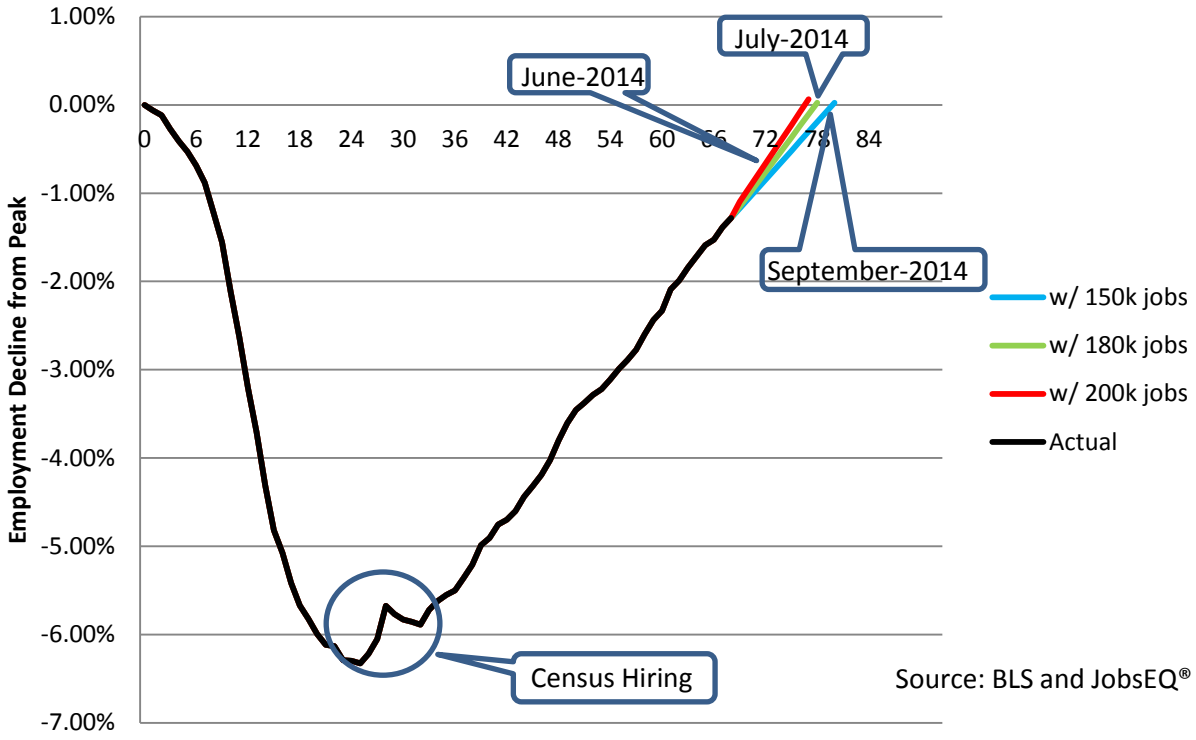
in the past three years compared to 39% in the nation. However, in the Inland Empire region more than three-fifths of all jobs were created over the same period in the lowest 10% of all jobs by wages—these are jobs paying less than $30,200.

Figure 3: Low Wage Job Creation

Region	Total Jobs Created Q3 2010 to Q3 2013	Share of Jobs Created in Lowest Decile	Lowest Decile Average Annual Wage
Inland Empire	54,237	58%	$30,200
California	896,318	42%	$31,600
USA	5,718,374	39%	$28,200

Source: JobsEQ®

Figure 4: Almost There: US Employment Level Nears Pre-Recession Peak



California Outlook, 2013-2014

The recovery of California's economy is roughly at pace with the nation, but California lost a larger share of its employment during the recession. In 2012, California's employment increased by 2.7%, faster than the 1.7% increase in the nation. Chmura forecasts employment in California to increase by 2.0% in 2013 and by another 1.8% in 2014, whereas unemployment will average about 8.7% in 2013 and 8.1% in 2014.

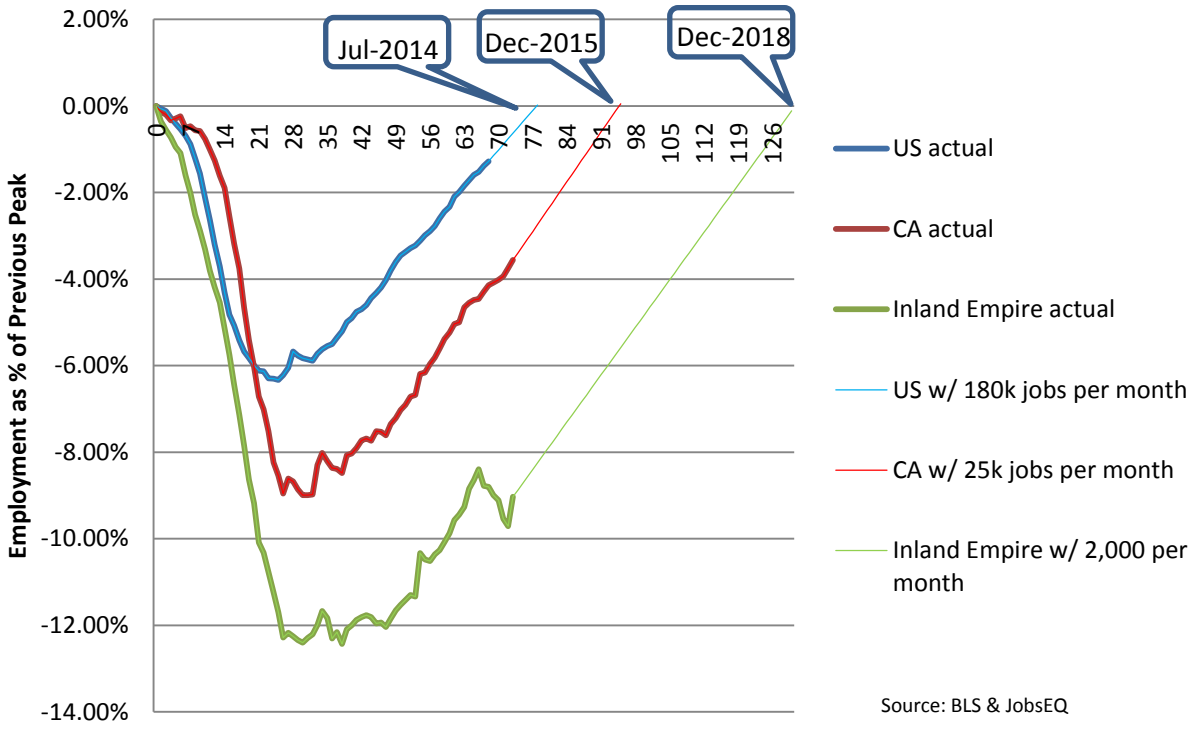
Figure 4: California Employment Summary Forecasts

	California Employment Growth**			California Unemployment Rate		
	2012*	2013	2014	2012*	2013	2014
Chmura Forecast	2.7%	2.0%	1.8%	10.5%	8.7%	8.1%

Forecasts as of Sep-Nov-2013
*Actual
**Employment refers to nonagricultural employment.

Because California's economy lost approximately 9% of its employment from its mid-2007 peak to its trough in early 2010, it is unlikely to fully recover these losses until the end of 2015. Since July 2011—at which point the California economy began to steadily add employment—the state economy has averaged close to 24,000 new jobs per month. As of October 2013, its labor market was about 3.3% below its previous employment peak (15.2 million jobs).

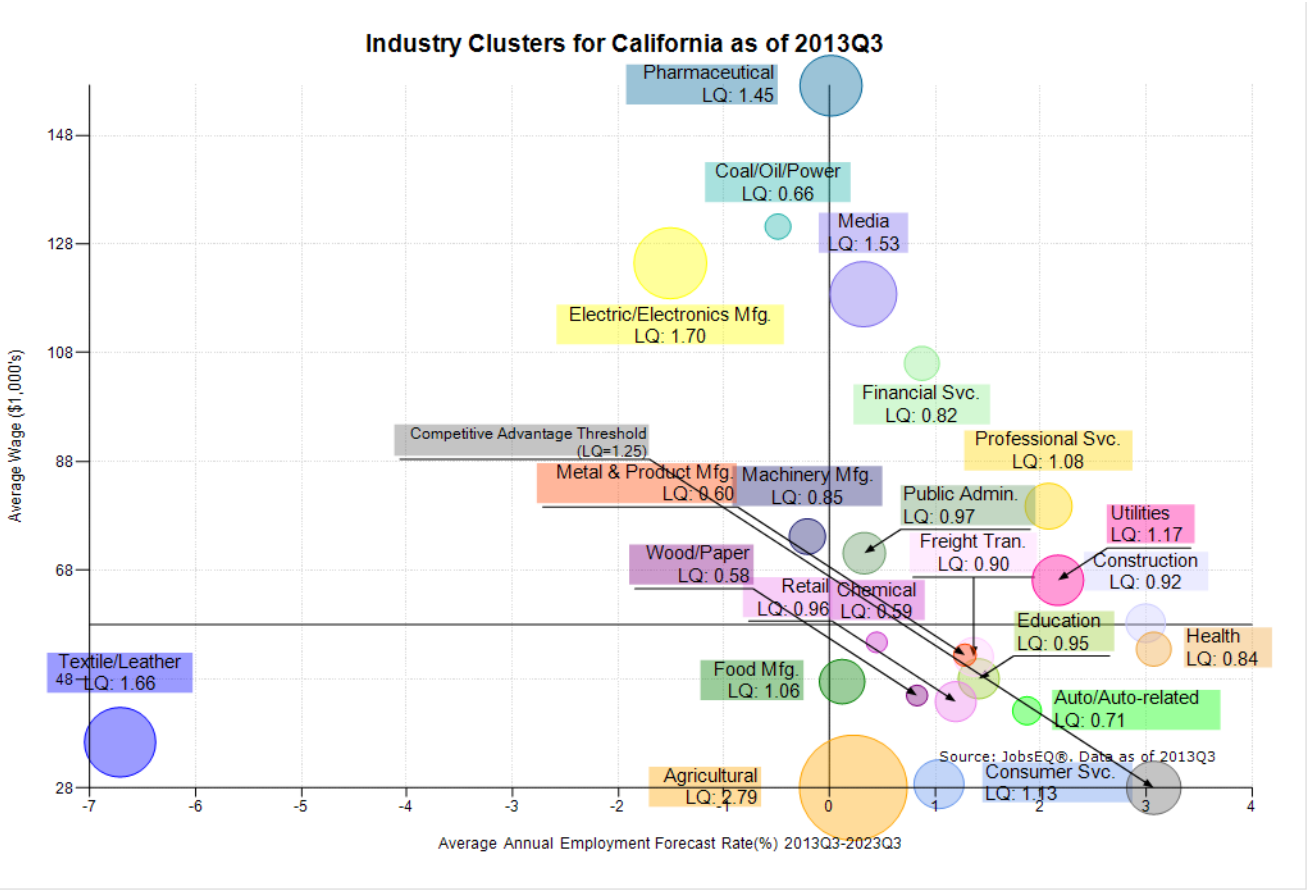
Figure 5: How Long will it Take to Regain Lost Ground?



In the past three years, California's economy has added approximately 777,000 jobs. However, more than 72% of these new jobs were created in only four sectors: professional, scientific and technical services; accommodation and food services; administrative and waste management and remediation services; and healthcare and social assistance. Meanwhile, California's education services and public administration sectors have continued to shed jobs as state and local budgets are cut. The Golden State's manufacturing sector, which added jobs at a modest

pace in both 2011 and 2012 began to decline again in 2013, and has added a paltry net 5,400 jobs (average annual growth of 0.1%) in the past three years—third quarter 2010 to third quarter 2013.

Figure 6: California Industry Cluster 10-Year Growth Forecast



In terms of the location quotient (LQ)—a common measure of the relative size of an industry and traditional gauge of the presence of competitive clusters—California has competitive clusters in agriculture (LQ=2.79), pharmaceutical manufacturing (1.45), electrical/electronic manufacturing (1.70), textiles/leather manufacturing (1.66), and media (1.53). Annual average employment growth over the next decade is expected to be slow for the pharmaceutical (+0.0%), media (+0.3%), and agricultural (+0.2%) clusters. Moreover, the textile/leather manufacturing cluster is forecast to shrink by 6.7% annually and employment in the electrical/electronics manufacturing cluster is forecast to decline by 1.5% annually. The state's three clusters with the fastest long-run employment growth projections are its health sector (+3.1%), construction (+3.0%), and utilities (+2.2%).

III. Inland Empire Economic Outlook

The remainder of this report focuses on the Inland Empire region, San Bernardino and Riverside counties, which is equivalent to the Riverside-San Bernardino-Ontario, California MSA.

Demographic Profile

The Riverside-San Bernardino-Ontario, California MSA is home to more than 4.3 million people and represents about 11.4% of California's total population. Over the past ten years, this region has grown much faster than the state and national norms of roughly 1% per year. The population of the two-county region has grown a rapid 2.2% per year for the past decade. Chmura projects the population of the Riverside-San Bernardino-Ontario, California MSA will continue to grow faster than the rest of California over the coming decade, which in turn will help bolster the region's long-run economic prospects.

Figure 7: Population Growth Statistics

Region	Average Yearly Population Growth 2000-2010	Working Age Population Growth 2013-2020	Ratio of Retirees to Working Age Population in 2020
Inland Empire	2.2%	+24%	4.80
California	0.9%	+7%	4.66

Source: Chmura Economics & Analytics

The Inland Empire region has a poverty rate about one percentage point above that of the nation, but only about a half percentage point above California's poverty rate. Overall, the Inland Empire is nearly half Hispanic or Latino according to the U.S. 2010 Census, and about 40% white. African Americans account for roughly 7.6% of the population and Asian Americans about 6.1%. This demographic profile is distinct from the rest of California—with roughly a 13% Asian-American mix—and starkly different from the demographic make-up of the nation where Latinos account for only about 16.3% of the total population. The Inland Empire region has approximately the same level of military personnel living in the area as state and national norms.

The average educational attainment in the Inland Empire is lower than both state and national averages. The share of population in the Inland Empire with no high school diploma is 21.4% compared to 19.2% for California and 14.6% for the nation. Similarly, the share of the Inland Empire's population with a bachelor's degree is only 12.8% compared to 19.3% in California and 17.7% in the nation. Overall postsecondary attainment—share of the population with an associate's degree or higher—is about ten percentage points lower than the California average of 38% and eight percentage points below the national norm of 36%.

Figure 8: Demographic Profile Riverside-San Bernardino-Ontario, CA MSA

Demographic Profile

	----------Percent----------			----------Value----------		
	Riverside-San Bernardino-Ontario, CA MSA	**California**	**USA**	**Riverside-San Bernardino-Ontario, CA MSA**	**California**	**USA**
Demographics						
Population[3]	-	-	-	4,304,997	37,691,912	311,591,917
Population Annual Average Growth[3]	2.2%	0.9%	0.9%	92,763	321,245	2,662,296
Median Age[4]	-	-	-	32.7	35.2	37.2
Under 18 Years	28.8%	25.0%	24.0%	1,214,696	9,295,040	74,181,467
18 to 24 Years	10.9%	10.5%	9.9%	458,633	3,922,951	30,672,088
25 to 34 Years	13.4%	14.3%	13.3%	564,520	5,317,877	41,063,948
35 to 44 Years	13.4%	13.9%	13.3%	566,254	5,182,710	41,070,606
45 to 54 Years	13.5%	14.1%	14.6%	570,032	5,252,371	45,006,716
55 to 64 Years	9.7%	10.8%	11.8%	410,782	4,036,493	36,482,729
65 to 74 Years	5.8%	6.1%	7.0%	244,093	2,275,336	21,713,429
75 Years, and Over	4.6%	5.3%	6.0%	195,841	1,971,178	18,554,555
Race: White	58.9%	57.6%	72.4%	2,488,308	21,453,934	223,553,265
Race: Black or African American	7.6%	6.2%	12.6%	322,405	2,299,072	38,929,319
Race: American Indian and Alaska Native	1.1%	1.0%	0.9%	46,399	362,801	2,932,248
Race: Asian	6.1%	13.0%	4.8%	259,071	4,861,007	14,674,252
Race: Native Hawaiian and Other Pacific Islander	0.3%	0.4%	0.2%	13,744	144,386	540,013
Race: Some Other Race	21.0%	17.0%	6.2%	887,896	6,317,372	19,107,368
Race: Two or More Races	4.9%	4.9%	2.9%	207,028	1,815,384	9,009,073
Hispanic or Latino (of any race)	47.3%	37.6%	16.3%	1,996,402	14,013,719	50,477,594
Economic						
Labor Force (civilian population 16 years & over)[5]	62.1%	64.1%	64.4%	1,932,781	18,472,288	155,320,515
Armed Forces Labor Force[5]	0.6%	0.5%	0.5%	18,648	146,361	1,136,179
Median Household Income[4,5]	-	-	-	$57,096	$61,632	$52,762
Poverty Level (of all people)[5]	15.1%	14.4%	14.3%	618,822	5,211,481	42,739,924
Mean Commute Time (minutes)[5]	-	-	-	30.6	27	25.4
Commute via Public Transportation[5]	1.6%	5.1%	5.0%	26,836	833,261	6,915,130

Figure 9: Demographic Profile (cont.) Riverside-San Bernardino-Ontario, CA MSA

	----------Percent----------			----------Value----------		
	Riverside-San Bernardino-Ontario, CA MSA	California	USA	Riverside-San Bernardino-Ontario, CA MSA	California	USA
Housing						
Total Housing Units	-	-	-	1,500,344	13,680,081	131,704,730
Median House Value (of owner-occupied units)[4,5]	-	-	-	$281,600	$421,600	$186,200
Homeowner Vacancy	3.5%	2.1%	2.4%	30,555	154,775	1,896,796
Rental Vacancy	9.1%	6.3%	9.2%	45,439	374,610	4,137,567
Renter-Occupied Housing Units (Percent of Occupied Units)	35.5%	44.6%	35.5%	452,093	5,542,127	40,730,218
Occupied Housing Units with No Vehicle Available (Percent of Occupied Units)[5]	5.1%	7.7%	8.9%	64,458	953,126	10,264,658
Social						
Educational Attainment: No High school Diploma[5]	21.4%	19.2%	14.6%	539,253	4,564,854	29,518,935
Educational Attainment: High School Graduate[5]	26.1%	21.1%	28.6%	655,435	5,025,372	57,861,283
Educational Attainment: Some College, No Degree[5]	25.0%	21.8%	21.0%	629,643	5,186,847	42,350,233
Educational Attainment: Associate's Degree[5]	7.8%	7.7%	7.6%	196,907	1,825,704	15,344,048
Educational Attainment: Bachelor's Degree[5]	12.8%	19.3%	17.7%	321,303	4,583,032	35,852,277
Educational Attainment: Post Graduate Degree[5]	6.9%	11.0%	10.5%	172,413	2,612,035	21,121,347
Disabled, Age 16 to 64 (Percent of Total Population)[1]	1.6%	1.6%	1.5%	68,862	622,147	4,776,516
Foreign Born[5]	21.8%	27.2%	12.8%	911,725	10,042,574	39,268,838
Speak English Less Than Very Well (population 5 yrs and over)[5]	17.0%	19.7%	8.7%	654,907	6,792,119	24,950,788

Recent Economic Performance & Outlook 2013-2014

The Riverside-San Bernardino-Ontario MSA was hit harder in the previous recession and housing crisis than most regions of California. Thus far, the Inland Empire's recovery has been behind the overall state as well as the nation. California has shown better job growth and registered stronger wage gains in the previous two years than the Inland Empire. However, in contrast to Chmura's initial forecast in March 2013, the Inland Empire economy will likely underperform the California economy in terms of job creation and wage growth in 2013 and 2014. Real retail sales should remain strong in the metro area, averaging about 5.2% for both of the next two years. Building permits, a leading indicator of economic activity, should maintain a double-digit expansion over the next two years, and are projected to beat the statewide norm. Chmura's forecast for 2013 is consistent with approximately 18,000 jobs being created over the course of the year or about 1,500 jobs per month. This 1,500-per-month jobs projection is below the recent average for monthly job creation from March 2012 to October 2013 for the Inland Empire economy, which averaged 1,700 per month. The 2,000 jobs created per month that is referenced in Figure 5 (Section II) represents an accelerated growth estimate consistent with the region's long-run growth rate, but one that is unlikely to be achieved consistently over the next 2 years.

Figure 10: Recent and Forecast Economic Performance

Region/Indicators		Actual		Forecast	
San Bernardino MSA	**2010**	**2011**	**2012**	**2013**	**2014**
Employment	-2.30%	0.80%	2.70%	1.70%	1.50%
Wages and Salaries	-1.20%	2.70%	3.50%	3.20%	3.10%
Real Retail Sales	2.80%	6.50%	6.10%	5.70%	4.80%
Building Permits	5.00%	-23.90%	23.30%	43.90%	24.80%
California					
Employment	-1.40%	0.90%	2.70%	2.00%	1.80%
Wages and Salaries	1.80%	4.60%	5.90%	4.20%	4.00%
Real Retail Sales	3.30%	6.30%	6.00%	6.20%	5.80%
Building Permits	24.80%	7.20%	27.80%	36.80%	18.10%

Source: Chmura Economics & Analytics

*Employment refers to nonagricultural employment.

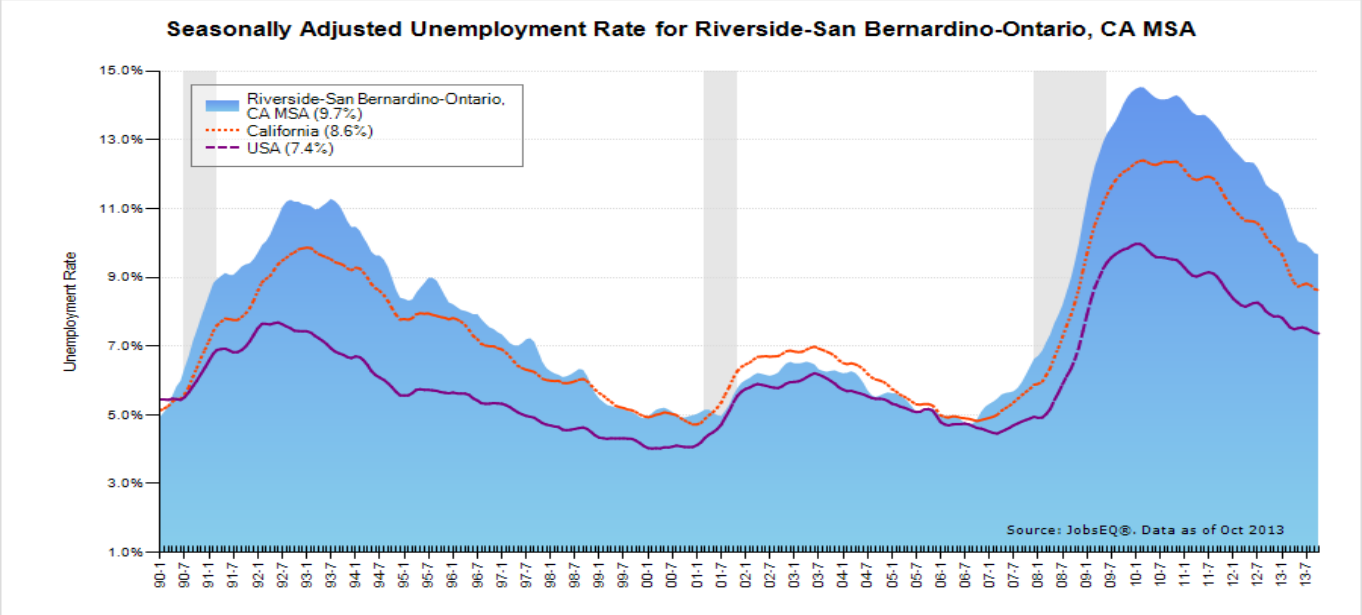
**Wages and salaries include some options that were exercised. Actual data are through the 3rd quarter of 2013.

The outlook among Inland Empire businesses varied over the course of 2013 based on business survey results. In the first half of the year, 23% of respondents expected "increasing" sales and this rose to 29% among respondents during the second half of 2013. When asked what their business plans were, 21% in the first half said they planned to expand; however, this dropped to 10% among respondents during the second half of the year. Among manufacturing firms specifically, the percentage with expansion plans fell from 25% in the first half to 13% in the second half of 2013.

The Inland Empire's unemployment rate has tracked steadily lower in 2013 (seasonally adjusted),[2] and is currently estimated to be 9.7% as of October 2013. The region's unemployment rate peaked at roughly 14.5% in early 2010, has dropped nearly 5 percentage points since then, but remains nearly 2.5 percentage points higher than the national unemployment rate. Much of this improvement in the unemployment rate has come through a decline in the region's labor force participation due to a rise in the number of discouraged workers no longer looking for work. The region is still probably at least five years from reaching its previous level of peak employment.

[2] The seasonal adjustment calculation in JobsEQ is based on a proprietary algorithm designed for online applications. Thus, seasonally adjusted data in JobsEQ may not match exactly with seasonally adjusted data from other sources, such as the Bureau of Labor Statistics (BLS).

Figure 11: Seasonally Adjusted Unemployment Trends



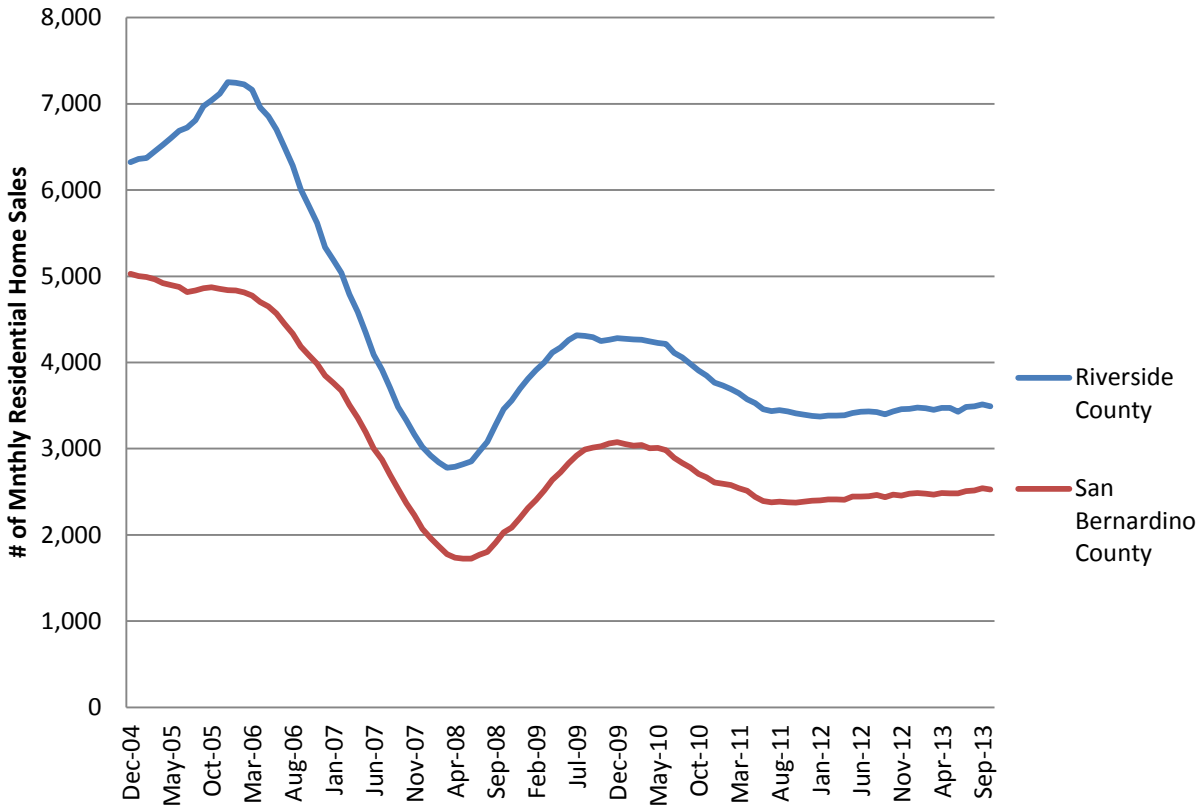
Housing Sector Analysis

The housing sector is moving in a positive direction on a number of fronts. Home sales are moving toward levels that are based on healthy fundamentals such as household formation, overall population growth, and the replenishment of depreciated housing stock (replacing old homes). Several metrics indicate that the region's distressed housing stock (short-sales, foreclosures, and other non-traditional sales) are becoming a smaller share of overall sales. In fact, foreclosures could represent less than 5% of all sales by the end of 2014 in both San Bernardino and Riverside Counties. Perhaps most importantly, housing prices have bottomed out and are slowly, but steadily, moving upwards.

The commercial real estate market looks much stronger relative to the residential market, with vacancies moving steadily downward and rental/lease prices moving upward. The region's commercial sector looks particularly strong in the industrial segment, where the region benefits from the ultra-low industrial space vacancy rates in Los Angeles (roughly 2.5%) and the continuing strong volumes being processed through the Port of Los Angeles.[34]

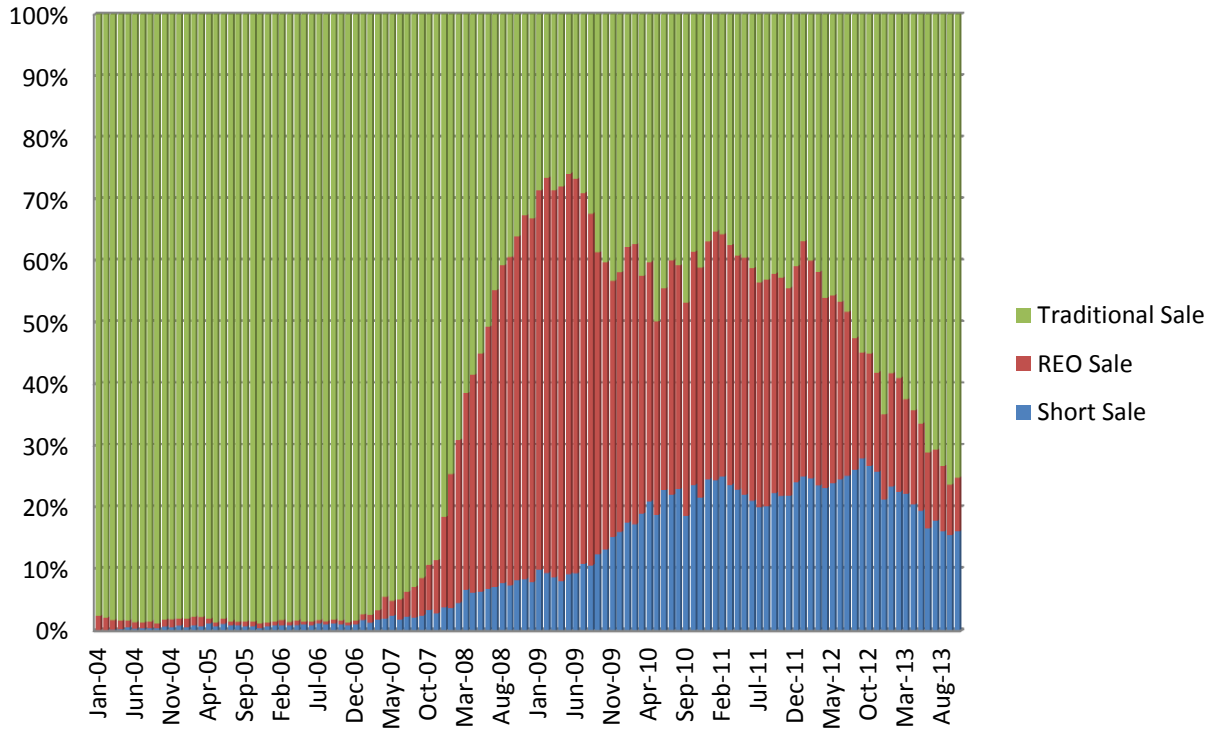
[3] "In the Inland Empire, and Industrial Real Estate Boom" Roger Vincent, Los Angeles Times; 12-Apr-2013
[4] Port of Los Angeles Container Statistics 2012-2013

Figure 12: Twelve-Month Moving Average Home Sales



The San Bernardino residential housing market is also moving in a positive direction and steady progress was made in 2013 to converge with neighboring Riverside County. Housing prices (see Figure 15) and the moving average of monthly home sales are both moving at roughly the same rate as in Riverside County. Additionally, the number of distressed sales as a share of overall residential sales has begun to decline consistently and the share of foreclosure sales are very close to the corresponding rate in Riverside County. Foreclosure sales in San Bernardino have declined to roughly 8% of all sales and the share of short sales fell from over 20% down to 16% of all sales in San Bernardino County by mid-2013. Chmura expects the twelve-month moving average of home sales will hover near 2,500 sales per month for the remainder of 2013—which is a level of sales consistent with the region's household formation fundamentals.

Figure 13: San Bernardino County: Residential Home Sales by Type



The housing market is slightly stronger in Riverside County than in San Bernardino where the number of foreclosure-based sales has been in decline for nearly two years and is now only about 6.5% of all monthly sales. Short sales as a share of all sales in Riverside County peaked in mid-2012 but have since been trending steadily lower and are now less than 13% of all monthly sales. Based on these trends, the share of total distressed sales will likely fall below 15% of all sales by the end of 2014. Chmura expects that the twelve-month moving average of home sales—a simple way to remove the strong seasonality associated with home sales—will hover near 3,500 sales per month for the remainder of 2013.

Figure 14: Riverside County: Residential Home Sales by Type

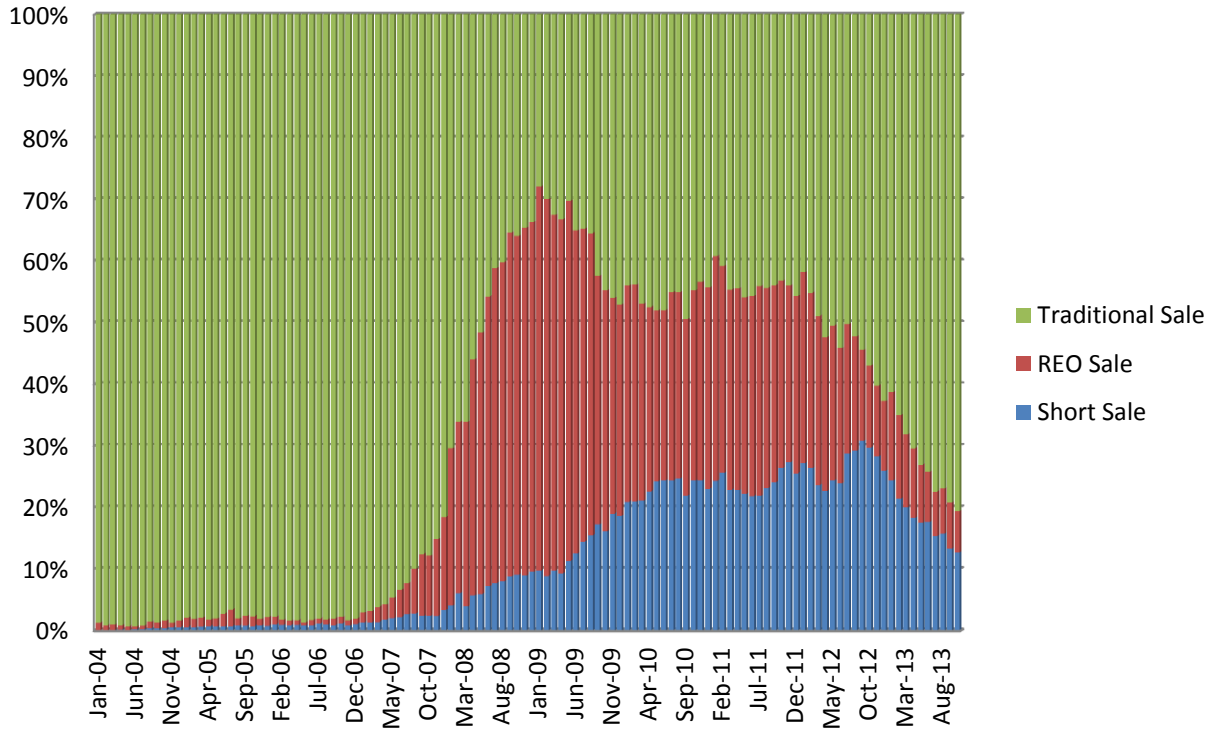
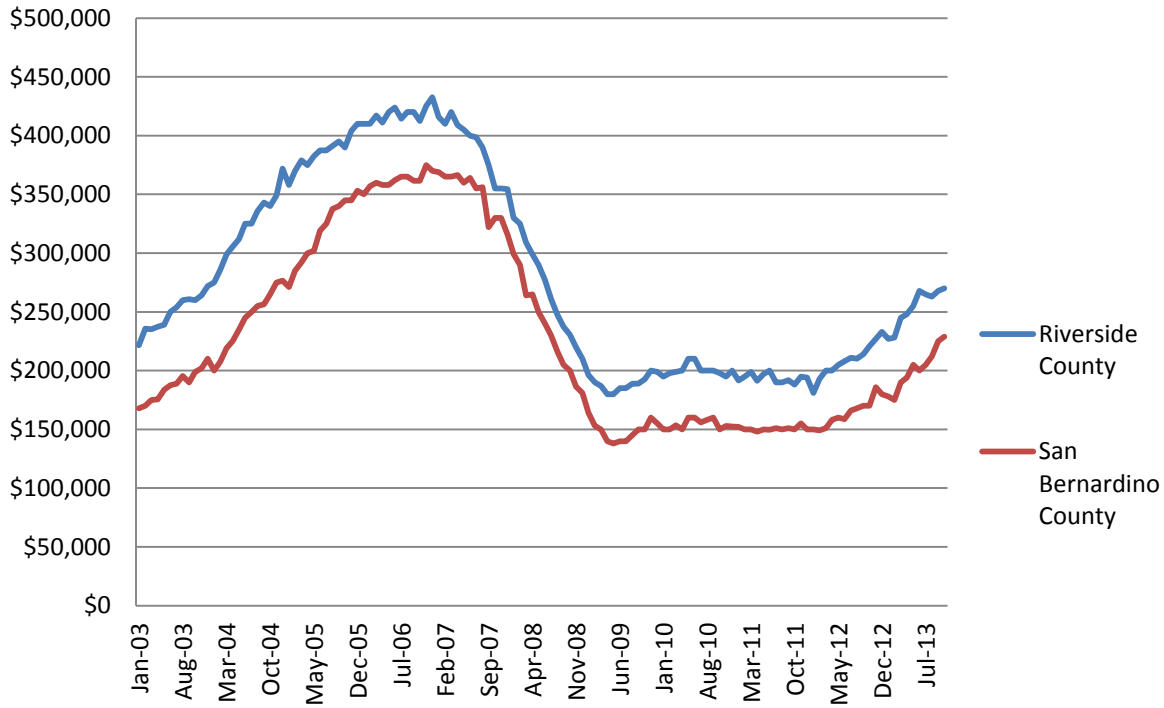


Figure 15: Median Single Family Home Prices



Industry Clusters and Job Creation Potential

A sector scorecard brings together several metrics to assess the relative ability of an industry to drive long-run employment gains. This analysis synthesizes several different employment-related trends to identify those industries that are thriving and likely to continue to thrive in the local economy; thus driving job gains. In particular, this analysis examines the location quotient, the three-year employment growth projection, and the three-year competitiveness score—which indicates if employment (not output) has increased after accounting for national employment trends and the local mix of industries.

Figure 16: Sector Scorecard

	Current			Historical				Forecast	
	Four Quarters Ending with 2013q3			Total Change over the Last 3 Years	Average Annual % Change in Employment 2010q3-2013q3			Next 3-Years	3-Year Analytic
Sector	Employment	Average Annual Wages	LQ	Employ-ment	Riverside-San Bernardino-Ontario, CA MSA	CA	USA	Average Annual Growth Percent	Local Compet-itiveness
Health Care and Social Assistance	149,790	$46,003	0.87	18,203	4.4%	3.8%	1.9%	3.7%	✓
Transportation and Warehousing	71,322	$42,968	1.54	7,836	4.0%	1.3%	1.5%	2.7%	✓
Retail Trade	165,270	$28,568	1.21	9,213	1.9%	1.5%	1.3%	2.1%	✓
Wholesale Trade	53,635	$50,595	1.04	5,173	3.4%	2.5%	1.5%	2.2%	✓
Arts, Entertainment, and Recreation	28,918	$29,967	1.33	-76	-0.1%	1.9%	1.7%	2.6%	
Manufacturing	85,447	$48,070	0.79	1,463	0.6%	0.1%	1.3%	1.3%	
Construction	63,293	$50,325	1.19	1,903	1.0%	2.8%	1.0%	3.9%	
Utilities	9,888	$84,898	1.35	-152	-0.5%	0.4%	-0.3%	1.5%	✓
Total All Industries	1,201,274	$40,383	1.00	54,241	1.6%	1.8%	1.5%	2.5%	

Source: JobsEQ®

Based on this analysis, four sectors—health care and social assistance, transportation and warehousing, retail trade, and construction—emerge as having particularly good prospects for driving future job growth in the Inland Empire.[5] While this analysis is a quantitative way to assess a sector's employment "health" as well as potential to drive future job growth, it is not a suitable methodology for assessing the long-run output (economic value measured in gross domestic product calculations) of a firm or sector nor is it a reliable proxy for the underlying

[5] In the retail sector, only 4-digit industries with above-average wages were included. The five industries in this sector with wages which exceeded the average annual wage for the MSA are: automobile dealers (4411), other motor vehicle dealers (4412), electronics and appliance stores (4431), electronic shopping and mail-order houses (4541), and vending machine operators (4542).

profitability of individual firms operating within the sector. Within these four sectors are 21 separate industries (4-digit NAICS) that have strong growth potential after factoring in the same criteria—long-run growth rates, high location quotient, three-year job gains, and three-year competitiveness.

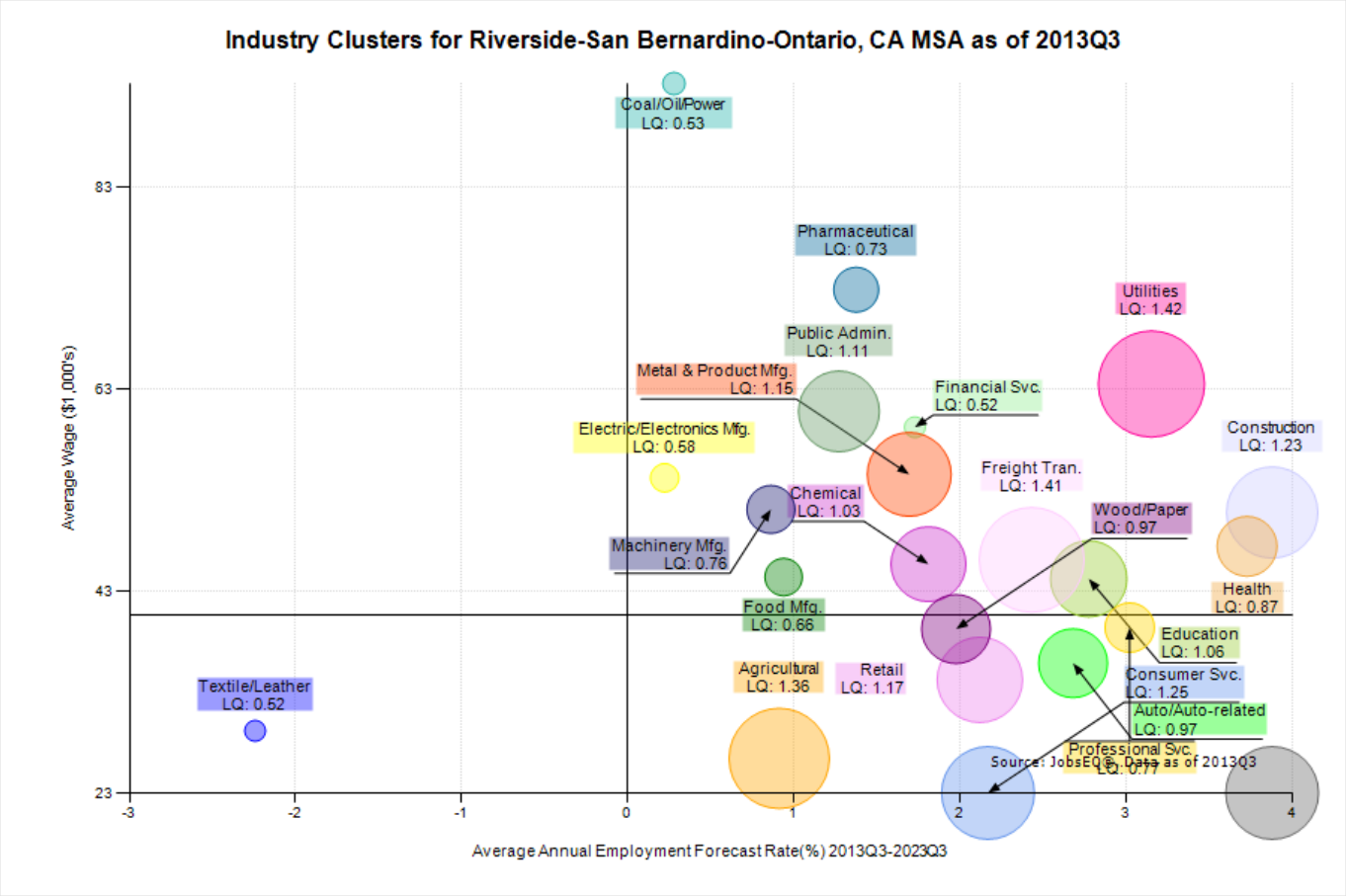
Figure 17: Industries with High Job-Creating Potential

		Current			Historical				Forecast		
		Four Quarters Ending with 2013q3			Total Change	Average Annual % Change in Employment 2010q3-2013q3			Over the Next 3 Years		
NAICS	Industry	Employ-ment	Average Annual Wages	LQ	3-Year Employ-ment	Riverside-San Bernardino-Ontario, CA MSA	CA	USA	Total Approx. Replace-ment Demand	Total Employ-ment Change	Average Annual Growth Percent
6211	Offices of Physicians	27,203	$73,228	1.23	3,874	5.3%	2.8%	1.7%	1,504	3,124	3.7%
4931	Warehousing and Storage	22,995	$39,587	3.66	5,426	9.4%	0.3%	3.2%	1,774	2,304	3.2%
4841	General Freight Trucking	17,122	$43,380	2.02	2,390	5.1%	0.7%	2.8%	1,035	1,288	2.4%
2383	Building Finishing Contractors	10,719	$33,841	1.83	366	1.2%	-2.1%	-0.1%	677	1,257	3.8%
4411	Automobile Dealers	12,856	$53,749	1.28	2,191	6.4%	3.1%	3.6%	992	1,125	2.8%
6212	Offices of Dentists	9,460	$39,958	1.22	489	1.8%	2.7%	1.6%	559	1,086	3.7%
2361	Residential Building Construction	5,872	$44,927	1.11	367	2.2%	-1.6%	0.2%	313	725	4.0%
4842	Specialized Freight Trucking	5,586	$46,609	1.44	336	2.1%	3.1%	4.4%	350	684	3.9%
4244	Grocery and Related Product Merchant Wholesalers	8,009	$50,516	1.23	1,103	5.1%	-0.2%	0.6%	562	650	2.6%
4413	Automotive Parts, Accessories, and Tire Stores	6,864	$30,776	1.47	558	2.9%	0.9%	2.0%	536	510	2.4%
2371	Utility System Construction	4,117	$79,277	1.04	297	2.5%	-1.9%	5.1%	244	472	3.7%
4239	Miscellaneous Durable Goods Merchant Wholesalers	3,953	$35,072	1.46	1,269	13.8%	0.4%	3.1%	284	409	3.3%
4881	Support Activities for Air Transportation	2,371	$41,448	1.23	407	6.5%	2.9%	1.7%	183	230	3.1%
4232	Furniture and Home Furnishing Merchant Wholesalers	2,673	$45,100	3.05	351	4.8%	1.9%	1.6%	187	212	2.6%
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	2,537	$51,590	1.24	168	2.3%	0.7%	0.8%	174	165	2.1%
4412	Other Motor Vehicle Dealers	1,540	$40,168	1.28	25	0.6%	0.3%	1.2%	118	154	3.2%
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	3,111	$45,182	1.06	517	6.2%	-1.2%	0.0%	222	150	1.6%
4859	Other Transit and Ground Passenger Transportation	981	$23,203	1.18	54	1.9%	7.4%	4.8%	53	121	3.9%
4922	Local Messengers and Local Delivery	577	$32,183	1.33	166	12.0%	2.5%	4.5%	37	56	3.1%
6239	Other Residential Care Facilities	1,915	$30,042	1.22	136	2.5%	1.9%	-0.6%	118	46	0.8%
4243	Apparel, Piece Goods, and Notions Merchant Wholesalers	1,305	$42,304	1	169	4.7%	4.2%	1.8%	95	34	0.9%

Source: JobsEQ®

In Chmura's long-run growth model, the Inland Empire has four industry clusters that are likely to expand employment in excess of 3% per year over the next decade. These industries—utilities, professional services, healthcare, and construction—represent about one-fifth of the total employment in the region and are likely to expand faster than the overall pace of job growth in California.

Figure 18: Riverside-San Bernardino-Ontario, CA MSA Industrial Clusters (scaled by employment)



Workforce Alignment Analysis & Outlook

Over the next ten years, job growth in the Inland Empire is expected to be reasonably balanced with greater than 2% annual expansions across job cohorts, regardless of educational requirements. Fast growth is expected for jobs requiring very little education to those typically requiring extensive postsecondary education. While the relatively strong growth rates for jobs requiring a high school diploma or less is at odds with state trends—which is seeing more of a skill-bias in job creation—the region's average annual wages and unemployment rates by education level strongly mirror the norms of the state and the nation.

Figure 19: Employment Growth by Education Level

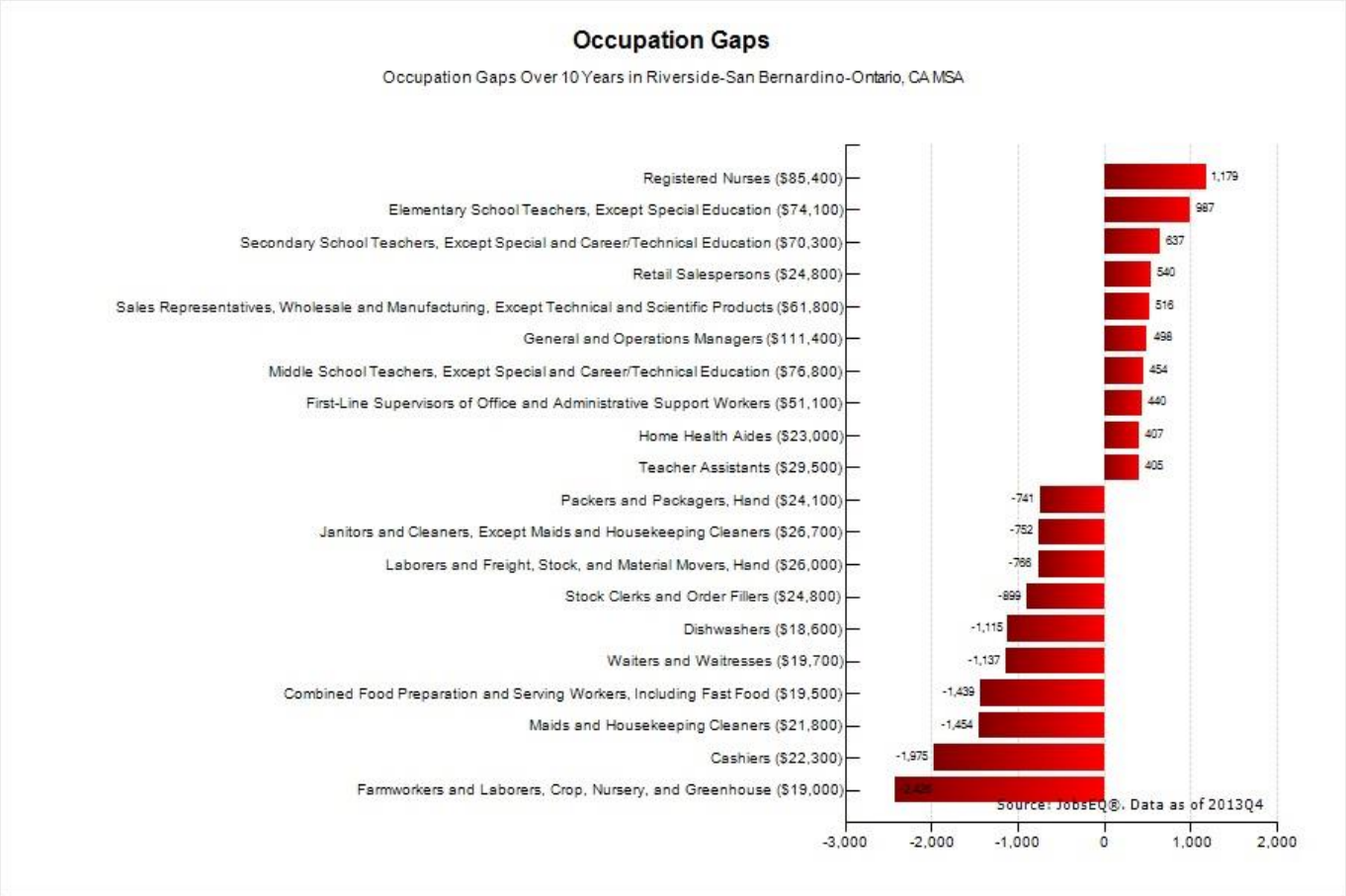
	Regional Employment Q3 2013	Average Annual Salary Q3 2013	Average Annual Growth Rate Next 10 Years
Postgraduate	43,528	$ 102,100	3.0%
Bachelor's degree	156,200	$ 74,900	2.9%
2-Year degree or certificate	108,341	$ 63,800	2.7%
Previous work experience, no award	129,273	$ 49,100	2.4%
Long-term training, no exp, no award	55,946	$ 50,500	2.7%
Moderate-term OJT, no exp, no award	169,736	$ 42,000	2.4%
Short-term OJT, no exp, no award	538,250	$26,400	2.4%

Source: JobsEQ®

High-Level Workforce Alignment Metrics

Estimated occupational deficits over the next ten years are likely to vary across the Inland Empire in terms of the level of education required. Overall, about 60% of the occupations (at the 6-digit SOC code level) with the highest projected gaps over the next ten years will require some postsecondary education. About one quarter of these occupations with the largest projected gaps are likely to require a STEM-related degree or specific training in a medical or healthcare field. In the case of gaps related to positions that require only short-term on-the-job training, it is likely that the Inland Empire economy will not suffer from widespread skill-shortages, but rather the need to facilitate the transition of workers from some of its declining industries—such as low-value-added food service industries—into the higher-level service sector jobs that are likely to be growing rapidly over the next decade—such as home-health aides as shown in the chart below.

Figure 20: Inland Empire Long-Run Potential Occupational Gap



At the major occupation group level (2-digit SOC), the Inland Empire has a shortfall in the number of awards (graduates) by the region's postsecondary schools. This is not uncommon but can be a particular challenge, especially for areas with below-average postsecondary educational attainment. Taking into account the size of the regional economy and the industry mix of the area, the Inland Empire region falls short in the number of recent postsecondary awards across several major occupational groups. For example, in the 2011-2012 academic year, 692 awards were produced by postsecondary schools in the Inland Empire region related to occupations in the business and financial operations field. However, given the region's current employment in these occupations, this award production fell short of the national norm relative to the number employed in the region by 1,159 awards. Likewise, award production in the Inland Empire region fell short by 371 awards related to architectural and engineering occupations and was short by 3,260 awards for education, training, and library occupations. In other words, for the region to maintain a properly trained employment base, new workers for these occupations would need to be "imported" from schools outside the region. This "import" of trained individuals includes residents of the area who may have moved outside the region to be educated and then move back for employment once their studies are completed.

Figure 21: Broad-Level Educational Alignment Analysis

Title	2013Q3 Employment	Awards (2011-2012)	Training Concentration[6]	Short-Run Supply & Demand Analysis	Max Annual Shortfall
Management Occupations	42,205	5,084	119.0%	↔ Equilibrium	-
Business and Financial Operations Occupations	41,316	692	37.0%	⬇ Under-Supply	1,179
Computer and Mathematical Occupations	19,088	818	93.0%	⬇ Under-Supply	65
Architecture and Engineering Occupations	11,043	478	56.0%	⬇ Under-Supply	383
Life, Physical, and Social Science Occupations	6,410	1,014	94.0%	⬇ Under-Supply	64
Community and Social Service Occupations	16,503	1,831	85.0%	⬇ Under-Supply	325
Legal Occupations	5,443	187	49.0%	⬇ Under-Supply	190
Education, Training, and Library Occupations	81,320	6,549	67.0%	⬇ Under-Supply	3,265
Arts, Design, Entertainment, Sports, and Media Occupations	10,653	1,371	91.0%	⬇ Under-Supply	130
Healthcare Practitioners and Technical Occupations	56,458	4,102	107.0%	↔ Equilibrium	-

Source: JobsEQ®

Industry-Occupation Crosswalk

This section of the report examines the specific occupations that are most relevant to the four sectors with the highest potential for job creation and estimates the supply and demand of skilled workers—at all education levels—in the region. A proprietary industry-to-occupation crosswalk was utilized to identify those occupations that were employed in these sectors. This crosswalk yielded more than 600 occupations that were employed in these various industrial sectors. Additional occupations were flagged as priorities because they had previously been identified by the California Workforce Investment Board as key occupations to support the development and expansion of top industries in the state of California.

[6] Training concentration is the comparison of the local rate of degree production to the national average. 100% is equal to the average rate of degree production in the nation for a particular occupation. For example, 110% is 10% above average, 50% is half the national average, and so on.

Key Occupations

This list of occupations most relevant to the Inland Empire's key industries was further refined down to 75 occupations by examining a variety of labor market factors. Chmura identified key occupations that are filled by workers with at least some postsecondary training. Occupations that require little to no specialized training—that are filled predominantly by individuals with a high school education or less and may only require short-term on-the-job training—are largely excluded from this analysis. This analysis specifically incorporates recent employment growth trends, current estimates of unemployment by occupation, and long-run growth forecasts for individual occupations. Based on these inputs and a proprietary algorithm, Chmura identified those occupations with high projected employment growth and a below-average unemployment rate which are therefore likely to either currently be in short supply or to become a binding constraint on growing the economy through existing business expansion or new business attraction.

Relevant factors:[7]

3-Year Growth Trend: This factor identifies those occupations that have experienced above average growth in the 4-quarter moving average of employment by occupation for the period Q4-2010 to Q4-2013.

Unemployment Rate: This factor identifies those occupations that currently have below average (for a given region) unemployment rates as of the most recent quarter.

3-Year Growth Forecast: This factor identifies those occupations that are currently projected to increase employment above the average pace (for a given region) in terms of their 3-year growth rates from the JobsEQ baseline forecast.

As noted earlier, this analysis yielded 75 occupations that are or could potentially become constraints on the expansion of the key job creating sectors (see Figure 22).

[7] A complete definition of the data utilized in this section is in the appendix.

Figure 22: Occupations with a High Potential to be in Short-Supply

The table below is rank-ordered based on the average annual growth percent forecast over the next 3 years (last column in the table).

		Current					Historical				Forecast		
		Four Quarters Ending with 2013q4					Change over the Last 3 Years	Average Annual % Change in Employment 2010q4-2013q4			Over the Next 3 Years		
SOC	Title	Employ-ment	Average Annual Wages	Location Quotient	Estimated Un-employed	Unemploy-ment Rate	Employ-ment Change	Riverside-San Bernardino-Ontario, CA MSA	CA	USA	Total Replace-ment Demand	Total Employ-ment Change	Average Annual Growth Percent
29-2056	Veterinary Technologists	549	$32,700	0.7	48	6.0%	76	5.1%	3.0%	2.5%	24	91	5.2%
13-1121	Meeting, Convention, and Event Planners	486	$45,600	0.8	58	8.7%	21	1.5%	0.9%	1.6%	24	73	4.8%
27-3091	Interpreters and Translators	415	$47,500	0.9	38	7.1%	38	3.2%	2.1%	1.6%	29	61	4.7%
29-2032	Diagnostic Medical Sonographers	503	$73,600	1	16	2.6%	48	3.4%	1.6%	1.2%	20	74	4.7%
13-1161	Market Research Analysts and Marketing Specialists	2,495	$60,200	0.7	145	4.4%	135	1.9%	1.1%	2.2%	175	362	4.6%
21-1013	Marriage and Family Therapists	346	$52,000	1	6	1.5%	140	18.8%	3.3%	4.3%	20	49	4.5%
31-2021	Physical Therapist Assistants	493	$62,200	0.8	41	6.3%	45	3.3%	2.4%	2.4%	20	70	4.5%
31-2011	Occupational Therapy	212	$64,500	0.8	10	3.7%	21	3.5%	2.1%	2.1%	9	29	4.4%
13-1051	Cost Estimators	2,089	$69,200	1.2	182	6.9%	170	2.9%	-0.5%	1.6%	108	287	4.4%
19-1042	Medical Scientists, Except Epidemiologists	433	$84,400	0.5	12	2.2%	21	1.6%	-0.5%	0.9%	7	59	4.4%
21-1091	Health Educators	468	$47,700	0.9	37	6.3%	78	6.3%	1.8%	1.7%	27	63	4.3%
29-2021	Dental Hygienists	2,109	$82,300	1.2	61	2.4%	110	1.8%	2.5%	1.7%	112	273	4.1%
21-1014	Mental Health Counselors	1,076	$47,900	1	16	1.3%	307	11.9%	2.6%	3.2%	62	138	4.1%
29-1123	Physical Therapists	1,385	$86,200	0.8	31	2.0%	133	3.4%	2.4%	2.5%	43	174	4.0%
29-1181	Audiologists	111	$65,900	1	2	2.0%	10	3.3%	2.3%	1.8%	2	14	4.0%
21-1022	Healthcare Social Workers	1,188	$64,500	0.9	77	5.5%	252	8.3%	2.3%	2.4%	76	146	3.9%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,151	$50,200	1	257	8.8%	149	2.4%	-1.1%	1.8%	103	264	3.9%

		Current					Historical				Forecast		
		Four Quarters Ending with 2013q4					Change over the Last 3 Years	Average Annual % Change in Employment 2010q4-2013q4			Over the Next 3 Years		
SOC	Title	Employ-ment	Average Annual Wages	Location Quotient	Estimated Un-employed	Unemploy-ment Rate	Employ-ment Change	Riverside-San Bernardino-Ontario, CA MSA	CA	USA	Total Replace-ment Demand	Total Employ-ment Change	Average Annual Growth Percent
15-1133	Software Developers, Systems Software	1,662	$117,100	0.5	103	4.3%	47	1.0%	1.2%	2.8%	47	196	3.8%
49-9062	Medical Equipment	295	$50,100	0.9	16	4.0%	28	3.4%	-0.4%	0.8%	22	34	3.7%
29-1122	Occupational Therapists	810	$90,400	0.8	13	1.5%	77	3.4%	2.1%	2.1%	42	93	3.7%
11-9151	Social and Community Service Managers	1,092	$67,400	1	56	4.2%	390	15.9%	3.1%	3.1%	66	125	3.7%
21-1023	Mental Health and Substance Abuse Social Workers	1,052	$56,800	1	74	6.0%	268	10.3%	2.4%	2.9%	68	120	3.7%
15-1141	Database Administrators	639	$74,400	0.6	32	3.8%	6	0.3%	1.2%	2.2%	29	73	3.7%
31-9091	Dental Assistants	3,297	$32,900	1.2	288	6.6%	174	1.8%	2.5%	1.7%	189	372	3.6%
13-1151	Training and Development Specialists	1,509	$57,300	0.8	109	5.5%	57	1.3%	0.6%	1.6%	70	169	3.6%
29-2031	Cardiovascular Technologists and Technicians	427	$53,400	0.9	12	2.4%	34	2.8%	1.0%	1.1%	18	47	3.6%
13-1081	Logisticians	866	$68,300	0.8	94	7.7%	39	1.5%	0.6%	1.8%	47	96	3.6%
29-9091	Athletic Trainers	165	$46,000	0.9	10	5.1%	9	1.9%	1.4%	1.5%	16	18	3.6%
31-9092	Medical Assistants	5,430	$27,700	1.1	559	7.8%	697	4.7%	2.5%	2.0%	227	596	3.5%
29-1071	Physician Assistants	830	$90,900	1.1	21	2.2%	100	4.4%	2.1%	1.7%	43	91	3.5%
21-1015	Rehabilitation Counselors	950	$33,100	1	16	1.5%	208	8.6%	2.5%	2.0%	56	104	3.5%
29-1041	Optometrists	225	$92,300	0.8	3	1.2%	24	3.8%	3.0%	2.8%	21	24	3.5%
29-2034	Radiologic Technologists	1,691	$63,000	1	54	2.6%	156	3.3%	1.4%	1.3%	72	180	3.4%
15-1142	Network and Computer Systems Administrators	2,141	$89,500	0.7	135	4.6%	22	0.3%	0.9%	2.0%	100	227	3.4%
29-2035	Magnetic Resonance Imaging Technologists	248	$77,600	0.9	8	2.7%	23	3.4%	1.9%	1.3%	11	26	3.4%

		Current					Historical				Forecast		
		Four Quarters Ending with 2013q4					Change over the Last 3 Years	Average Annual % Change in Employment 2010q4-2013q4			Over the Next 3 Years		
SOC	Title	Employ-ment	Average Annual Wages	Location Quotient	Estimated Un-employed	Unemploy-ment Rate	Employ-ment Change	Riverside-San Bernardino-Ontario, CA MSA	CA	USA	Total Replace-ment Demand	Total Employ-ment Change	Average Annual Growth Percent
11-9031	Education Administrators, Preschool and Childcare Center/Program	310	$53,400	0.7	15	4.1%	22	2.4%	1.2%	0.7%	24	33	3.4%
29-1128	Exercise Physiologists	48	$52,200	0.9	1	2.1%	5	3.5%	1.3%	1.4%	3	5	3.4%
25-2011	Preschool Teachers, Except Special Education	2,253	$31,300	0.7	134	4.8%	102	1.5%	1.1%	0.6%	164	234	3.4%
25-2051	Special Education Teachers, Preschool	230	$62,400	1.1	3	1.2%	33	5.2%	1.7%	1.3%	19	24	3.3%
29-1126	Respiratory Therapists	911	$65,300	0.9	29	2.7%	54	2.1%	0.6%	0.9%	48	94	3.3%
15-1132	Software Developers, Applications	2,522	$91,000	0.5	147	4.2%	87	1.2%	1.5%	3.1%	72	253	3.2%
21-1099	Community and Social Service Specialists, All Other	930	$45,600	1	116	9.6%	211	8.9%	2.3%	1.9%	57	93	3.2%
29-1151	Nurse Anesthetists	342	$145,000	1.1	9	2.3%	36	3.8%	2.1%	1.5%	17	34	3.2%
29-1011	Chiropractors	174	$73,800	0.7	5	2.3%	16	3.3%	3.3%	3.5%	9	17	3.2%
39-5094	Skincare Specialists	298	$31,500	1	21	5.5%	30	3.6%	1.8%	1.9%	15	30	3.2%
21-1019	Counselors, All Other	275	$36,100	1.1	5	1.6%	64	9.2%	2.3%	2.2%	17	27	3.2%
29-1171	Nurse Practitioners	1,007	$101,400	1	20	1.9%	114	4.1%	2.3%	1.8%	51	100	3.2%
17-3025	Environmental Engineering Technicians	126	$43,000	0.7	13	7.2%	8	2.3%	-0.2%	2.1%	7	13	3.2%
29-1141	Registered Nurses	21,582	$85,400	0.9	503	2.0%	1,695	2.8%	1.1%	1.3%	1,084	2,143	3.2%
29-1129	Therapists, All Other	109	$61,300	0.9	6	5.0%	15	5.1%	2.2%	2.2%	6	11	3.2%
17-1022	Surveyors	234	$81,300	0.6	18	5.8%	9	1.3%	-2.3%	1.4%	14	23	3.2%
29-1069	Physicians and Surgeons, All Other	2,951	$165,100	1	25	0.8%	309	3.8%	1.8%	1.3%	163	289	3.2%

		Current					Historical				Forecast		
		Four Quarters Ending with 2013q4					Change over the Last 3 Years	Average Annual % Change in Employment 2010q4-2013q4			Over the Next 3 Years		
SOC	Title	Employ-ment	Average Annual Wages	Location Quotient	Estimated Un-employed	Unemploy-ment Rate	Employ-ment Change	Riverside-San Bernardino-Ontario, CA MSA	CA	USA	Total Replace-ment Demand	Total Employ-ment Change	Average Annual Growth Percent
19-4091	Environmental Science and Protection Technicians, Including Health	219	$46,400	0.8	26	8.6%	12	1.9%	0.3%	1.8%	26	21	3.2%
27-3031	Public Relations Specialists	1,242	$56,400	0.7	59	3.6%	47	1.3%	1.0%	1.4%	94	121	3.1%
21-1012	Educational, Guidance, School, and Vocational Counselors	2,314	$67,800	1.1	42	1.6%	33	0.5%	1.1%	0.2%	142	224	3.1%
29-1051	Pharmacists	2,685	$119,700	1	92	3.2%	168	2.2%	1.7%	1.3%	190	260	3.1%
29-1063	Internists, General	461	$179,900	1.1	4	0.8%	58	4.6%	2.3%	1.6%	26	44	3.1%
29-1127	Speech-Language Pathologists	1,113	$92,100	1	15	1.3%	63	2.0%	1.5%	1.3%	60	107	3.1%
29-1064	Obstetricians and Gynecologists	220	$230,800	1.1	2	0.8%	29	4.8%	2.4%	1.7%	12	21	3.1%
29-1067	Surgeons	444	$215,500	1.1	4	0.8%	56	4.6%	2.4%	1.6%	25	43	3.1%
21-1021	Child, Family, and School Social Workers	2,878	$49,400	1.1	268	7.7%	807	11.6%	2.7%	2.3%	195	277	3.1%
29-1062	Family and General Practitioners	1,136	$191,000	1.1	10	0.9%	143	4.6%	2.4%	1.7%	63	109	3.1%
29-1161	Nurse Midwives	57	$104,500	1	2	2.9%	3	2.1%	1.9%	1.4%	3	5	3.1%
29-1065	Pediatricians, General	314	$135,400	1.1	3	0.8%	41	4.8%	2.5%	1.7%	17	30	3.1%
29-1061	Anesthesiologists	318	$200,400	1.2	3	0.8%	42	4.8%	2.6%	1.7%	18	30	3.1%
13-1111	Management Analysts	3,751	$83,400	0.7	364	7.4%	234	2.2%	1.4%	2.5%	173	357	3.1%
17-1011	Architects, Except Landscape and Naval	449	$92,300	0.6	32	5.3%	13	1.0%	-2.5%	1.6%	25	43	3.1%
19-3031	Clinical, Counseling, and School Psychologists	1,032	$85,600	1.1	13	1.2%	108	3.8%	1.6%	1.5%	92	97	3.1%
25-9031	Instructional Coordinators	1,173	$77,100	1	36	2.7%	14	0.4%	0.7%	0.4%	74	110	3.0%

		Current					Historical				Forecast		
		Four Quarters Ending with 2013q4					Change over the Last 3 Years	Average Annual % Change in Employment 2010q4-2013q4			Over the Next 3 Years		
SOC	Title	Employ-ment	Average Annual Wages	Location Quotient	Estimated Un-employed	Unemploy-ment Rate	Employ-ment Change	Riverside-San Bernardino-Ontario, CA MSA	CA	USA	Total Replace-ment Demand	Total Employ-ment Change	Average Annual Growth Percent
13-1075	Labor Relations Specialists	570	$71,700	0.8	35	5.0%	23	1.4%	0.1%	-0.1%	27	53	3.0%
39-9032	Recreation Workers	2,610	$23,700	0.9	249	7.5%	322	4.5%	1.4%	1.0%	120	243	3.0%
17-2081	Environmental Engineers	355	$95,300	0.8	10	2.4%	16	1.5%	-0.2%	1.9%	22	33	3.0%
29-1066	Psychiatrists	244	$165,700	1.1	2	0.8%	23	3.4%	1.6%	1.5%	13	22	3.0%
13-1071	Human Resources	3,262	$57,600	0.9	334	7.8%	136	1.4%	1.3%	2.5%	156	296	2.9%
13-2041	Credit Analysts	375	$75,800	0.7	15	3.0%	7	0.6%	3.2%	1.6%	23	34	2.9%

IV. Key Findings and Conclusions

The list of 75 occupations should be further refined to a smaller list that can be the focus of specific targeted intervention by the San Bernardino County WIB. As suggested in the previous report, focus groups and interviews with some of the area's larger employers, community colleges, and WIB professionals should provide the basis for identifying those select occupations where the supply of qualified candidates is the most constrained. Additionally, data from job-posting websites can be included to further identify those occupations that are experiencing a surge of hiring in the previous six-month or twelve-month period.

The type of intervention needed to strengthen the talent pipeline will vary considerably because the 75 occupations cut across all education levels. For some occupations that require less than a bachelor's degree, discussions with local community colleges and workforce development practitioners will yield insight as to whether the constraint is more likely a function of insufficient enrollment in key programs or a failure to complete, including applying (e.g. sitting for an exam) for final credentialing. It is likely that marketing efforts to increase enrollment in programs designed to feed select occupations may require outreach to neighborhoods with low-educational attainment populations. It is equally possible that special incentive plans or targeted assistance may be required to overcome social barriers that have thus far inhibited some individuals from seeking postsecondary educational opportunities.

In many cases, the region would benefit from promoting and identifying those students with the potential to progress from an associate's degree to a bachelor's degree via an industry-focused 2 + 2 degree program. In many cases, this can be accomplished via a combination of online or flexible-time classes to accommodate various work schedules. Similarly, there may be opportunities to advance the skill-sets of some unemployed workers with prior work experience and potentially some stackable credentials within several construction-related trades fields for occupations that require advanced electro-mechanical trouble-shooting skills.

Other key occupations will inevitably require increasing the enrollment and subsequent graduation of individuals with at least a 4-year bachelor's degree in STEM fields. This has typically involved a multi-faceted approach to provide more money towards high school STEM programs, including advanced placement classes, initiatives to incentivize STEM degrees at the four-year level through scholarships and grants, expanding the funding available for universities with strong STEM-related research and development programs, and outreach and marketing efforts designed to convey to students the value of a STEM degree.

Key Summary Points

The San Bernardino-Riverside economy is rebounding:

- Employment is set to expand by 1.7% in 2013; the California economy is also poised for modest employment growth.
    - Job growth is expected to be relatively strong across jobs requiring all levels of education.
    - The unemployment rate is trending down, but likely to remain elevated throughout 2014.
- The local housing marketing is continuing to improve; building permits are growing, but from a low-base.
    - Distressed sales as a share of total sales are on a downward trend, particularly in Riverside County.
- The region has four broad sectors that are primed to create the bulk of jobs over the next three years: healthcare; transportation and warehousing; retail trade; and construction.
    - The occupation alignment analysis identified 75 occupations where the opportunity exists for expanding supply of locally trained and credentialed workers.
        - The Inland Empire lags the state and the nation in terms of postsecondary education attainment in its populace
    - In several cases, clear up-skilling and 2 + 2 opportunities exist where collaboration from local community colleges and technical schools with regional colleges and universities would bear fruit.
        - This may require additional outreach to some low-education attainment communities to foster greater enrollment in key medical fields.

V. Appendix

The following section contains supplementary information relevant to this report.

Terms & Definitions

Demographics: All data are from the U.S. Census Bureau per the dates shown in the profile table footnotes included in the accompanying spreadsheets.

Current Employment & Historical (5-Year) Job Growth: Measures the current employment and past performance of an industry sector and identifies whether industries have been growing/declining/emerging and the rate of change. Employment and wages data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and updated through 2012Q3 with preliminary estimates by Chmura updated to 2013Q1. Forecast employment growth uses national projections from the Bureau of Labor Statistics, forecasts for 2010-2020, adapted for regional growth patterns by Chmura.

Projected Job Growth (5-Year): Incorporates historical growth and performance with additional factors and expectations of growth/decline of the region's working-age population, industry mix, educational attainment, and regional growth expectations. The JobsEQ® Baseline Forecast comprises industry and occupation projections based, in part, upon the Bureau of Labor Statistics (BLS) national forecasts or state forecasts provided by state employment agencies.

Location Quotient & Location Quotient Trend: The location quotient variable is a comparative statistic used to calculate relative employment concentration of a given industry against the average employment of the industry in the nation. Industries with a higher location quotient (usually greater than 1.25) indicate that the region has a comparative advantage or specialization in the production of that good or service. The location quotient trend is the change in the location quotient over time, in this case from average employment by industry in 2007 to the average employment by sector in 2012.

Industry Competitiveness 1-Year & 5-Year (Shift-Share Analysis): A standard method of regional economic analysis that attempts to separate regional job growth into its component causes. The three main causes identified are the "national growth effect," which is regional growth that can be attributed to the overall growth of the entire U.S. economy; the "industrial mix effect," which is regional growth that can be attributed to positive trends in the specific industry or occupation at a national level; and the "regional competitiveness effect," which is growth that cannot be explained by either overall or industry-specific trends. This measure can be measured in terms of economic output or employment, and the examples found in this report utilize employment levels. A positive value indicates that an industry has a regional competitive advantage compared to the nation in terms of generating employment. Positive shift share values do not explain why an industry has a competitive advantage, only that there are potential factors that contribute to the industry's ability to outperform the national average rate of growth/decline.

Indirect (Supply Chain) Job Multiplier Effects: A job multiplier indicates how important an industry is in terms of regional job creation for creating ancillary jobs, suppliers, and other service providers. For example, a job multiplier of 0.5 would mean that for every job created by the primary industry, another 1/2 job would be created in other related (supplier) industries (for a total of 1.5 jobs). Higher job multipliers indicated industries that have the potential to anchor regional job creation. For example, a new construction firm may buy lumber from local suppliers and may use accounting services from local private accountants

Spillover (Earnings) Induced Multiplier Effects: An earnings multiplier indicates the level of additional earnings associated with adding one new dollar of earnings or employment to an industry in an economy. Therefore, the jobs and sales/output created when new employees from the new or expanded firm spend their wages at local establishments; for example, a new manufacturing plant may increase business at a nearby diner causing the diner with increased sales to hire more employees.

Average Annual (Industry) Wage & Wage Trend: This statistic is based on an industry staffing pattern and the average occupational wage associated with that staffing pattern for a given region and industry. Employment and wages data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and updated through 2012Q3 with preliminary estimates by Chmura updated to 2013Q1.

Real Output Growth (5-Year): This is a measure of the inflation-adjusted economic value ($ of sales) generated by the industry, that is a central component of the US GDP figure. This data is collected by the Bureau of Economic Analysis (BEA) and the BEA's national, international, regional, and industry estimates; the Survey of Current Business; and BEA news releases are available without charge on BEA's Web site at www.bea.gov.

Trend in the # of Firms: This statistic indicates the number of firms currently active in an industry and is derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and updated through 2012Q3 with preliminary estimates by Chmura updated to 2013Q1.

Wages & Unemployment Rate by Occupation: Occupation average wage data are derived from national occupation/industry wage data provided by the Bureau of Labor Statistics modified where necessary. Wages by occupation are as of 2011 provided by the BLS and imputed by Chmura where necessary. All occupation data are presented in terms of at-place employment except for occupation unemployment and unemployment rate which are calculated by place of residence. Occupation unemployment figures are imputed by Chmura. Employment forecasts are developed by Chmura using occupation forecasts from the BLS.

Long-run (5-Year) Occupational Forecast: Average Annual Growth Rate: Forecast employment growth uses national projections from the Bureau of Labor Statistics, forecasts for 2010-2020, adapted for regional growth patterns by Chmura. Occupation employment data are derived from the most recent industry employment (from the Bureau of Labor Statistics, updated quarterly) and the industry/occupation matrix available for the region. Although JobsEQ baseline forecast may use national forecasts (by industry or occupation), these forecasts are adjusted to be more reflective of the region rather than the nation by taking into account the unique industry/occupation mix of the region as well as the region's general overall growth expectations. Regional employment growth expectations are modeled to be consistent with US Census population forecasts, labor market commuting patterns, and expected changes in participation rates over time by education level.

Training Concentration: This analysis provides an estimate of supply and demand alignment between local postsecondary training output and the demands of local area industries.

A training concentration of 100% means that a region is producing a number of awards per occupation employment that matches the national norm. A training concentration of 200% means the region is producing twice the number of awards than the national norm and a training concentration of 50% means the region is at half the norm. For example, if postsecondary schools in the nation grant awards for registered nurses at the rate of one award for every ten nurses employed, and if a region grants awards at the rate of one award for every twenty employed nurses, that region will have a training concentration of 50% for registered nurses.

Awards data are estimates, produced via a Chmura algorithm that distributes degrees conferred for the academic year 2010-2011, data for which are provided by the National Center for Education Statistics. Occupation

employment data are estimated via industry employment data and the Chmura industry/occupation matrix. Industry employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and currently updated through 2012Q3 with preliminary estimates by Chmura updated to 2013Q1.

The education program to occupation crosswalk methodology description refers to the training concentration analysis. Training programs are classified according to the Classification of Instructional Programs (CIP codes). For relating training programs, this report uses a modified version of the CIP to SOC crosswalk from the National Center for Education Statistics (NCES). While this is a very helpful crosswalk for estimating occupation production from training program awards data, the crosswalk is neither perfect nor comprehensive. Indeed, it is hard to imagine such a crosswalk being perfect since many training program graduates for one reason or another do not end up employed in occupations that are most related to the training program from which they graduated. Therefore, the education program analyses should be considered in this light.

As an example of the many scenarios that may unfold, consider a journalism degree that crosswalks into three occupations: editors, writers, and postsecondary communications teachers. Graduates with a journalism degree may get a job in one of these occupations—and that may be the most-likely scenario—but a good number of these graduates may get a job in a different occupation altogether (the job may be somewhat related, such as a reporter, or the job may be totally unrelated, such as a real estate agent). Furthermore, a graduate may stay in school or go back to school for a degree that will lead to other occupation possibilities. Still another possibility includes the graduate not entering the labor market (maybe being unemployed, being a non-participant, or moving to another region).

Given this background, training concentration gaps that are close to the average value of 100% (such as within 20 percentage points) should largely be viewed as having supply and demand for those occupations to be roughly in equilibrium. However, in areas where the training concentration is significantly lower (such as below 80%), one can infer a substantial deficit of training for this occupation exists that corresponds to a market opportunity. The threshold where a shortage can be clearly identified varies based on the size of the region, with larger regions allowing a finer estimate of the shortfall.

Occupational Replacement Demand: Replacement demand is the minimum demand due to separations such as retirements and moves into different occupations. Said differently, it is an estimate of the minimum number of workers that would need to be hired to replace those incumbent workers that due to retirement, death, incarceration or a permanent move into an alternate occupation will need to be back-filled by their employer.

The methodology for this estimate is based upon BLS-derived techniques. To develop estimates of replacements, the BLS used occupational employment data from the Current Population Survey (CPS), a household survey that collects demographic and employment information about individuals. BLS analysts measured the net change in occupational employment for 13 different age cohorts over a 5-year period.

Long-Run (5-Year) Expected Occupational Gap: Gaps projection data are developed by Chmura and updated quarterly. Employment supply and demand projections are based on a starting date of 2012Q3. Technical Notes: Occupation gaps are developed by Chmura and use a multitude of data sources. This analytic is updated quarterly along with ES-202 updates. Gaps are forecast based upon the educational make-up of the region's first-time workers and include changes due to replacements. For example, consider the case in which a retail salesperson gets a degree, leaves their occupation, and becomes a financial analyst. This turnover dictates that a new retail salesperson is needed. Even though the total number of retail salespersons in the region is unchanged, the analysis counts this situation as an increase of one in demand for retail salesperson. The forecasts that are provided are long-run (over a period of three, five, or ten years) and do not fully account for short-run imbalances in the workforce. The short-run deficit is not accounted for in the forecast gap because of the long-term perspective of

the gap. From a practical perspective, Chmura created the gaps to have a long-term view because it is highly relevant for strategic planning.

- **Annual Supply Gap (or Surplus) -** The annual average difference between projected supply and demand. A positive number represents a deficit in workers and a negative (parenthetical) number represents a surplus of workers.
- **Annual Growth Demand -** The demand due to overall growth in that occupation.
- **Annual Replacement Demand -** The minimum demand due to separations such as retirements and moves into different occupations (based on an annual average over the next ten years).
- ***Total Annual Demand* -** The sum of growth and replacement demand (if growth is positive, otherwise, this is simply replacement demand).

California Priority Occupations (Mid-Skill)

The occupations identified in Figure 23 represent priority occupations identified by the California Workforce Investment Board. The occupations marked Training Recommendation represent those occupations in the Inland Empire region that have a combination of low unemployment (less than the regional average of 9.6%), high growth rates (more than 1.4% for the nation over the next ten years), and either a short-run supply constraint (based on JobsEQ training concentration of 75%) or long-run projected occupational gap, which includes openings based on expected retirement. Several specialty healthcare occupations are in relatively short-supply in the region.

Figure 23: California Priority Occupations, Mid-Skill

Occupations	Current Regional Employment	Average Annual Wages	Projected Average Annual Employment Growth	Estimated Unemployment Rate	Potential Regional Current Skill Deficiency	Emerging Regional Occupation-Skills Gap	Training Recommendation
Installation, Maintenance, & Repair							
Aircraft Mechanics and Service Technicians	880	$63,500	2.0%	3.2%		✓	✓
Automotive Service Technicians and Mechanics	7,293	$39,800	2.6%	7.8%		✓	✓
Bus and Truck Mechanics and Diesel Engine Specialists	2,688	$44,500	2.3%	5.6%		✓	✓
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,151	$50,200	3.9%	8.8%		✓	✓
Industrial Machinery Mechanics	2,312	$52,100	3.3%	6.2%		✓	✓
Mobile Heavy Equipment Mechanics, Except Engines	941	$53,200	2.8%	4.4%	✓	✓	✓
Telecommunications Line Installers and Repairers	924	$58,900	2.7%	10.3%	✓	✓	
Telecommunications Equipment Installers and Repairers, Except Line Installers	1,387	$51,800	2.7%	8.7%	✓	✓	✓

Occupations	Current Regional Employ-ment	Average Annual Wages	Projected Average Annual Employ-ment Growth	Estimated Unemploy-ment Rate	Potential Regional Current Skill Deficiency	Emerging Regional Occupation-Skills Gap	Training Recom-menda-tion
Engineering							
Civil Engineers	1,727	$96,400	2.6%	5.3%	✓	✓	✓
Electrical and Electronic Engineering Technicians	850	$58,900	1.3%	6.6%		✓	
Production							
Machinists	2,860	$39,900	2.0%	6.4%		✓	✓
Welders, Cutters, Solderers, and Brazers	2,690	$36,200	2.7%	14.6%	✓	✓	
Production, Planning, and Expediting Clerks	2,230	$41,400	1.9%	8.0%	✓	✓	✓
Construction							
Carpenters	6,679	$56,700	2.9%	16.0%	✓	✓	
Construction and Building Inspectors	634	$73,300	2.6%	7.6%		✓	✓
Operating Engineers and Other Construction Equipment Operators	3,194	$66,100	3.4%	16.2%	✓	✓	
Painters, Construction and Maintenance	2,778	$46,900	3.0%	15.0%			
Plumbers, Pipefitters, and Steamfitters	3,061	$45,800	3.3%	11.8%	✓	✓	
Healthcare							
Dental Hygienists	2,109	$82,300	4.1%	2.4%		✓	✓
Diagnostic Medical Sonographers	503	$73,600	4.7%	2.6%		✓	✓
Medical and Clinical Laboratory Technologists	1,290	$74,500	2.0%	4.1%	✓	✓	✓
Radiologic Technologists	1,691	$63,000	3.4%	2.6%	✓	✓	✓
Respiratory Therapy Technicians	107	$51,400	1.2%	3.0%		✓	✓
Surgical Technologists	823	$44,200	2.7%	3.4%		✓	✓
Licensed Practical and Licensed Vocational Nurses	5,790	$46,200	2.9%	5.1%		✓	✓

Source: CA Workforce Investment Board & JobsEQ®