

APRIL 2017

REGIONAL WORKFORCE STUDY

SOUTH CAROLINA I-77 ALLIANCE



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ACKNOWLEDGEMENTS

TIP would like to thank the following individuals and organizations for their participation in this planning process:



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*Chris Finn,
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*Karlisa Parker
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*Ty Davenport
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*Jeff Ruble
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TIP STRATEGIES, INC. is a privately held Austin and Seattle based economic development consulting firm committed to providing quality solutions for public and private sector clients. Established in 1995, the firm's primary focus is economic development strategic planning.

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INTRODUCTION

The South Carolina I-77 Alliance Region has added almost 30,000 jobs between 2011 and 2016, outperforming the US in terms of job growth in each of the last three years. Manufacturing, healthcare, and professional services have led this growth. Even with this success, the region has continued its commitment to economic development and attracting new investment into the region as a driver of sustained growth and economic prosperity.

Although labor has long been a consideration of corporate site location decisions, in the past year the focus has been on the availability of skilled labor rather than the cost of labor. As a result, regions must understand the skills and strengths of their workforce and labor market in order to compete successfully for corporate investment.

In the fall of 2016, the South Carolina I-77 Alliance hired TIP Strategies to assess and profile the region's workforce and examine the alignment of the region's workforce with the I-77 Alliance's target industries. The resulting study documents the depth and breadth of the regional workforce, highlights its strengths, and identifies key challenges that must be addressed in order to maintain the region's competitive edge.

KEY FINDINGS

Distinct and expansive laborsheds. As a region that is situated on the I-77 corridor between Charlotte and Columbia, the north and south sides of the region have distinct laborsheds. The north laborshed draws from Mecklenburg, Union, Gaston, and Lancaster counties and has a civilian labor force of 1.2 million. The south laborshed also extends up to Mecklenburg County and draws from Kershaw, Sumter, Lexington, Calhoun, Orangeburg, and Newberry counties. The south laborshed also has a civilian labor force of about 1.2 million. Each of these laborsheds have a strong supply of middle- and high-skill workers. Just over 50 percent of the workers have at least a high school diploma but less than a four year degree, and about 36 percent of the labor force has a bachelor degree or higher.

Highly educated and young. The I-77 Alliance Region itself has a highly educated labor force, with 32 percent of the population earning a bachelor degree or higher. In addition, the senior age cohort (age 65+) represents a smaller share of the population than in the US overall, signifying the relative youth of the regional labor force. Furthermore, the higher labor force participation rate in the region is demonstrative of a strong work ethic.

Destination for talent. The region has experienced healthy population growth over the last 10 years. Migration patterns demonstrate that the region is a destination for talent with high flows of migrants to York County and Richland County. In fact, regional employers agreed that attracting talent to the region to fill open positions is relatively easy.

Mobile workforce. The region as a whole is a net importer of labor. However, more than 100,000 workers commute outside of the region to work. Transportation & warehousing, management of companies & enterprises, and manufacturing are the three sectors with the largest outflow of workers, on net, out of the four-county region. The largest destination for the region's commuters outside of the four counties is Charlotte.

Strong middle-skill workforce. The occupational structure of the region is reflective of its strong manufacturing sector and growing healthcare sector. Employers in the region note the region's history in manufacturing as one of its greatest workforce strengths.

Affordable labor costs. The regional median hourly wage rates compare well to the nation's. Almost all of the median hourly wages for major occupational groups are at or below the US median. The vast majority of the regional median hourly wage rates for the high-demand occupations are at or below the US median as well.

Robust network of education and training institutions. Within a 30-minute drive of the region are 29 colleges and universities that graduate about 30,000 students each year. The corridor is anchored by University of South Carolina on the south end and University of North Carolina at Charlotte to the north. York Technical College and Midlands Technical College are the two primary two-year institutions that service the area.

Access to Veterans. With more than 800 soldiers separating from service annually and 46,000 retirees and family members served, Fort Jackson represents another source of skilled workers. Many of these workers have skills related to office and administrative functions, maintenance and repair, technical healthcare, and transportation and material moving.

CHALLENGES

Evidence of tightening labor market. The civilian labor force of the region has grown by 17,000 over the last five years while the number of jobs increased by 30,000, and unemployment has declined to 4.5 percent. This has led to a tightening of the labor market. In certain occupations, upward pressure on wages appear to be mounting. In production occupations, in particular, the regional median hourly wages for certain specialized machine workers or assemblers is more than 10 percent the US median.

Continuing demand for more workers. Over the next five years, the region is expected to have more than 70,000 openings. Almost 25,000 of these will be new jobs to the region. Thirty-five percent of the openings will be for middle-skill occupations and 22 percent for high-skill occupations. A number of the employers in the region commented on the growing difficulty of finding local talent.

Employability. With the tightening of the labor market, the challenge that the employers voiced most often was a lack of applicants with basic employability attributes—passing a drug test and/or criminal background check and following basic workplace etiquette. This challenge is not unique to the region—it is a national challenge.

Aging workforce. Although the overall population is fairly young, in many of the middle-skill and high-skill, high-demand occupations, more than 20 percent of the workers are aged 55 and older. This near-term wave of retirements means that employers must not only fill today's openings but also plan for the replacement of tenured individuals in their firms.

WORKFORCE-TARGET INDUSTRY ALIGNMENT

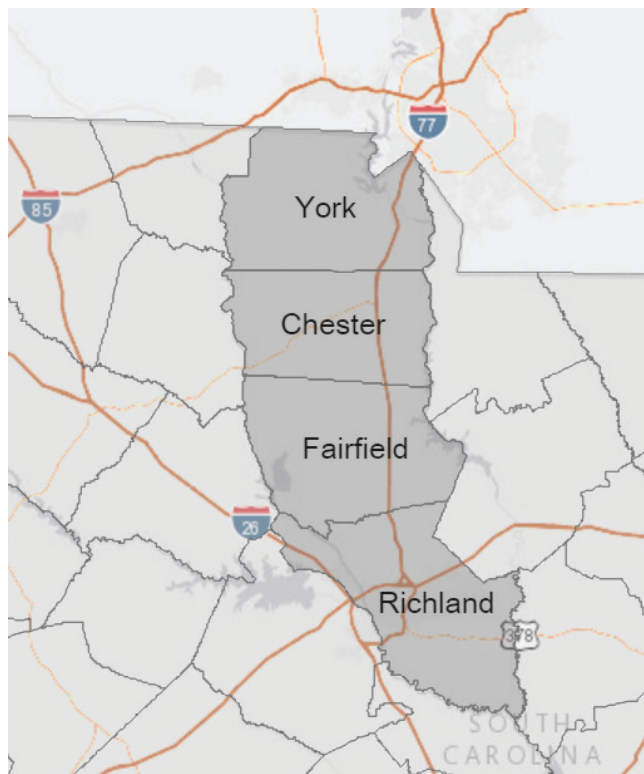
The workforce capacity scenarios demonstrated that the regional labor market and its laborshed areas should be able to accommodate growth in the target industries. However, if unemployment continues to decline, competition among employers for skilled workers will likely increase. As mentioned above, the rising wages in some of the more specialized production occupations could indicate a need for shoring up the pipeline of local talent that feeds those occupations. Bringing employers together to raise awareness among potential employees of their future hiring needs could help accomplish this.

CONCLUSION

The South Carolina I-77 Alliance region has access a large pool of skilled labor. As a destination for talent with high-quality local workforce, the region is well positioned to continue its sustained growth. However, this continued success will likely exacerbate some of the workforce challenges that employers in the region currently face. While this phenomenon is not unique to the I-77 Alliance region, those regions who come together to address these workforce challenges collectively will likely be more competitive in the future.

REGIONAL WORKFORCE ASSESSMENT

WORKFORCE CHARACTERISTICS

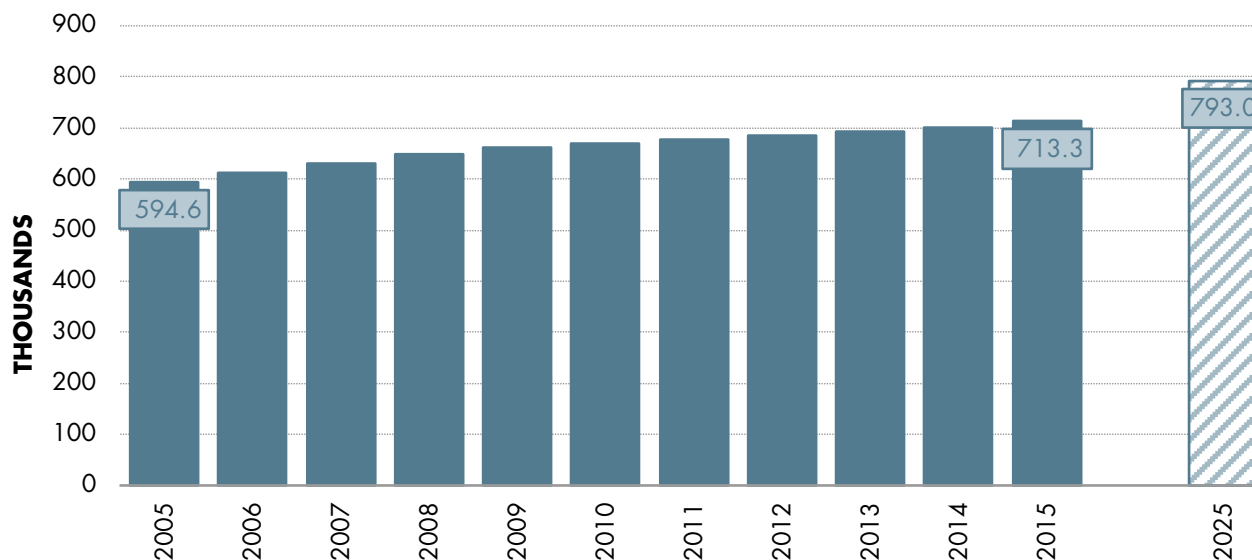


The South Carolina I-77 Alliance covers the four-county region along Interstate 77 between Charlotte, North Carolina and Columbia, South Carolina. The region includes York, Chester, Fairfield, and Richland counties.

FIGURE 1. POPULATION TRENDS

ANNUAL ESTIMATES, 2005 – 2015, PROJECTION 2025

Between 2005 and 2015, the region grew by more than 118,000 residents, an increase of 20 percent. By 2025, the population in the region is expected to reach almost 800,000.



Source: US Census Bureau, Population Estimates program. Projections from South Carolina Revenue and Fiscal Affairs Office.

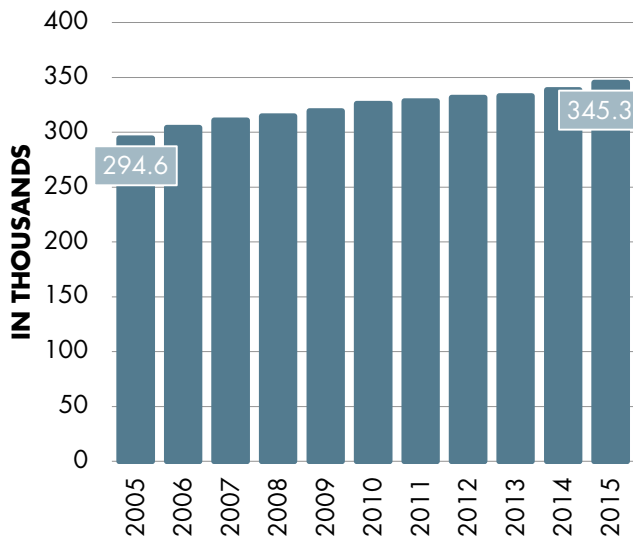
FIGURE 2. COMPARATIVE LABOR MARKET OVERVIEW

AS OF DECEMBER 31, 2015

The I-77 Alliance region has a labor force of 345,000. At year-end 2015, the unemployment rate was 5.7 percent, which was lower than the state's but slightly higher than the national unemployment rate.

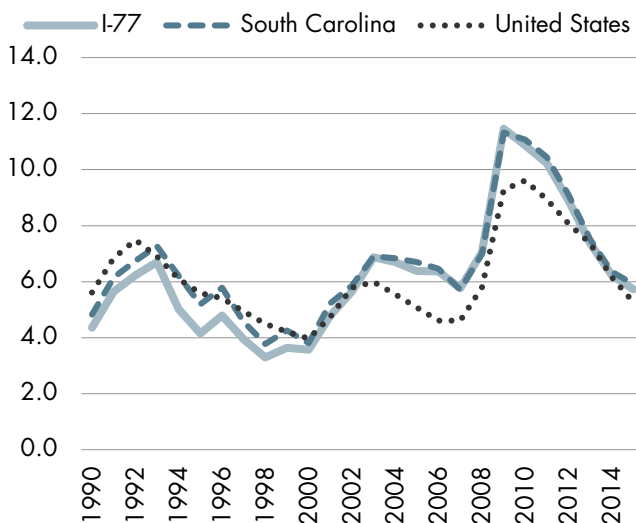
GEOGRAPHY	CIVILIAN LABOR FORCE	EMPLOYED	UNEMPLOYED	UNEMPLOYMENT RATE
United States	157,128,167	148,840,583	8,287,833	5.3%
South Carolina	2,253,158	2,119,754	133,404	5.9%
I-77 Alliance	345,279	325,497	19,782	5.7%

Source: US Bureau of Labor Statistics, Local Area Unemployment Statistics (state and local), Current Population Survey (national) via Moody's economy.com.

**FIGURE 3. CIVILIAN LABOR FORCE**
2005-2015

Between 2005 and 2015, the labor force grew from 295,000 to 345,300, an increase of just over 17 percent. This growth was significantly higher than that of the state (8.9 percent) and the nation (5.3 percent) over the same period.

Source: US Bureau of Labor Statistics via Moody's economy.com.

**FIGURE 4. ANNUAL UNEMPLOYMENT RATES**
SEASONALLY ADJUSTED, 1990-2015

Between 1990 and 2000, the regional unemployment rate remained lower than South Carolina and the national rate. Since 2003, the regional unemployment rate, as well as the state's, has been slightly higher than the national unemployment rate. Over this same period, the regional unemployment rate varied from a high of 11.5 percent to a low of 3.3 percent. As of November 2016, the regional unemployment rate was 4.5 percent.

Source: US Bureau of Labor Statistics, Local Area Unemployment Statistics (state and local), Current Population Survey (national) via Moody's economy.com.

FIGURE 5. LABOR FORCE PARTICIPATION RATE COMPARISON

The I-77 Alliance's labor force participation rate is 63.9 percent, which is significantly higher than South Carolina's and in line with the national rate of 63.5 percent.

Source: Census Bureau, 2010-14 American Community Survey via Moody's economy.com.

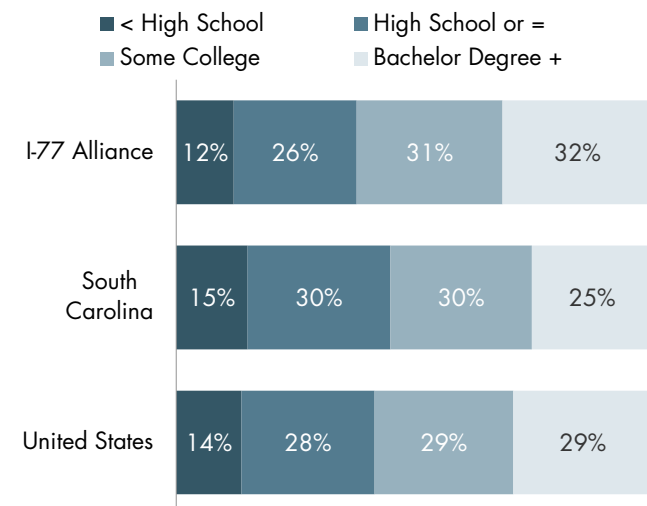
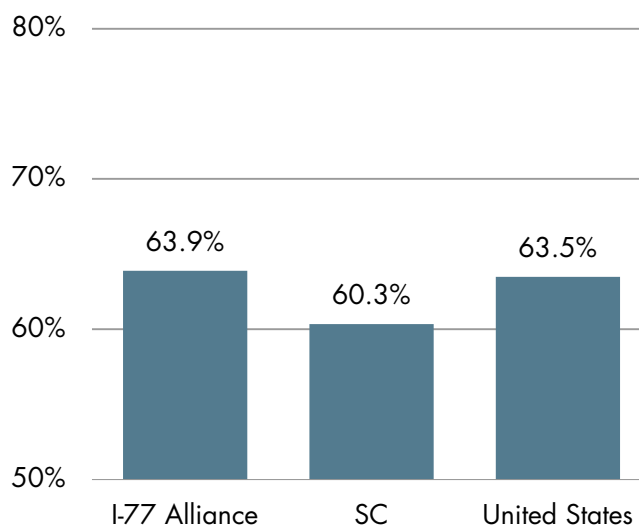


FIGURE 6. EDUCATIONAL ATTAINMENT POPULATION 25+

The I-77 Alliance's regional population has a high educational attainment. Thirty-two percent of the population has earned a bachelor degree or higher, which is higher than both the state of South Carolina and the US.

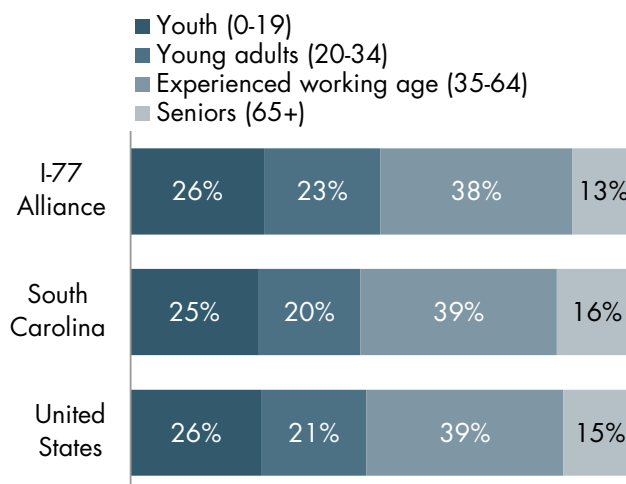
Only 38 percent of the population has a high school diploma or less, which is considerably lower than the state (45 percent) and the nation (42 percent).

Source: Census Bureau, 2010-14 American Community Survey via Moody's economy.com.

FIGURE 7. AGE DISTRIBUTION

The regional population is also younger than the state and the US. Seniors (65+) represent only 13 percent of the population, which is three percentage points less than South Carolina and two percentage points less than the US. Young Adults (20-34) represent 23 percent of the population, which is three percentage points higher than South Carolina and two percentage points higher than the US.

Source: Census Bureau, 2010-14 American Community Survey via Moody's economy.com.

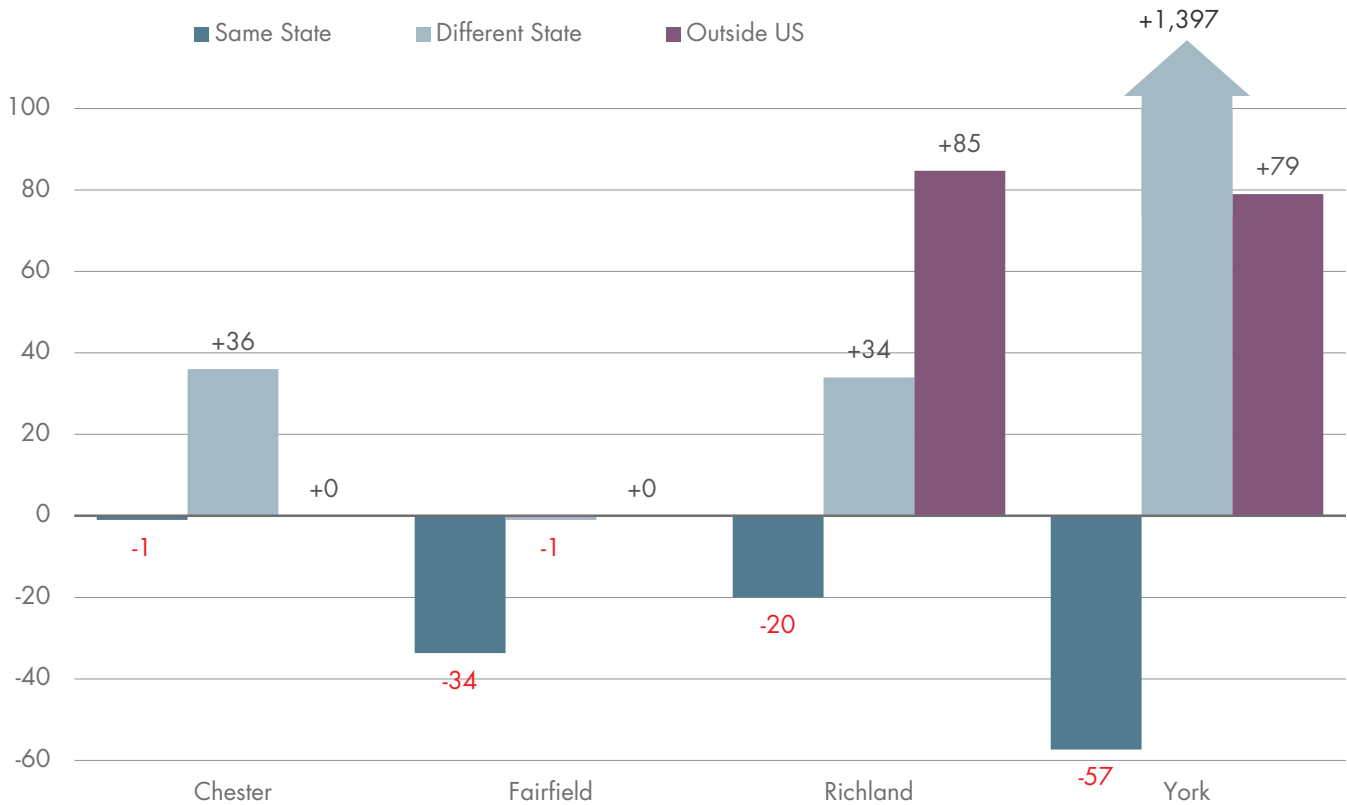


MIGRATION PATTERNS

The Internal Revenue Service tracks migration by comparing addresses on tax returns from year to year. Figure 8 shows the total net migration flows by county. All four counties have more people from South Carolina moving out of the county than into the county. However, Chester, Richland, and York counties each have more people moving into their county from a different state than are moving out. Both Richland and York counties have experienced a net in-migration of residents from outside the US.

Richland County has an average of about 11,000 residents move in and out of the county. York County has about 6,000 in-migrants and 5,000 out-migrants. Chester and Fairfield Counties each have about 500 residents move in and out of the county.

FIGURE 8. TOTAL NET MIGRATION BY COUNTY
3-YEAR AVERAGE (2013-15)



Source: Internal Revenue Service, County-to-County Migration data (accessed via Missouri Census Data Center).

The figures below show the mix of inbound and outbound migrants by source. The majority of migrants in Chester and Fairfield counties are from South Carolina. In Richland County, about half are from South Carolina and half are from outside the state. In York County, more than 70 percent of migrants are from outside of South Carolina. However, a large portion of these out-of-state migrants is from Mecklenburg County.

FIGURE 9. TOTAL MIGRATION FLOWS BY SOURCE
3-YEAR AVERAGE (2013-15)



Source: Internal Revenue Service, County-to-County Migration data (accessed via Missouri Census Data Center)
Notes: Tax years 2014-2015, 2013-2014, and 2012-2013. Figures exclude counties that had fewer than 10 returns identified as entering or leaving the county from/to another county.

LABOR MOBILITY

FIGURE 10. NORTH LABORSHED
DRAW AREA FOR YORK AND CHESTER COUNTIES

The north end of the I-77 Alliance draws workers in from the four counties that form the region and from Mecklenburg, Gaston, Union, and Lancaster counties. The north laborshed has a civilian labor force of 1.2 million.

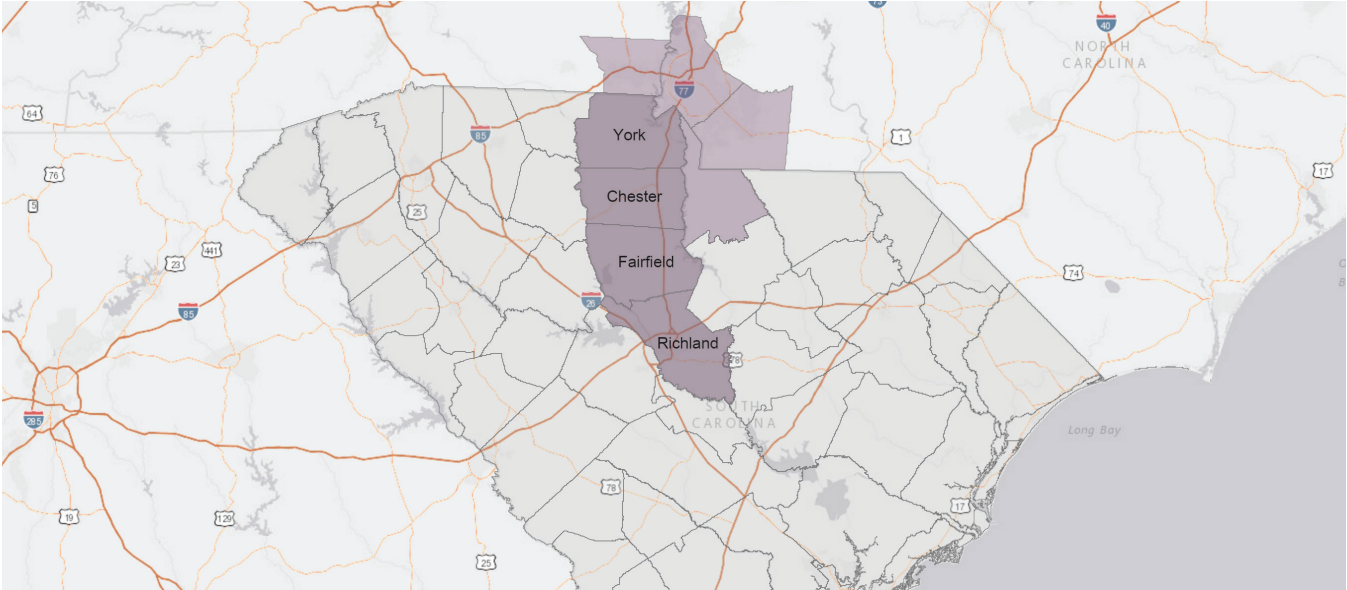


FIGURE 11. SOUTH LABORSHED
DRAW AREA FOR FAIRFIELD AND RICHLAND COUNTIES

The south end of the I-77 Alliance draws workers in from the region's four counties and from Newberry, Lexington, Orangeburg, Calhoun, and Kershaw counties, as well as Mecklenburg County. The south laborshed also has a civilian labor force of 1.2 million.

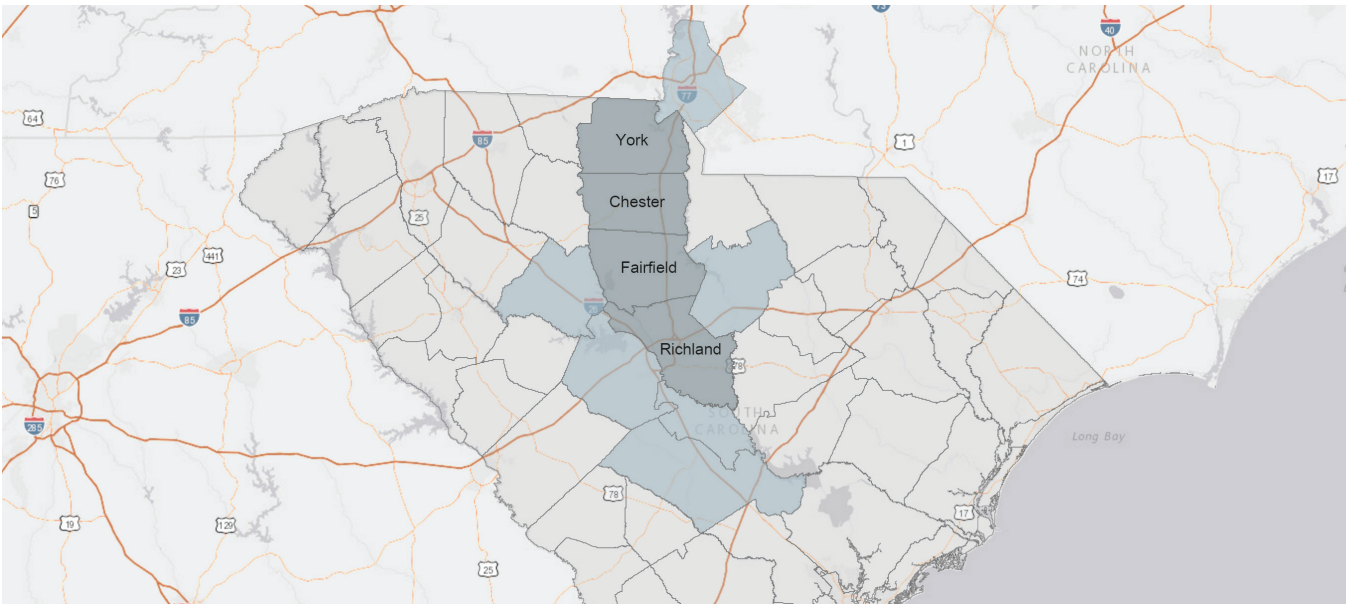


FIGURE 12. INFLOW/OUTFLOW FOR I-77 ALLIANCE REGION, 2014
FLOW OF WORKERS TO/FROM THE REGION

The four-county I-77 Alliance region is a net importer of labor with 118,000 workers commuting out of the region for work and 150,000 workers commuting in. Fifty-six percent of workers live and work in the region.



Source: US Census Bureau, Local Employment Dynamics.

Notes: Overlay arrows are for illustrative purposes and do not indicate directionality of worker flow between home and employment locations.

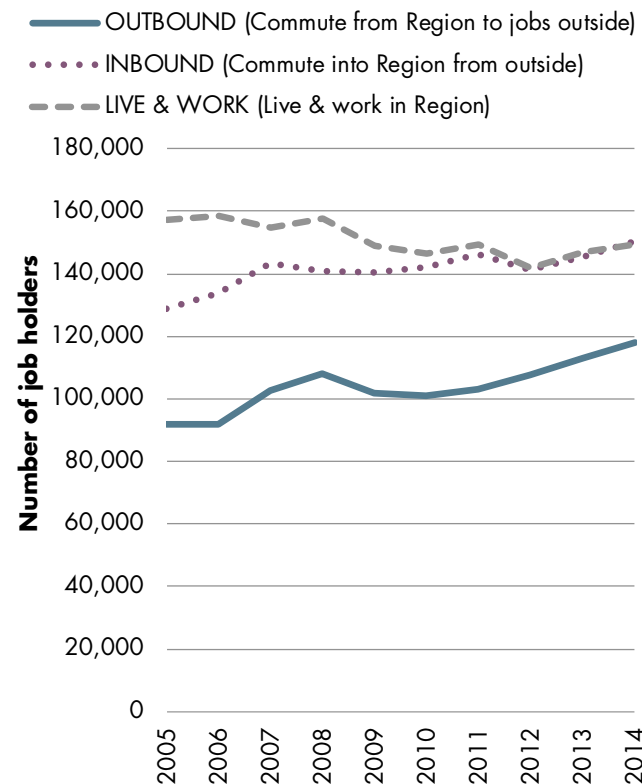


FIGURE 13. COMMUTING FLOWS, 2005-2014
NUMBER OF JOB HOLDERS

Since 2005, the number of inbound and outbound commuters has steadily climbed while the number of workers who live and work in the region has gradually declined.

The region is consistently a net importer of labor. The difference between the number of inbound and outbound commuters has stayed steadily between 30,000 and 40,000.

Source: US Census Bureau, Local Employment Dynamics.

PEOPLE WHO WORK IN THE I-77 ALLIANCE REGION

People who work in the region are travelling farther to work than they did in 2004. As of 2014, 40 percent of workers lived within 10 miles of their place of employment. This percentage has dropped since 2004 when 47 percent of workers lived within 10 miles of their place of employment. Between 2004 and 2014, the share of job holders who travel more than 50 miles increased by four percent while the share of job holders travelling 10 to 24 miles and 25 to 50 miles each increased 1 percent. Richland, York, and Lexington Counties are top sources of labor.

FIGURE 14. DISTANCE TRAVELED, 2004 VS. 2014
SHARE OF JOB HOLDERS

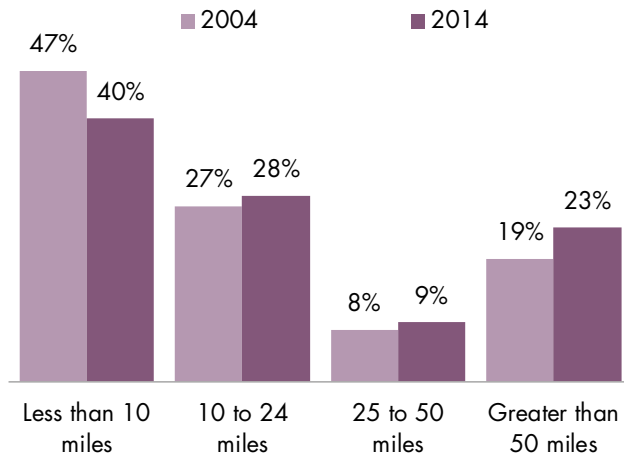


FIGURE 15. DESTINATION, 2014
WHERE REGIONAL WORKERS LIVE

County	Count	Share
1 Richland County, SC	90,361	30.1%
2 York County, SC	46,629	15.5%
3 Lexington County, SC	42,763	14.3%
4 Mecklenburg County, NC	10,184	3.4%
5 Kershaw County, SC	8,713	2.9%
6 Chester County, SC	7,239	2.4%
7 Lancaster County, SC	6,237	2.1%
8 Greenville County, SC	6,231	2.1%
9 Charleston County, SC	5,488	1.8%
10 Fairfield County, SC	5,259	1.8%
All Other Locations	70,788	23.6%
Total	299,892	100.0%

EMPLOYED PEOPLE WHO LIVE IN I-77 ALLIANCE REGION

Employed people who live in the region are also travelling farther to work. As of 2014, 44 percent of jobholders lived less than 10 miles from work, down from 51 percent in 2004. The share of jobholders that travel between 10 and 24 miles has increased from 28 percent to 32 percent, while the share of workers commuting 25 to 50 miles and greater than 50 miles increased by 1 percent and 2 percent respectively. Richland, York, and Mecklenburg Counties are the top destinations for employed people that live in the region.

FIGURE 16. DISTANCE TRAVELED, 2004 VS. 2014
SHARE OF JOB HOLDERS

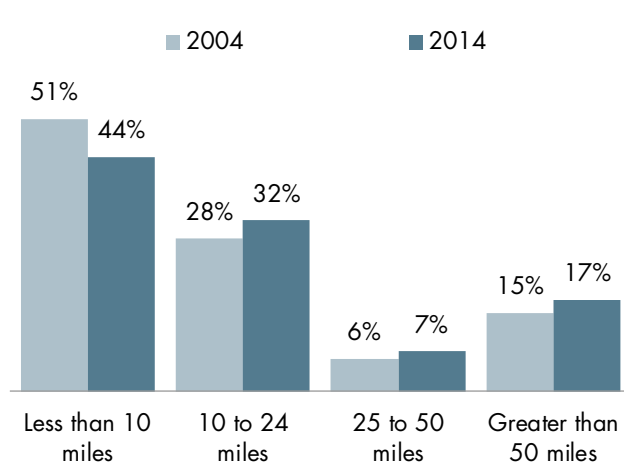


FIGURE 17. DESTINATION, 2014
WHERE EMPLOYED RESIDENTS WORK

County	Count	Share
1 Richland County, SC	92,773	34.7%
2 York County, SC	47,309	17.7%
3 Mecklenburg County, NC	32,285	12.1%
4 Lexington County, SC	27,741	10.4%
5 Greenville County, SC	7,745	2.9%
6 Chester County, SC	5,302	2.0%
7 Charleston County, SC	4,388	1.6%
8 Fairfield County, SC	4,104	1.5%
9 Lancaster County, SC	4,037	1.5%
10 Spartanburg County, SC	3,917	1.5%
All Other Locations	38,076	14.2%
Total	267,677	100.0%

Source: (all figures) US Census Bureau, Local Employment Dynamics.

Below are the top 20 sources of workers for the I-77 Alliance region. Richland and York Counties are the largest employment and residential centers within the region. Mecklenburg County is the largest employment center outside of the region for employed residents of the I-77 Alliance region and is one of the largest sources of workers for regional employers.

FIGURE 18. TOP 20 SOURCES OF WORKERS, 2014
COUNTIES WHERE REGIONAL WORKERS LIVE, WITH NET FLOW

	People who WORK in the I-77 Alliance Region and live in this county	People who LIVE in the I-77 Alliance Region and work in this county	Net flow
1 Richland County, SC	90,361	92,773	(2,412)
2 York County, SC	46,629	47,309	(680)
3 Lexington County, SC	42,763	27,741	15,022
4 Mecklenburg County, NC	10,184	32,285	(22,101)
5 Kershaw County, SC	8,713	2,140	6,573
6 Chester County, SC	7,239	5,302	1,937
7 Lancaster County, SC	6,237	4,037	2,200
8 Greenville County, SC	6,231	7,745	(1,514)
9 Charleston County, SC	5,488	4,388	1,100
10 Fairfield County, SC	5,259	4,104	1,155
11 Spartanburg County, SC	4,696	3,917	779
12 Sumter County, SC	4,342	2,257	2,085
13 Horry County, SC	4,187	1,706	2,481
14 Orangeburg County, SC	4,068	1,489	2,579
15 Florence County, SC	3,113	1,585	1,528
16 Berkeley County, SC	2,856	875	1,981
17 Aiken County, SC	2,667	1,616	1,051
18 Newberry County, SC	2,663	1,497	1,166
19 Anderson County, SC	2,581	1,552	1,029
20 Gaston County, NC	2,561	3,078	(517)

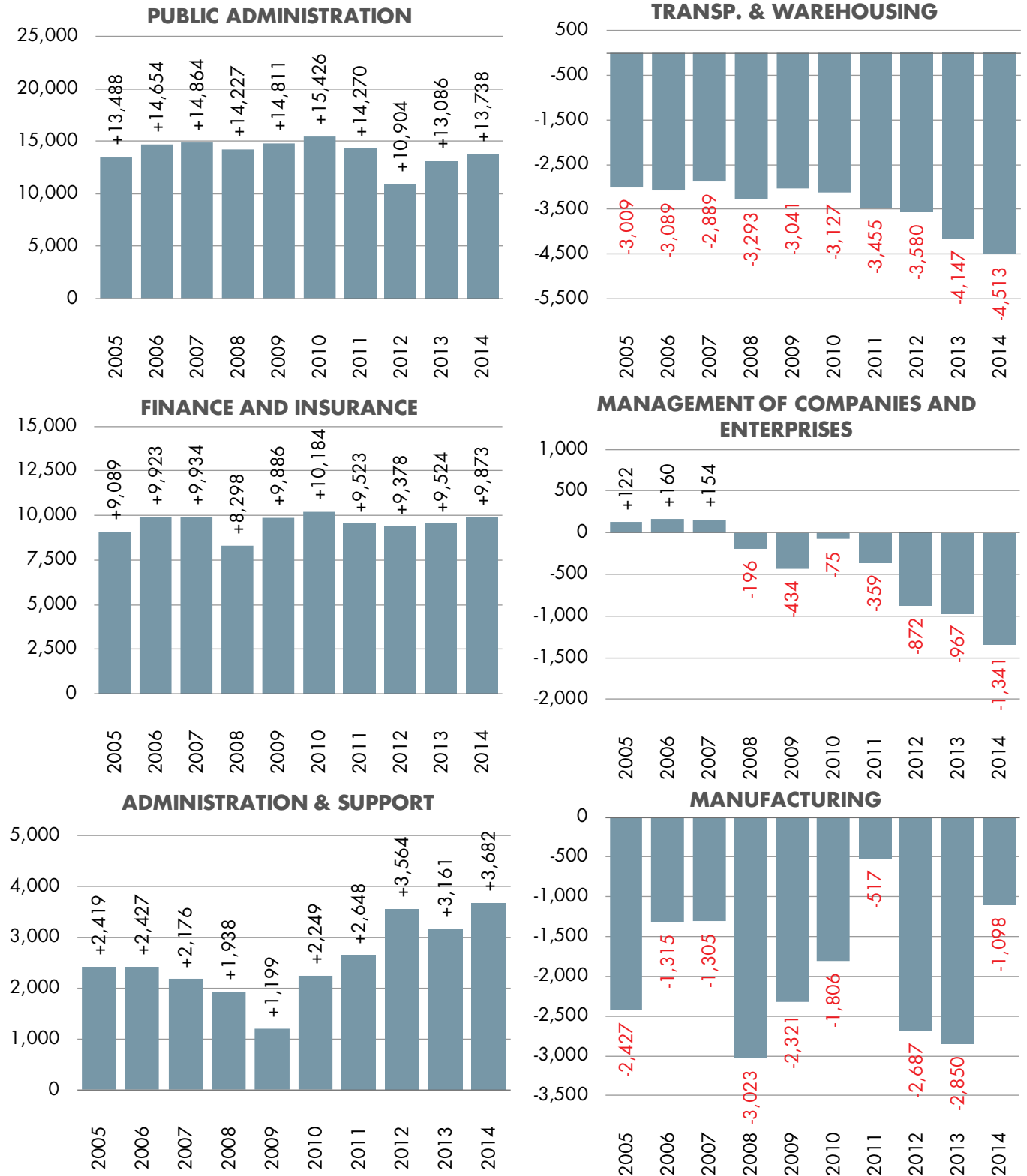
Source: US Census Bureau, Local Employment Dynamics.

In 2014, public administration, finance and insurance, and administration & support were the industries that drew people (on net) into the I-77 Alliance region for work. These sectors have consistently been net importers of workers.

Transportation & warehousing, management of companies and enterprises, and manufacturing were the industries that drew workers out of the I-77 Alliance region. The region has been a net exporter of workers in manufacturing and transportation & warehousing consistently. However, the management of companies and enterprises sector changed from a net importer to a net exporter of workers in 2008.

FIGURE 19. NET COMMUTING FLOWS BY NAICS INDUSTRY SECTOR, 2014

NET FLOWS = INBOUND - OUTBOUND FLOWS



Source: US Census Bureau, Local Employment Dynamics.

OCCUPATIONAL STRUCTURE

Low-skill occupations are those occupations that require a high school diploma or less and no on the job training. Middle-skill occupations are those occupations that require at least a high school diploma and some additional training but less than a bachelor degree. High-skill occupations are those that require a bachelor degree or higher. The I-77 Alliance region has slightly more high- and middle-skill jobs than the US.

The number of openings includes both new jobs and replacement jobs. Replacement jobs are positions needed to replace existing workers who leave the occupation due to a variety of factors including retirement, career advancement, or exiting the workforce to raise children or attend school. Over the next five years, the region is expected to have more than 70,000 openings. More than 60 percent of these openings will be replacement jobs. Thirty-five percent of the openings will be for middle-skill occupations and 22 percent for high-skill occupations.

FIGURE 20. OCCUPATIONS BY SKILL LEVEL, 2016

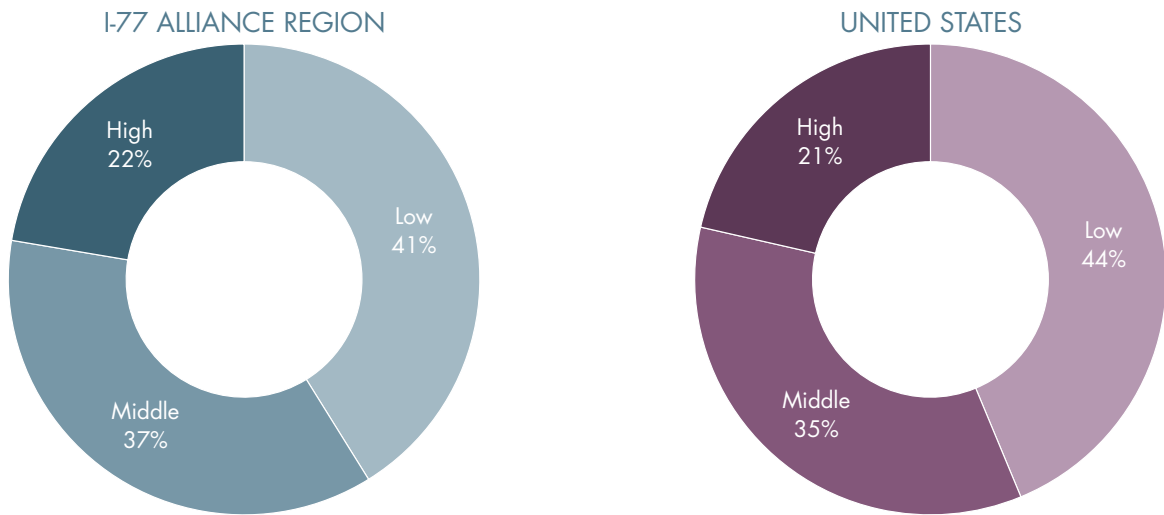
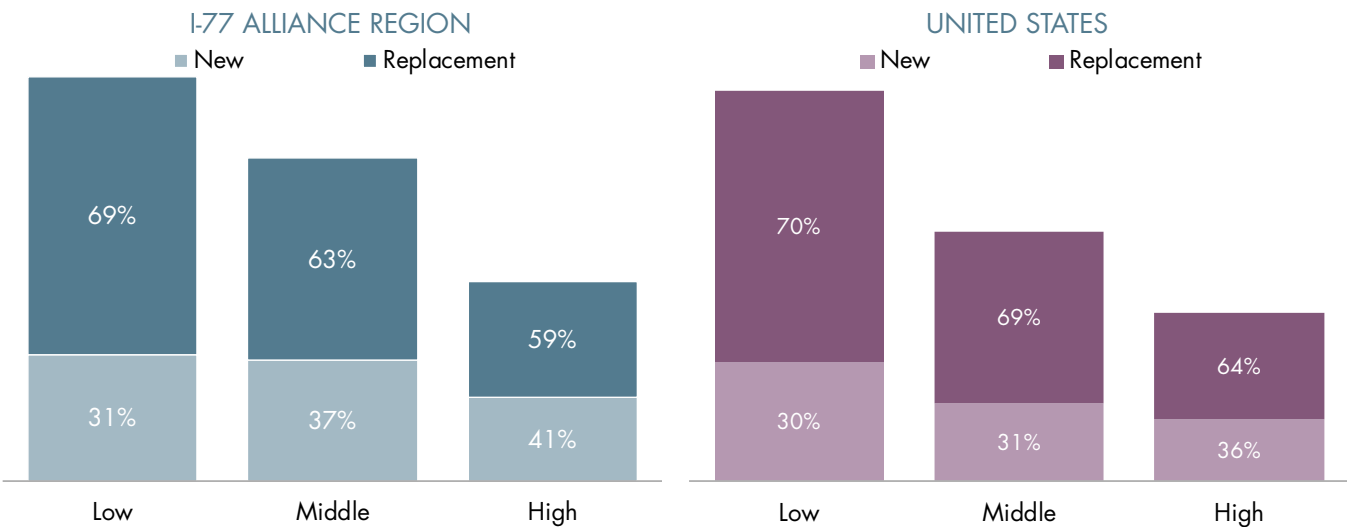


FIGURE 21. ESTIMATED OPENINGS BY SKILL LEVEL, 2016-2021



Source: (all figures) EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

The largest occupations categories in the region are office and administrative support; sales and related; food preparation and serving related; production; and education, training, and library.

FIGURE 22. EMPLOYMENT BY OCCUPATION, I-77 ALLIANCE REGION

2016

SOC Code & Description	I-77 Alliance Region	
43 Office and Administrative Support	59,992	
41 Sales and Related	34,365	
35 Food Preparation and Serving Related	28,483	
51 Production	22,590	
25 Education, Training, and Library	21,027	
29 Healthcare Practitioners and Technical	20,524	
13 Business and Financial Operations	20,118	
53 Transportation and Material Moving	19,526	
11 Management	17,472	
49 Installation, Maintenance, and Repair	13,773	
37 Building/Grounds Cleaning and Maintenance	12,486	
39 Personal Care and Service	12,431	
47 Construction and Extraction	11,738	
33 Protective Service	10,784	
15 Computer and Mathematical	9,918	
31 Healthcare Support	9,090	
21 Community and Social Service	7,003	
17 Architecture and Engineering	6,349	
27 Arts, Design, Entertainment, Sports, and Media	5,255	
23 Legal	4,305	
19 Life, Physical, and Social Science	2,283	
45 Farming, Fishing, and Forestry	1,174	

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Note: Excludes military and unclassified occupations

The occupational categories with the highest concentration of employment in the region are office and administrative; sales and related; and food preparation and serving related. This distribution pattern is similar to those of the laborshed, state, and US.

FIGURE 23. OCCUPATIONAL DISTRIBUTION (% OF TOTAL)
COMPARISON OF I-77 ALLIANCE REGION WITH SELECTED GEOGRAPHIES AND US

SOC Code & Description	I-77 Alliance Region	North Laborshed	South Laborshed	State	US
43 Office & Administrative Support	17.1%	16.0%	16.1%	14.9%	15.2%
41 Sales & Related	9.8%	10.9%	11.0%	10.7%	10.2%
35 Food Preparation & Serving Related	8.1%	8.1%	8.2%	9.2%	8.4%
51 Production	6.4%	6.0%	5.9%	9.0%	6.0%
25 Education, Training, & Library	6.0%	4.9%	4.9%	5.6%	5.8%
29 Healthcare Practitioners & Technical	5.9%	5.3%	5.4%	5.6%	5.5%
13 Business & Financial Operations	5.7%	6.6%	6.3%	4.0%	5.1%
53 Transportation & Material Moving	5.6%	6.9%	7.2%	6.8%	6.6%
11 Management	5.0%	5.6%	5.5%	4.7%	5.5%
49 Installation, Maintenance, & Repair	3.9%	3.9%	4.0%	4.5%	3.8%
37 Building/Grounds Cleaning & Maint.	3.6%	3.4%	3.4%	4.3%	3.8%
39 Personal Care & Service	3.5%	3.3%	3.3%	3.5%	4.1%
47 Construction & Extraction	3.3%	3.9%	3.8%	4.2%	4.5%
33 Protective Service	3.1%	2.6%	2.5%	2.2%	2.3%
15 Computer & Mathematical	2.8%	3.7%	3.5%	1.9%	2.8%
31 Healthcare Support	2.6%	2.6%	2.6%	2.6%	2.8%
21 Community & Social Service	2.0%	1.5%	1.5%	1.5%	1.6%
17 Architecture & Engineering	1.8%	1.5%	1.5%	1.8%	1.7%
27 Arts, Design, Entertainment, & Media	1.5%	1.6%	1.5%	1.3%	1.8%
23 Legal	1.2%	0.9%	0.9%	0.7%	0.8%
19 Life, Physical, & Social Science	0.7%	0.5%	0.5%	0.5%	0.8%
45 Farming, Fishing, & Forestry	0.3%	0.3%	0.4%	0.5%	0.8%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Excludes military and unclassified employment. Three largest occupations are highlighted.

The occupational categories in the I-77 Alliance region with much higher concentrations of workers relative to the US are legal and protective service occupations.

FIGURE 24. OCCUPATIONAL CONCENTRATION (LQ)
COMPARISON OF I-77 ALLIANCE REGION WITH SELECTED GEOGRAPHIES AND US

SOC Code & Description	I-77 Alliance Region	North Laborshed	South Laborshed	State	US
23 Legal	1.47	1.11	1.09	0.83	1.00
33 Protective Service	1.36	1.15	1.12	0.99	1.00
21 Community & Social Service	1.21	0.93	0.94	0.94	1.00
13 Business & Financial Operations	1.13	1.31	1.24	0.78	1.00
43 Office & Administrative Support	1.12	1.05	1.06	0.98	1.00
17 Architecture & Engineering	1.08	0.91	0.88	1.09	1.00
51 Production	1.07	1.00	0.99	1.49	1.00
29 Healthcare Practitioners & Technical	1.07	0.97	0.99	1.03	1.00
25 Education, Training, & Library	1.04	0.84	0.84	0.97	1.00
49 Installation, Maintenance, & Repair	1.02	1.02	1.05	1.16	1.00
15 Computer & Mathematical	1.01	1.31	1.25	0.68	1.00
35 Food Preparation & Serving Related	0.97	0.96	0.97	1.09	1.00
41 Sales & Related	0.96	1.06	1.07	1.04	1.00
37 Building/Grounds Cleaning & Maint.	0.93	0.90	0.90	1.12	1.00
31 Healthcare Support	0.93	0.93	0.93	0.95	1.00
11 Management	0.91	1.01	0.99	0.85	1.00
39 Personal Care & Service	0.87	0.80	0.81	0.86	1.00
53 Transportation & Material Moving	0.84	1.04	1.09	1.02	1.00
27 Arts, Design, Entertainment, & Media	0.83	0.89	0.84	0.72	1.00
19 Life, Physical, & Social Science	0.80	0.61	0.59	0.60	1.00
47 Construction & Extraction	0.74	0.87	0.84	0.93	1.00
45 Farming, Fishing, & Forestry	0.43	0.34	0.46	0.66	1.00

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Excludes military and unclassified employment. LQs greater than 1.25 are presumed to show competitive advantage and are highlighted.

ABOUT LOCATION QUOTIENTS (LQS)

Location quotient (LQ) is a way of quantifying how concentrated a particular occupation is in a region as compared to the nation. LQs are calculated as an occupation's share of total local employment divided by the same occupation's share of employment at the national level:

$$\frac{(\text{local employment in occupation } x / \text{total local employment -all occupations})}{(\text{national employment in occupation } x / \text{total national employment-all occupations})}$$

If the local occupation and national occupation are perfectly proportional, the LQ will be 1.00. LQs greater than 1.25 are presumed to indicate a comparative advantage; those below 0.75 suggest areas of weakness.

The I-77 Alliance region has a number of unique occupational strengths. At the top of the list is the region's specialized workforce related to the nuclear industry. In addition, a range of production occupations are present in this list, in particular, machine operators of various types and chemical operators. The region also has a strength in two occupations that are difficult to fill nationally—HR assistants and computer programmers.

FIGURE 25. I-77 ALLIANCE REGION OCCUPATIONAL STRENGTHS
TOP 30 LOCATION QUOTIENTS

SOC CODE	DESCRIPTION	I-77 Alliance Region			
		2016 Jobs	2016 LQ	Median Hourly Earnings	Wage Premium over US Avg.
19-4051	Nuclear Technicians	367	24.45	\$44.18	1.12
51-8011	Nuclear Power Reactor Operators	215	13.43	\$45.35	1.04
17-2161	Nuclear Engineers	485	11.10	\$49.37	1.01
21-1029	Social Workers, All Other	864	5.76	\$19.61	0.70
51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	224	4.82	\$14.03	0.88
27-4012	Broadcast Technicians	324	4.76	\$15.63	0.81
51-9196	Paper Goods Machine Workers	903	4.28	\$26.43	1.52
31-1015	Orderlies	541	4.10	\$11.24	0.86
19-2043	Hydrologists	62	3.83	\$27.12	0.70
51-6064	Textile Winding, Twisting, & Drawing Machine	245	3.76	\$12.38	0.95
17-1021	Cartographers & Photogrammetrists	106	3.58	\$24.84	0.83
51-8091	Chemical Plant & System Operators	253	3.15	\$21.26	0.73
45-4011	Forest & Conservation Workers	76	2.72	\$12.36	0.88
51-4191	Heat Treating Equip. Workers, Metal/Plastic	126	2.71	\$19.63	1.09
53-3011	Ambulance Drivers & Attendants, Except EMTs	127	2.66	\$13.38	1.12
11-9161	Emergency Management Directors	60	2.55	\$25.73	0.77
51-4023	Rolling Machine Workers, Metal/Plastic	178	2.50	\$20.31	1.02
23-1023	Judges, Magistrate Judges, & Magistrates	168	2.47	\$39.85	0.73
43-9071	Office Machine Operators, Except Computer	364	2.40	\$14.10	0.99
43-4161	HR Asst., Except Payroll & Timekeeping	837	2.38	\$15.92	0.86
51-6063	Textile Knitting & Weaving Machine	121	2.36	\$13.87	1.05
23-2011	Paralegals & Legal Assistants	1,559	2.36	\$21.04	0.86
11-3131	Training & Development Managers	184	2.34	\$40.65	0.82
51-4033	Grinding & Buffing Machine, Metal/Plastic	376	2.27	\$21.25	1.33
29-2051	Dietetic Technicians	154	2.22	\$11.89	0.89
15-1131	Computer Programmers	1,558	2.17	\$33.00	0.86
39-5011	Barbers	327	2.15	\$10.39	0.94
43-3011	Bill & Account Collectors	1,609	2.14	\$16.76	1.01
29-2053	Psychiatric Technicians	303	2.13	\$11.65	0.69
43-9111	Statistical Assistants	70	2.09	\$20.51	0.99

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Note: Occupations with at least 50 jobs in for I-77 Alliance region. Wage premiums that are more than 10 percent above the national average are highlighted.

The following two pages show the region's top occupations based on various indicators.

FIGURE 26. TOP 10 OCCUPATIONS, I-77 ALLIANCE REGION

Employment in 2016	◀ LARGEST	Median hourly earnings
9,799	Retail Salespersons	\$11.20
8,646	Cashiers	\$10.04
8,503	Combined Food Prep. & Servers, Incl. Fast Food	\$9.91
8,249	Customer Service Representatives	\$15.62
8,169	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	\$15.77
7,025	Registered Nurses	\$28.05
6,800	Laborers/Freight, Stock, & Material Movers, Hand	\$13.37
6,493	Office Clerks, General	\$12.99
6,146	Janitors & Cleaners, Exc. Maids & Housekeepers	\$11.11
5,446	First-Line Supvrs., Office & Admin. Support	\$23.13

Employment in 2016	HIGHEST-PAYING (\$) ▶	Median hourly earnings
143	Internists, General	\$105.78
630	Physicians & Surgeons, All Other	\$92.45
166	Surgeons	\$91.03
597	Family & General Practitioners	\$87.00
949	Chief Executives	\$82.14
299	Dentists, General	\$78.02
60	Nurse Anesthetists	\$76.21
72	Psychiatrists	\$74.48
63	Obstetricians & Gynecologists	\$63.70
367	Architectural & Engineering Mgrs.	\$56.88

Net change	◀ FASTEST-GROWING, 2016-21 (#)	Median hourly earnings
+952	Combined Food Prep. & Servers, Incl. Fast Food	\$9.91
+856	Laborers/Freight, Stock, & Material Movers, Hand	\$13.37
+774	Team Assemblers	\$14.61
+567	Security Guards	\$11.85
+551	Registered Nurses	\$28.05
+477	Personal Care Aides	\$10.33
+463	Customer Service Representatives	\$15.62
+450	Waiters & Waitresses	\$10.08
+370	General & Operations Managers	\$47.63
+367	Office Clerks, General	\$12.99

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Note: Excludes military (I-77 Alliance region). Includes only those occupations with >50 jobs.

The following two pages show the region's top occupations based on various indicators.

FIGURE 26. TOP 10 OCCUPATIONS, I-77 ALLIANCE REGION—CONT.

% change	◀FASTEST-GROWING, 2016-21 (%)	Median hourly earnings
+53%	CNC Machine Operators, Metal/Plastic	\$17.16
+51%	Electrical & Electronic Equip. Assemblers	\$16.77
+43%	Parking Lot Attendants	\$12.38
+39%	Eligibility Interviewers, Govt. Programs	\$19.84
+38%	Woodworking Machine, Except Sawing	\$13.69
+37%	Assemblers & Fabricators, All Other	\$12.89
+33%	Coating, Painting, & Spraying Machine Workers	\$17.44
+30%	Multiple Machine Tool Workers, Metal/Plastic	\$20.66
+29%	First-Line Supvsr., Correctional Officers	\$22.44
+28%	Probation Officers & Correctional Specialists	\$20.26

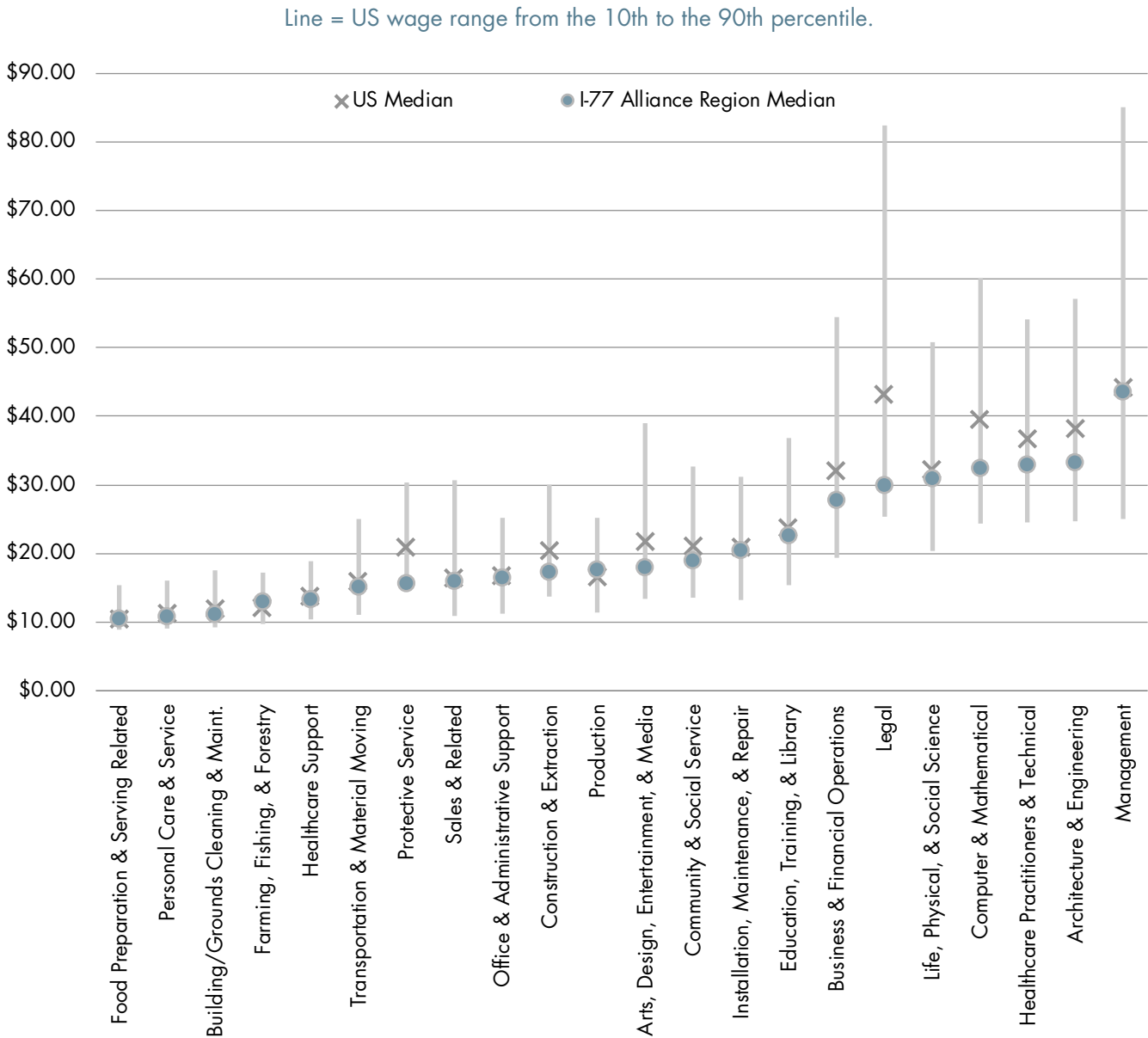
Net change	◀FASTEST-DECLINING, 2016-21 (#)	Median hourly earnings
-84	Psychiatric Technicians	\$11.65
-64	Drywall & Ceiling Tile Installers	\$16.44
-64	Painters, Construction & Maintenance	\$13.57
-63	Carpenters	\$16.35
-61	Telecomm. Equip. Install./Repair, Exc. Line Install.	\$26.43
-60	Cooks, Fast Food	\$9.88
-57	Paper Goods Machine Workers	\$26.43
-48	Construction Managers	\$33.60
-42	Loan Officers	\$30.34
-36	Pressers, Textile, Garment, & Related	\$10.57

% change	◀FASTEST-DECLINING, 2016-21 (%)	Median hourly earnings
-30%	Insulation Workers, Floor, Ceiling, & Wall	\$16.99
-29%	Drywall & Ceiling Tile Installers	\$16.44
-28%	Psychiatric Technicians	\$11.65
-24%	Door-to-Door Sales, Street Vendors, & Related	\$11.89
-22%	Reporters & Correspondents	\$18.49
-21%	Telecomm. Equip. Install./Repair, Exc. Line Install.	\$26.43
-18%	Pressers, Textile, Garment, & Related	\$10.57
-16%	Telecomm. Line Installers & Repairers	\$20.82
-16%	Brickmasons & Blockmasons	\$17.27
-14%	Switchboard Operators, Incl. Answering Service	\$13.40

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed
 Note: Excludes military (I-77 Alliance region). Includes only those occupations with >50 jobs.

For most occupational groups, regional wages are at or below the US median. One notable exception is that the regional median hourly wage for production occupations is 6.4 percent higher than the US median. Of the occupational categories that pay less than the US median, legal occupations have the widest disparity with the regional median being almost 31 percent lower than the US median hourly wage.

FIGURE 27. I-77 ALLIANCE REGION WAGES IN THE CONTEXT OF THE NATIONAL WAGE RATES
BY MAJOR OCCUPATIONAL GROUP



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed
Note: Figures exclude military occupations.

DEMAND DRIVERS

FIGURE 28. TOTAL JOBS, I-77 ALLIANCE REGION
2006 TO 2016

Since 2006, the regional employment base grew from almost 340,000 to over 362,000, an increase of almost 7 percent. Between 2008 and 2011, the region lost 5 percent of its job base, but all jobs were recovered by 2014.

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

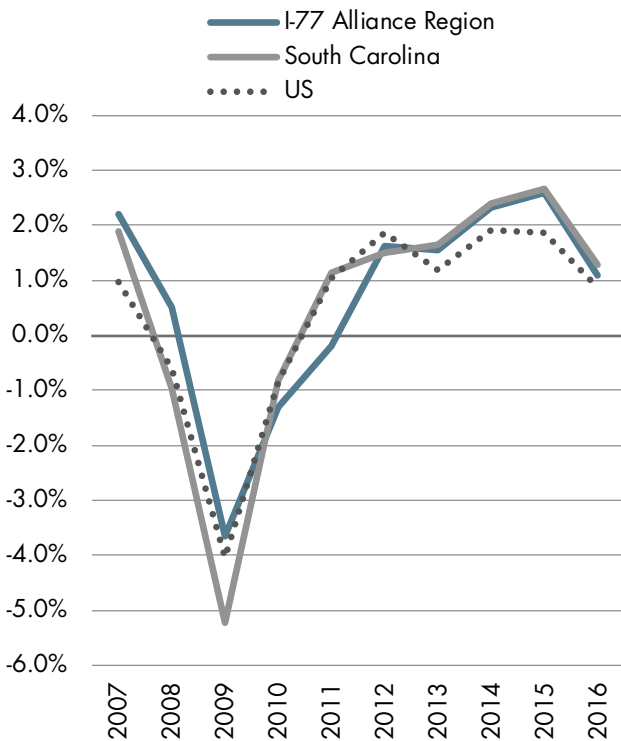
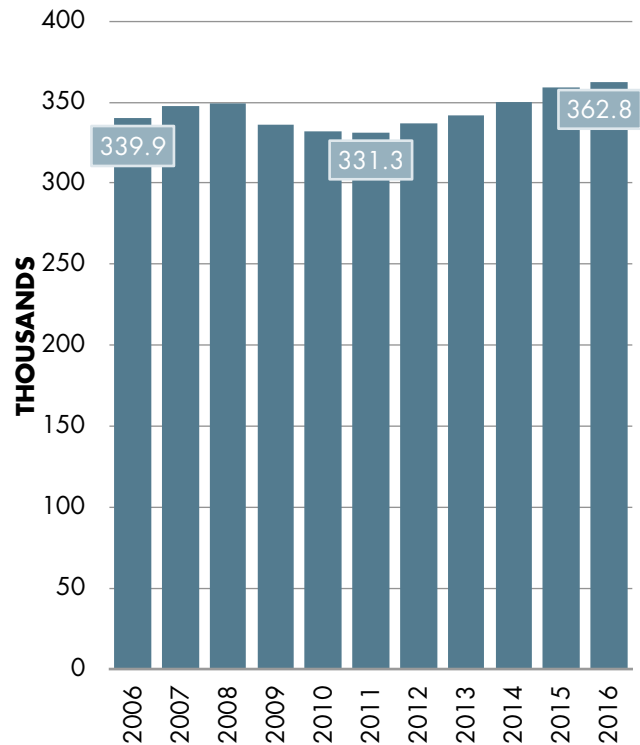


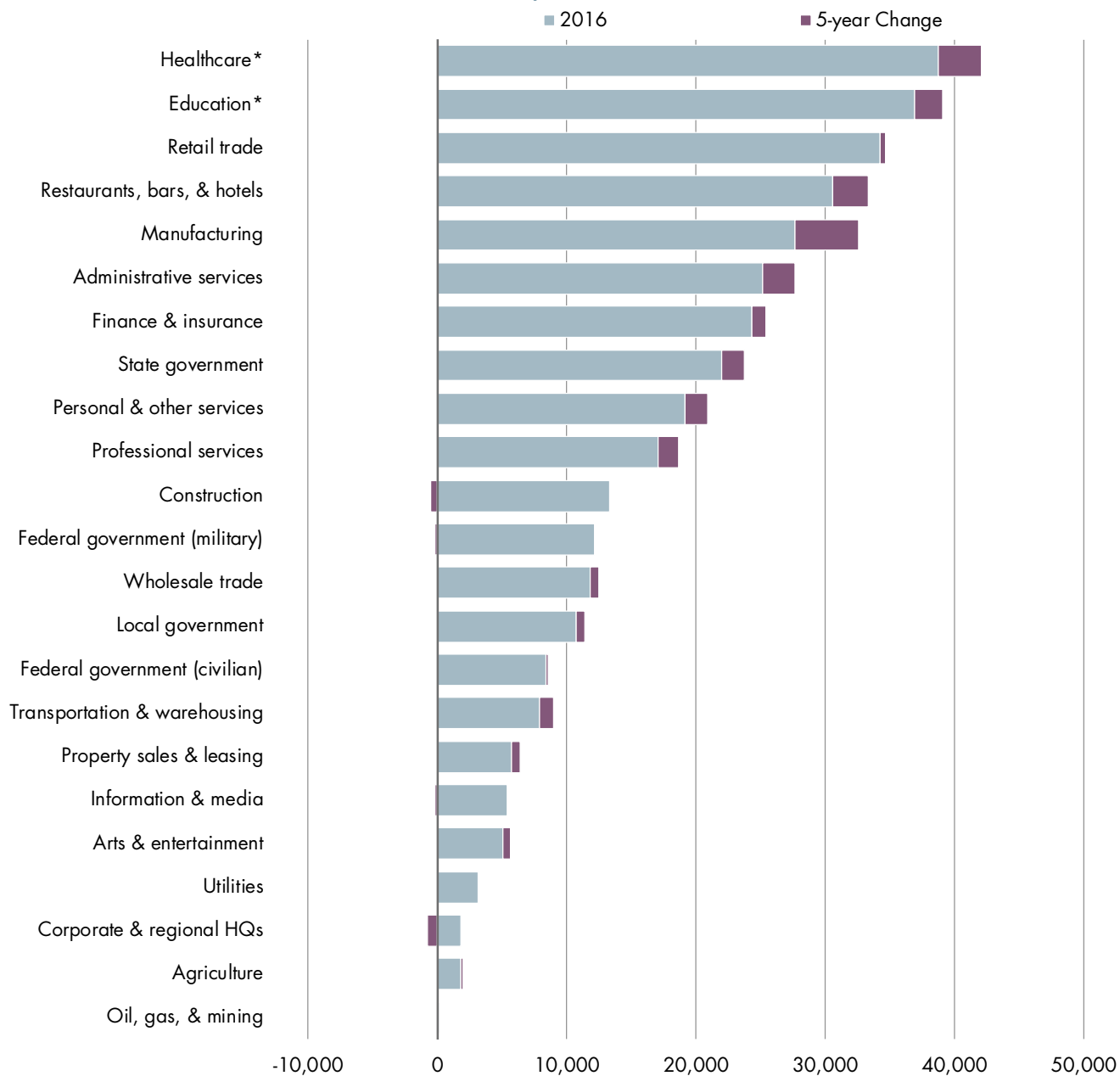
FIGURE 29. COMPARATIVE CHANGE IN JOBS
2007 TO 2016

The I-77 Alliance region performed better than the state and nation from 2007 to 2009. After the recession, however, it lagged behind the state and nation until 2012 when the region caught up with state trends.

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Healthcare, education, and retail are the top three industry sectors in the I-77 Alliance region. Manufacturing is the fifth largest sector, employing more than 27,000 workers in the region. Over the next five years, the manufacturing sector is expected to add the most jobs with the healthcare sector adding the second largest number of jobs.

FIGURE 30. TOTAL EMPLOYMENT BY INDUSTRY, JOB BASE 2016 + PROJECTED 5-YEAR CHANGE



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

*Note: Education includes all public schools, colleges, & universities, and healthcare includes all public hospitals

Healthcare, education, and retail hold the largest shares of employment in the region. Corporate and regional office, agriculture and forestry, and mining are the sectors with the smallest shares of employment in the region.

FIGURE 31. INDUSTRY DISTRIBUTION (% OF TOTAL)
COMPARISON OF I-77 ALLIANCE REGION WITH STATE AND NATION

NAICS Code & Description	I-77 Alliance Region	North Laborshed	South Laborshed	South Carolina	US
62 Healthcare & social assistance*	11.0%	10.9%	11.0%	11.5%	13.3%
61 Education*	10.5%	7.4%	7.7%	9.0%	9.3%
44-45 Retail trade	9.8%	9.8%	10.1%	11.7%	10.6%
72 Lodging, restaurants, & bars	8.7%	8.5%	8.5%	10.0%	8.6%
31-33 Manufacturing	7.9%	7.0%	7.2%	11.0%	8.1%
56 Administrative & support services	7.2%	7.9%	7.8%	8.0%	6.3%
52 Finance & insurance	6.9%	7.4%	6.9%	3.3%	3.9%
9029 State govt.	6.3%	2.1%	2.1%	2.2%	1.5%
81 Personal & other services	5.5%	4.9%	5.0%	5.1%	4.9%
54 Professional services	4.9%	6.7%	6.1%	4.9%	6.5%
23 Construction	3.8%	4.9%	5.1%	5.3%	5.4%
42 Wholesale trade	3.4%	4.5%	4.5%	3.4%	3.9%
9039 Local govt.	3.0%	3.3%	3.1%	3.4%	3.6%
9011 Federal govt. (civilian)	2.9%	1.4%	1.4%	1.5%	1.8%
48-49 Transportation & warehousing	1.8%	3.6%	4.0%	3.1%	3.5%
53 Property sales & leasing	1.6%	1.8%	1.8%	1.7%	1.7%
51 Information	1.5%	2.5%	2.3%	1.3%	1.9%
71 Arts, entertainment, & recreation	1.4%	1.9%	1.8%	1.5%	1.7%
22 Utilities	0.9%	0.5%	0.6%	0.6%	0.4%
55 Corporate & regional offices	0.5%	2.8%	2.5%	0.8%	1.4%
11 Agriculture & forestry	0.5%	0.3%	0.6%	0.8%	1.3%
21 Mining (incl. oil & gas)	0.0%	0.0%	0.1%	0.1%	0.4%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

*Note: Education includes all public schools, colleges, & universities, and healthcare includes all public hospitals. Excludes military and unclassified employment.

State government, utilities, finance and insurance, and federal government are the sectors with significantly larger shares of the regional employment base in comparison to the US. The corporate and regional offices sector has significantly smaller representation in the region than it has in either of the laborsheds. Manufacturing and administrative and support services have lower concentrations in the region relative to the US than they do in the state.

FIGURE 32. INDUSTRY CONCENTRATION (LQ)
COMPARISON OF I-77 ALLIANCE REGION WITH STATE AND NATION

NAICS Code & Description	I-77 Alliance Region	North Laborshed	South Laborshed	South Carolina	US
9029 State govt.	4.18	1.44	1.42	1.45	1.00
22 Utilities	2.44	1.35	1.65	1.56	1.00
52 Finance & insurance	1.72	1.88	1.74	0.83	1.00
9011 Federal govt. (civilian)	1.52	0.76	0.76	0.83	1.00
61 Education*	1.13	0.79	0.82	0.96	1.00
56 Administrative & support services	1.11	1.24	1.23	1.25	1.00
81 Personal & other services	1.10	1.01	1.01	1.04	1.00
72 Lodging, restaurants, & bars	0.99	0.98	0.98	1.15	1.00
31-33 Manufacturing	0.96	0.86	0.89	1.35	1.00
53 Property sales & leasing	0.95	1.08	1.05	0.99	1.00
44-45 Retail trade	0.91	0.93	0.95	1.09	1.00
42 Wholesale trade	0.85	1.17	1.16	0.86	1.00
62 Healthcare & social assistance*	0.83	0.82	0.82	1.23	1.00
9039 Local govt.	0.83	0.90	0.86	0.94	1.00
71 Arts, entertainment, & recreation	0.82	1.12	1.05	0.88	1.00
51 Information	0.79	1.32	1.23	0.69	1.00
54 Professional services	0.74	1.04	0.94	0.74	1.00
23 Construction	0.68	0.90	0.93	0.97	1.00
48-49 Transportation & warehousing	0.51	1.04	1.14	0.88	1.00
11 Agriculture & forestry	0.40	0.22	0.45	0.61	1.00
55 Corporate & regional offices	0.35	1.97	1.76	0.55	1.00
21 Mining (incl. oil & gas)	0.08	0.07	0.11	0.14	1.00

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

*Note: Education includes all public schools, colleges, & universities, and healthcare includes all public hospitals. Excludes military and unclassified employment.

The following figures show the top 20 high demand occupations for each skill level—low, middle, and high. Many of the middle- and high-skill, high-demand occupations are facing a wave of retirements, with more than 25 percent of the workers in those occupations aged 55 or older. In all but four of the occupations, the regional median hourly wage is near or below that of the US.

FIGURE 33. DEMAND FACTORS BY SKILL LEVEL

ESTIMATED ANNUAL OPENINGS (THROUGH 2021) WITH ESTIMATE OF NET CHANGE & REPLACEMENT DEMAND

SOC CODE	DESCRIPTION	2016 Jobs	DEMAND FACTORS			Wage Premium over US	DEMOGRAPHICS	
			Projected Annual Openings (2016-21)	New jobs	Replacement		% 55+ Years	% 65+ Years
LOW-SKILL (High school or less)								
35-3021	Combined Food Prep. & Servers, Incl. Fast Food	8,503	487	35%	65%	1.05	6%	3%
41-2031	Retail Salespersons	9,799	419	10%	90%	1.04	14%	7%
41-2011	Cashiers	8,646	419	7%	93%	1.03	9%	4%
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,800	392	38%	62%	1.08	12%	3%
35-3031	Waiters & Waitresses	4,784	335	23%	77%	1.02	4%	1%
43-4051	Customer Service Representatives	8,249	304	27%	73%	1.00	14%	3%
43-9061	Office Clerks, General	6,493	223	30%	70%	0.89	19%	7%
43-5081	Stock Clerks & Order Fillers	3,905	181	25%	75%	0.98	13%	4%
33-9032	Security Guards	3,830	174	58%	42%	0.95	18%	9%
37-2011	Janitors & Cleaners, Exc. Maids & Housekeepers	6,146	157	13%	87%	0.93	22% ◀	9%
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	8,169	140	28%	72%	0.95	25% ◀	7%
35-2014	Cooks, Restaurant	2,375	137	45%	55%	0.94	6%	2%
39-9021	Personal Care Aides	2,617	119	72%	28%	0.99	23% ◀	12% ◀
31-1011	Home Health Aides	1,968	115	52%	48%	0.99	19%	6%
37-2012	Maids & Housekeepers	2,608	89	25%	75%	0.90	20%	8%
43-4171	Receptionists & Information Clerks	2,346	88	21%	79%	0.98	15%	8%
35-9031	Hosts & Hostesses	935	88	17%	83%	1.03	3%	3%
39-9011	Childcare Workers	2,244	86	17%	83%	0.99	15%	9%
37-3011	Landscaping & Groundskeeping Workers	2,346	85	39%	61%	0.90	18%	7%
53-3033	Light Truck or Delivery Services Drivers	1,820	68	45%	55%	1.02	18%	9%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Highlights: Wage premium = 10% or higher than US wages; %55+ = 20% or higher; %65+ = 10% or higher. Replacement demand is an estimate of the number of workers required to replace existing workers who leave the occupation due to a variety of factors including retirement, career advancement, or exiting the workforce to raise children or attend school.

FIGURE 34. DEMAND FACTORS BY SKILL LEVEL—CONT.

ESTIMATED ANNUAL OPENINGS (THROUGH 2021) WITH ESTIMATE OF NET CHANGE & REPLACEMENT DEMAND

SOC CODE	DESCRIPTION	2016 Jobs	DEMAND FACTORS			Wage Premium over US	DEMOGRAPHICS			
			Projected Annual Openings (2016-21)	New jobs	Replacement		% 55+ Years	% 65+ Years		
MIDDLE-SKILL (More than high school, less than four years)										
29-1141	Registered Nurses	7,025	287	35%	65%	0.83	21%	◀	4%	
51-2092	Team Assemblers	4,554	265	49%	51%	1.01	16%		3%	
49-9071	Maintenance & Repair Workers, General	3,752		165	33%	67%	0.97	23%	◀	6%
43-1011	First-Line Supvsr., Office & Admin. Support	5,446		129	30%	70%	0.91	21%	◀	4%
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,397		128	37%	63%	1.10	21%	◀	6%
35-1012	First-Line Supvsr., Food Prep. & Servers	2,221		119	36%	64%	0.92	8%		2%
33-3051	Police & Sheriff's Patrol Officers	2,527		118	24%	76%	0.65	9%		2%
39-5012	Hairdressers, Hairstylists, & Cosmetologists	1,963		111	45%	55%	0.95	8%		9%
25-9041	Teacher Assistants	2,770		110	31%	69%	0.95	22%	◀	5%
53-3032	Heavy & Tractor-Trailer Truck Drivers	3,188		110	42%	58%	1.00	21%	◀	7%
31-1014	Nursing Assistants	2,622		109	37%	63%	0.92	15%		4%
33-3012	Correctional Officers & Jailers	2,007		102	37%	63%	0.65	12%		2%
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,637		93	44%	56%	1.01	21%	◀	5%
41-1011	First-Line Supvsr., Retail Sales Workers	3,299		92	9%	91%	1.02	15%		3%
51-9111	Packaging & Filling Machine Workers	1,177		86	39%	61%	1.01	14%		3%
41-3021	Insurance Sales Agents	2,101		82	23%	77%	0.95	21%	◀	8%
51-4041	Machinists	962		80	54%	46%	1.05	22%	◀	4%
29-2061	Licensed Practical/Vocational Nurses	1,817		80	27%	73%	0.96	20%	◀	4%
49-3023	Automotive Service Technicians & Mechanics	1,842		64	16%	84%	1.09	13%		3%
49-9041	Industrial Machinery Mechanics	993		57	47%	53%	1.05	25%	◀	4%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Highlights: Wage premium = 10% or higher than US wages; %55+ = 20% or higher; %65+ = 10% or higher. Replacement demand is an estimate of the number of workers required to replace existing workers who leave the occupation due to a variety of factors including retirement, career advancement, or exiting the workforce to raise children or attend school.

FIGURE 35. DEMAND FACTORS BY SKILL LEVEL—CONT.

ESTIMATED ANNUAL OPENINGS (THROUGH 2021) WITH ESTIMATE OF NET CHANGE & REPLACEMENT DEMAND

SOC CODE	DESCRIPTION	2016 Jobs	DEMAND FACTORS			Wage Premium over US	DEMOGRAPHICS		
			Projected Annual Openings (2016-21)	New jobs	Replacement		% 55+ Years	% 65+ Years	
HIGH SKILL (Four-year degree or above)									
11-1021	General & Operations Managers	4,633	<div></div> 198	33%	67%	0.99	19%	4%	
13-2011	Accountants & Auditors	3,645	<div></div> 164	34%	66%	0.84	18%	6%	
25-1099	Teachers, Postsecondary	4,335	<div></div> 154	43%	57%	0.96	24%	◀ 9%	
25-2021	Teachers, Elementary (Except Special Ed.)	2,896	<div></div> 118	35%	65%	0.90	23%	◀ 4%	
25-2031	Teachers, Secondary (Exc. Special Ed. & CTE)	2,277	<div></div> 95	32%	68%	0.88	22%	◀ 4%	
13-1111	Management Analysts	2,828	<div></div> 90	48%	52%	0.84	20%	◀ 7%	
25-2022	Teachers, Middle School (Exc. Special Ed. & CTE)	1,903	<div></div> 74	31%	69%	0.86	23%	◀ 4%	
17-2051	Civil Engineers	1,357	<div></div> 66	32%	68%	0.75	20%	◀ 8%	
25-3098	Substitute Teachers	1,178	<div></div> 44	40%	60%	0.83	22%	◀ 10% ◀	
21-2011	Clergy	985	<div></div> 41	42%	58%	0.93	22%	◀ 22% ◀	
11-9111	Medical & Health Services Managers	913	<div></div> 36	29%	71%	0.87	25%	◀ 4%	
21-1012	Educ., Guidance, School, & Vocational Counselors	973	<div></div> 36	34%	66%	0.90	22%	◀ 5%	
41-4011	Sales Reps., Whls. & Mfg., Tech. & Scientific	640	<div></div> 31	46%	54%	1.13	20%	5%	
13-1041	Compliance Officers	909	<div></div> 26	44%	56%	0.71	24%	◀ 5%	
11-3051	Industrial Production Managers	383	<div></div> 24	43%	57%	1.05	23%	◀ 3%	
25-3099	Teachers & Instructors, All Other	431	<div></div> 24	57%	43%	1.06	16%	11% ◀	
11-3011	Administrative Services Managers	625	<div></div> 23	41%	59%	0.94	28%	◀ 6%	
11-1011	Chief Executives	949	<div></div> 21	5%	95%	1.11	29%	◀ 13% ◀	
21-2021	Directors, Religious Activities & Education	465	<div></div> 18	28%	72%	1.37	21%	◀ 11% ◀	
25-9099	Educ., Training, & Library Workers, All Other	179	<div></div> 6	64%	36%	1.26	25%	◀ 7%	

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Highlights: Wage premium = 10% or higher than US wages; %55+ = 20% or higher; %65+ = 10% or higher. Replacement demand is an estimate of the number of workers required to replace existing workers who leave the occupation due to a variety of factors including retirement, career advancement, or exiting the workforce to raise children or attend school.

EDUCATION AND TRAINING

Within the I-77 Alliance region, there are nine higher education institutions. The largest is the University of South Carolina in Columbia. York Technical College is the public, two-year college in the region. Within 30 minutes of the region, there are 20 additional institutions, including University of North Carolina at Charlotte.

FIGURE 36. INSTITUTIONS INCLUDED IN THE ANALYSIS

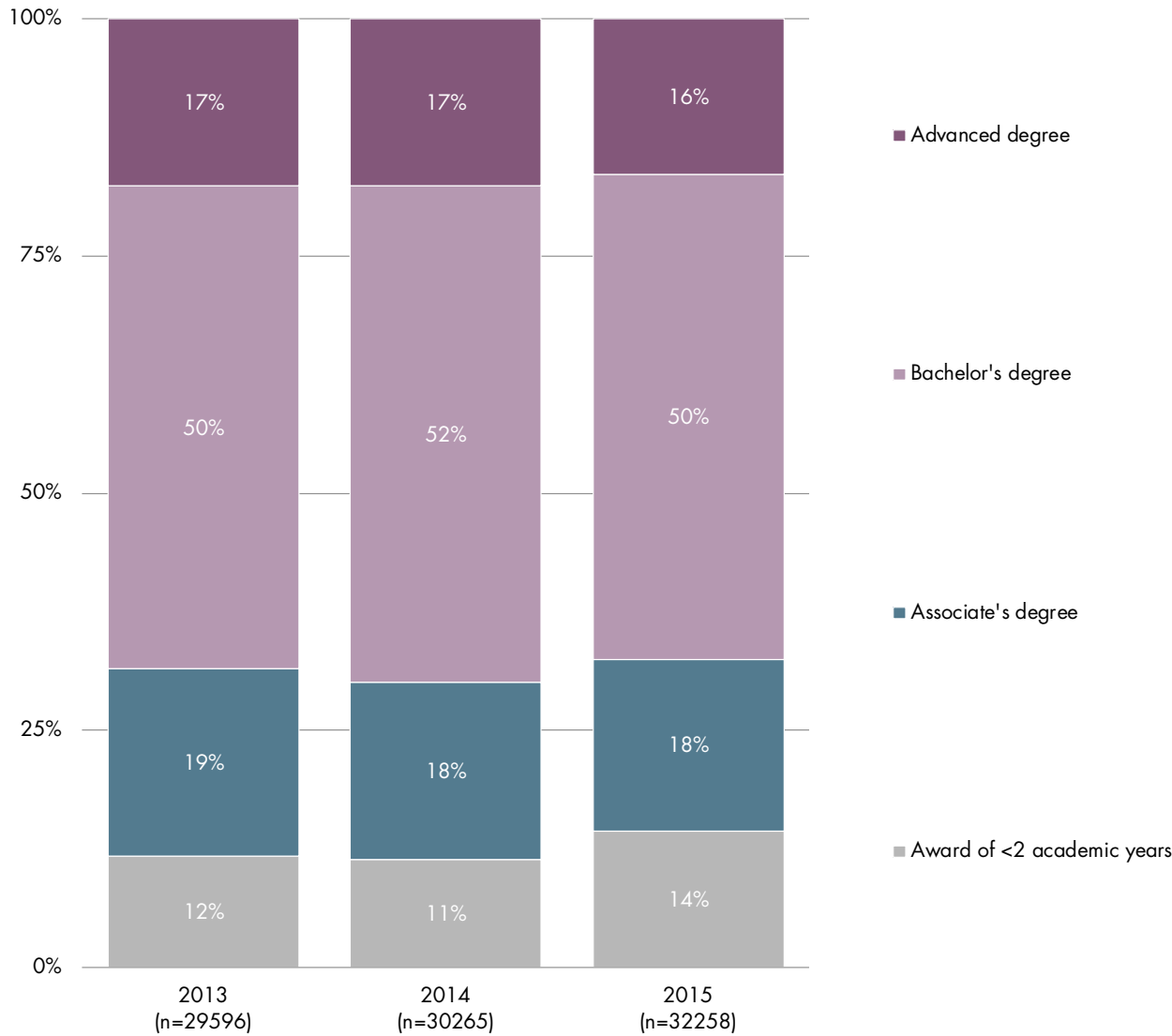
WITHIN A 30 MINUTE DRIVE

INSTITUTION NAME	COUNTY	SECTOR
Allen University	Richland	Private not-for-profit, 4-year or above
Benedict College	Richland	Private not-for-profit, 4-year or above
Columbia College	Richland	Private not-for-profit, 4-year or above
Columbia International University	Richland	Private not-for-profit, 4-year or above
Remington College-Columbia Campus	Richland	Private not-for-profit, less-than 2-year
University of South Carolina-Columbia	Richland	Public, 4-year or above
Clinton College	York	Private not-for-profit, 4-year or above
Winthrop University	York	Public, 4-year or above
York Technical College	York	Public, 2-year
Central Piedmont Community College	Mecklenburg	Public, 2-year
Davidson College	Mecklenburg	Private not-for-profit, 4-year or above
Johnson & Wales University-Charlotte	Mecklenburg	Private not-for-profit, 4-year or above
Johnson C Smith University	Mecklenburg	Private not-for-profit, 4-year or above
Queens University of Charlotte	Mecklenburg	Private not-for-profit, 4-year or above
University of North Carolina at Charlotte	Mecklenburg	Public, 4-year or above
Claflin University	Orangeburg	Private not-for-profit, 4-year or above
Orangeburg Calhoun Technical College	Orangeburg	Public, 2-year
South Carolina State University	Orangeburg	Public, 4-year or above
Central Carolina Technical College	Sumter	Public, 2-year
Morris College	Sumter	Private not-for-profit, 4-year or above
University of South Carolina-Sumter	Sumter	Public, 2-year
University of South Carolina-Union	Union	Public, 2-year
Wingate University	Union	Private not-for-profit, 4-year or above
Cleveland Community College	Cleveland	Public, 2-year
Belmont Abbey College	Gaston	Private not-for-profit, 4-year or above
Gaston College	Gaston	Public, 2-year
University of South Carolina-Lancaster	Lancaster	Public, 2-year
Midlands Technical College	Lexington	Public, 2-year
Newberry College	Newberry	Private not-for-profit, 4-year or above

Source: National Center for Education Statistics, IPEDS Survey.

Over the past three years, the regional institutions have graduated between 29,000 and 32,000 students. About half of these students earned a bachelor’s degree. Eighteen percent earned associate’s degree, 16 percent earned an advanced degree, and 14 percent earned an award of less than two academic years.

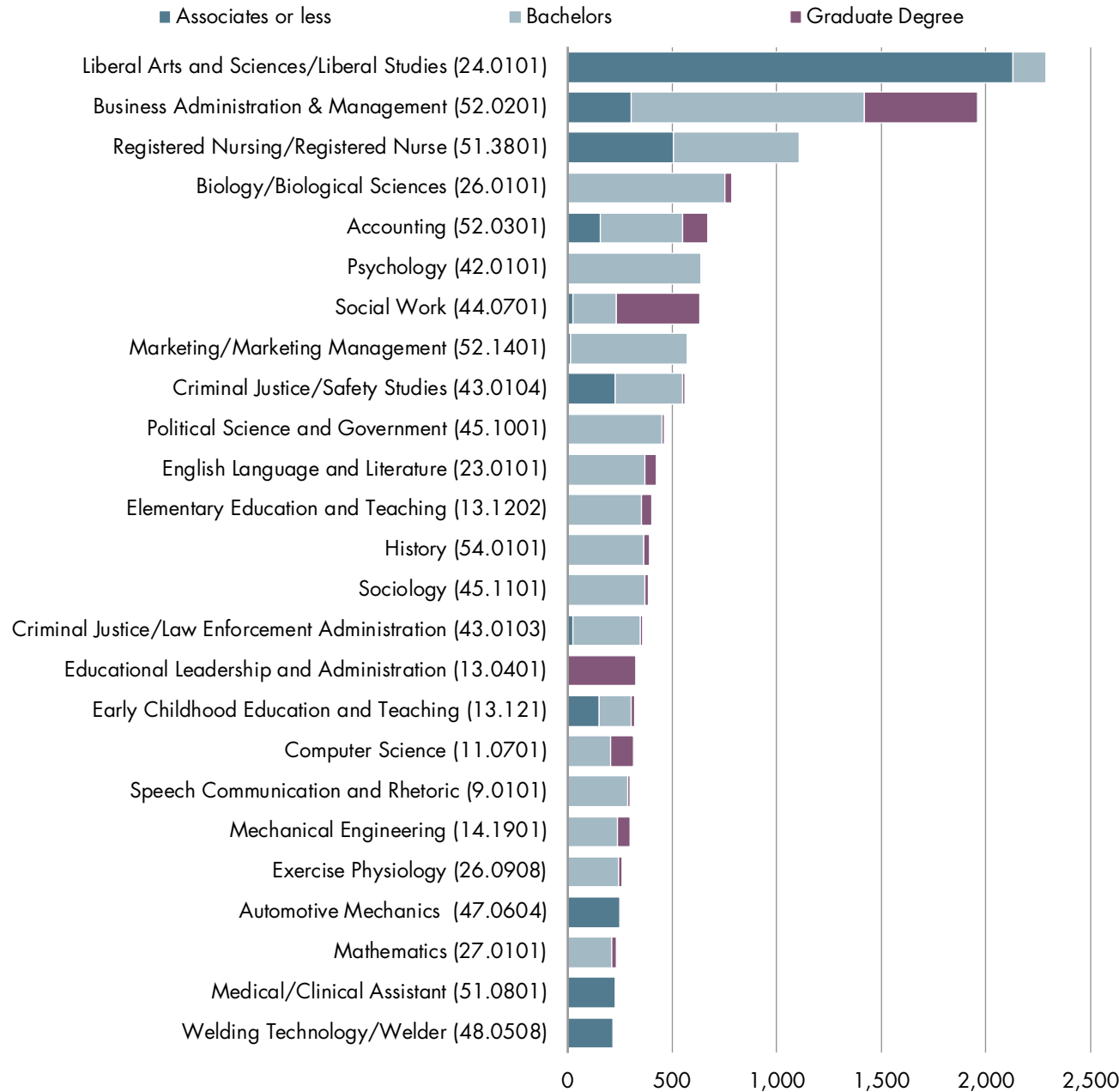
FIGURE 37. DISTRIBUTION OF FOR-CREDIT COMPLETIONS BY AWARD LEVEL
FOR-CREDIT COMPLETIONS BY SELECTED INSTITUTIONS FOR THREE MOST RECENT ACADEMIC YEARS



Source: National Center for Education Statistics, IPEDS Survey.

By far the most popular fields of study are liberal arts and business. Some of the degrees conferred track to high-demand occupations, in particular nursing and business administration. However, many of the high-demand occupations, such as industrial maintenance, machining, and teachers, are not among the top 25 fields of study.

FIGURE 38. 25 LARGEST FIELDS OF STUDY
RANKED BY AVERAGE NUMBER OF COMPLETIONS, ALL AWARD LEVELS



Source: Natl. Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS). Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors.

MILITARY PERSONNEL PROFILE

Fort Jackson serves as the US Army's main production center for Basic Combat Training (BCT), with more than 36,000 personnel going through basic training at the post each year. An additional 8,000 Soldiers complete Advanced Individual Training (AIT) at Fort Jackson. AIT schools provide hands-on training in specific career fields for those who have completed basic training.

Fort Jackson is also host to several schools in addition to BCT and AIT. These include the Army's Drill Sergeant School, (which trains all active and Reserve instructors), the Soldier Support Institute (created to grow the number of leaders in human resources and financial management), Armed Forces Chaplaincy Center, and the National Center for Credibility Assessment (previously known as the Department of Defense Polygraph Institute). An additional 10,000 students attend these and other courses on the post annually.

MILITARY EXITS

With more than 800 Soldiers separating from service annually through Fort Jackson and 46,000 retirees and family members served, the post represents a source of skilled workers. Information on military personnel separating from service in the state is captured as part of the Transition Assistance Program (TAP). TAP consists of a series of workshops designed to assist military personnel in transitioning to civilian careers. Service members attending TAP workshops are typically scheduled to leave active duty service within six months. As part of their out-processing, a one-page contact form solicits basic information from participants, including military occupation code, years of service, and intent to remain in the state upon separation. Data for the most recent period available suggest that almost one-third of military personnel intend to remain in the state. Another 25 percent (one in four) are undecided. Leveraging this pool of labor should be a priority.

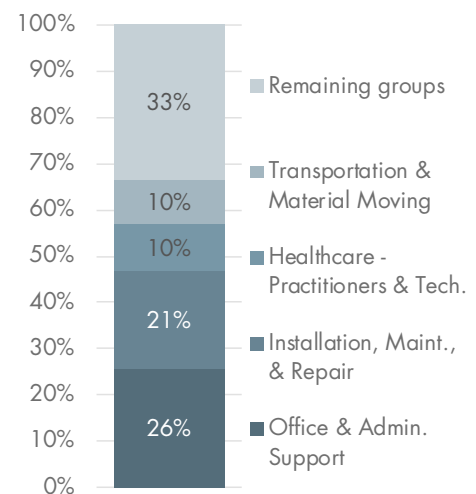
Chmura Economics & Analytics translates data on military exits into their civilian occupational classification equivalent. Data on military exits in fiscal year 2015 in the four-county region is used to help illustrate the skillsets of this potential workforce. Of the roughly 500 personnel that exited the military in the four-county region during the period, Office and Administrative Support Occupations (SOC 43-0000) represent the largest group of occupations, accounting for 26 percent of the total (Figure 40). Installation, Maintenance, and Repair Occupations is the next largest group of exits in the region, with roughly one in five personnel (21 percent) having military occupations associated with this group. Four occupational groups account for two-thirds of those leaving the military in the four-county region, with the other two groups being Healthcare Practitioners and Technical Occupations (SOC 29-0000)

FIGURE 39. FORT JACKSON SNAPSHOT

ASSET	#
Active duty personnel	3,500
Family members	12,000
Civilians	3,500
Retirees & family supported	46,000
Housing units (privatized)	850
Students (annual)	10,000
Acres	52,000

Source: Fort Jackson website

FIGURE 40. MILITARY EXITS IN THE I-77 ALLIANCE REGION, FY 2015 DISTRIBUTION BY MAJOR OCCUPATIONAL GROUP



Source: Chmura Economics & Analytics, TIP Strategies

and Transportation and Material Moving Occupations (SOC 53-0000), with roughly 10 percent of exiting personnel in FY 2015 having skills that align with occupations in each group.

A look at this data by detailed occupation is provided in Figure 41. Of the roughly 500 military exits reported in the Chmura Economics & Analytics data, nearly 1 in 10 had skills that most closely matched Human Resources Assistants, Except Payroll and Timekeeping (SOC 43-4161), a position that employed 845 people in the four-county region at the time. Median hourly wage rates for this occupation fall below the regional median for all occupations (\$20.05), but are well-above minimum wage rates. Five positions have median hourly wage rates in excess of this figure, with the highest being Human Resources Managers (SOC 11-3121) at \$45.01 per hour.

FIGURE 41. MILITARY EXITS BY DETAILED OCCUPATION
FOUR-COUNTY REGION, FISCAL YEAR 2015

SOC CODE	DESCRIPTION	MILITARY EXITS FY 2015		I-77 ALLIANCE REGION		
		#	% of Total	Jobs 2015	Median Hourly Wage	
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	46	<div></div>	9%	845	\$15.92
43-5081	Stock Clerks and Order Fillers	39	<div></div>	8%	3,838	\$11.17
29-2041	Emergency Medical Technicians and Paramedics	29	<div></div>	6%	660	\$15.98
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	26	<div></div>	5%	1,338	\$28.47
53-7072	Pump Operators, Except Wellhead Pumpers	18	<div></div>	4%	10	\$21.93
49-3023	Automotive Service Technicians and Mechanics	17	<div></div>	3%	1,808	\$18.79
35-2012	Cooks, Institution and Cafeteria	16	<div></div>	3%	1,397	\$11.43
33-3051	Police and Sheriff's Patrol Officers	15	<div></div>	3%	2,497	\$19.23
43-9011	Computer Operators	15	<div></div>	3%	129	\$17.79
11-3121	Human Resources Managers	14	<div></div>	3%	309	\$45.01
49-3011	Aircraft Mechanics and Service Technicians	13	<div></div>	3%	168	\$27.29
53-3032	Heavy and Tractor-Trailer Truck Drivers	13	<div></div>	3%	3,120	\$19.29
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	11	<div></div>	2%	49	\$22.65
47-4099	Construction and Related Workers, All Other	10	<div></div>	2%	40	\$16.20
43-2099	Communications Equipment Operators, All Other	10	<div></div>	2%	13	\$16.62

Source: Chmura Economics & Analytics, TIP Strategies

Notes: Figures include occupations with at least ten military exits during the period. Occupations with median hourly wage rates above the regional median for all occupations (\$20.05) are **highlighted**.

WORKFORCE-TARGET INDUSTRY ALIGNMENT

As part of the South Carolina I-77 Alliance’s Strategic Plan that was completed in May 2015, seven target industries were identified. These industry sectors were selected as the “best fit” for the region’s strengths and assets.

FIGURE 42. TARGETS

	ADVANCED MATERIALS
	TRANSPORTATION EQUIPMENT
	LIFE SCIENCES
	BUSINESS/FINANCIAL SERVICES
	DEFENSE
	CHEMICALS
	FOOD PRODUCTS

As part of this regional workforce assessment, we examined the staffing patterns associated with each target industry to identify critical occupations. For each of these occupations, we looked at demand factors, select demographics, and wage rates. We also looked at real-time labor market information for each industry sector to identify which employers in the region are currently hiring and what occupations, skills, and certifications they seek. Finally, we evaluated the regional capacity to accommodate growth in each sector. This information is presented in the industry profiles that follow.

Figure 43 lists the top 25 occupations across the target industries based on regional staffing patterns. Team assemblers is the most common occupation and is critical to all but one of the target industries. Customer service representatives and computer programmers are the next highest ranked. First-line supervisors and general managers are among the management occupations within the top 25 occupations. The other top occupations include information technology, engineering, maintenance and repair, administrative, and various types of laborers.

FIGURE 43. TOP OCCUPATIONS ACROSS INDUSTRY SECTORS

BASED ON REGIONAL STAFFING PATTERNS, PERCENTS REPRESENT SHARE OF INDUSTRY EMPLOYMENT

SOC Description	<div> <div>Less than 0.25%</div> <div>Greater than 0.25%, but less than 1.0%</div> <div>Greater than 1.0%, but less than 2.5%</div> <div>Greater than 2.5%, but less than 5.0%</div> <div>Greater than 5.0%</div> </div>							Total
	Advanced Materials	Transportation Equipment	Life Sciences	Business/Financial Services	Defense	Chemical	Food Processing	
51-2092 Team Assemblers	10.6%	21.1%	2.9%	0.0%	0.3%	2.2%	3.0%	40.1%
43-4051 Customer Service Representatives	0.9%	1.0%	3.0%	15.8%	2.6%	1.1%	1.1%	25.3%
15-1131 Computer Programmers	0.1%	0.4%	0.9%	1.7%	15.7%	0.1%	0.0%	18.9%
51-9061 Inspectors, Testers, Sorters, Samplers, & Weighers	4.7%	5.1%	3.0%	0.0%	0.2%	3.0%	2.6%	18.5%
51-1011 First-Line Supvrs., Production & Operating Workers	3.7%	3.3%	1.6%	0.0%	0.1%	4.5%	3.9%	17.1%
51-9111 Packaging & Filling Machine Workers	1.4%	1.0%	2.1%	0.0%	0.0%	5.4%	6.6%	16.5%
53-7062 Laborers/Freight, Stock, & Material Movers, Hand	3.3%	2.6%	0.8%	0.1%	0.1%	1.6%	4.7%	13.2%
11-1021 General & Operations Managers	1.7%	1.3%	1.5%	2.0%	2.2%	1.6%	1.4%	11.7%
51-3092 Food Batchmakers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.3%	11.3%
15-1151 Computer User Support Specialists	0.1%	0.3%	0.7%	1.6%	7.3%	0.2%	0.1%	10.4%
51-8091 Chemical Plant & System Operators	0.0%	0.0%	0.5%	0.0%	0.0%	9.7%	0.0%	10.2%
15-1132 Software Developers, Applications	0.0%	0.2%	0.5%	1.4%	7.9%	0.1%	0.0%	10.1%
49-9041 Industrial Machinery Mechanics	2.0%	0.9%	0.9%	0.0%	0.0%	3.2%	2.7%	9.7%
17-2112 Industrial Engineers	1.4%	3.1%	2.1%	0.0%	0.5%	2.0%	0.5%	9.7%
43-1011 First-Line Supvrs., Office & Admin. Support	0.5%	0.5%	1.3%	5.1%	0.8%	0.6%	0.7%	9.6%
41-4012 Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	2.6%	1.7%	0.4%	0.2%	0.7%	2.1%	1.8%	9.6%
15-1133 Software Developers, Systems Software	0.0%	0.4%	0.8%	0.9%	7.4%	0.0%	0.0%	9.6%
15-1121 Computer Systems Analysts	0.0%	0.2%	0.6%	2.4%	5.9%	0.3%	0.0%	9.4%
51-9011 Chemical Equipment Workers	0.1%	0.0%	0.6%	0.0%	0.0%	8.6%	0.0%	9.4%
49-9071 Maintenance & Repair Workers, General	1.8%	1.4%	1.0%	0.2%	0.1%	3.0%	1.8%	9.4%
13-1161 Market Research Analysts & Mktng. Specialists	0.2%	0.8%	1.2%	1.8%	3.4%	0.9%	0.3%	8.5%
43-5061 Production, Planning, & Expediting Clerks	1.2%	1.9%	1.5%	0.3%	0.5%	1.6%	1.3%	8.4%
43-6014 Secy./Admin. Asst., Exc. Legal, Med., & Exec.	0.8%	0.6%	1.6%	2.1%	1.3%	1.0%	0.6%	8.0%
11-3021 Computer & Info. Systems Managers	0.1%	0.3%	0.8%	1.4%	4.5%	0.2%	0.1%	7.3%
51-9198 Helpers-Production Workers	2.0%	0.8%	0.4%	0.0%	0.0%	0.8%	3.2%	7.3%

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies



ADVANCED MATERIALS

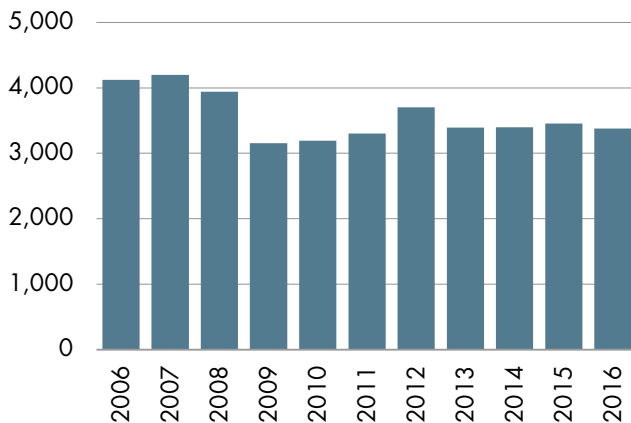
OVERVIEW. The advanced materials sector includes metals, plastics, composites, glass, textiles, and wood product manufacturing. The sector serves the automotive, aerospace, construction, and medical device industries of a much greater economic region. After contracting during the recession, the sector has remained stable and currently employs more than 3,000 workers.

FIGURE 44. INDUSTRY DEFINITION-ADVANCED MATERIALS

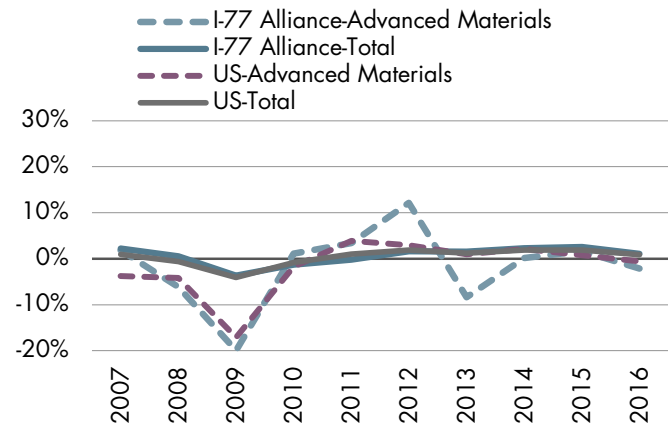
NAICS	DESCRIPTION
32111	Sawmills and Wood Preservation
32121	Veneer, Plywood, and Engineered Wood Product Manufacturing
32613	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing
32615	Urethane and Other Foam Product (except Polystyrene) Manufacturing
32619	Other Plastics Product Manufacturing
32629	Other Rubber Product Manufacturing
32711	Pottery, Ceramics, and Plumbing Fixture Manufacturing
32721	Glass and Glass Product Manufacturing
33111	Iron and Steel Mills and Ferroalloy Manufacturing
33121	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel
33122	Rolling and Drawing of Purchased Steel
33131	Alumina and Aluminum Production and Processing
33142	Copper Rolling, Drawing, Extruding, and Alloying
33149	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, Extruding, and Alloying
33151	Ferrous Metal Foundries
33152	Nonferrous Metal Foundries
33211	Forging and Stamping
33231	Plate Work and Fabricated Structural Product Manufacturing
33281	Coating, Engraving, Heat Treating, and Allied Activities

FIGURE 45. EMPLOYMENT TRENDS, 2006-2016

TOTAL EMPLOYMENT IN RELATED OCCUPATIONS



COMPARATIVE GROWTH, 2006-2016



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

ADVANCED MATERIALS CONT.

KEY OCCUPATIONS. Team assemblers account for the largest share of industry employment. Inspectors, testers, sorters, samplers, and weighers account for the next largest share, and first-line supervisors is the occupation with the third largest share. The occupations with the highest concentration of employment relative to the US are heat treating equipment, rolling machine workers, and grinding and buffing machine workers. Four of the key occupations have median hourly wages more than 10 percent above the US median. These occupations are tire builders and three specialized machine occupations related to metal and plastic fabrication.

FIGURE 46. KEY OCCUPATIONS-ADVANCED MATERIALS
BASED ON STAFFING PATTERNS IN THE I-77 ALLIANCE

SOC Code	Description	Share of Industry Employment	Jobs	LQ (US=1.00)	Median Hourly Earnings	Relative to US (US=1.00)
51-2092	Team Assemblers	10.6%	4,554	1.74	14.61	1.01
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	4.7%	1,637	1.36	17.97	1.01
51-1011	First-Line Supvrs., Production & Operating Workers	3.7%	1,435	1.01	28.68	1.06
51-7041	Sawing Machine Workers, Wood	3.4%	142	1.19	14.15	1.04
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	3.3%	6,800	1.14	13.37	1.08
51-4121	Welders, Cutters, Solderers, & Brazers	2.6%	1,032	1.10	18.90	1.01
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	2.6%	3,397	0.99	29.15	1.10
51-4033	Grinding & Buffing Machine, Metal/Plastic	2.3%	376	2.27	21.25	1.33 ●
51-9041	Extruding, Forming, & Compacting Machine	2.2%	226	1.35	15.79	1.01
51-4023	Rolling Machine Workers, Metal/Plastic	2.1%	178	2.50	20.31	1.02
49-9041	Industrial Machinery Mechanics	2.0%	993	1.28	25.41	1.05
51-9198	Helpers—Production Workers	2.0%	780	0.77	10.79	0.91
49-9071	Maintenance & Repair Workers, General	1.8%	3,752	1.11	17.42	0.97
51-4191	Heat Treating Equip. Workers, Metal/Plastic	1.8%	126	2.71	19.63	1.09
11-1021	General & Operations Managers	1.7%	4,633	0.90	47.63	0.99
51-4193	Plating & Coating Machine, Metal/Plastic	1.7%	72	0.90	17.12	1.15 ●
51-4041	Machinists	1.7%	962	1.04	20.54	1.05
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	1.6%	323	0.73	21.70	1.41 ●
43-5071	Shipping, Receiving, & Traffic Clerks	1.5%	1,456	0.92	15.23	1.03
51-9111	Packaging & Filling Machine Workers	1.4%	1,177	1.32	13.46	1.01
53-7063	Machine Feeders & Offbearers	1.4%	269	1.13	14.20	0.99
17-2112	Industrial Engineers	1.4%	769	1.33	39.58	0.97
53-7051	Industrial Truck & Tractor Operators	1.3%	872	0.68	15.50	0.98
51-9197	Tire Builders	1.3%	56	1.36	21.56	1.14 ●
51-2041	Structural Metal Fabricators & Fitters	1.3%	248	1.34	17.43	0.96

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: LQs greater than 1.25 are highlighted, as are wage rates above the regional average (\$17.57). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (✖)

ADVANCED MATERIALS CONT.

DEMAND. Laborers/freight movers is the occupation with the highest number of openings expected over the next five years. Team assemblers has the next highest number of openings, annually. Much of the demand for these positions is driven by replacement demand. This could be due to the aging of the workforce, but is also reflective of high turnover rates in some occupations. In 11 of the occupations, more than 20 percent of the workers are 55 years of age or older. The occupations with the largest percent of openings due to new growth are first-line supervisors; machinists; cutting, punching, and press machine, metal/plastic; and structural metal fabricators and fitters.

**FIGURE 47. DEMAND FACTORS & DEMOGRAPHICS – ADVANCED MATERIALS
KEY OCCUPATIONS**

SOC Code	Description	2015 Jobs	Annual Openings 2016-21	% of openings due to:		% of the workforce:	
				Net change	Replacement	Age 55+ Yrs.	Age 65+ Yrs.
51-2092	Team Assemblers	4,554	265	49%	51%	18%	3%
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,637	93	44%	56%	26% ◀	5% ◀
51-1011	First-Line Supvsr., Production & Operating Workers	1,435	64	54%	46%	25% ◀	3%
51-7041	Sawing Machine Workers, Wood	142	8	40%	60%	15%	—
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,800	392	38%	62%	16%	3%
51-4121	Welders, Cutters, Solderers, & Brazers	1,032	72	47%	53%	17%	3%
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,397	128	37%	63%	26% ◀	6% ◀
51-4033	Grinding & Buffing Machine, Metal/Plastic	376	25	23%	77%	21% ◀	3%
51-9041	Extruding, Forming, & Compacting Machine	226	10	9%	91%	17%	—
51-4023	Rolling Machine Workers, Metal/Plastic	178	6	6%	94%	20%	—
49-9041	Industrial Machinery Mechanics	993	57	47%	53%	28% ◀	4%
51-9198	Helpers—Production Workers	780	47	38%	62%	16%	3%
49-9071	Maintenance & Repair Workers, General	3,752	165	33%	67%	29% ◀	6% ◀
51-4191	Heat Treating Equip. Workers, Metal/Plastic	126	5	35%	65%	17%	—
11-1021	General & Operations Managers	4,633	198	33%	67%	23% ◀	4%
51-4193	Plating & Coating Machine, Metal/Plastic	72	4	48%	52%	15%	—
51-4041	Machinists	962	80	54%	46%	26% ◀	4%
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	323	16	57%	43%	23% ◀	3%
43-5071	Shipping, Receiving, & Traffic Clerks	1,456	63	40%	60%	20%	3%
51-9111	Packaging & Filling Machine Workers	1,177	86	39%	61%	18%	3%
53-7063	Machine Feeders & Offbearers	269	16	51%	49%	23% ◀	5% ◀
17-2112	Industrial Engineers	769	46	40%	60%	26% ◀	4%
53-7051	Industrial Truck & Tractor Operators	872	55	50%	50%	16%	2%
51-9197	Tire Builders	56	—	n/a	n/a	n/a	—
51-2041	Structural Metal Fabricators & Fitters	248	13	54%	46%	18%	—

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Annual openings are an estimate of job openings due to **net change** in employment and **replacement** needs (e.g., turnover, retirement). ◀

Indicates significant share of workforce is reaching retirement age (defined here as ≥ 25% age 55+ and/or ≥ 5% age 65+).

ADVANCED MATERIALS CONT.

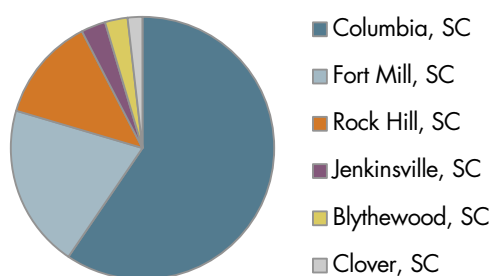
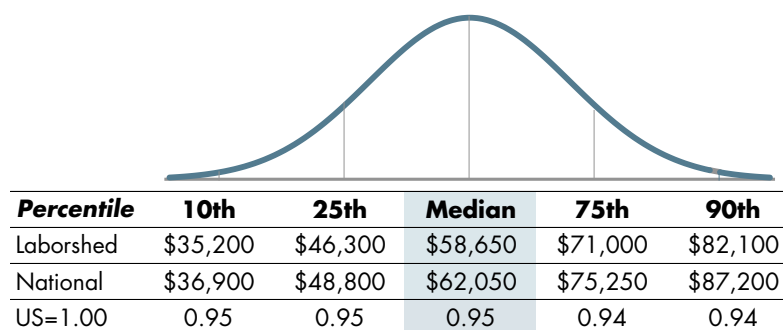
REAL-TIME LABOR MARKET INFORMATION. The information below is derived from a database of more than a million unique postings that are mined and aggregated for valuable, real-time labor insights. The charts and tables below represent the analytics for job postings related to the key occupations that support the advanced materials sector.

FIGURE 48. SUMMARY FOR JOB POSTINGS IN KEY OCCUPATIONS
OPENINGS

Current job openings	Direct employers competing	Average posting duration (in days)
706	322	44

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)

**SALARY RANGE****TOP 10 COUNTS (BASED ON POSTINGS FROM 01-01-2016 TO 06-30-2016)**

Employers	# postings	Occupations	# postings
FedEx	213	Maintenance and Repair Workers, General	715
State of South Carolina	108	Sales Representatives, Wholesale and Mfg	709
Schaeffler Group	80	General and Operations Managers	500
Lowe's	78	First-Line Supervisors	489
Westinghouse Electric Company, LLC	57	Industrial Engineers	433
Continental AG	49	Laborers/Freight, Stock, & Material Movers	420
Cardinal Health	46	Inspect., Testers, Sorters, Samplers, & Weighers	112
Schaeffler	43	Industrial Truck and Tractor Operators	83
City of Columbia	40	Industrial Machinery Mechanics	76
Sc Department Of Public Safety	39	Machinists	72

Hard skills	# postings	Certifications	# postings
Quality Assurance	455	Driver's License	503
Preventative maintenance inspections	201	Occupational Safety & Health Admin. Cert.	148
Preventive maintenance	178	ISO TS16949	71
Quality control	158	Material Handling Equipment	65
Material Handling	116	EPA certification	42
Lean Manufacturing	93	American Society of Mechanical Engineers	40
Work order	87	HAZMAT	40
Quality Systems	87	Food safety programs	39
Electrical systems	78	Commercial Driver's License	34
Process controls	73	Forklift certification	31

Source: Wanted Analytics.

ADVANCED MATERIALS CONT.

EDUCATION & TRAINING. The wage ranges as well as the education and training requirements for each occupation are listed in the figure below.

FIGURE 49. EDUCATION & TRAINING REQUIREMENTS – ADVANCED MATERIALS
WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

SOC Code	Description	Median Hourly Earnings	Hourly Earnings (percentiles)		Typical req. for entry into occupation		Training required for competency
			10th	90th	Edu.	Exp.	
51-2092	Team Assemblers	\$14.61	\$9.62	\$24.65	HS or equiv.	None	Mod.-term OJT
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	\$17.97	\$10.33	\$28.78	HS or equiv.	None	Mod.-term OJT
51-1011	First-Line Supvrs., Production & Operating Workers	\$28.68	\$16.06	\$45.67	Non-deg. award	< 5 years	None
51-7041	Sawing Machine Workers, Wood	\$14.15	\$9.24	\$20.04	HS or equiv.	None	Short-term OJT
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	\$13.37	\$9.19	\$21.01	Less than HS	None	Short-term OJT
51-4121	Welders, Cutters, Solderers, & Brazers	\$18.90	\$13.24	\$28.21	HS or equiv.	None	Mod.-term OJT
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	\$29.15	\$14.77	\$56.23	HS or equiv.	None	Mod.-term OJT
51-4033	Grinding & Buffing Machine, Metal/Plastic	\$21.25	\$13.30	\$25.57	HS or equiv.	None	Mod.-term OJT
51-9041	Extruding, Forming, & Compacting Machine	\$15.79	\$11.65	\$22.37	HS or equiv.	None	Mod.-term OJT
51-4023	Rolling Machine Workers, Metal/Plastic	\$20.31	\$14.71	\$26.74	HS or equiv.	None	Mod.-term OJT
49-9041	Industrial Machinery Mechanics	\$25.41	\$16.57	\$35.94	HS or equiv.	None	Long-term OJT
51-9198	Helpers–Production Workers	\$10.79	\$9.00	\$17.06	Less than HS	None	Short-term OJT
49-9071	Maintenance & Repair Workers, General	\$17.42	\$11.09	\$27.96	HS or equiv.	None	Long-term OJT
51-4191	Heat Treating Equip. Workers, Metal/Plastic	\$19.63	\$11.34	\$26.90	HS or equiv.	None	Mod.-term OJT
11-1021	General & Operations Managers	\$47.63	\$23.80	\$104.00	Bachelor's	< 5 years	None
51-4193	Plating & Coating Machine, Metal/Plastic	\$17.12	\$11.80	\$24.65	HS or equiv.	None	Mod.-term OJT
51-4041	Machinists	\$20.54	\$12.77	\$29.53	HS or equiv.	None	Long-term OJT
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	\$21.70	\$12.14	\$28.85	HS or equiv.	None	Mod.-term OJT
43-5071	Shipping, Receiving, & Traffic Clerks	\$15.23	\$10.14	\$22.99	HS or equiv.	None	Short-term OJT
51-9111	Packaging & Filling Machine Workers	\$13.46	\$9.39	\$25.44	HS or equiv.	None	Mod.-term OJT
53-7063	Machine Feeders & Offbearers	\$14.20	\$9.64	\$20.14	Less than HS	None	Short-term OJT
17-2112	Industrial Engineers	\$39.58	\$25.92	\$58.53	Bachelor's	None	None
53-7051	Industrial Truck & Tractor Operators	\$15.50	\$10.97	\$25.50	Less than HS	None	Short-term OJT
51-9197	Tire Builders	\$21.56	\$13.72	\$31.90	HS or equiv.	None	Mod.-term OJT
51-2041	Structural Metal Fabricators & Fitters	\$17.43	\$11.89	\$25.23	HS or equiv.	None	Mod.-term OJT

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

FIGURE 50. LABOR CAPACITY SCENARIOS
 HYPOTHETICAL EXPECTED LABOR NEEDS
 FOR A NEW FACILITY

Target group: Advanced materials
Number of jobs: 500

		REGIONAL CAPACITY			I-77 REGIONAL IMPACT			
SOC Code	Primary occupations required	2016 EMPLOYMENT			Est. new jobs created	MEDIAN HOURLY WAGES		Typical education required
		I-77 Region (4 counties)	N. Laborshed (8 counties)	So. Laborshed (10 counties)		I-77 region	Relative to US (US= 1.00)	
51-2092	Team Assemblers	4,787	12,133	13,112	53	\$14.61	1.01	HS diploma/GED
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,676	4,618	4,722	24	\$18.05	1.01	HS diploma/GED
51-1011	First-Line Supvsr., Production & Operating Workers	1,485	4,927	4,989	19	\$28.66	1.06	HS diploma/GED
51-7041	Sawing Machine Workers, Wood	151	277	291	17	\$14.16	1.04	HS diploma/GED
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,946	23,634	27,445	17	\$13.37	1.08	None required
51-4121	Welders, Cutters, Solderers, & Brazers	1,069	2,757	3,154	13	\$18.81	1.01	HS diploma/GED
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,414	14,929	15,000	13	\$29.17	1.10	HS diploma/GED
51-4033	Grinding & Buffing Machine, Metal/Plastic	389	1,124	888	11	\$21.26	1.33	HS diploma/GED
51-9041	Extruding, Forming, & Compacting Machine	230	762	737	11	\$15.78	1.01	HS diploma/GED
51-4023	Rolling Machine Workers, Metal/Plastic	184	364	378	11	\$20.30	1.02	HS diploma/GED
49-9041	Industrial Machinery Mechanics	1,007	2,574	2,932	10	\$25.37	1.05	HS diploma/GED
51-9198	Helpers-Production Workers	808	3,938	3,632	10	\$10.79	0.91	None required
49-9071	Maintenance & Repair Workers, General	3,763	11,923	12,511	9	\$17.41	0.97	HS diploma/GED
51-4191	Heat Treating Equip. Workers, Metal/Plastic	130	223	219	9	\$19.62	1.09	HS diploma/GED
11-1021	General & Operations Managers	4,669	18,036	18,452	9	\$47.64	0.99	Bachelor's
51-4193	Plating & Coating Machine, Metal/Plastic	77	262	230	9	\$17.08	1.15	HS diploma/GED
51-4041	Machinists	999	3,497	3,404	8	\$20.58	1.05	HS diploma/GED
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	340	1,268	1,263	8	\$21.71	1.41	HS diploma/GED
43-5071	Shipping, Receiving, & Traffic Clerks	1,473	6,203	6,130	7	\$15.24	1.03	HS diploma/GED
51-9111	Packaging & Filling Machine Workers	1,206	3,590	3,174	7	\$13.46	1.01	HS diploma/GED
53-7063	Machine Feeders & Offbearers	272	621	720	7	\$14.19	0.99	None required
17-2112	Industrial Engineers	805	1,955	2,031	7	\$39.57	0.97	Bachelor's
53-7051	Industrial Truck & Tractor Operators	879	4,870	4,931	7	\$15.50	0.98	None required
51-9197	Tire Builders	56	140	962	7	\$21.55	1.14	HS diploma/GED
51-2041	Structural Metal Fabricators & Fitters	261	667	675	6	\$17.43	0.96	HS diploma/GED

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies



TRANSPORTATION EQUIPMENT

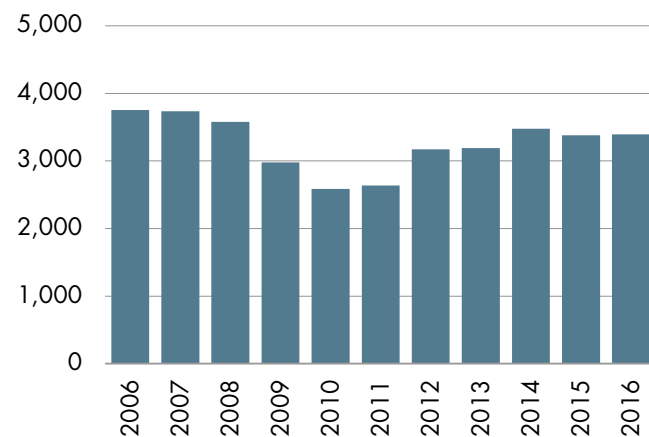
OVERVIEW. The transportation equipment sector includes segments that support the automotive and aerospace industries as well as marine and utility vehicle manufacturing. The sector has performed fairly well since the recession, growing 28 percent between 2011 and 2016. Currently, the sector employs more than 3,000 workers.

FIGURE 51. INDUSTRY DEFINITION

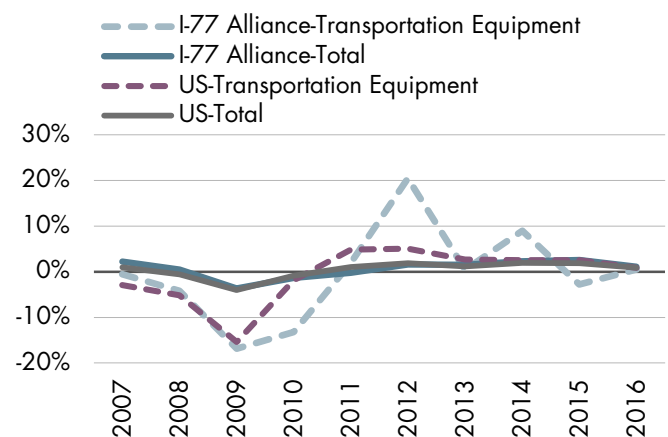
NAICS	DESCRIPTION
33361	Engine, Turbine, and Power Transmission Equipment Manufacturing
33531	Electrical Equipment Manufacturing
33591	Battery Manufacturing
33593	Wiring Device Manufacturing
33599	All Other Electrical Equipment and Component Manufacturing
33611	Automobile and Light Duty Motor Vehicle Manufacturing
33612	Heavy Duty Truck Manufacturing
33621	Motor Vehicle Body and Trailer Manufacturing
33631	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing
33632	Motor Vehicle Electrical and Electronic Equipment Manufacturing
33633	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing
33634	Motor Vehicle Brake System Manufacturing
33635	Motor Vehicle Transmission and Power Train Parts Manufacturing
33636	Motor Vehicle Seating and Interior Trim Manufacturing
33637	Motor Vehicle Metal Stamping
33639	Other Motor Vehicle Parts Manufacturing
33641	Aerospace Product and Parts Manufacturing
336612	Boat Building
336999	All Other Transportation Equipment Manufacturing

FIGURE 52. EMPLOYMENT TRENDS, 2006-2016

TOTAL EMPLOYMENT IN RELATED OCCUPATIONS



COMPARATIVE GROWTH, 2006-2016



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

TRANSPORTATION EQUIPMENT CONT.

KEY OCCUPATIONS. Team assemblers accounts for the largest share of industry employment. Inspectors, testers, sorters, samplers, and weighers accounts for the next largest share, and welders, cutters, solderers, and brazers is tied with machinists for the third largest share. The occupations with the highest concentration of employment relative to the US are grinding and buffing machine workers; production, planning, and expediting clerks; and team assemblers. Five of the key occupations have median hourly wages more than 10 percent above the US median. These occupations are specialized machine operators related to metal and plastic fabrication and electrical equipment assemblers. Only one key occupation has a median hourly wage that falls below 80 percent of the US median: purchasing agents, except wholesale, retail, and farm products.

FIGURE 53. KEY OCCUPATIONS–TRANSPORTATION EQUIPMENT
BASED ON STAFFING PATTERNS IN THE I-77 ALLIANCE

SOC Code	Description	Share of Industry Employment	Jobs	LQ (US= 1.00)	Median Hourly Earnings	Relative to US (US=1.00)
51-2092	Team Assemblers	21.1%	4,554	1.74	14.61	1.01
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	5.1%	1,637	1.36	17.97	1.01
51-4121	Welders, Cutters, Solderers, & Brazers	3.4%	1,032	1.10	18.90	1.01
51-4041	Machinists	3.4%	962	1.04	20.54	1.05
51-1011	First-Line Supvrs., Production & Operating Workers	3.3%	1,435	1.01	28.68	1.06
17-2112	Industrial Engineers	3.1%	769	1.33	39.58	0.97
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	2.6%	6,800	1.14	13.37	1.08
17-2141	Mechanical Engineers	2.2%	660	1.00	34.20	0.84
43-5061	Production, Planning, & Expediting Clerks	1.9%	1,350	1.79	23.80	1.07
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	1.7%	3,397	0.99	29.15	1.10
51-4081	Multiple Machine Tool Workers, Metal/Plastic	1.6%	191	0.78	20.66	1.25 ●
43-5071	Shipping, Receiving, & Traffic Clerks	1.5%	1,456	0.92	15.23	1.03
49-9071	Maintenance & Repair Workers, General	1.4%	3,752	1.11	17.42	0.97
51-4111	Tool & Die Makers	1.4%	195	1.14	24.77	1.01
11-1021	General & Operations Managers	1.3%	4,633	0.90	47.63	0.99
51-4033	Grinding & Buffing Machine, Metal/Plastic	1.2%	376	2.27	21.25	1.33 ●
51-2022	Electrical & Electronic Equip. Assemblers	1.1%	107	0.22	16.77	1.11 ●
11-3051	Industrial Production Managers	1.1%	383	0.95	47.59	1.05
17-2071	Electrical Engineers	1.0%	366	0.87	41.38	0.91
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	1.0%	323	0.73	21.70	1.41 ●
51-4021	Extruding & Drawing Machine, Metal/Plastic	1.0%	97	0.59	19.78	1.22 ●
51-9111	Packaging & Filling Machine Workers	1.0%	1,177	1.32	13.46	1.01
43-4051	Customer Service Representatives	1.0%	8,249	1.34	15.62	1.00
49-9041	Industrial Machinery Mechanics	0.9%	993	1.28	25.41	1.05
13-1023	Purchasing Agents, Exc, Whls., Retail, & Farm	0.8%	631	0.89	24.12	0.79 ✕

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: LQs greater than 1.25 are highlighted, as are wage rates above the regional average (\$17.57). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (✕)

TRANSPORTATION EQUIPMENT CONT.

DEMAND. Laborers/freight movers is the occupation with the highest number of openings expected over the next five years. Industrial machinery mechanics has the next highest number of openings, annually. Much of the demand for these positions is driven by replacement demand. This could be due to the aging of the workforce, but is also reflective of high turnover rates in some occupations. In 17 of the occupations, more than 20 percent of the workers are 55 years of age or older. The occupations with the largest percent of openings due to new growth are electrical and electronic equipment assemblers, multiple machine tool workers, and tool and die makers.

FIGURE 54. DEMAND FACTORS & DEMOGRAPHICS-TRANSPORTATION EQUIPMENT KEY OCCUPATIONS

SOC Code	Description	2015 Jobs	Annual Openings 2016-21	% of openings due to:		% of the workforce:	
				Net change	Replacement	Age 55+ Yrs.	Age 65+ Yrs.
51-2092	Team Assemblers	4,554	265	49%	51%	18%	3%
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,637	93	44%	56%	26% ◀	5% ◀
51-4121	Welders, Cutters, Solderers, & Brazers	1,032	72	47%	53%	17%	3%
51-4041	Machinists	962	80	54%	46%	26% ◀	4%
51-1011	First-Line Supvsr., Production & Operating Workers	1,435	64	54%	46%	25% ◀	3%
17-2112	Industrial Engineers	769	46	40%	60%	26% ◀	4%
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,800	392	38%	62%	16%	3%
17-2141	Mechanical Engineers	660	46	43%	57%	22% ◀	4%
43-5061	Production, Planning, & Expediting Clerks	1,350	58	24%	76%	24% ◀	4%
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,397	128	37%	63%	26% ◀	6% ◀
51-4081	Multiple Machine Tool Workers, Metal/Plastic	191	15	68%	32%	19%	—
43-5071	Shipping, Receiving, & Traffic Clerks	1,456	63	40%	60%	20%	3%
49-9071	Maintenance & Repair Workers, General	3,752	165	33%	67%	29% ◀	6% ◀
51-4111	Tool & Die Makers	195	6	65%	35%	38% ◀	6% ◀
11-1021	General & Operations Managers	4,633	198	33%	67%	23% ◀	4%
51-4033	Grinding & Buffing Machine, Metal/Plastic	376	25	23%	77%	21% ◀	3%
51-2022	Electrical & Electronic Equip. Assemblers	107	13	89%	11%	22% ◀	—
11-3051	Industrial Production Managers	383	24	43%	57%	26% ◀	3%
17-2071	Electrical Engineers	366	17	43%	57%	29% ◀	5% ◀
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	323	16	57%	43%	23% ◀	3%
51-4021	Extruding & Drawing Machine, Metal/Plastic	97	7	49%	51%	16%	—
51-9111	Packaging & Filling Machine Workers	1,177	86	39%	61%	18%	3%
43-4051	Customer Service Representatives	8,249	304	27%	73%	17%	3%
49-9041	Industrial Machinery Mechanics	993	57	47%	53%	28% ◀	4%
13-1023	Purchasing Agents, Exc. Whls., Retail, & Farm	631	29	31%	69%	30% ◀	5% ◀

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Annual openings are an estimate of job openings due to **net change** in employment and **replacement** needs (e.g., turnover, retirement). ◀

Indicates significant share of workforce is reaching retirement age (defined here as ≥ 25% age 55+ and/or ≥ 5% age 65+).

TRANSPORTATION EQUIPMENT CONT.

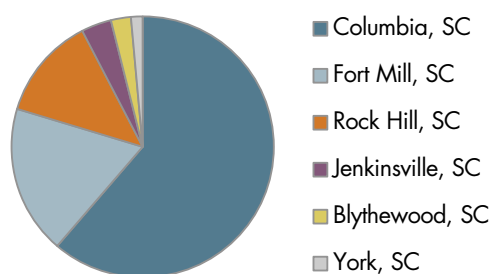
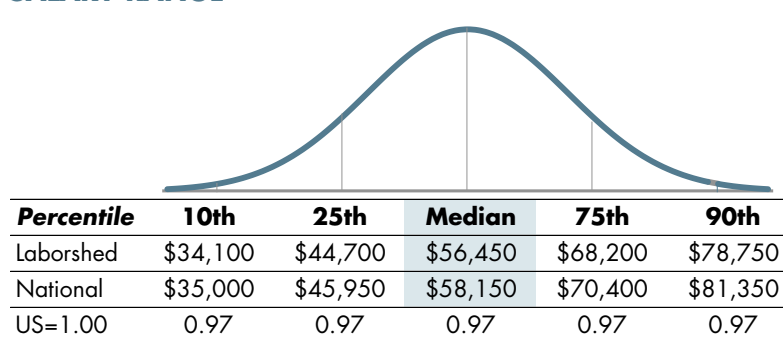
REAL-TIME LABOR MARKET INFORMATION. The information below is derived from a database of more than a million unique postings that are mined and aggregated for valuable, real-time labor insights. The charts and tables below represent the analytics for job postings related to the key occupations that support the transportation equipment sector.

FIGURE 55. SUMMARY FOR JOB POSTINGS CLASSIFIED AS TRANSPORTATION EQUIPMENT OPENINGS

Current job openings	Direct employers competing	Average posting duration (in days)
1,010	422	44

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)

**SALARY RANGE****TOP 10 COUNTS (BASED ON POSTINGS FROM 01-01-2016 TO 06-30-2016)**

Employers	# postings
FedEx	221
State of South Carolina	213
Blue Cross & Blue Shield Association	105
Lowe's	103
Schaeffler Group	82
Sc Department Of Public Safety	74
Fluor Corporation	69
Westinghouse Electric Company, LLC	67
Palmetto Health	62
Granite Services Inc	59

Hard skills	# postings
Quality Assurance	511
Preventative maintenance inspections	207
Preventive maintenance	190
Quality control	184
Technical support	126
Bilingual	108
Material Handling	106
Electrical systems	102
Instrumentation	99
Lean Manufacturing	99

Occupations	# postings
Customer Service Representatives	1,234
Maintenance & Repair Workers, General	715
Sales Reps, Whsle. & Mfg., Exc. Tech. & Sci. Prod.	709
General & Operations Managers	500
First-Line Sups. of Prod. & Operating Workers	489
Industrial Engineers	433
Laborers & Freight, Stock, & Mat. Movers, Hand	420
Purch. Agents, Exc. Whsle., Retail, & Farm Prod.	175
Mechanical Engineers	168
Electrical Engineers	168

Certifications	# postings
Driver's License	644
Occupational Safety & Health Admin. Cert.	145
ISO TS16949	71
Health Ins. Portability & Accountability Act-HIPPA	68
International Federation of Technical Analysts	65
American Society of Mechanical Engineers	59
Material Handling Equipment	56
HAZMAT	53
Professional Engineer	48
Engineer-In-Training	43

Source: Wanted Analytics

TRANSPORTATION EQUIPMENT CONT.

EDUCATION & TRAINING. The wage ranges as well as the education and training requirements for each occupation are listed in the figure below.

FIGURE 56. EDUCATION & TRAINING REQUIREMENTS–TRANSPORTATION EQUIPMENT
WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

SOC Code	Description	Median Hourly Earnings	Hourly Earnings (percentiles)		Typical req. for entry into occupation		Training required for competency
			10th	90th	Edu.	Exp.	
51-2092	Team Assemblers	\$14.61	\$9.62	\$24.65	HS or equiv.	None	Mod.-term OJT
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	\$17.97	\$10.33	\$28.78	HS or equiv.	None	Mod.-term OJT
51-4121	Welders, Cutters, Solderers, & Brazers	\$18.90	\$13.24	\$28.21	HS or equiv.	None	Mod.-term OJT
51-4041	Machinists	\$20.54	\$12.77	\$29.53	HS or equiv.	None	Long-term OJT
51-1011	First-Line Supvrs., Production & Operating Workers	\$28.68	\$16.06	\$45.67	Non-deg. award < 5 years		None
17-2112	Industrial Engineers	\$39.58	\$25.92	\$58.53	Bachelor's	None	None
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	\$13.37	\$9.19	\$21.01	Less than HS	None	Short-term OJT
17-2141	Mechanical Engineers	\$34.20	\$20.76	\$53.41	Bachelor's	None	None
43-5061	Production, Planning, & Expediting Clerks	\$23.80	\$14.15	\$34.11	HS or equiv.	None	Mod.-term OJT
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	\$29.15	\$14.77	\$56.23	HS or equiv.	None	Mod.-term OJT
51-4081	Multiple Machine Tool Workers, Metal/Plastic	\$20.66	\$13.70	\$27.58	HS or equiv.	None	Mod.-term OJT
43-5071	Shipping, Receiving, & Traffic Clerks	\$15.23	\$10.14	\$22.99	HS or equiv.	None	Short-term OJT
49-9071	Maintenance & Repair Workers, General	\$17.42	\$11.09	\$27.96	HS or equiv.	None	Long-term OJT
51-4111	Tool & Die Makers	\$24.77	\$14.62	\$33.30	HS or equiv.	None	Long-term OJT
11-1021	General & Operations Managers	\$47.63	\$23.80	\$104.00	Bachelor's	< 5 years	None
51-4033	Grinding & Buffing Machine, Metal/Plastic	\$21.25	\$13.30	\$25.57	HS or equiv.	None	Mod.-term OJT
51-2022	Electrical & Electronic Equip. Assemblers	\$16.77	\$11.99	\$20.54	HS or equiv.	None	Short-term OJT
11-3051	Industrial Production Managers	\$47.59	\$29.99	\$78.40	Bachelor's	5 years +	None
17-2071	Electrical Engineers	\$41.38	\$28.99	\$61.63	Bachelor's	None	None
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	\$21.70	\$12.14	\$28.85	HS or equiv.	None	Mod.-term OJT
51-4021	Extruding & Drawing Machine, Metal/Plastic	\$19.78	\$11.47	\$27.64	HS or equiv.	None	Mod.-term OJT
51-9111	Packaging & Filling Machine Workers	\$13.46	\$9.39	\$25.44	HS or equiv.	None	Mod.-term OJT
43-4051	Customer Service Representatives	\$15.62	\$10.16	\$25.40	HS or equiv.	None	Short-term OJT
49-9041	Industrial Machinery Mechanics	\$25.41	\$16.57	\$35.94	HS or equiv.	None	Long-term OJT
13-1023	Purchasing Agents, Exc, Whls., Retail, & Farm	\$24.12	\$16.07	\$39.89	HS or equiv.	None	Long-term OJT

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

FIGURE 57. LABOR CAPACITY SCENARIOS
 HYPOTHETICAL EXPECTED LABOR NEEDS
 FOR A NEW FACILITY

		REGIONAL CAPACITY			I-77 REGIONAL IMPACT			
		2016 EMPLOYMENT			Est. new jobs created	MEDIAN HOURLY WAGES		Typical education required
SOC Code	Primary occupations required	I-77 Region (4 counties)	N. Laborshed (8 counties)	So. Laborshed (10 counties)		I-77 region	Relative to US (US= 1.00)	
51-2092	Team Assemblers	4,787	12,133	13,112	106	\$14.61	1.01	HS diploma/GED
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,676	4,618	4,722	25	\$18.05	1.01	HS diploma/GED
51-4121	Welders, Cutters, Solderers, & Brazers	1,069	2,757	3,154	17	\$18.81	1.01	HS diploma/GED
51-4041	Machinists	999	3,497	3,404	17	\$20.58	1.05	HS diploma/GED
51-1011	First-Line Supvrs., Production & Operating Workers	1,485	4,927	4,989	16	\$28.66	1.06	HS diploma/GED
17-2112	Industrial Engineers	805	1,955	2,031	15	\$39.57	0.97	Bachelor's
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,946	23,634	27,445	13	\$13.37	1.08	None required
17-2141	Mechanical Engineers	680	2,094	2,069	11	\$34.24	0.84	Bachelor's
43-5061	Production, Planning, & Expediting Clerks	1,382	3,152	3,710	10	\$23.81	1.07	HS diploma/GED
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,414	14,929	15,000	9	\$29.17	1.10	HS diploma/GED
51-4081	Multiple Machine Tool Workers, Metal/Plastic	198	892	1,018	8	\$20.63	1.25	HS diploma/GED
43-5071	Shipping, Receiving, & Traffic Clerks	1,473	6,203	6,130	8	\$15.24	1.03	HS diploma/GED
49-9071	Maintenance & Repair Workers, General	3,763	11,923	12,511	7	\$17.41	0.97	HS diploma/GED
51-4111	Tool & Die Makers	201	371	374	7	\$24.76	1.01	HS diploma/GED
11-1021	General & Operations Managers	4,669	18,036	18,452	6	\$47.64	0.99	Bachelor's
51-4033	Grinding & Buffing Machine, Metal/Plastic	389	1,124	888	6	\$21.26	1.33	HS diploma/GED
51-2022	Electrical & Electronic Equip. Assemblers	120	996	941	6	\$16.76	1.11	HS diploma/GED
11-3051	Industrial Production Managers	390	1,255	1,188	6	\$47.58	1.05	Bachelor's
17-2071	Electrical Engineers	378	1,314	1,377	5	\$41.41	0.91	Bachelor's
51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	340	1,268	1,263	5	\$21.71	1.41	HS diploma/GED
51-4021	Extruding & Drawing Machine, Metal/Plastic	105	970	662	5	\$19.76	1.22	HS diploma/GED
51-9111	Packaging & Filling Machine Workers	1,206	3,590	3,174	5	\$13.46	1.01	HS diploma/GED
43-4051	Customer Service Representatives	8,420	29,305	31,702	5	\$15.61	1.00	HS diploma/GED
49-9041	Industrial Machinery Mechanics	1,007	2,574	2,932	5	\$25.37	1.05	HS diploma/GED
13-1023	Purchasing Agents, Exc, Whls., Retail, & Farm	646	2,251	2,242	4	\$24.14	0.79	Bachelor's

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies



LIFE SCIENCES

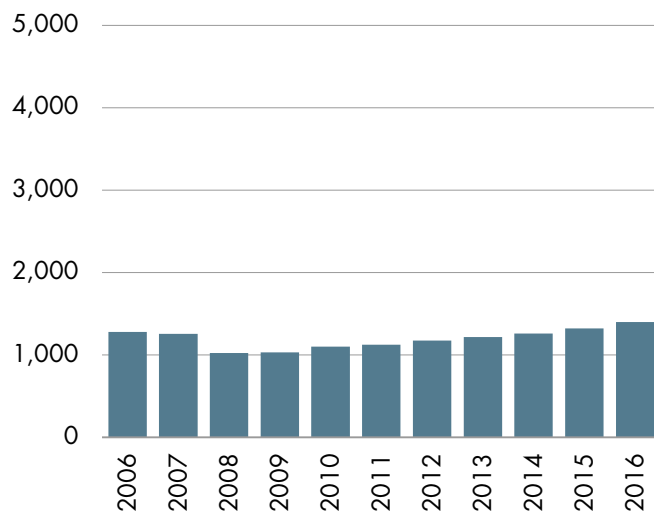
OVERVIEW. The life sciences sector includes pharmaceuticals, medical devices, biosciences, and medical supplies. After a brief contraction in 2008, the sector has been growing steadily since. In the last five years, the sector has increased by 24 percent and has outperformed the sector nationally. Over the next five years, the sector is expected to grow another 20 percent. It currently employs almost 1,500 workers.

FIGURE 58. INDUSTRY DEFINITION—LIFE SCIENCES

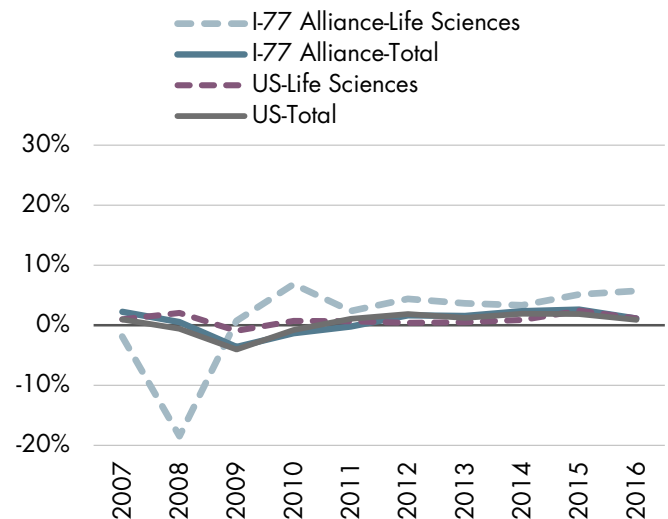
NAICS	DESCRIPTION
32541	Pharmaceutical and Medicine Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334516	Analytical Laboratory Instrument Manufacturing
33911	Medical Equipment and Supplies Manufacturing
54171	Research and Development in the Physical, Engineering, and Life Sciences
62151	Medical and Diagnostic Laboratories

FIGURE 59. EMPLOYMENT TRENDS, 2006-2016

TOTAL EMPLOYMENT IN RELATED OCCUPATIONS



COMPARATIVE GROWTH, 2006-2016



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

LIFE SCIENCES CONT.

KEY OCCUPATIONS. Medical and clinical laboratory technologists accounts for the largest share of sector employment. Phlebotomists accounts for the next largest share, and medical and clinical laboratory technicians is the occupation with the third largest share. The occupations with the highest concentration of workers relative to the US are production, planning, and expediting clerks; team assemblers; and first-line supervisors. None of the key occupations has a median hourly wage more than 10 percent above the US median. Only one key occupation has a median hourly wage that falls below 80 percent of the US median: medical and clinical laboratory technologists.

FIGURE 60. KEY OCCUPATIONS—LIFE SCIENCES
BASED ON STAFFING PATTERNS IN THE I-77 ALLIANCE

SOC Code	Description	Share of Industry Employment	Jobs	LQ (US= 1.00)	Median Hourly Earnings	Relative to US (US=1.00)
29-2011	Medical & Clinical Laboratory Technologists	5.8%	489	1.27	23.09	0.78 *
31-9097	Phlebotomists	5.7%	275	0.98	13.16	0.86
29-2012	Medical & Clinical Laboratory Technicians	5.6%	449	1.21	17.95	0.94
43-4051	Customer Service Representatives	3.0%	8,249	1.34	15.62	1.00
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	3.0%	1,637	1.36	17.97	1.01
51-2092	Team Assemblers	2.9%	4,554	1.74	14.61	1.01
29-2034	Radiologic Technologists	2.7%	599	1.29	23.88	0.85
43-5021	Couriers & Messengers	2.5%	276	1.19	11.81	0.85
17-2112	Industrial Engineers	2.1%	769	1.33	39.58	0.97
51-9111	Packaging & Filling Machine Workers	2.1%	1,177	1.32	13.46	1.01
51-1011	First-Line Supvrs., Production & Operating Workers	1.6%	1,435	1.01	28.68	1.06
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	1.6%	8,169	1.30	15.77	0.95
43-5061	Production, Planning, & Expediting Clerks	1.5%	1,350	1.79	23.80	1.07
11-1021	General & Operations Managers	1.5%	4,633	0.90	47.63	0.99
19-2031	Chemists	1.5%	233	1.17	31.71	0.91
43-1011	First-Line Supvrs., Office & Admin. Support	1.3%	5,446	1.59	23.13	0.91
13-1161	Market Research Analysts & Mktng. Specialists	1.2%	1,926	1.51	28.18	0.92
29-2032	Diagnostic Medical Sonographers	1.1%	156	1.06	28.83	0.84
13-2011	Accountants & Auditors	1.0%	3,645	1.13	27.33	0.84
17-2141	Mechanical Engineers	1.0%	660	1.00	34.20	0.84
43-9061	Office Clerks, General	1.0%	6,493	0.85	12.99	0.89
43-6013	Medical Secretaries	1.0%	1,220	0.95	15.33	0.95
49-9071	Maintenance & Repair Workers, General	1.0%	3,752	1.11	17.42	0.97
11-9111	Medical & Health Services Managers	0.9%	913	1.18	39.55	0.87
43-3021	Billing & Posting Clerks	0.9%	1,166	0.97	16.16	0.95

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: LQs greater than 1.25 are highlighted, as are wage rates above the regional average (\$17.57). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (✖)

LIFE SCIENCES CONT.

DEMAND. Customer service representatives is the occupation with the highest number of openings expected over the next five years. Team assemblers has the next highest number of openings, annually. Much of the demand for the majority of life sciences occupations is driven by replacement demand. This could be due to the aging of the workforce, but is also reflective of high turnover rates in some occupations. In 17 of the occupations, more than 20 percent of the workers are 55 years of age or older. The occupations with the largest percent of openings due to new growth are market research analysts, first-line supervisors, and medical secretaries.

FIGURE 61. DEMAND FACTORS & DEMOGRAPHICS-LIFE SCIENCES
KEY OCCUPATIONS

SOC Code	Description	2015 Jobs	Annual Openings 2016-21	% of openings due to:		% of the workforce:	
				Net change	Replacement	Age 55+ Yrs.	Age 65+ Yrs.
29-2011	Medical & Clinical Laboratory Technologists	489	21	36%	64%	21% ◀	3%
31-9097	Phlebotomists	275	11	25%	75%	9%	—
29-2012	Medical & Clinical Laboratory Technicians	449	18	34%	66%	20%	3%
43-4051	Customer Service Representatives	8,249	304	27%	73%	17%	3%
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,637	93	44%	56%	26% ◀	5% ◀
51-2092	Team Assemblers	4,554	265	49%	51%	18%	3%
29-2034	Radiologic Technologists	599	16	24%	76%	16%	2%
43-5021	Couriers & Messengers	276	8	45%	55%	35% ◀	16% ◀
17-2112	Industrial Engineers	769	46	40%	60%	26% ◀	4%
51-9111	Packaging & Filling Machine Workers	1,177	86	39%	61%	18%	3%
51-1011	First-Line Supvsr., Production & Operating Workers	1,435	64	54%	46%	25% ◀	3%
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	8,169	140	28%	72%	32% ◀	7% ◀
43-5061	Production, Planning, & Expediting Clerks	1,350	58	24%	76%	24% ◀	4%
11-1021	General & Operations Managers	4,633	198	33%	67%	23% ◀	4%
19-2031	Chemists	233	10	37%	63%	26% ◀	5% ◀
43-1011	First-Line Supvsr., Office & Admin. Support	5,446	129	30%	70%	25% ◀	4%
13-1161	Market Research Analysts & Mktng. Specialists	1,926	69	58%	42%	15%	3%
29-2032	Diagnostic Medical Sonographers	156	7	51%	49%	13%	—
13-2011	Accountants & Auditors	3,645	164	34%	66%	24% ◀	6% ◀
17-2141	Mechanical Engineers	660	46	43%	57%	22% ◀	4%
43-9061	Office Clerks, General	6,493	223	30%	70%	26% ◀	7% ◀
43-6013	Medical Secretaries	1,220	32	52%	48%	27% ◀	6% ◀
49-9071	Maintenance & Repair Workers, General	3,752	165	33%	67%	29% ◀	6% ◀
11-9111	Medical & Health Services Managers	913	36	29%	71%	29% ◀	4%
43-3021	Billing & Posting Clerks	1,166	39	32%	68%	20% ◀	4%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Annual openings are an estimate of job openings due to **net change** in employment and **replacement** needs (e.g., turnover, retirement). ◀

Indicates significant share of workforce is reaching retirement age (defined here as ≥ 25% age 55+ and/or ≥ 5% age 65+).

LIFE SCIENCES CONT.

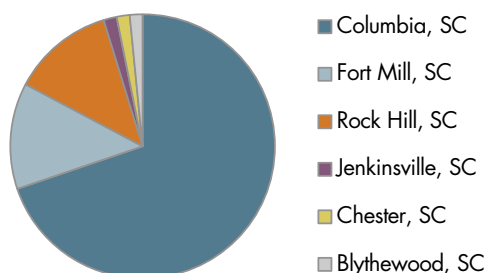
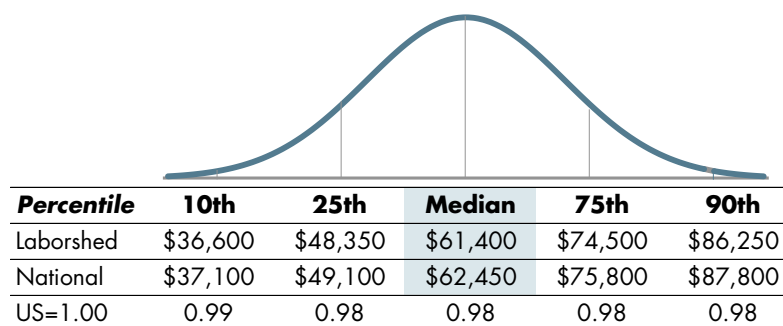
REAL-TIME LABOR MARKET INFORMATION. The information below is derived from a database of more than a million unique postings that are mined and aggregated for valuable, real-time labor insights. The charts and tables below represent the analytics for job postings related to the key occupations that support the life sciences sector.

FIGURE 62. SUMMARY FOR JOB POSTINGS CLASSIFIED AS LIFE SCIENCES OPENINGS

Current job openings	Direct employers competing	Average posting duration (in days)
1,492	484	45

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)

**SALARY RANGE****TOP 10 COUNTS (BASED ON POSTINGS FROM 01-01-2016 TO 06-30-2016)**

Employers		# postings		Occupations		# postings	
Palmetto Health & Related (Richland & Baptist)			840	Customer Service Representatives			1,234
State of South Carolina			728	First-Line Supvs. of Office & Admin. Sup. Workers			1,213
Sc Department Of Public Safety			294	Medical & Health Services Managers			999
Blue Cross & Blue Shield Association			248	Accountants & Auditors			804
Department of Veterans Affairs			129	Maintenance & Repair Workers, General			715
AmerisourceBergen			115	General & Operations Managers			500
University of South Carolina			105	First-Line Sups. of Prod. & Operating Workers			489
CITI			74	Medical Secretaries			454
Tenet Healthcare Corporation			74	Industrial Engineers			433
PHPP - PH Physician Practices			72	Sec. & Admin. Assist., Exc. Legal, Med., & Exec			259
Hard skills		# postings		Certifications		# postings	
Quality Assurance			800	Driver's License			785
Preventive maintenance			380	Continuing Education			381
Medicaid			303	Certified Registered Nurse			380
Quality control			273	Health Ins. Portability & Accountability Act-HIPPA			355
Accounts Receivable			235	Basic Life Support			270
Preventative maintenance inspections			208	Occupational Safety & Health Admin. Cert.			197
General Ledger Software			188	Basic Cardiac Life Support			196
Accounts payable			173	Certified Public Accountant			182
Technical support			156	Medical Technologist			150
Bilingual			114	Medical Laboratory Technician			126

Source: Wanted Analytics

LIFE SCIENCES CONT.

EDUCATION & TRAINING. The wage ranges as well as the education and training requirements for each occupation are listed in the figure below.

FIGURE 63. EDUCATION & TRAINING REQUIREMENTS–LIFE SCIENCES
WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

SOC Code	Description	Median Hourly Earnings	Hourly Earnings (percentiles)		Typical req. for entry into occupation		Training required for competency
			10th	90th	Edu.	Exp.	
29-2011	Medical & Clinical Laboratory Technologists	\$23.09	\$14.04	\$34.53	Bachelor's	None	None
31-9097	Phlebotomists	\$13.16	\$9.24	\$17.45	Non-deg. award	None	None
29-2012	Medical & Clinical Laboratory Technicians	\$17.95	\$10.14	\$29.46	Associate's	None	None
43-4051	Customer Service Representatives	\$15.62	\$10.16	\$25.40	HS or equiv.	None	Short-term OJT
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	\$17.97	\$10.33	\$28.78	HS or equiv.	None	Mod.-term OJT
51-2092	Team Assemblers	\$14.61	\$9.62	\$24.65	HS or equiv.	None	Mod.-term OJT
29-2034	Radiologic Technologists	\$23.88	\$15.98	\$33.27	Associate's	None	None
43-5021	Couriers & Messengers	\$11.81	\$9.38	\$15.68	HS or equiv.	None	Short-term OJT
17-2112	Industrial Engineers	\$39.58	\$25.92	\$58.53	Bachelor's	None	None
51-9111	Packaging & Filling Machine Workers	\$13.46	\$9.39	\$25.44	HS or equiv.	None	Mod.-term OJT
51-1011	First-Line Supvrs., Production & Operating Workers	\$28.68	\$16.06	\$45.67	Non-deg. award	< 5 years	None
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec	\$15.77	\$10.91	\$23.13	HS or equiv.	None	Short-term OJT
43-5061	Production, Planning, & Expediting Clerks	\$23.80	\$14.15	\$34.11	HS or equiv.	None	Mod.-term OJT
11-1021	General & Operations Managers	\$47.63	\$23.80	\$104.00	Bachelor's	< 5 years	None
19-2031	Chemists	\$31.71	\$19.68	\$51.26	Bachelor's	None	None
43-1011	First-Line Supvrs., Office & Admin. Support	\$23.13	\$15.57	\$36.14	HS or equiv.	< 5 years	None
13-1161	Market Research Analysts & Mktng. Specialists	\$28.18	\$14.62	\$54.73	Bachelor's	None	None
29-2032	Diagnostic Medical Sonographers	\$28.83	\$16.13	\$39.32	Associate's	None	None
13-2011	Accountants & Auditors	\$27.33	\$18.09	\$42.45	Bachelor's	None	None
17-2141	Mechanical Engineers	\$34.20	\$20.76	\$53.41	Bachelor's	None	None
43-9061	Office Clerks, General	\$12.99	\$9.19	\$20.76	HS or equiv.	None	Short-term OJT
43-6013	Medical Secretaries	\$15.33	\$10.04	\$21.97	HS or equiv.	None	Mod.-term OJT
49-9071	Maintenance & Repair Workers, General	\$17.42	\$11.09	\$27.96	HS or equiv.	None	Long-term OJT
11-9111	Medical & Health Services Managers	\$39.55	\$23.35	\$69.75	Bachelor's	None	None
43-3021	Billing & Posting Clerks	\$16.16	\$11.47	\$23.23	HS or equiv.	None	Short-term OJT

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

FIGURE 64. LABOR CAPACITY SCENARIOS
 HYPOTHETICAL EXPECTED LABOR NEEDS
 FOR A NEW FACILITY

		REGIONAL CAPACITY			I-77 REGIONAL IMPACT			
		2016 EMPLOYMENT			Est. new jobs created	MEDIAN HOURLY WAGES		Typical education required
SOC Code	Primary occupations required	I-77 Region (4 counties)	N. Laborshed (8 counties)	So. Laborshed (10 counties)		I-77 region	Relative to US (US= 1.00)	
29-2011	Medical & Clinical Laboratory Technologists	500	1,147	1,284	29	\$23.07	0.78	Bachelor's
31-9097	Phlebotomists	284	1,178	1,235	29	\$13.16	0.86	Non-degree award
29-2012	Medical & Clinical Laboratory Technicians	459	1,299	1,427	28	\$17.94	0.94	Associate's
43-4051	Customer Service Representatives	8,420	29,305	31,702	15	\$15.61	1.00	HS diploma/GED
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,676	4,618	4,722	15	\$18.05	1.01	HS diploma/GED
51-2092	Team Assemblers	4,787	12,133	13,112	15	\$14.61	1.01	HS diploma/GED
29-2034	Radiologic Technologists	603	1,764	1,937	13	\$23.78	0.85	Associate's
43-5021	Couriers & Messengers	277	837	917	13	\$11.68	0.85	HS diploma/GED
17-2112	Industrial Engineers	805	1,955	2,031	11	\$39.57	0.97	Bachelor's
51-9111	Packaging & Filling Machine Workers	1,206	3,590	3,174	11	\$13.46	1.01	HS diploma/GED
51-1011	First-Line Supvrs., Production & Operating Workers	1,485	4,927	4,989	8	\$28.66	1.06	HS diploma/GED
43-6014	Secy./Admin. Asst., Exc. Legal, Med., & Exec.	8,269	21,729	23,306	8	\$15.78	0.96	HS diploma/GED
43-5061	Production, Planning, & Expediting Clerks	1,382	3,152	3,710	8	\$23.81	1.07	HS diploma/GED
11-1021	General & Operations Managers	4,669	18,036	18,452	8	\$47.64	0.99	Bachelor's
19-2031	Chemists	240	575	600	7	\$31.45	0.90	Bachelor's
43-1011	First-Line Supvrs., Office & Admin. Support	5,527	14,827	16,444	7	\$23.12	0.91	HS diploma/GED
13-1161	Market Research Analysts & Mktng. Specialists	1,926	7,318	6,496	6	\$28.21	0.92	Bachelor's
29-2032	Diagnostic Medical Sonographers	160	410	453	6	\$28.71	0.84	Associate's
13-2011	Accountants & Auditors	3,673	14,276	14,599	5	\$27.10	0.84	Bachelor's
17-2141	Mechanical Engineers	680	2,094	2,069	5	\$34.24	0.84	Bachelor's
43-9061	Office Clerks, General	6,574	23,330	23,820	5	\$13.00	0.89	HS diploma/GED
43-6013	Medical Secretaries	1,258	3,257	3,563	5	\$15.34	0.95	HS diploma/GED
49-9071	Maintenance & Repair Workers, General	3,763	11,923	12,511	5	\$17.41	0.97	HS diploma/GED
11-9111	Medical & Health Services Managers	927	2,249	2,487	5	\$39.53	0.86	Bachelor's
43-3021	Billing & Posting Clerks	1,195	4,239	4,462	5	\$16.12	0.94	HS diploma/GED

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies



BUSINESS/FINANCIAL SERVICES

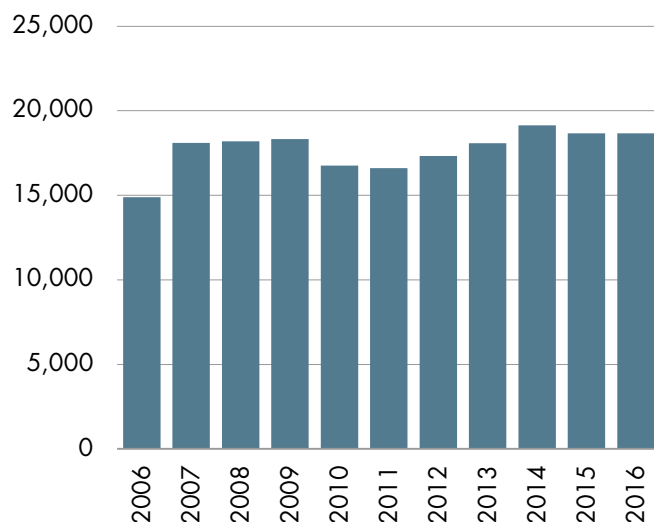
OVERVIEW. The business and financial services sector includes finance, insurance, and some back office functions. It also includes emerging industries such financial technology and logistics planning and software. The sector suffered late in the recession (2010-11), but has since recovered. Between 2011 and 2016, the sector grew 12 percent and is expected to grow another 7 percent by 2021. Current employment in the sector is more than 18,000.

FIGURE 65. INDUSTRY DEFINITION—BUSINESS/FINANCIAL SERVICES

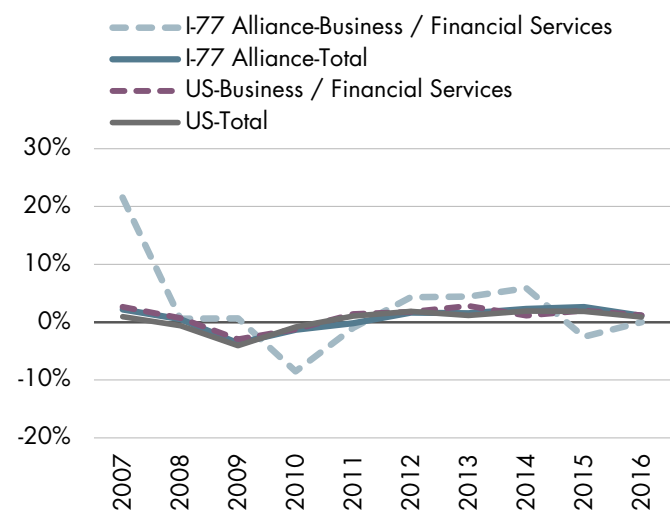
NAICS	DESCRIPTION
51121	Software Publishers
51821	Data Processing, Hosting, and Related Services
51913	Internet Publishing and Broadcasting and Web Search Portals
52211	Commercial Banking
52221	Credit Card Issuing
52232	Financial Transactions Processing, Reserve, and Clearinghouse Activities
52311	Investment Banking and Securities Dealing
52312	Securities Brokerage
52392	Portfolio Management
52393	Investment Advice
52411	Direct Life, Health, and Medical Insurance Carriers
52412	Direct Insurance (except Life, Health, and Medical) Carriers
56111	Office Administrative Services
56142	Telephone Call Centers

FIGURE 66. EMPLOYMENT TRENDS, 2006-2016

TOTAL EMPLOYMENT IN RELATED OCCUPATIONS



COMPARATIVE GROWTH, 2006-2016



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

BUSINESS/FINANCIAL SERVICES CONT.

KEY OCCUPATIONS. Customer service representatives account for the largest share of industry employment. Insurance sales agents account for the next largest share, and first-line supervisors is the occupation with the third largest share. The occupations with the highest concentration of employment relative to the US are computer programmers, insurance underwriters, and claims adjusters. None of the key occupations has a median hourly wage more than 10 percent above the US median. Three occupations have median hourly wages more than 20 percent below the US median—insurance underwriters, personal financial advisors, and financial analysts.

FIGURE 67. KEY OCCUPATIONS—BUSINESS/FINANCIAL SERVICES
BASED ON STAFFING PATTERNS IN THE I-77 ALLIANCE

SOC Code	Description	Share of Industry Employment	Jobs	LQ (US= 1.00)	Median Hourly Earnings	Relative to US (US=1.00)
43-4051	Customer Service Representatives	15.8%	8,249	1.34	15.62	1.00
41-3021	Insurance Sales Agents	5.9%	2,101	1.55	22.41	0.95
43-1011	First-Line Supvrs., Office & Admin. Support	5.1%	5,446	1.59	23.13	0.91
43-9041	Insurance Claims & Policy Processing Clerks	4.4%	1,189	1.91	15.58	0.85
43-3071	Tellers	3.4%	1,152	0.99	13.70	1.07
13-1031	Claims Adjusters, Examiners, & Investigators	3.1%	1,156	1.73	29.74	0.99
13-1111	Management Analysts	2.7%	2,828	1.52	31.87	0.84
29-1141	Registered Nurses	2.6%	7,025	1.07	28.05	0.83
15-1121	Computer Systems Analysts	2.4%	1,375	1.00	33.65	0.81
13-2011	Accountants & Auditors	2.1%	3,645	1.13	27.33	0.84
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	2.1%	8,169	1.30	15.77	0.95
11-1021	General & Operations Managers	2.0%	4,633	0.90	47.63	0.99
11-3031	Financial Managers	1.8%	1,209	0.91	49.27	0.86
13-1161	Market Research Analysts & Mktng. Specialists	1.8%	1,926	1.51	28.18	0.92
13-2053	Insurance Underwriters	1.7%	442	2.02	25.08	0.79 *
15-1131	Computer Programmers	1.7%	1,558	2.17	33.00	0.86
43-9061	Office Clerks, General	1.7%	6,493	0.85	12.99	0.89
15-1151	Computer User Support Specialists	1.6%	1,789	1.16	22.88	0.96
13-2052	Personal Financial Advisors	1.6%	452	0.78	30.74	0.72 *
43-3031	Bookkeeping, Accounting, & Auditing Clerks	1.5%	3,814	0.94	17.67	0.97
15-1132	Software Developers, Applications	1.4%	814	0.45	39.63	0.83
11-3021	Computer & Info. Systems Managers	1.4%	1,006	1.21	52.68	0.83
13-2072	Loan Officers	1.3%	1,218	1.68	30.34	0.97
13-2051	Financial Analysts	1.1%	501	0.77	30.64	0.77 *
15-1142	Network & Computer Systems Admin.	1.0%	924	1.03	35.91	0.94

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: LQs greater than 1.25 are highlighted, as are wage rates above the regional average (\$17.57). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (*)

BUSINESS/FINANCIAL SERVICES CONT.

DEMAND. Customer service representatives is the occupation with the highest number of openings expected over the next five years. Registered nurses have the next highest number of openings, annually. Much of the demand for the occupations in this sector is driven by replacement demand. In 15 of the occupations, more than 20 percent of the workers are 55 years of age or older. The occupations with the largest percent of openings due to new growth are software developers, computer systems analysts, and market research analysts.

FIGURE 68. DEMAND FACTORS & DEMOGRAPHICS—BUSINESS/FINANCIAL SERVICES KEY OCCUPATIONS

SOC Code	Description	2015 Jobs	Annual Openings 2016-21	% of openings due to:		% of the workforce:	
				Net change	Replacement	Age 55+ Yrs.	Age 65+ Yrs.
43-4051	Customer Service Representatives	8,249	304	27%	73%	17%	3%
41-3021	Insurance Sales Agents	2,101	82	23%	77%	29% ◀	8% ◀
43-1011	First-Line Supvrs., Office & Admin. Support	5,446	129	30%	70%	25% ◀	4%
43-9041	Insurance Claims & Policy Processing Clerks	1,189	50	35%	65%	20% ◀	3%
43-3071	Tellers	1,152	46	0%	100%	17%	3%
13-1031	Claims Adjusters, Examiners, & Investigators	1,156	59	42%	58%	21% ◀	3%
13-1111	Management Analysts	2,828	90	48%	52%	27% ◀	7% ◀
29-1141	Registered Nurses	7,025	287	35%	65%	24% ◀	4%
15-1121	Computer Systems Analysts	1,375	55	60%	40%	20% ◀	3%
13-2011	Accountants & Auditors	3,645	164	34%	66%	24% ◀	6% ◀
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	8,169	140	28%	72%	32% ◀	7% ◀
11-1021	General & Operations Managers	4,633	198	33%	67%	23% ◀	4%
11-3031	Financial Managers	1,209	43	27%	73%	22% ◀	4%
13-1161	Market Research Analysts & Mktng. Specialists	1,926	69	58%	42%	15%	3%
13-2053	Insurance Underwriters	442	10	9%	91%	21% ◀	2%
15-1131	Computer Programmers	1,558	46	0%	100%	20%	3%
43-9061	Office Clerks, General	6,493	223	30%	70%	26% ◀	7% ◀
15-1151	Computer User Support Specialists	1,789	47	42%	58%	17%	2%
13-2052	Personal Financial Advisors	452	18	24%	76%	27% ◀	8% ◀
43-3031	Bookkeeping, Accounting, & Auditing Clerks	3,814	53	0%	100%	32% ◀	8% ◀
15-1132	Software Developers, Applications	814	51	69%	31%	15%	2%
11-3021	Computer & Info. Systems Managers	1,006	30	52%	48%	20%	2%
13-2072	Loan Officers	1,218	20	0%	100%	16%	2%
13-2051	Financial Analysts	501	16	30%	70%	14%	3%
15-1142	Network & Computer Systems Admin.	924	23	40%	60%	15%	2%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Annual openings are an estimate of job openings due to **net change** in employment and **replacement** needs (e.g., turnover, retirement). ◀

Indicates significant share of workforce is reaching retirement age (defined here as ≥ 25% age 55+ and/or ≥ 5% age 65+).

BUSINESS/FINANCIAL SERVICES CONT.

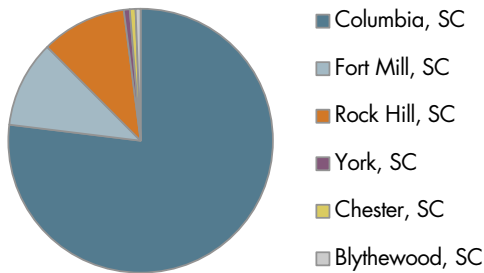
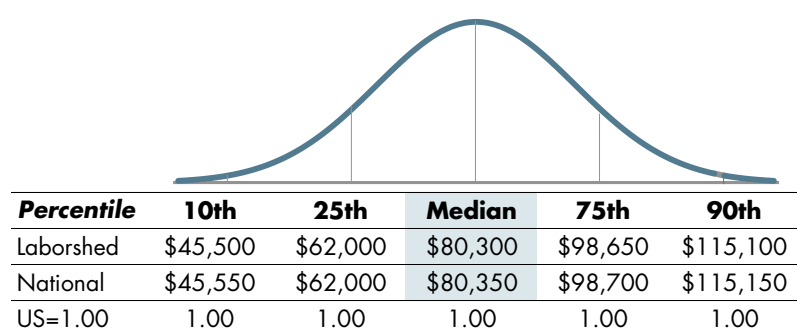
REAL-TIME LABOR MARKET INFORMATION. The information below is derived from a database of more than a million unique postings that are mined and aggregated for valuable, real-time labor insights. The charts and tables below represent the analytics for job postings related to the key occupations that support the business and financial services sector.

FIGURE 69. SUMMARY FOR JOB POSTINGS CLASSIFIED AS BUSINESS/FINANCIAL SERVICES OPENINGS

Current job openings	Direct employers competing	Average posting duration (in days)
2,936	632	45

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)

**SALARY RANGE****TOP 10 COUNTS (BASED ON POSTINGS FROM 01-01-2016 TO 06-30-2016)**

Employers	# postings
Palmetto Health	2,589
State of South Carolina	972
Blue Cross & Blue Shield Association	545
Sc Department Of Public Safety	400
Wells Fargo	315
Department of Veterans Affairs	233
CITI	217
Expinfo, Inc.	163
University of South Carolina	157
PH Baptist Parkridge	157

Occupations	# postings
Registered Nurses	4,774
Customer Service Representatives	1,234
First-Line Supvs. of Office & Admin. Sup. Workers	1,213
Computer Systems Analysts	933
Computer User Support Specialists	911
Insurance Sales Agents	834
Accountants & Auditors	804
Network & Computer Systems Admin.	703
Management Analysts	555
Financial Managers	516

Hard skills	# postings
Structured query language	779
Quality Assurance	599
Technical support	527
Microsoft SQL Server	398
Medicaid	390
Microsoft SharePoint	379
Accounts payable	363
Microsoft .NET Framework	346
Medical-Surgical Nursing	345
Critical care	316

Certifications	# postings
Certified Registered Nurse	4,353
Basic Life Support	2,499
Basic Cardiac Life Support	2,127
Driver's License	923
Certif. in Cardiopulmonary Resuscitation	525
Continuing Education	387
Advanced Cardiac Life Support	386
Certified Public Accountant	313
State insurance license	253
Commission on Collegiate Nursing Edu.	249

Source: Wanted Analytics

BUSINESS/FINANCIAL SERVICES CONT.

EDUCATION & TRAINING. The wage ranges as well as the education and training requirements for each occupation are listed in the figure below.

FIGURE 70. EDUCATION & TRAINING REQUIREMENTS–BUSINESS/FINANCIAL SERVICES
WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

SOC Code	Description	Median Hourly Earnings	Hourly Earnings (percentiles)		Typical req. for entry into occupation		Training required for competency
			10th	90th	Edu.	Exp.	
43-4051	Customer Service Representatives	\$15.62	\$10.16	\$25.40	HS or equiv.	None	Short-term OJT
41-3021	Insurance Sales Agents	\$22.41	\$11.75	\$37.54	HS or equiv.	None	Mod.-term OJT
43-1011	First-Line Supvrs., Office & Admin. Support	\$23.13	\$15.57	\$36.14	HS or equiv.	< 5 years	None
43-9041	Insurance Claims & Policy Processing Clerks	\$15.58	\$10.81	\$22.78	HS or equiv.	None	Mod.-term OJT
43-3071	Tellers	\$13.70	\$10.62	\$17.71	HS or equiv.	None	Short-term OJT
13-1031	Claims Adjusters, Examiners, & Investigators	\$29.74	\$16.05	\$38.03	HS or equiv.	None	Long-term OJT
13-1111	Management Analysts	\$31.87	\$18.26	\$50.20	Bachelor's	< 5 years	None
29-1141	Registered Nurses	\$28.05	\$17.47	\$38.14	Associate's	None	None
15-1121	Computer Systems Analysts	\$33.65	\$21.17	\$51.06	Bachelor's	None	None
13-2011	Accountants & Auditors	\$27.33	\$18.09	\$42.45	Bachelor's	None	None
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec	\$15.77	\$10.91	\$23.13	HS or equiv.	None	Short-term OJT
11-1021	General & Operations Managers	\$47.63	\$23.80	\$104.00	Bachelor's	< 5 years	None
11-3031	Financial Managers	\$49.27	\$30.84	\$101.85	Bachelor's	5 years +	None
13-1161	Market Research Analysts & Mktng. Specialists	\$28.18	\$14.62	\$54.73	Bachelor's	None	None
13-2053	Insurance Underwriters	\$25.08	\$16.51	\$36.41	Bachelor's	None	Mod.-term OJT
15-1131	Computer Programmers	\$33.00	\$20.54	\$53.61	Bachelor's	None	None
43-9061	Office Clerks, General	\$12.99	\$9.19	\$20.76	HS or equiv.	None	Short-term OJT
15-1151	Computer User Support Specialists	\$22.88	\$12.99	\$35.45	Some college	None	Mod.-term OJT
13-2052	Personal Financial Advisors	\$30.74	\$15.55	\$91.57	Bachelor's	None	None
43-3031	Bookkeeping, Accounting, & Auditing Clerks	\$17.67	\$11.63	\$25.03	HS or equiv.	None	Mod.-term OJT
15-1132	Software Developers, Applications	\$39.63	\$25.63	\$57.19	Bachelor's	None	None
11-3021	Computer & Info. Systems Managers	\$52.68	\$31.25	\$81.98	Bachelor's	5 years +	None
13-2072	Loan Officers	\$30.34	\$17.18	\$67.17	Bachelor's	None	Mod.-term OJT
13-2051	Financial Analysts	\$30.64	\$17.35	\$46.81	Bachelor's	None	None
15-1142	Network & Computer Systems Admin.	\$35.91	\$22.69	\$57.85	Bachelor's	None	None

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

FIGURE 71. LABOR CAPACITY SCENARIOS
 HYPOTHETICAL EXPECTED LABOR NEEDS
 FOR A NEW FACILITY

Target group: Business/Financial Services
Number of jobs: 500

		REGIONAL CAPACITY			I-77 REGIONAL IMPACT			
		2016 EMPLOYMENT			Est. new jobs created	MEDIAN HOURLY WAGES		Typical education required
SOC Code	Primary occupations required	I-77 Region (4 counties)	N. Laborshed (8 counties)	So. Laborshed (10 counties)		I-77 region	Relative to US (US= 1.00)	
43-4051	Customer Service Representatives	8,420	29,305	31,702	79	\$15.61	1.00	HS diploma/GED
41-3021	Insurance Sales Agents	2,149	5,939	6,155	29	\$22.70	0.96	HS diploma/GED
43-1011	First-Line Supvsr., Office & Admin. Support	5,527	14,827	16,444	26	\$23.12	0.91	HS diploma/GED
43-9041	Insurance Claims & Policy Processing Clerks	1,209	2,634	2,748	22	\$15.59	0.85	HS diploma/GED
43-3071	Tellers	1,169	3,458	3,889	17	\$13.70	1.07	HS diploma/GED
13-1031	Claims Adjusters, Examiners, & Investigators	1,169	2,815	2,852	16	\$29.78	0.99	HS diploma/GED
13-1111	Management Analysts	2,872	9,730	9,697	14	\$31.68	0.84	Bachelor's
29-1141	Registered Nurses	7,128	24,458	26,050	13	\$28.00	0.83	Bachelor's
15-1121	Computer Systems Analysts	1,394	8,634	8,480	12	\$33.69	0.82	Bachelor's
13-2011	Accountants & Auditors	3,673	14,276	14,599	11	\$27.10	0.84	Bachelor's
43-6014	Secy./Admin. Asst., Exc. Legal, Med., & Exec.	8,269	21,729	23,306	10	\$15.78	0.96	HS diploma/GED
11-1021	General & Operations Managers	4,669	18,036	18,452	10	\$47.64	0.99	Bachelor's
11-3031	Financial Managers	1,220	7,433	7,385	9	\$49.32	0.86	Bachelor's
13-1161	Market Research Analysts & Mktng. Specialists	1,926	7,318	6,496	9	\$28.21	0.92	Bachelor's
13-2053	Insurance Underwriters	450	1,568	1,563	9	\$25.08	0.79	Bachelor's
15-1131	Computer Programmers	1,587	3,808	4,014	8	\$33.14	0.86	Bachelor's
43-9061	Office Clerks, General	6,574	23,330	23,820	8	\$13.00	0.89	HS diploma/GED
15-1151	Computer User Support Specialists	1,810	6,365	6,710	8	\$22.94	0.96	Some college/no degr.
13-2052	Personal Financial Advisors	458	3,222	3,218	8	\$31.50	0.73	Bachelor's
43-3031	Bookkeeping, Accounting, & Auditing Clerks	3,842	13,110	13,749	7	\$17.59	0.97	Some college/no degr.
15-1132	Software Developers, Applications	833	7,376	7,228	7	\$39.97	0.84	Bachelor's
11-3021	Computer & Info. Systems Managers	1,025	4,806	4,808	7	\$52.76	0.83	Bachelor's
13-2072	Loan Officers	1,267	5,303	5,386	6	\$30.33	0.97	Bachelor's
13-2051	Financial Analysts	504	4,297	4,258	6	\$30.69	0.77	Bachelor's
15-1142	Network & Computer Systems Admin.	937	3,432	3,563	5	\$35.96	0.94	Bachelor's

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies



DEFENSE

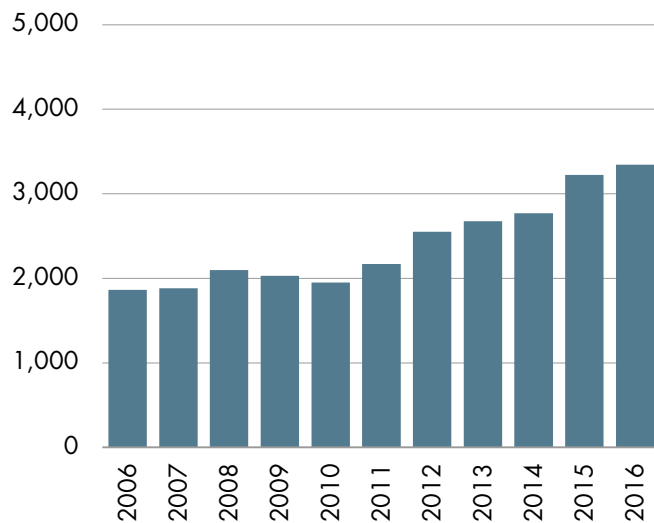
OVERVIEW. The defense sector includes software development, security, and instrumentation. It is a complementary sector to transportation equipment, which supports aerospace and other industries that have defense applications. Growth in the defense sector has been somewhat volatile. However, since 2011, the sector has grown by more than 50 percent. The sector currently employs more than 3,000 workers in the region.

FIGURE 72. INDUSTRY DEFINITION-DEFENSE

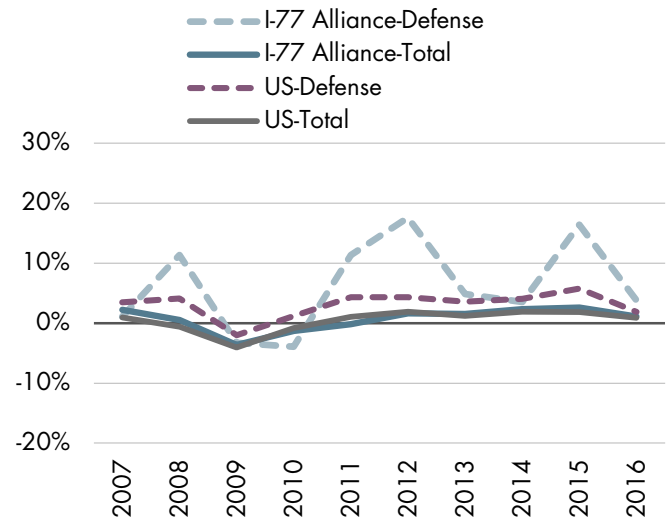
NAICS	DESCRIPTION
33422	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
51121	Software Publishers
51741	Satellite Telecommunications
517919	All Other Telecommunications
54151	Computer Systems Design and Related Services

FIGURE 73. EMPLOYMENT TRENDS, 2006-2016

TOTAL EMPLOYMENT IN RELATED OCCUPATIONS



COMPARATIVE GROWTH, 2006-2016



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

DEFENSE CONT.

KEY OCCUPATIONS. Computer programmers account for the largest share of industry employment. Software developers (applications and systems software) account for the next largest share, and computer user support specialist is the occupation with the fourth largest share. The occupations with the highest concentration of employment relative to the US are computer programmers, information security analysts, and first-line supervisors. One of the key occupations has a median hourly wage more than 10 percent above the US median—sales representatives.

FIGURE 74. KEY OCCUPATIONS—DEFENSE
BASED ON STAFFING PATTERNS IN THE I-77 ALLIANCE

SOC Code	Description	Share of Industry Employment	Jobs	LQ (US= 1.00)	Median Hourly Earnings	Relative to US (US=1.00)
15-1131	Computer Programmers	15.7%	1,558	2.17	33.00	0.86
15-1132	Software Developers, Applications	7.9%	814	0.45	39.63	0.83
15-1133	Software Developers, Systems Software	7.4%	715	0.75	37.39	0.73 *
15-1151	Computer User Support Specialists	7.3%	1,789	1.16	22.88	0.96
15-1121	Computer Systems Analysts	5.9%	1,375	1.00	33.65	0.81
11-3021	Computer & Info. Systems Managers	4.5%	1,006	1.21	52.68	0.83
13-1161	Market Research Analysts & Mktng. Specialists	3.4%	1,926	1.51	28.18	0.92
15-1142	Network & Computer Systems Admin.	2.9%	924	1.03	35.91	0.94
15-1134	Web Developers	2.7%	315	0.81	26.00	0.88
43-4051	Customer Service Representatives	2.6%	8,249	1.34	15.62	1.00
41-3099	Sales Reps., Services, All Other	2.5%	1,300	0.58	17.76	0.71 *
41-4011	Sales Reps., Whls. & Mfg., Tech. & Scientific	2.4%	640	0.79	41.57	1.13 ●
11-1021	General & Operations Managers	2.2%	4,633	0.90	47.63	0.99
13-1111	Management Analysts	2.1%	2,828	1.52	31.87	0.84
15-1122	Information Security Analysts	1.8%	409	1.92	37.52	0.86
13-2011	Accountants & Auditors	1.4%	3,645	1.13	27.33	0.84
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec	1.3%	8,169	1.30	15.77	0.95
15-1199	Computer Occupations, All Other	1.3%	640	1.13	35.72	0.87
15-1152	Computer Network Support Specialists	1.2%	388	0.81	29.64	0.97
43-9061	Office Clerks, General	1.0%	6,493	0.85	12.99	0.89
43-3031	Bookkeeping, Accounting, & Auditing Clerks	0.9%	3,814	0.94	17.67	0.97
43-1011	First-Line Supvsr., Office & Admin. Support	0.8%	5,446	1.59	23.13	0.91
11-9199	Managers, All Other	0.8%	1,322	0.73	29.84	0.87
15-1141	Database Administrators	0.8%	297	1.07	33.17	0.83
13-1151	Training & Development Specialists	0.8%	911	1.47	25.28	0.89

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: LQs greater than 1.25 are highlighted, as are wage rates above the regional average (\$17.57). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (*)

DEFENSE CONT.

DEMAND. Customer service representatives, office clerks, and general managers are the three occupations with the largest number of openings projected over the next five years. The occupations with the largest percent of openings due to new growth are applications software developers, web developers, and computer systems analysts. In 13 of the occupations, more than 20 percent of the workers are 55 years of age or older.

FIGURE 75. DEMAND FACTORS & DEMOGRAPHICS—DEFENSE
KEY OCCUPATIONS

SOC Code	Description	2015 Jobs	Annual Openings 2016-21	% of openings due to:		% of the workforce:	
				Net change	Replacement	Age 55+ Yrs.	Age 65+ Yrs.
15-1131	Computer Programmers	1,558	46	0%	100%	20%	3%
15-1132	Software Developers, Applications	814	51	69%	31%	15%	2%
15-1133	Software Developers, Systems Software	715	27	53%	47%	15%	2%
15-1151	Computer User Support Specialists	1,789	47	42%	58%	17%	2%
15-1121	Computer Systems Analysts	1,375	55	60%	40%	20% ◀	3%
11-3021	Computer & Info. Systems Managers	1,006	30	52%	48%	20%	2%
13-1161	Market Research Analysts & Mktng. Specialists	1,926	69	58%	42%	15%	3%
15-1142	Network & Computer Systems Admin.	924	23	40%	60%	15%	2%
15-1134	Web Developers	315	17	67%	33%	8%	—
43-4051	Customer Service Representatives	8,249	304	27%	73%	17%	3%
41-3099	Sales Reps., Services, All Other	1,300	43	30%	70%	22% ◀	5% ◀
41-4011	Sales Reps., Whls. & Mfg., Tech. & Scientific	640	31	46%	54%	24% ◀	5% ◀
11-1021	General & Operations Managers	4,633	198	33%	67%	23% ◀	4%
13-1111	Management Analysts	2,828	90	48%	52%	27% ◀	7% ◀
15-1122	Information Security Analysts	409	13	51%	49%	20% ◀	3%
13-2011	Accountants & Auditors	3,645	164	34%	66%	24% ◀	6% ◀
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	8,169	140	28%	72%	32% ◀	7% ◀
15-1199	Computer Occupations, All Other	640	15	37%	63%	17%	2%
15-1152	Computer Network Support Specialists	388	10	44%	56%	16%	— ◀
43-9061	Office Clerks, General	6,493	223	30%	70%	26% ◀	7% ◀
43-3031	Bookkeeping, Accounting, & Auditing Clerks	3,814	53	0%	100%	32% ◀	8% ◀
43-1011	First-Line Supvsr., Office & Admin. Support	5,446	129	30%	70%	25% ◀	4%
11-9199	Managers, All Other	1,322	51	37%	63%	34% ◀	9% ◀
15-1141	Database Administrators	297	12	38%	62%	18%	—
13-1151	Training & Development Specialists	911	34	27%	73%	24% ◀	4%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Annual openings are an estimate of job openings due to **net change** in employment and **replacement** needs (e.g., turnover, retirement). ◀

Indicates significant share of workforce is reaching retirement age (defined here as ≥ 25% age 55+ and/or ≥ 5% age 65+).

DEFENSE CONT.

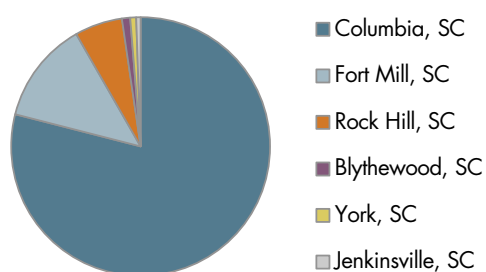
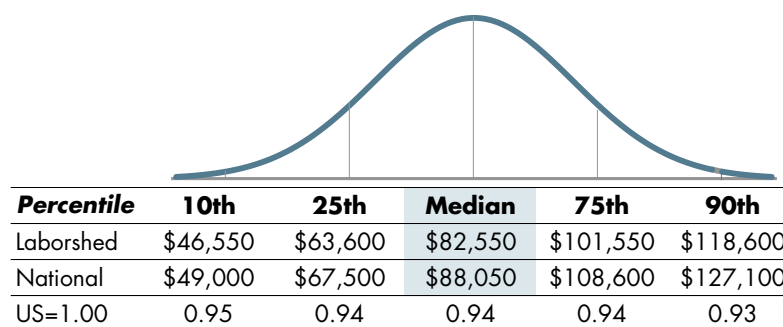
REAL-TIME LABOR MARKET INFORMATION. The information below is derived from a database of more than a million unique postings that are mined and aggregated for valuable, real-time labor insights. The charts and tables below represent the analytics for job postings related to the key occupations that support the defense sector.

FIGURE 76. SUMMARY FOR JOB POSTINGS CLASSIFIED AS DEFENSE OPENINGS

Current job openings	Direct employers competing	Average posting duration (in days)
2,319	602	44

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)

**SALARY RANGE****TOP 10 COUNTS (BASED ON POSTINGS FROM 01-01-2016 TO 06-30-2016)**

Employers	# postings
State of South Carolina	1,036
Blue Cross & Blue Shield Association	472
Sc Department Of Public Safety	444
Palmetto Health	348
Expinfo, Inc.	286
University of South Carolina	182
CITI	179
American Express	178
Wells Fargo	168
AmerisourceBergen	167

Occupations	# postings
Customer Service Representatives	1,234
First-Line Supvs. of Office & Admin. Sup. Workers	1,213
Computer Occupations, All Other	945
Computer Systems Analysts	933
Computer User Support Specialists	911
Accountants & Auditors	804
Network & Computer Systems Administrators	703
Management Analysts	555
Managers, All Other	523
Sales Reps, Whsle. & Mfg., Exc. Tech. & Sci. Prod	509

Hard skills	# postings
Structured query language	1,078
Quality Assurance	708
Microsoft SQL Server	664
Technical support	603
Information security	588
Linux	548
Systems Development Life Cycle	528
Java	516
Microsoft .NET Framework	502
Microsoft SharePoint	482

Certifications	# postings
Driver's License	945
Project Management Professional	320
Project Management Institute	300
Certified Public Accountant	191
Certified Info. Systems Security Professional	185
Health Ins. Portability & Accountability Act-HIPPA	159
Continuing Education	137
Microsoft Certified Systems Engineer	128
Certified Information Systems Auditor	117
Certified Scrum Master	113

Source: Wanted Analytics; TIP Strategies

DEFENSE CONT.

EDUCATION & TRAINING. The wage ranges as well as the education and training requirements for each occupation are listed in the figure below.

FIGURE 77. EDUCATION & TRAINING REQUIREMENTS-DEFENSE
WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

SOC Code	Description	Median Hourly Earnings	Hourly Earnings (percentiles)		Typical req. for entry into occupation		Training required for competency
			10th	90th	Edu.	Exp.	
15-1131	Computer Programmers	\$33.00	\$20.54	\$53.61	Bachelor's	None	None
15-1132	Software Developers, Applications	\$39.63	\$25.63	\$57.19	Bachelor's	None	None
15-1133	Software Developers, Systems Software	\$37.39	\$22.48	\$54.56	Bachelor's	None	None
15-1151	Computer User Support Specialists	\$22.88	\$12.99	\$35.45	Some college	None	Mod.-term OJT
15-1121	Computer Systems Analysts	\$33.65	\$21.17	\$51.06	Bachelor's	None	None
11-3021	Computer & Info. Systems Managers	\$52.68	\$31.25	\$81.98	Bachelor's	5 years +	None
13-1161	Market Research Analysts & Mktng. Specialists	\$28.18	\$14.62	\$54.73	Bachelor's	None	None
15-1142	Network & Computer Systems Admin.	\$35.91	\$22.69	\$57.85	Bachelor's	None	None
15-1134	Web Developers	\$26.00	\$16.35	\$39.32	Associate's	None	None
43-4051	Customer Service Representatives	\$15.62	\$10.16	\$25.40	HS or equiv.	None	Short-term OJT
41-3099	Sales Reps., Services, All Other	\$17.76	\$11.60	\$36.91	HS or equiv.	None	Short-term OJT
41-4011	Sales Reps., Whls. & Mfg., Tech. & Scientific	\$41.57	\$18.24	\$76.11	Bachelor's	None	Mod.-term OJT
11-1021	General & Operations Managers	\$47.63	\$23.80	\$104.00	Bachelor's	< 5 years	None
13-1111	Management Analysts	\$31.87	\$18.26	\$50.20	Bachelor's	< 5 years	None
15-1122	Information Security Analysts	\$37.52	\$25.94	\$53.74	Bachelor's	< 5 years	None
13-2011	Accountants & Auditors	\$27.33	\$18.09	\$42.45	Bachelor's	None	None
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	\$15.77	\$10.91	\$23.13	HS or equiv.	None	Short-term OJT
15-1199	Computer Occupations, All Other	\$35.72	\$22.34	\$49.32	Bachelor's	None	None
15-1152	Computer Network Support Specialists	\$29.64	\$18.69	\$45.07	Associate's	None	None
43-9061	Office Clerks, General	\$12.99	\$9.19	\$20.76	HS or equiv.	None	Short-term OJT
43-3031	Bookkeeping, Accounting, & Auditing Clerks	\$17.67	\$11.63	\$25.03	HS or equiv.	None	Mod.-term OJT
43-1011	First-Line Supvsr., Office & Admin. Support	\$23.13	\$15.57	\$36.14	HS or equiv.	< 5 years	None
11-9199	Managers, All Other	\$29.84	\$19.50	\$46.36	HS or equiv.	< 5 years	None
15-1141	Database Administrators	\$33.17	\$18.01	\$54.65	Bachelor's	< 5 years	None
13-1151	Training & Development Specialists	\$25.28	\$15.67	\$41.69	Bachelor's	< 5 years	None

Source: TIP Strategies

FIGURE 78. LABOR CAPACITY SCENARIOS
 HYPOTHETICAL EXPECTED LABOR NEEDS
 FOR A NEW FACILITY

		REGIONAL CAPACITY			I-77 REGIONAL IMPACT			
		2016 EMPLOYMENT			Est. new jobs created	MEDIAN HOURLY WAGES		Typical education required
SOC Code	Primary occupations required	I-77 Region (4 counties)	N. Laborshed (8 counties)	So. Laborshed (10 counties)		I-77 region	Relative to US (US=1.00)	
15-1131	Computer Programmers	1,587	3,808	4,014	78	\$33.14	0.86	Bachelor's
15-1132	Software Developers, Applications	833	7,376	7,228	40	\$39.97	0.84	Bachelor's
15-1133	Software Developers, Systems Software	727	4,475	4,438	37	\$37.57	0.73	Bachelor's
15-1151	Computer User Support Specialists	1,810	6,365	6,710	37	\$22.94	0.96	Some college/no degr.
15-1121	Computer Systems Analysts	1,394	8,634	8,480	29	\$33.69	0.82	Bachelor's
11-3021	Computer & Info. Systems Managers	1,025	4,806	4,808	23	\$52.76	0.83	Bachelor's
13-1161	Market Research Analysts & Mktng. Specialists	1,926	7,318	6,496	17	\$28.21	0.92	Bachelor's
15-1142	Network & Computer Systems Admin.	937	3,432	3,563	15	\$35.96	0.94	Bachelor's
15-1134	Web Developers	322	1,631	1,617	13	\$26.70	0.91	Associate's
43-4051	Customer Service Representatives	8,420	29,305	31,702	13	\$15.61	1.00	HS diploma/GED
41-3099	Sales Reps., Services, All Other	1,333	8,816	8,906	13	\$17.82	0.71	HS diploma/GED
41-4011	Sales Reps., Whls. & Mfg., Tech. & Scientific	646	2,585	2,630	12	\$41.63	1.13	Bachelor's
11-1021	General & Operations Managers	4,669	18,036	18,452	11	\$47.64	0.99	Bachelor's
13-1111	Management Analysts	2,872	9,730	9,697	10	\$31.68	0.84	Bachelor's
15-1122	Information Security Analysts	415	1,880	1,876	9	\$37.53	0.86	Bachelor's
13-2011	Accountants & Auditors	3,673	14,276	14,599	7	\$27.10	0.84	Bachelor's
43-6014	Secy./Admin. Asst., Exc. Legal, Med., & Exec.	8,269	21,729	23,306	7	\$15.78	0.96	HS diploma/GED
15-1199	Computer Occupations, All Other	644	1,249	1,327	6	\$35.86	0.88	Bachelor's
15-1152	Computer Network Support Specialists	390	1,995	1,993	6	\$29.74	0.97	Associate's
43-9061	Office Clerks, General	6,574	23,330	23,820	5	\$13.00	0.89	HS diploma/GED
43-3031	Bookkeeping, Accounting, & Auditing Clerks	3,842	13,110	13,749	4	\$17.59	0.97	Some college/no degr.
43-1011	First-Line Supvsr., Office & Admin. Support	5,527	14,827	16,444	4	\$23.12	0.91	HS diploma/GED
11-9199	Managers, All Other	1,288	5,818	5,637	4	\$30.62	0.88	Bachelor's
15-1141	Database Administrators	298	1,149	1,168	4	\$33.15	0.83	Bachelor's
13-1151	Training & Development Specialists	918	3,520	3,598	4	\$25.30	0.89	Bachelor's

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies

CHEMICALS

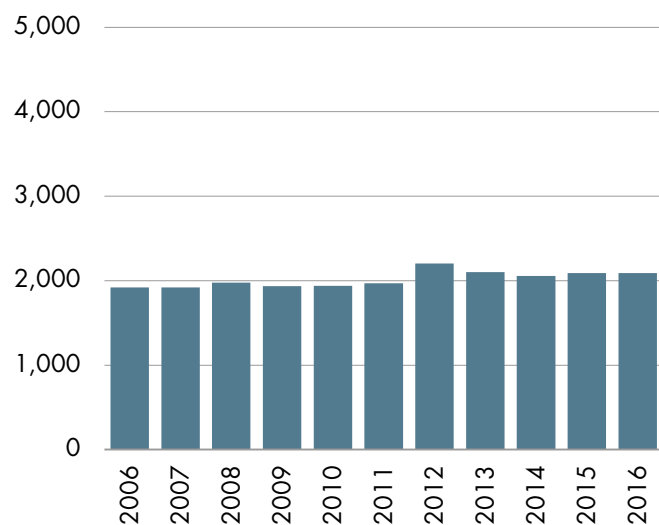
OVERVIEW. The chemicals sector supports pharmaceuticals, automotive, and even food products by producing intermediate goods that are used as inputs, packaging, and/or finishing agents. The sector has been very stable over the last 10 years. Between 2011 and 2016, the sector grew 6 percent. It currently employs about 2,000 workers in the region.

FIGURE 79. INDUSTRY DEFINITION—CHEMICALS

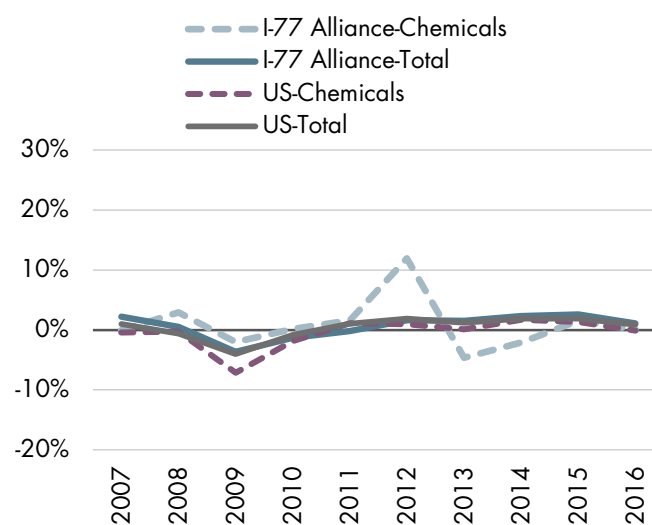
NAICS	DESCRIPTION
32513	Synthetic Dye and Pigment Manufacturing
32518	Other Basic Inorganic Chemical Manufacturing
32519	Other Basic Organic Chemical Manufacturing
32521	Resin and Synthetic Rubber Manufacturing
32522	Artificial and Synthetic Fibers and Filaments Manufacturing
32532	Pesticide and Other Agricultural Chemical Manufacturing
32551	Paint and Coating Manufacturing
32552	Adhesive Manufacturing
32561	Soap and Cleaning Compound Manufacturing
32562	Toilet Preparation Manufacturing

FIGURE 80. EMPLOYMENT TRENDS, 2006-2016

TOTAL EMPLOYMENT IN RELATED OCCUPATIONS



COMPARATIVE GROWTH, 2006-2016



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

CHEMICALS CONT.

KEY OCCUPATIONS. Chemical plant and system operators is the occupation that accounts for the largest share of industry employment. Chemical equipment workers account for the next largest share, and packaging and filling machine workers is the occupation with the third largest share. The occupations with the highest concentration of employment relative to the US are extruding/forming machine worker, chemical plant operator, and production, planning, and expediting clerk. None of the key occupations has a median hourly wage more than 10 percent above the US median.

FIGURE 81. KEY OCCUPATIONS—CHEMICALS
BASED ON STAFFING PATTERNS IN THE I-77 ALLIANCE

SOC Code	Description	Share of Industry Employment	Jobs	LQ (US= 1.00)	Median Hourly Earnings	Relative to US (US=1.00)
51-8091	Chemical Plant & System Operators	9.7%	253	3.15	21.26	0.73 *
51-9011	Chemical Equipment Workers	8.6%	245	1.56	23.77	1.01
51-9111	Packaging & Filling Machine Workers	5.4%	1,177	1.32	13.46	1.01
51-1011	First-Line Supvsr., Production & Operating Workers	4.5%	1,435	1.01	28.68	1.06
51-9023	Mixing & Blending Machine Workers	4.2%	260	0.86	17.22	1.02
19-2031	Chemists	3.2%	233	1.17	31.71	0.91
49-9041	Industrial Machinery Mechanics	3.2%	993	1.28	25.41	1.05
49-9071	Maintenance & Repair Workers, General	3.0%	3,752	1.11	17.42	0.97
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	3.0%	1,637	1.36	17.97	1.01
19-4031	Chemical Technicians	2.3%	120	0.79	20.51	0.94
51-2092	Team Assemblers	2.2%	4,554	1.74	14.61	1.01
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	2.1%	3,397	0.99	29.15	1.10
53-3032	Heavy & Tractor-Trailer Truck Drivers	2.0%	3,188	0.72	19.29	1.00
17-2112	Industrial Engineers	2.0%	769	1.33	39.58	0.97
11-3051	Industrial Production Managers	1.7%	383	0.95	47.59	1.05
51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	1.7%	224	4.82	14.03	0.88
43-5061	Production, Planning, & Expediting Clerks	1.6%	1,350	1.79	23.80	1.07
11-1021	General & Operations Managers	1.6%	4,633	0.90	47.63	0.99
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	1.6%	6,800	1.14	13.37	1.08
43-5071	Shipping, Receiving, & Traffic Clerks	1.5%	1,456	0.92	15.23	1.03
43-4051	Customer Service Representatives	1.1%	8,249	1.34	15.62	1.00
51-9012	Separating, Filtering, & Precipitating Machine	1.1%	80	0.69	15.58	0.82
49-1011	First-Line Supvsr., Mechanics, Install, & Repair	1.0%	1,350	1.27	28.47	0.94
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec	1.0%	8,169	1.30	15.77	0.95
13-1161	Market Research Analysts & Mktng. Specialists	0.9%	1,926	1.51	28.18	0.92

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: LQs greater than 1.25 are highlighted, as are wage rates above the regional average (\$17.57). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (✖)

CHEMICALS CONT.

DEMAND. Laborers/freight movers is the occupation with the highest number of openings expected over the next five years. Customer service representative has the next highest number of openings, annually. The occupations with the largest percent of openings due to new growth are market research analysts, first-line supervisors, and mixing and blending machine workers. In 18 of the occupations, more than 20 percent of the workers are 55 years of age or older.

FIGURE 82. DEMAND FACTORS & DEMOGRAPHICS—CHEMICALS
KEY OCCUPATIONS

SOC Code	Description	2015 Jobs	Annual Openings 2016-21	% of openings due to:		% of the workforce:	
				Net change	Replacement	Age 55+ Yrs.	Age 65+ Yrs.
51-8091	Chemical Plant & System Operators	253	12	7%	93%	23% ◀	—
51-9011	Chemical Equipment Workers	245	12	25%	75%	23% ◀	—
51-9111	Packaging & Filling Machine Workers	1,177	86	39%	61%	18%	3%
51-1011	First-Line Supvrs., Production & Operating Workers	1,435	64	54%	46%	25% ◀	3%
51-9023	Mixing & Blending Machine Workers	260	15	54%	46%	21% ◀	—
19-2031	Chemists	233	10	37%	63%	26% ◀	5% ◀
49-9041	Industrial Machinery Mechanics	993	57	47%	53%	28% ◀	4%
49-9071	Maintenance & Repair Workers, General	3,752	165	33%	67%	29% ◀	6% ◀
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,637	93	44%	56%	26% ◀	5% ◀
19-4031	Chemical Technicians	120	6	31%	69%	28% ◀	—
51-2092	Team Assemblers	4,554	265	49%	51%	18%	3%
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,397	128	37%	63%	26% ◀	6% ◀
53-3032	Heavy & Tractor-Trailer Truck Drivers	3,188	110	42%	58%	28% ◀	7% ◀
17-2112	Industrial Engineers	769	46	40%	60%	26% ◀	4%
11-3051	Industrial Production Managers	383	24	43%	57%	26% ◀	3%
51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	224	7	0%	100%	24% ◀	—
43-5061	Production, Planning, & Expediting Clerks	1,350	58	24%	76%	24% ◀	4%
11-1021	General & Operations Managers	4,633	198	33%	67%	23% ◀	4%
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,800	392	38%	62%	16%	3%
43-5071	Shipping, Receiving, & Traffic Clerks	1,456	63	40%	60%	20%	3%
43-4051	Customer Service Representatives	8,249	304	27%	73%	17%	3%
51-9012	Separating, Filtering, & Precipitating Machine	80	4	30%	70%	16%	—
49-1011	First-Line Supvrs., Mechanics, Install, & Repair	1,350	39	26%	74%	29% ◀	4%
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	8,169	140	28%	72%	32% ◀	7% ◀
13-1161	Market Research Analysts & Mktng. Specialists	1,926	69	58%	42%	15%	3%

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Annual openings are an estimate of job openings due to **net change** in employment and **replacement** needs (e.g., turnover, retirement). ◀ Indicates significant share of workforce is reaching retirement age (defined here as ≥ 25% age 55+ and/or ≥ 5% age 65+).

CHEMICALS CONT.

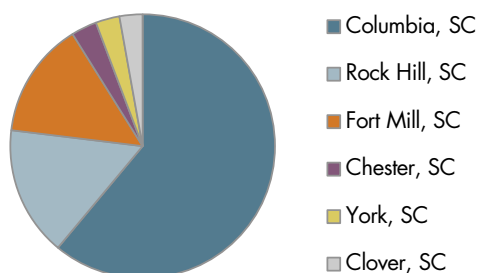
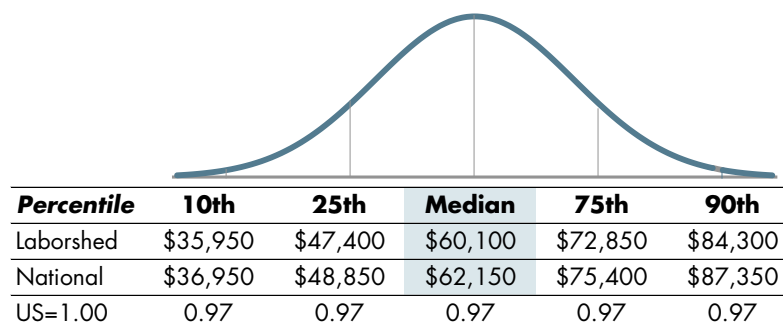
REAL-TIME LABOR MARKET INFORMATION. The information below is derived from a database of more than a million unique postings that are mined and aggregated for valuable, real-time labor insights. The charts and tables below represent the analytics for job postings related to the key occupations that support the chemicals sector.

FIGURE 83. SUMMARY FOR JOB POSTINGS CLASSIFIED AS CHEMICALS OPENINGS

Current job openings	Direct employers competing	Average posting duration (in days)
1,652	563	44

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)

**SALARY RANGE****TOP 10 COUNTS (BASED ON POSTINGS FROM 01-01-2016 TO 06-30-2016)**

Employers	# postings
State of South Carolina	367
FedEx	221
Swift	214
CRST	209
Celadon	175
Sc Department Of Public Safety	115
U.S. Xpress	114
Forward Air, Inc.	114
Blue Cross and Blue Shield Association	110
Lowe's	103

Occupations	# postings
Heavy and Tractor-Trailer Truck Drivers	3,321
Customer Service Representatives	1,234
Maintenance and Repair Workers, General	715
Sales Reps, Whsle. & Mfg., Exc. Tech. & Sci. Prod	709
First-Line Sups. of Mechs., Installers, & Repairers	572
General and Operations Managers	500
First-Line Sups. of Prod. & Operating Workers	489
Industrial Engineers	433
Laborers & Freight, Stock, & Mat. Movers, Hand	420
Sec. & Admin. Assist., Exc. Legal, Med., & Exec	259

Hard skills	# postings
Quality Assurance	522
Preventive maintenance	353
Preventative maintenance inspections	289
Quality control	191
Bilingual	117
Electrical systems	116
Material Handling	109
Technical support	99
Customer relationship management	98
Lean Manufacturing	97

Certifications	# postings
Commercial Driver's License	2,937
Driver's License	902
HAZMAT	739
Certified Purchasing Manager	359
Tanker and Hazmat Endorsement	210
DOT Medical card	195
Class A Commercial Drivers License	194
Occupational Safety & Health Admin. Cert.	188
EPA certification	85
International Federation of Technical Analysts	82

Source: Wanted Analytics; TIP Strategies

CHEMICALS CONT.

EDUCATION & TRAINING. The wage ranges as well as the education and training requirements for each occupation are listed in the figure below.

FIGURE 84. EDUCATION & TRAINING REQUIREMENTS–CHEMICALS
WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

SOC Code	Description	Median Hourly Earnings	Hourly Earnings (percentiles)		Typical req. for entry into occupation		Training required for competency
			10th	90th	Edu.	Exp.	
51-8091	Chemical Plant & System Operators	\$21.26	\$14.86	\$30.21	HS or equiv.	None	Long-term OJT
51-9011	Chemical Equipment Workers	\$23.77	\$15.54	\$34.40	HS or equiv.	None	Mod.-term OJT
51-9111	Packaging & Filling Machine Workers	\$13.46	\$9.39	\$25.44	HS or equiv.	None	Mod.-term OJT
51-1011	First-Line Supvrs., Production & Operating Workers	\$28.68	\$16.06	\$45.67	Non-deg. award	< 5 years	None
51-9023	Mixing & Blending Machine Workers	\$17.22	\$12.62	\$25.48	HS or equiv.	None	Mod.-term OJT
19-2031	Chemists	\$31.71	\$19.68	\$51.26	Bachelor's	None	None
49-9041	Industrial Machinery Mechanics	\$25.41	\$16.57	\$35.94	HS or equiv.	None	Long-term OJT
49-9071	Maintenance & Repair Workers, General	\$17.42	\$11.09	\$27.96	HS or equiv.	None	Long-term OJT
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	\$17.97	\$10.33	\$28.78	HS or equiv.	None	Mod.-term OJT
19-4031	Chemical Technicians	\$20.51	\$13.28	\$31.93	Associate's	None	Mod.-term OJT
51-2092	Team Assemblers	\$14.61	\$9.62	\$24.65	HS or equiv.	None	Mod.-term OJT
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	\$29.15	\$14.77	\$56.23	HS or equiv.	None	Mod.-term OJT
53-3032	Heavy & Tractor-Trailer Truck Drivers	\$19.29	\$13.06	\$28.93	Non-deg. award	None	Short-term OJT
17-2112	Industrial Engineers	\$39.58	\$25.92	\$58.53	Bachelor's	None	None
11-3051	Industrial Production Managers	\$47.59	\$29.99	\$78.40	Bachelor's	5 years +	None
51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	\$14.03	\$11.12	\$26.97	HS or equiv.	None	Mod.-term OJT
43-5061	Production, Planning, & Expediting Clerks	\$23.80	\$14.15	\$34.11	HS or equiv.	None	Mod.-term OJT
11-1021	General & Operations Managers	\$47.63	\$23.80	\$104.00	Bachelor's	< 5 years	None
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	\$13.37	\$9.19	\$21.01	Less than HS	None	Short-term OJT
43-5071	Shipping, Receiving, & Traffic Clerks	\$15.23	\$10.14	\$22.99	HS or equiv.	None	Short-term OJT
43-4051	Customer Service Representatives	\$15.62	\$10.16	\$25.40	HS or equiv.	None	Short-term OJT
51-9012	Separating, Filtering, & Precipitating Machine	\$15.58	\$9.28	\$25.50	HS or equiv.	None	Mod.-term OJT
49-1011	First-Line Supvrs., Mechanics, Install, & Repair	\$28.47	\$17.33	\$46.38	HS or equiv.	< 5 years	None
43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	\$15.77	\$10.91	\$23.13	HS or equiv.	None	Short-term OJT
13-1161	Market Research Analysts & Mktng. Specialists	\$28.18	\$14.62	\$54.73	Bachelor's	None	None

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

FIGURE 85. LABOR CAPACITY SCENARIOS
 HYPOTHETICAL EXPECTED LABOR NEEDS
 FOR A NEW FACILITY

		REGIONAL CAPACITY			I-77 REGIONAL IMPACT			
		2016 EMPLOYMENT			Est. new jobs created	MEDIAN HOURLY WAGES		Typical education required
SOC Code	Primary occupations required	I-77 Region (4 counties)	N. Laborshed (8 counties)	So. Laborshed (10 counties)		I-77 region	Relative to US (US= 1.00)	
51-8091	Chemical Plant & System Operators	261	314	461	48	\$21.26	0.73	HS diploma/GED
51-9011	Chemical Equipment Workers	257	700	784	43	\$23.77	1.01	HS diploma/GED
51-9111	Packaging & Filling Machine Workers	1,206	3,590	3,174	27	\$13.46	1.01	HS diploma/GED
51-1011	First-Line Supvrs., Production & Operating Workers	1,485	4,927	4,989	23	\$28.66	1.06	HS diploma/GED
51-9023	Mixing & Blending Machine Workers	265	1,226	1,112	21	\$17.23	1.02	HS diploma/GED
19-2031	Chemists	240	575	600	16	\$31.45	0.90	Bachelor's
49-9041	Industrial Machinery Mechanics	1,007	2,574	2,932	16	\$25.37	1.05	HS diploma/GED
49-9071	Maintenance & Repair Workers, General	3,763	11,923	12,511	15	\$17.41	0.97	HS diploma/GED
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,676	4,618	4,722	15	\$18.05	1.01	HS diploma/GED
19-4031	Chemical Technicians	122	463	465	12	\$20.48	0.94	Associate's
51-2092	Team Assemblers	4,787	12,133	13,112	11	\$14.61	1.01	HS diploma/GED
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,414	14,929	15,000	11	\$29.17	1.10	HS diploma/GED
53-3032	Heavy & Tractor-Trailer Truck Drivers	3,190	15,930	17,337	10	\$19.04	0.99	Non-degree award
17-2112	Industrial Engineers	805	1,955	2,031	10	\$39.57	0.97	Bachelor's
11-3051	Industrial Production Managers	390	1,255	1,188	8	\$47.58	1.05	Bachelor's
51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	243	681	1,231	8	\$14.03	0.88	HS diploma/GED
43-5061	Production, Planning, & Expediting Clerks	1,382	3,152	3,710	8	\$23.81	1.07	HS diploma/GED
11-1021	General & Operations Managers	4,669	18,036	18,452	8	\$47.64	0.99	Bachelor's
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,946	23,634	27,445	8	\$13.37	1.08	None required
43-5071	Shipping, Receiving, & Traffic Clerks	1,473	6,203	6,130	8	\$15.24	1.03	HS diploma/GED
43-4051	Customer Service Representatives	8,420	29,305	31,702	5	\$15.61	1.00	HS diploma/GED
51-9012	Separating, Filtering, & Precipitating Machine	82	242	246	5	\$15.56	0.82	HS diploma/GED
49-1011	First-Line Supvrs., Mechanics, Install, & Repair	1,359	4,391	4,744	5	\$28.45	0.94	HS diploma/GED
43-6014	Secy./Admin. Asst., Exc. Legal, Med., & Exec.	8,269	21,729	23,306	5	\$15.78	0.96	HS diploma/GED
13-1161	Market Research Analysts & Mktng. Specialists	1,926	7,318	6,496	5	\$28.21	0.92	Bachelor's

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies



FOOD PRODUCTS

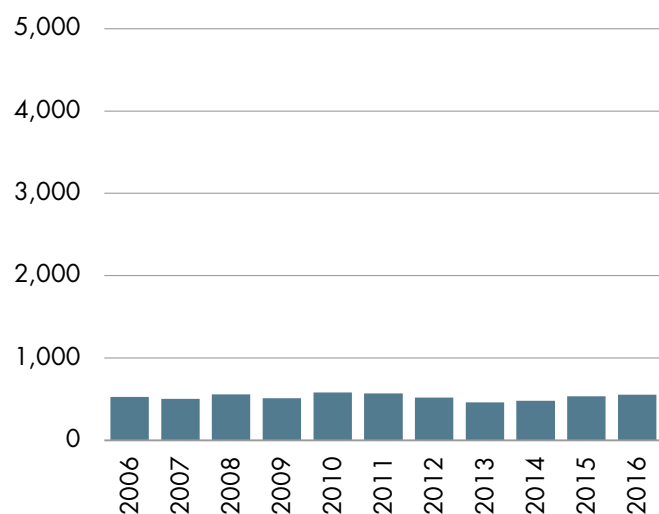
OVERVIEW. The food products sector includes the processing and production of fruits, vegetables, meats, breads, and snacks. The sector has been fairly volatile over the last 10 years. However, the sector is expected to grow by almost 9 percent by 2021. Overall, the food products sector employs about 500 workers in the region.

FIGURE 86. INDUSTRY DEFINITION-FOOD PRODUCTS

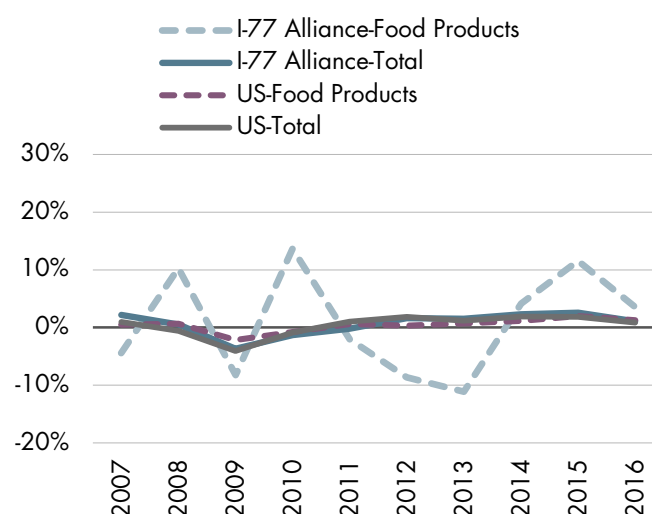
NAICS	DESCRIPTION
31161	Animal Slaughtering and Processing
31182	Cookie, Cracker, and Pasta Manufacturing
31191	Snack Food Manufacturing
31192	Coffee and Tea Manufacturing
31194	Seasoning and Dressing Manufacturing
31199	All Other Food Manufacturing

FIGURE 87. EMPLOYMENT TRENDS, 2006-2016

TOTAL EMPLOYMENT IN RELATED OCCUPATIONS



COMPARATIVE GROWTH, 2006-2016



Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

FOOD PRODUCTS CONT.

KEY OCCUPATIONS. Food batchmakers accounts for the largest share of industry employment. Packaging and filling machine workers accounts for the next largest share, and baker is the occupation with the third largest share. The two occupations with the highest concentration of employment relative to the US are production, planning, and expediting clerks and team assemblers. One of the key occupations has a median hourly wage more than 10 percent above the US median. This occupation is driver/sales workers.

FIGURE 88. KEY OCCUPATIONS–FOOD PRODUCTS
BASED ON STAFFING PATTERNS IN THE I-77 ALLIANCE

SOC Code	Description	Share of Industry Employment	Jobs	LQ (US= 1.00)	Median Hourly Earnings	Relative to US (US=1.00)
51-3092	Food Batchmakers	11.3%	274	0.87	12.96	0.97
51-9111	Packaging & Filling Machine Workers	6.6%	1,177	1.32	13.46	1.01
51-3011	Bakers	4.9%	319	0.72	11.63	0.98
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	4.7%	6,800	1.14	13.37	1.08
53-7064	Packers & Packagers, Hand	4.2%	1,378	0.81	11.36	1.07
51-1011	First-Line Supvsr., Production & Operating Workers	3.9%	1,435	1.01	28.68	1.06
51-9198	Helpers–Production Workers	3.2%	780	0.77	10.79	0.91
51-2092	Team Assemblers	3.0%	4,554	1.74	14.61	1.01
51-3022	Meat, Poultry, & Fish Cutters & Trimmers	2.9%	127	0.34	11.69	1.00
49-9041	Industrial Machinery Mechanics	2.7%	993	1.28	25.41	1.05
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	2.6%	1,637	1.36	17.97	1.01
41-2011	Cashiers	2.3%	8,646	1.06	10.04	1.03
53-3031	Driver/Sales Workers	2.1%	1,149	1.13	13.21	1.15 ●
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	1.8%	3,397	0.99	29.15	1.10
41-2031	Retail Salespersons	1.8%	9,799	0.89	11.20	1.04
49-9071	Maintenance & Repair Workers, General	1.8%	3,752	1.11	17.42	0.97
53-7051	Industrial Truck & Tractor Operators	1.8%	872	0.68	15.50	0.98
37-2011	Janitors & Cleaners, Exc. Maids & Housekeepers	1.7%	6,146	1.04	11.11	0.93
51-3093	Food Cooking Machine Workers	1.6%	30	0.36	13.83	1.01
53-3032	Heavy & Tractor-Trailer Truck Drivers	1.5%	3,188	0.72	19.29	1.00
43-5071	Shipping, Receiving, & Traffic Clerks	1.5%	1,456	0.92	15.23	1.03
11-1021	General & Operations Managers	1.4%	4,633	0.90	47.63	0.99
43-5061	Production, Planning, & Expediting Clerks	1.3%	1,350	1.79	23.80	1.07
51-3023	Slaughterers & Meat Packers	1.3%	14	0.07	11.34	0.89
53-3033	Light Truck or Delivery Services Drivers	1.2%	1,820	0.88	14.88	1.02

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: LQs greater than 1.25 are highlighted, as are wage rates above the regional average (\$17.57). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (✖)

FOOD PRODUCTS CONT.

DEMAND. Cashiers and retail salespersons are the occupations with the highest number of openings expected over the next five years. Laborer/freight movers has the next highest number of openings, annually. In most of the top occupations, more than 50 percent of the demand is replacement. In 12 of the occupations, more than 20 percent of the workers are 55 years of age or older.

FIGURE 89. DEMAND FACTORS & DEMOGRAPHICS—FOOD PRODUCTS
KEY OCCUPATIONS

SOC Code	Description	2015 Jobs	Annual Openings 2016-21	% of openings due to:		% of the workforce:	
				Net change	Replacement	Age 55+ Yrs.	Age 65+ Yrs.
51-3092	Food Batchmakers	274	13	43%	57%	12%	—
51-9111	Packaging & Filling Machine Workers	1,177	86	39%	61%	18%	3%
51-3011	Bakers	319	15	45%	55%	17%	3%
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,800	392	38%	62%	16%	3%
53-7064	Packers & Packagers, Hand	1,378	80	45%	55%	17%	4%
51-1011	First-Line Supvsr., Production & Operating Workers	1,435	64	54%	46%	25% ◀	3%
51-9198	Helpers—Production Workers	780	47	38%	62%	16%	3%
51-2092	Team Assemblers	4,554	265	49%	51%	18%	3%
51-3022	Meat, Poultry, & Fish Cutters & Trimmers	127	4	30%	70%	15%	—
49-9041	Industrial Machinery Mechanics	993	57	47%	53%	28% ◀	4%
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,637	93	44%	56%	26% ◀	5% ◀
41-2011	Cashiers	8,646	419	7%	93%	13%	4%
53-3031	Driver/Sales Workers	1,149	31	30%	70%	20% ◀	6% ◀
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,397	128	37%	63%	26% ◀	6% ◀
41-2031	Retail Salespersons	9,799	419	10%	90%	21% ◀	7% ◀
49-9071	Maintenance & Repair Workers, General	3,752	165	33%	67%	29% ◀	6% ◀
53-7051	Industrial Truck & Tractor Operators	872	55	50%	50%	16%	2%
37-2011	Janitors & Cleaners, Exc. Maids & Housekeepers	6,146	157	13%	87%	31% ◀	9% ◀
51-3093	Food Cooking Machine Workers	30	—	n/a	n/a	n/a	—
53-3032	Heavy & Tractor-Trailer Truck Drivers	3,188	110	42%	58%	28% ◀	7% ◀
43-5071	Shipping, Receiving, & Traffic Clerks	1,456	63	40%	60%	20%	3%
11-1021	General & Operations Managers	4,633	198	33%	67%	23% ◀	4%
43-5061	Production, Planning, & Expediting Clerks	1,350	58	24%	76%	24% ◀	4%
51-3023	Slaughterers & Meat Packers	14	—	n/a	n/a	n/a	—
53-3033	Light Truck or Delivery Services Drivers	1,820	68	45%	55%	27% ◀	9% ◀

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

Notes: Annual openings are an estimate of job openings due to **net change** in employment and **replacement** needs (e.g., turnover, retirement). ◀

Indicates significant share of workforce is reaching retirement age (defined here as ≥ 25% age 55+ and/or ≥ 5% age 65+).

FOOD PRODUCTS CONT.

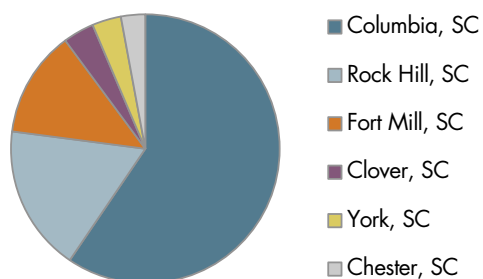
REAL-TIME LABOR MARKET INFORMATION. The information below is derived from a database of more than a million unique postings that are mined and aggregated for valuable, real-time labor insights. The charts and tables below represent the analytics for job postings related to the key occupations that support the food products sector.

FIGURE 90. SUMMARY FOR JOB POSTINGS CLASSIFIED AS FOOD PRODUCTS OPENINGS

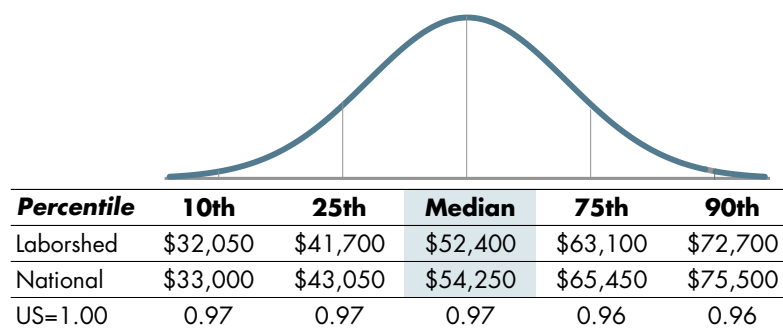
Current job openings	Direct employers competing	Average posting duration (in days)
1,942	595	47

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)



SALARY RANGE



TOP 10 COUNTS (BASED ON POSTINGS FROM 01-01-2016 TO 06-30-2016)

Employers	# postings	Occupations	# postings
Lowe's	426	Heavy & Tractor-Trailer Truck Drivers	3,321
Swift	216	Retail Salespersons	1,656
FedEx	214	Maintenance & Repair Workers, General	715
CRST	209	Sales Reps, Whsle. & Mfg., Exc. Tech. & Sci. Prod.	709
Food Lion	203	Cashiers	532
Celadon	175	General & Operations Managers	500
State of South Carolina	135	First-Line Sups. of Prod. & Operating Workers	489
Hannaford Brothers	121	Laborers & Freight, Stock, & Mat. Movers, Hand	420
U.S. Xpress	118	Light Truck or Delivery Services Drivers	306
Forward Air, Inc.	117	Janitors & Cleaners, Exc. Maids & Hskp. Cleaners	244
Hard skills	# postings	Certifications	# postings
Computer based training	377	Commercial Driver's License	3,034
Quality Assurance	375	Driver's License	1,079
Preventative maintenance inspections	197	HAZMAT	814
Preventive maintenance	191	Certified Purchasing Manager	359
Material Handling	139	DOT Medical card	234
Quality control	133	Tanker & Hazmat Endorsement	227
Bilingual	123	Class A Commercial Drivers License	198
Customer relationship management	85	Occupational Safety & Health Admin. Cert.	183
Work order	81	Material Handling Equipment	83
Electrical systems	72	Forklift certification	68

Source: Wanted Analytics; TIP Strategies

FOOD PRODUCTS CONT.

EDUCATION & TRAINING. The wage ranges as well as the education and training requirements for each occupation are listed in the figure below.

FIGURE 91. EDUCATION & TRAINING REQUIREMENTS-FOOD PRODUCTS
WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

SOC Code	Description	Median Hourly Earnings	Hourly Earnings (percentiles)		Typical req. for entry into occupation		Training required for competency
			10th	90th	Edu.	Exp.	
51-3092	Food Batchmakers	\$12.96	\$9.48	\$17.36	HS or equiv.	None	Mod.-term OJT
51-9111	Packaging & Filling Machine Workers	\$13.46	\$9.39	\$25.44	HS or equiv.	None	Mod.-term OJT
51-3011	Bakers	\$11.63	\$9.20	\$16.26	Less than HS	None	Long-term OJT
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	\$13.37	\$9.19	\$21.01	Less than HS	None	Short-term OJT
53-7064	Packers & Packagers, Hand	\$11.36	\$9.03	\$17.57	Less than HS	None	Short-term OJT
51-1011	First-Line Supvrs., Production & Operating Workers	\$28.68	\$16.06	\$45.67	Non-deg. award	< 5 years	None
51-9198	Helpers-Production Workers	\$10.79	\$9.00	\$17.06	Less than HS	None	Short-term OJT
51-2092	Team Assemblers	\$14.61	\$9.62	\$24.65	HS or equiv.	None	Mod.-term OJT
51-3022	Meat, Poultry, & Fish Cutters & Trimmers	\$11.69	\$9.34	\$14.81	Less than HS	None	Short-term OJT
49-9041	Industrial Machinery Mechanics	\$25.41	\$16.57	\$35.94	HS or equiv.	None	Long-term OJT
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	\$17.97	\$10.33	\$28.78	HS or equiv.	None	Mod.-term OJT
41-2011	Cashiers	\$10.04	\$9.00	\$12.60	Less than HS	None	Short-term OJT
53-3031	Driver/Sales Workers	\$13.21	\$9.01	\$25.81	HS or equiv.	None	Short-term OJT
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	\$29.15	\$14.77	\$56.23	HS or equiv.	None	Mod.-term OJT
41-2031	Retail Salespersons	\$11.20	\$9.07	\$19.61	Less than HS	None	Short-term OJT
49-9071	Maintenance & Repair Workers, General	\$17.42	\$11.09	\$27.96	HS or equiv.	None	Long-term OJT
53-7051	Industrial Truck & Tractor Operators	\$15.50	\$10.97	\$25.50	Less than HS	None	Short-term OJT
37-2011	Janitors & Cleaners, Exc. Maids & Housekeepers	\$11.11	\$9.08	\$15.50	Less than HS	None	Short-term OJT
51-3093	Food Cooking Machine Workers	\$13.83	\$10.12	\$22.53	HS or equiv.	None	Mod.-term OJT
53-3032	Heavy & Tractor-Trailer Truck Drivers	\$19.29	\$13.06	\$28.93	Non-deg. award	None	Short-term OJT
43-5071	Shipping, Receiving, & Traffic Clerks	\$15.23	\$10.14	\$22.99	HS or equiv.	None	Short-term OJT
11-1021	General & Operations Managers	\$47.63	\$23.80	\$104.00	Bachelor's	< 5 years	None
43-5061	Production, Planning, & Expediting Clerks	\$23.80	\$14.15	\$34.11	HS or equiv.	None	Mod.-term OJT
51-3023	Slaughterers & Meat Packers	\$11.34	\$9.45	\$14.87	Less than HS	None	Short-term OJT
53-3033	Light Truck or Delivery Services Drivers	\$14.88	\$9.10	\$28.13	HS or equiv.	None	Short-term OJT

Source: EMSI 2017.1 – QCEW Employees, Non-QCEW Employees, and Self-Employed

FIGURE 92. LABOR CAPACITY SCENARIOS
 HYPOTHETICAL EXPECTED LABOR NEEDS
 FOR A NEW FACILITY

		REGIONAL CAPACITY			I-77 REGIONAL IMPACT			
		2016 EMPLOYMENT			Est. new jobs created	MEDIAN HOURLY WAGES		Typical education required
SOC Code	Primary occupations required	I-77 Region (4 counties)	N. Laborshed (8 counties)	So. Laborshed (10 counties)		I-77 region	Relative to US (US= 1.00)	
51-3092	Food Batchmakers	275	389	733	56	\$12.96	0.97	HS diploma/GED
51-9111	Packaging & Filling Machine Workers	1,206	3,590	3,174	33	\$13.46	1.01	HS diploma/GED
51-3011	Bakers	317	1,091	1,126	25	\$11.59	0.98	None required
53-7062	Laborers/Freight, Stock, & Material Movers, Hand	6,946	23,634	27,445	23	\$13.37	1.08	None required
53-7064	Packers & Packagers, Hand	1,395	5,612	5,523	21	\$11.38	1.07	None required
51-1011	First-Line Supvrs., Production & Operating Workers	1,485	4,927	4,989	20	\$28.66	1.06	HS diploma/GED
51-9198	Helpers-Production Workers	808	3,938	3,632	16	\$10.79	0.91	None required
51-2092	Team Assemblers	4,787	12,133	13,112	15	\$14.61	1.01	HS diploma/GED
51-3022	Meat, Poultry, & Fish Cutters & Trimmers	125	694	872	15	\$11.71	1.00	None required
49-9041	Industrial Machinery Mechanics	1,007	2,574	2,932	13	\$25.37	1.05	HS diploma/GED
51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,676	4,618	4,722	13	\$18.05	1.01	HS diploma/GED
41-2011	Cashiers	8,622	26,343	29,174	11	\$10.03	1.03	None required
53-3031	Driver/Sales Workers	1,139	3,566	3,960	10	\$13.21	1.15	HS diploma/GED
41-4012	Sales Reps., Whls. & Mfg., Exc. Tech. & Scientific	3,414	14,929	15,000	9	\$29.17	1.10	HS diploma/GED
41-2031	Retail Salespersons	9,726	37,871	40,028	9	\$11.17	1.03	None required
49-9071	Maintenance & Repair Workers, General	3,763	11,923	12,511	9	\$17.41	0.97	HS diploma/GED
53-7051	Industrial Truck & Tractor Operators	879	4,870	4,931	9	\$15.50	0.98	None required
37-2011	Janitors & Cleaners, Exc. Maids & Housekeepers	6,204	18,367	19,117	8	\$11.02	0.92	None required
51-3093	Food Cooking Machine Workers	30	275	203	8	\$13.82	1.01	HS diploma/GED
53-3032	Heavy & Tractor-Trailer Truck Drivers	3,190	15,930	17,337	8	\$19.04	0.99	Non-degree award
43-5071	Shipping, Receiving, & Traffic Clerks	1,473	6,203	6,130	7	\$15.24	1.03	HS diploma/GED
11-1021	General & Operations Managers	4,669	18,036	18,452	7	\$47.64	0.99	Bachelor's
43-5061	Production, Planning, & Expediting Clerks	1,382	3,152	3,710	7	\$23.81	1.07	HS diploma/GED
51-3023	Slaughterers & Meat Packers	13	413	302	7	\$11.38	0.90	None required
53-3033	Light Truck or Delivery Services Drivers	1,811	7,046	8,171	6	\$14.85	1.02	HS diploma/GED

Source: 2016.4 – QCEW Employees, Non-QCEW Employees, and Self-Employed; TIP Strategies

APPENDIX: DATA & METHODOLOGY

CLASSIFICATION SYSTEMS

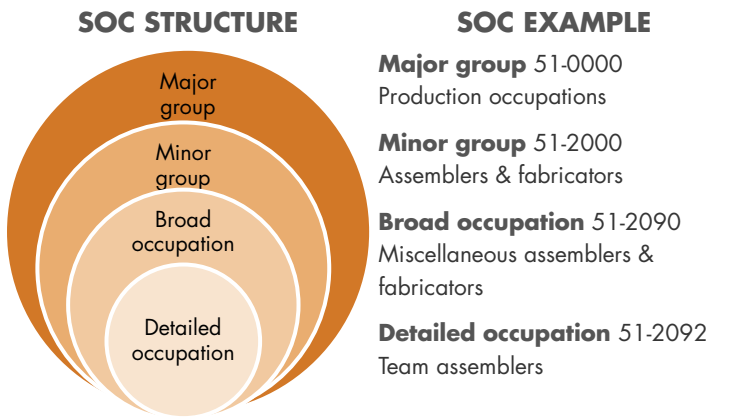
Much of the analysis presented in this report relies on three separate classification systems. A brief overview of each is presented below.

The **Standard Occupational Classification (SOC)** system is used by federal statistical agencies to classify workers into categories for the purpose of collecting, calculating, or disseminating data. This system groups all occupations in which work is performed for pay or profit according to the type of work performed and, in some cases, on the skills, education, or training needed to perform the work at a competent level. Under the 2010 SOC system, workers are classified into one of 840 detailed occupations, which are combined to form 461 broad occupations, 97 minor groups, and 23 major groups.

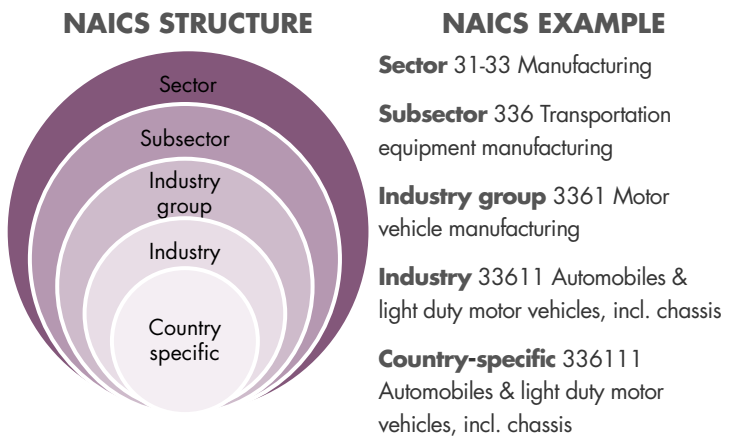
The **North American Industry Classification System** (NAICS, pronounced *Nakes*) was developed under the direction and guidance of the Office of Management and Budget (OMB) as the standard for use by Federal statistical agencies in classifying business establishments for the collection, tabulation, presentation, and analysis of statistical data describing the US economy. The classification system was developed jointly with government agencies in Canada and Mexico to allow for a high level of comparability in business statistics among the North American countries.

The version of NAICS currently in wide use was released in 2007 and classifies industries into 20 sectors based on production processes. These sectors are broken into subsectors, industry groups, and individual industries. An additional level of detail is provided to accommodate industry codes specific to the three countries. The classification system is updated every five years. The 2012 NAICS structure was finalized in August 2011. Federal statistical agencies were directed to begin using the new system for data published for reference years beginning on or after January 1, 2012.

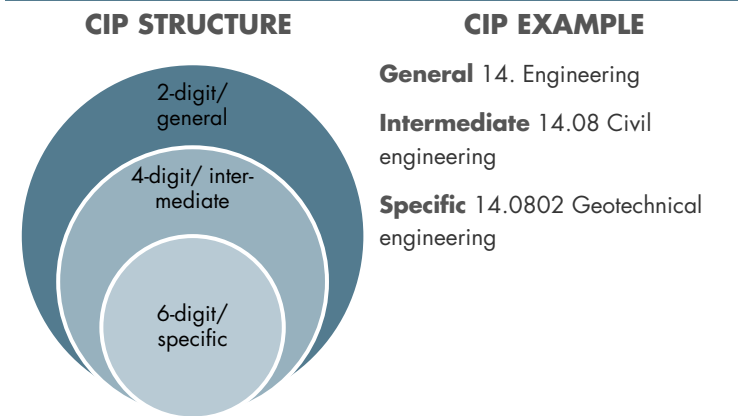
STANDARD OCCUPATIONAL CLASSIFICATION SYSTEM



NORTH AMERICAN INDUSTRIAL CLASS. SYSTEM



CLASSIFICATION OF INSTRUCTIONAL PROGRAMS



Source: US Bureau of Labor Statistics (SOC); US Census Bureau (NAICS); National Center for Education Statistics; TIP Strategies

The **Classification of Instructional Programs (CIP)** is the accepted federal government statistical standard on instructional program classifications. Developed in 1980 by the National Center for Education Statistics, the CIP is used by state agencies, national associations, academic institutions, and employment counseling services for collecting, reporting, and analyzing instructional program data.

The CIP titles and program descriptions are intended to be generic categories into which program completions data can be placed, and are not exact duplicates of specific major or field of study titles used by individual institutions. The vast majority of CIP titles correspond to academic and occupational instructional programs offered for credit at the postsecondary level. These programs result in recognized completion points and awards, including degrees, certificates, and other formal awards. The CIP also includes other types of instructional programs, such as residency programs in various dental, medical, podiatric, and veterinary specialties that may lead to advanced professional certification, personal improvement and leisure programs, and instructional programs that lead to diplomas and certificates at the secondary level only.

DATA SOURCES

EMPLOYMENT

The industry and occupational data presented in this report were prepared using EMSI's Complete Employment series. EMSI gathers and integrates economic, labor market, demo-graphic, and education data from over 90 government and private sector sources, creating a comprehensive and current database that includes both published data and detailed estimates with full coverage of the United States.

The company's core data consists of jobs (historical and projected) and earnings (current year) by industry and occupation for every ZIP code and county in the United States. EMSI data are annual averages of jobs (not workers); full- and part-time jobs are counted equally.

PRIMARY INDUSTRY/OCCUPATION DATA SOURCES MAJOR SOURCES USED FOR EMSI's 2013.2 DATA RELEASE

DATA SOURCE	ABBREV.	AGENCY	VERSION USED*
State Personal Income	SPI	BEA	2011
Local Area Personal Income	LPI	BEA	2010
Industry Economic Accounts	IEA	BEA	2002-2011
American Community Survey	ACS	Census	2005-2011
County Business Patterns	CBP	Census	2010
ZIP Code Business Patterns	ZBP	Census	2010
Nonemployer Statistics	NES	Census	2010
Quarterly Census of Employment and Wages	QCEW	BLS	2012 Q3
Current Employment Statistics	CES	BLS	Feb. 2013
Natl. Employment Projections (Industry Occupation Matrix)	EP	BLS	2010-2020
Occupational Employment Statistics	OES	BLS	2011
Railroad Retirement Board Tables, State/County	RRB	RRB	2012/2011
Equifax Business Data		Equifax	2013 Q1
Long-term state industry projections		Individual states	varies
LEHD/Quarterly Workforce Indicators	QWI	Census	varies

Source: EMSI data release notes * Indicates release date, not data reference period

EMSI produces industry and occupation datasets with two different types of coverage. Coverage refers to the types of jobs counted.

EMSI Covered: This dataset primarily counts "payroll" jobs that are covered by unemployment insurance (UI); the primary source is the Quarterly Census of Employment and Wages (QCEW). However, EMSI also includes some jobs excluded from QCEW, such as railroad jobs (which have their own UI program), all wage and salary agriculture jobs, and military. These additional categories are based on figures from State and Local Area Personal Income (S/LPI)

reports produced by the Commerce Department’s Bureau of Economic Analysis (BEA), and state and county railroad retirement boards (RRBs). Data from the Census-produced County Business Patterns (CBP) are also used.

EMSI Complete: This dataset includes all jobs in EMSI Covered, plus additional types of noncovered jobs, such as the self-employed (proprietors), commissions-only salespeople, and various types of non-UI-covered wage and salary workers. Major sources of self-employment data include Nonemployer Statistics (NES), the American Community Survey (ACS), and the S/LPI.

The relationship between EMSI Covered Employment and EMSI Complete Employment is diagrammed in the table above.

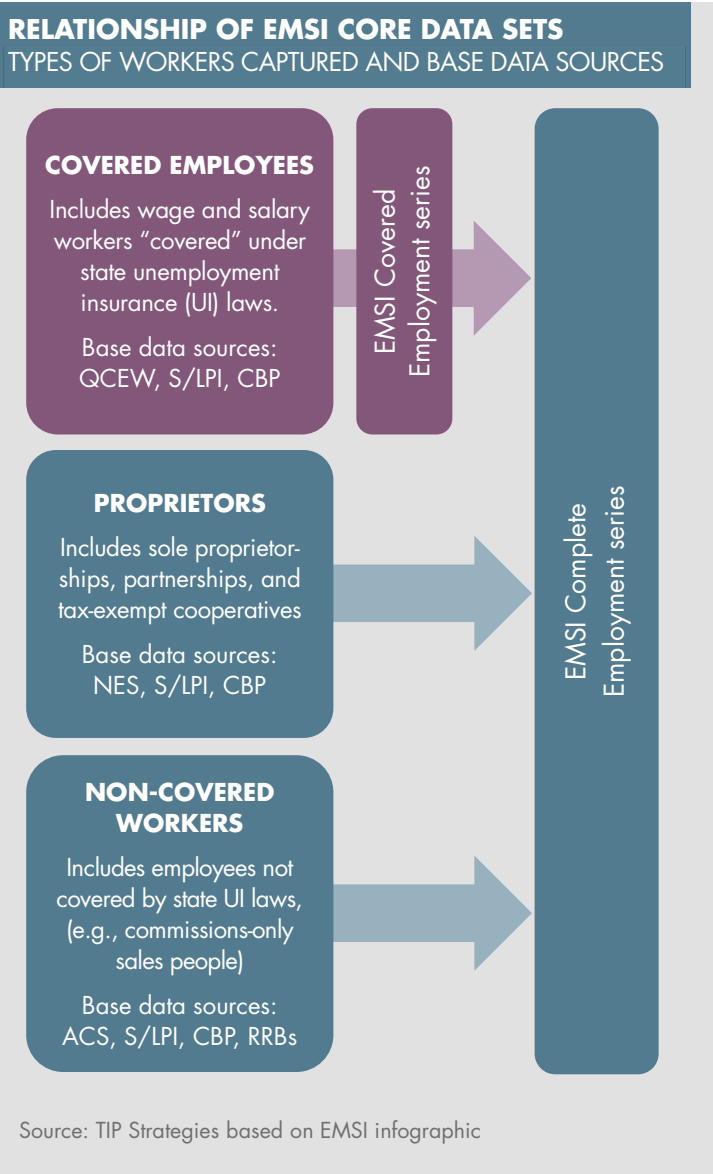
For each data set, EMSI creates long-term, 10-year industry projections starting from the current year. These projections are based on a combination of the following:

- Recent trends in all industries for every local geography,
- National industry projections produced by the US Bureau of Labor Statistics (BLS),
- State and sub-state regional projections produced by individual states.

The company’s methodology is designed to capture the expertise embodied in federal and state agencies. However, since official projections produced through the state-federal partnership typically have a base year that lags two to three years behind the current year, EMSI projections are also informed by the most recent data and trends available.

The first step in the process is to track recent local trends using a linear regression function. Taking into account the previous base data from 15, 10, and 5 years prior to the base year, EMSI’s analysts plot a line as a function of year and employment. This line is dampened (flattened) to smooth out the effects of any volatility. Once this is done, state and local government industries (as well as the US Postal Service) are projected based on the growth or decline of local economies rather than projected through linear regression. Federal government and military, however, are projected through linear regression at the national level and their growth rate is then applied to the states and counties. Next, EMSI adjusts the projections for all counties so they sum to state- and national-level numbers.

After these initial projections are completed, EMSI’s analysts begin a series of controls and adjustments to other data sources. The first of these is an adjustment to the BLS staffing patterns. Essentially the company’s projected national



growth rate is changed to match the growth rate of the BLS numbers. This adjusts the curve up or down while staying as close to our projected values as possible. Following this, county and state-level projections are adjusted to the state-produced state and sub-state regional projections. County values are controlled to the regional data and state projections are controlled to the reported state data. Once these adjustments and controls are completed, the final state-level numbers are aggregated to determine the final national projections. This causes EMSI data to match state projections very closely, but it also means EMSI projections can stray from the national projections.

The company has incorporated workforce demographics in the latest release of its analytical tools. This data is drawn from the relatively new Local Employment Household Dynamics series produced through a partnership of several federal agencies led by the US Census Bureau. One of its primary data sources, Quarterly Workforce Indicators, provides the basis for EMSI's estimates of occupations by age and gender.

REAL-TIME LABOR MARKET INFORMATION/JOB POSTING ANALYTICS

Data on real-time job postings used in this report was prepared by Wanted Technologies (Wanted). Since 2002, Wanted has maintained detailed data on online hiring demand. Wanted is the exclusive data provider for The Conference Board's Help-Wanted Online Data Series™, the monthly economic indicator of hiring demand in the United States. The company's database of more than one million unique job listings is accessible via Wanted Analytics, an online subscription service.

According to the company's website, more than 80 percent of job postings in their database have cities associated with them. This information is then used to filter postings within recognized geographies, including county, metropolitan statistical area, and state.

Industries are assigned based on the employer's name, which is matched to Dun & Bradstreet to obtain the associated NAICS code. As a result, only postings that include the employer's name are represented in the counts by NAICS code. The rest are listed as unclassified or unknown. The company estimates that 60 percent of postings in the Wanted Analytics database have been matched to a NAICS code.

EDUCATION & TRAINING

Under the Higher Education Act of 1965, every college, university, and vocational or technical institution that participates in federal financial student aid programs, such as Pell grants or federally backed student loans, is required to report annually to the US Department of Education (DOE) on a range of indicators. Data are collected through a system of interrelated surveys and are made available through the Integrated Postsecondary Education Data System (IPEDS).

Each fall, institutions report on the number of awards conferred for credit by field of study, by award level, and by the gender and race or ethnicity of the recipient. These data are referred to as "completions." Data on completions for the three most recent academic years available (2012-2013, 2013-2014, and 2014-2015) were downloaded from the IPEDS Data Center for all schools in the region that participate in IPEDS surveys, except for schools in which training was limited to cosmetology.

To help understand how education and training programs in the region align with the key occupations, we also compiled for-credit completions from the IPEDS analysis for key occupations in the talent clusters profiled in this report. This analysis was accomplished using a crosswalk that aligns occupational classifications (SOC codes) with subject matter areas (CIP codes). Specifically, we used a crosswalk created by the National Center for Education Statistics in cooperation with the US Bureau of Labor Statistics (available from the National Crosswalk Service Center).