APRIL 2015

REGIONAL WORKFORCE STUDY

PREPARED FOR THE SRS COMMUNITY REUSE ORGANIZATION

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INTRODUCTION

Over the next five years, the region is projected to have more than 37,000 job openings. Filling those openings will require the regional talent pipeline to be well aligned with high-demand jobs and will require the recruitment of key talent from outside the region. In an effort to position the region to do this, the Savannah River Site Community Reuse Organization (SRSCRO) assembled an internal task force to look at strategies the region could implement. The intent of the project was to support the region's economic growth and competitiveness. It was also to provide valuable tools for regional educational institutions and economic developers to use in their work aligning industry and education, attracting talent, and recruiting businesses to the region.

APPROACH

The SRSCRO hired TIP Strategies, an economic and workforce development strategy consultancy, to assist in conducting a detailed labor study and developing a regional workforce strategy with deep dives into four of the region's key economic drivers—nuclear, manufacturing, cybersecurity/IT, and healthcare.

Over the course of the last six months, we have visited with stakeholders in each of the five counties that compose the Community Reuse Organization (CRO) Region—Aiken, Allendale, Barnwell, Columbia, and Richmond. We have gathered input through one-on-one interviews, employer and educator roundtable discussions, and an employer survey. We have conducted a comprehensive analysis of the region's labor force, factors driving demand, and an examination of the alignment between educational output and industry requirements. For each of the four industries, we have developed detailed profiles that include staffing patterns, regional labor supply, job posting analytics, relevant educational output, and regional resources.

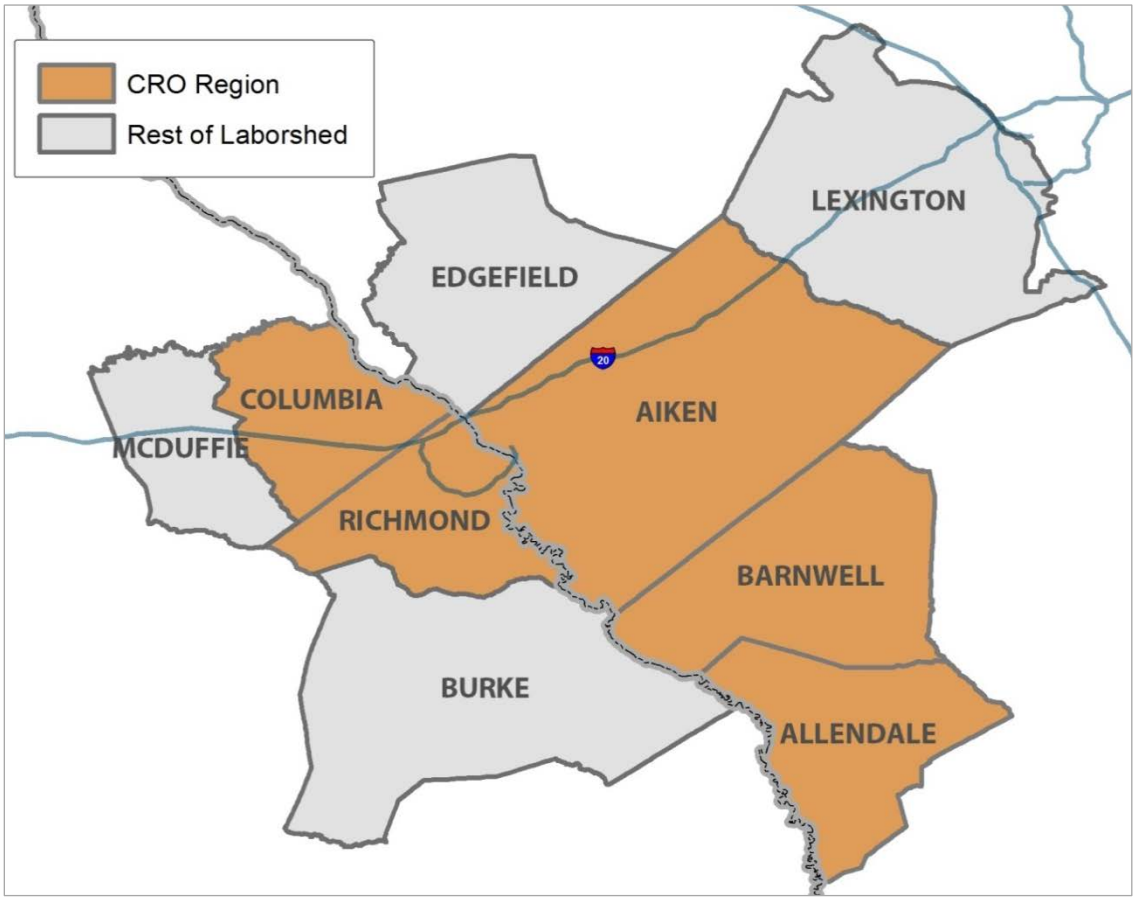
KEY FINDINGS

The laborshed of the CRO Region includes the surrounding counties of Lexington, Edgefield, Burke, and McDuffie. These counties each contribute at least 1 percent of the individuals who work in the CRO Region. The entire nine-county laborshed has a civilian labor force of just over 400,000.

The labor force within the CRO Region is highly mobile with strong commuter connections across county boundaries. Though about 70 percent of residents work in the county in which they live, almost 50,000 residents work in a different county. The cities of Augusta, Aiken, Martinez, Evans, and North Augusta are the largest centers of employment in the region.

Workforce characteristics vary widely across the region with pronounced differences between the urban/suburban and rural counties. In the more urban and suburban counties, educational attainment is more in line with the national average, with Columbia and Lexington counties having the highest percentage of residents who have earned a bachelor's degree or higher. The more rural counties, including Allendale, Barnwell, McDuffie, and Burke, have populations with much lower educational attainment—more than half of their residents over 25 have a high school degree or less. Labor force participation rates also follow a similar pattern with much higher participation rates in urban and suburban counties and lower participation rates in rural counties.

FIGURE 1. LABORSHED AND COMMUTER INFLOW/OUTFLOW



51,032
Commute to jobs in CRO Region from outside

124,544
Live and work in CRO Region

49,345
Live in CRO Region and commute to jobs outside

*The CRO Region is a net importer of labor, drawing in **1,687 more workers** in 2011 than it exported to surrounding areas.*

Of the 175,576 workers that held jobs in the CRO Region in 2011, just over 51,000 (29 percent) lived outside the 5-county area.

Of the 173,889 CRO Region residents employed in 2011, almost 50,000 (28 percent) commuted to jobs outside the 5-county region.

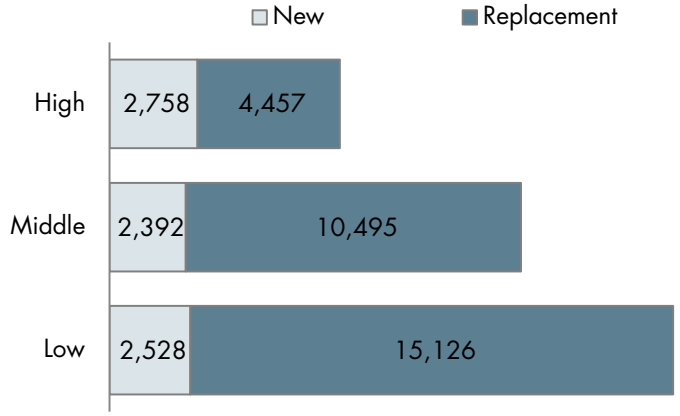
Source: US Bureau of Labor Statistics, Local Area Unemployment Statistics (state and county labor market data); US Census Bureau, Current Population Survey (national labor market data).
Note: Overlay arrows are for illustrative purposes and do not indicate directionality of worker flow between home and employment locations.

The CRO Region is expected to average about 7,500 job openings annually between 2014 and 2019. These openings include both new jobs and replacement jobs. About 18 percent of these openings are in occupations considered to be high-skill, while one-third is in middle-skill occupations. The high- and middle-skill occupations with the most annual openings in the CRO Region are registered nurses, accountants, nursing assistants, teacher assistants, elementary school teachers, general and operations managers, civil engineers, supervisors, and maintenance and repair workers. Many critical occupations are shared across industries. In particular, there is a high degree of overlap between the nuclear and manufacturing industries. Information technology and cybersecurity also cut across the nuclear, healthcare, and manufacturing sectors. Many of the occupations that were reported hardest-to-fill are positions that have been facing a difficult staffing environment for many years.

Post-secondary education institutions in the nine-county laborshed produce just over 7,000 graduates on average. The most popular fields of study among graduates of the regional postsecondary institutions are registered nursing, liberal arts, business administration, medical prep programs, and auto mechanics technology.

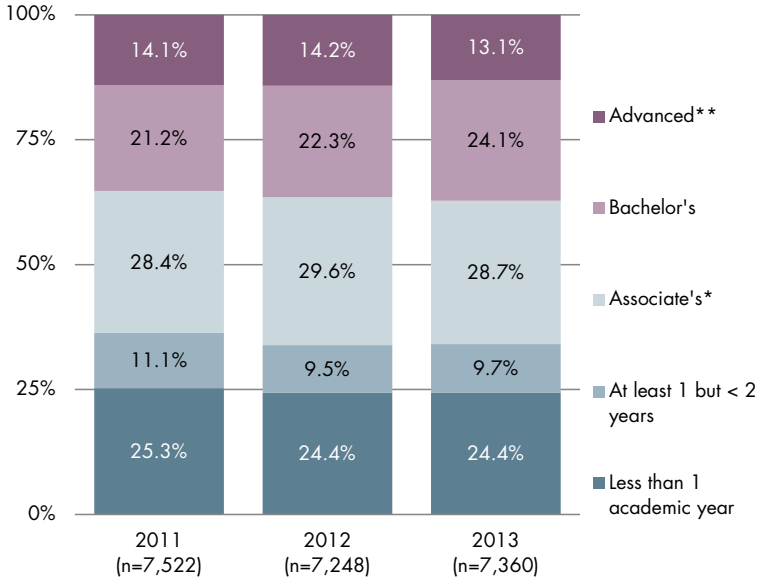
FIGURE 2. OCCUPATIONAL GROWTH BY SKILL-LEVEL

OPENINGS, 2014-19



Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.

FIGURE 3. COMPLETIONS BY YEAR, INSTITUTION, AND AWARD LEVEL



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. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level.

The region's K-12 institutions all have programs to support career clusters and do offer some vocational training. However, a regional inventory of programs does not exist. Therefore, it is difficult to draw conclusions about how well the programs are aligned with the region's industry needs.

Employers rate the overall regional workforce as good or excellent. Respondents to the employer survey reported the regional workforce was particularly strong in terms of their teamwork skills, attitude, trainability,

productivity, and reliability. The regional workforce's entry-level skills, computer skills, and math skills were rated the areas that most need improvement.

Some employers report that finding enough competent, reliable workers with adequate basic skills is difficult. Employers report that workers with strong soft skills and basic hard skills that can pass a background check and drug test are difficult to find. While this is a national issue, local approaches to address the challenge are needed. The WorkKeys assessment is available on both the Georgia and South Carolina sides and could be a valuable tool in improving the regional workforce's basic skills and employability.

Additionally, the regional nuclear and manufacturing industries have difficulty attracting young people. A number of different programs in the region have been initiated to raise awareness of career opportunities in the nuclear and manufacturing sectors.

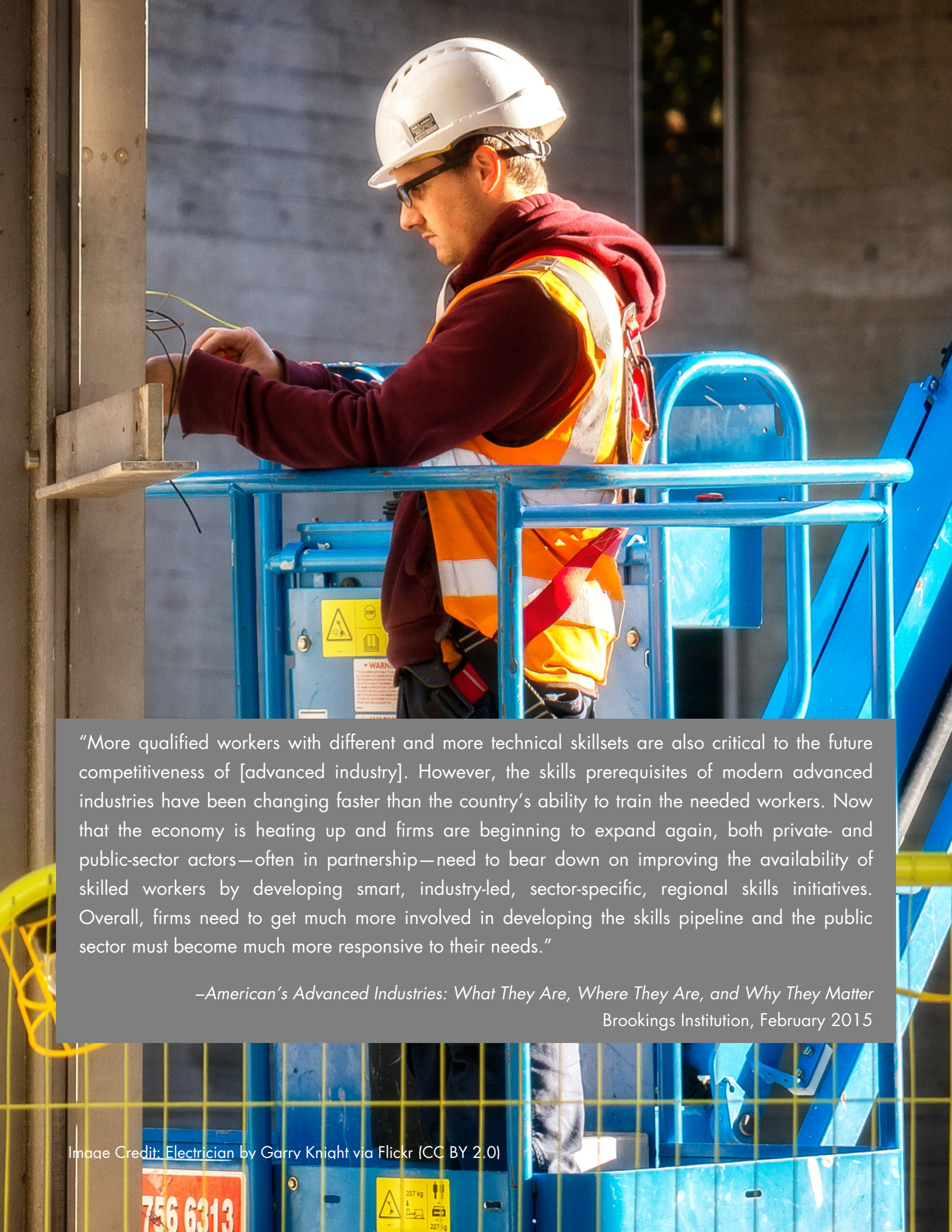
An aging workforce exacerbates the workforce challenges of regional employers. A number of key occupations are filled by a group of workers in which more than 25 percent are 55 years of age or older. Employers report that many of the workers that fill key occupations are already 65 years old and are currently eligible for retirement. These occupations include mechanical, electrical, and nuclear engineers as well as maintenance and repair workers, truck drivers, and technical occupations such as industrial machinery mechanics and hazardous materials removal workers. Many employers report that they are worried about the loss of this institutional knowledge and that they struggle to find solutions to prepare for the potential loss of this expertise.

Employers report that recruiting talent from other areas of the country is sometimes difficult. For some of the higher-skill positions, regional HR managers report difficulty attracting talent—in some cases young talent and in other cases talent from urban areas.

Education and training providers report that they need better information about employers' needs to ensure their programs are well-aligned with the region's key industry sectors. Education and training providers report that there are gaps in knowledge across the region regarding what employers require and what kind of programs are needed. Educational institutions must have validated data about job demand to create new programs, but a mechanism for collecting this data does not currently exist. In addition, maintaining connections with employers is difficult, given that the rotation of plant managers and other management positions commonly occurs every 2 or 3 years.

THE RESPONSE

Addressing these challenges will require a collaborative, regional effort. It will also require a great deal of coordination to ensure that information is shared and connections are made consistently across the region. The result of these efforts should yield a more demand-driven workforce system that is responsive to the needs of both existing and future employers in the region. The workforce strategy that follows lays out a common vision to guide the region's collective efforts, it identifies the primary goal of the initiative, and it defines the roles and strategies that, if implemented, will propel the region forward towards this goal.



"More qualified workers with different and more technical skillsets are also critical to the future competitiveness of [advanced industry]. However, the skills prerequisites of modern advanced industries have been changing faster than the country's ability to train the needed workers. Now that the economy is heating up and firms are beginning to expand again, both private- and public-sector actors—often in partnership—need to bear down on improving the availability of skilled workers by developing smart, industry-led, sector-specific, regional skills initiatives. Overall, firms need to get much more involved in developing the skills pipeline and the public sector must become much more responsive to their needs."

–American's Advanced Industries: What They Are, Where They Are, and Why They Matter
Brookings Institution, February 2015

Image Credit: Electrician by Garry Knight via Flickr (CC BY 2.0)

REGIONAL WORKFORCE STRATEGY

The regional workforce strategy provides a playbook to help the region better align its education and training resources with employer needs and to strengthen its talent pipeline. This, in turn, will better position employers in the region to fill the more than 37,000 openings that are projected over the next five years.

VISION

Establishing a common vision provides direction for the many stakeholders who participate in and contribute to the CRO Region's workforce development system. For this reason, the regional strategy begins with a vision statement:

The CRO Region is an economically competitive region where existing and new business can flourish.

The vision statement's focus on competitiveness implicitly recognizes that workforce is a critical element of economic success. It also recognizes that the region's success depends on its ability to both support its existing businesses and continue to attract and support new businesses.

GOAL

With this vision in mind, the primary goal of the regional workforce strategy becomes clear:

To create a more demand-driven workforce system that supports the recruitment, retention, and development of talent.

FRAMEWORK

Over the course of the project, five distinct roles emerged as necessary components of the regional workforce strategy. These are:

1. **COLLECT.** Serve as the regional clearinghouse of information and resources to support the regional workforce system.
2. **CONVENE.** Be a regional convener around workforce topics.
3. **CONNECT.** Create networks that partners can leverage to build a more responsive workforce system.
4. **INFORM.** Coordinate activities to raise awareness of opportunities in the region and to change perceptions.
5. **MARKET.** Develop an external marketing campaign to assist regional employers in attracting talent.

1 COLLECT.

Serve as the regional clearinghouse of information and resources to support the regional workforce system.

A workforce development system consists of many stakeholders—employers, education and training providers, and workers. One of the primary functions of a workforce intermediary is sharing information and resources that can enhance the decision-making of these stakeholders in the regional labor market.

PRIORITY PROJECT

1. Database of education and training resources

Because the CRO Region stretches across state and county lines and across workforce development regions, it does not have a single clearinghouse of information. As a result, there are knowledge and information gaps that reduce the efficiency of the regional labor market.

Assembling and maintaining databases that will be the foundation of the clearinghouse will require the combined efforts of multiple partners with the assistance of a single coordinator to collect, aggregate, and normalize the data and information. The coordinator will be responsible for taking the following steps:

- Create a template to collect the information with input from the relevant partners
- Distribute the template
- Gather the filled templates
- Aggregate the information on the templates and scrub the data to improve the quality and consistency of the information
- Analyze, summarize, and share the information
- Conduct periodic updates and reach out to new partners to gather input

This will be an ongoing process as updates must be made regularly, and new information will be added periodically. However, it is not likely that the databases will ever be complete as it is not likely that 100 percent of the relevant partners will ever provide 100 percent of the needed information. That said, some information is better than no information, and starting small and growing the number of database participants over time will still provide value to the partners.

The databases, once assembled, must be made widely accessible and must be widely used to have an impact on the regional labor market. This is why creating a sustainable collection and distribution system in collaboration with partners is of the utmost importance. Having partner buy-in from the beginning greatly improves the likelihood of their participation in the collection process and use of the databases.

1.1. Develop and maintain an inventory of regional training and education resources, including state programs, K-12, postsecondary, workforce development, apprenticeship, and nonprofits. This database should include everything from career and technical education programs in regional high schools to registered apprenticeship programs to certificate programs offering nonprofit career training programs. Start with programs critical to the region's key industries. The database template can include a brief program description, the type of program (industry certificate, postsecondary certificate, associate's degree, etc.), enrollment and graduation, and what constrains the program growth—is it a lack of students, a lack of instructors, a lack of equipment, a lack of classroom space? (*See case study page 9.*)

1.2. Develop and maintain a catalog of work-based learning opportunities and employer volunteers that educators can tap into a mechanism for engaging students, counselors, and parents in hands-on industry experience. Work-based learning includes plant tours, career days, job shadowing, internships, and classroom projects or demonstrations that integrate industry principles or concepts. These experiences give students the opportunity to test-drive careers and workplaces. It is also a great way for employers to increase the relevancy of education programs to their businesses and generally improve industry-education alignment. The database template can include a description, type of experience, related academic subject(s), grade level that it is appropriate for, time commitment, times available, and contact name. (*See case study page 9.*)

1.3. Assemble and maintain a regional database of area employers to be a resource for education providers. Education and training providers need industry input to create and maintain relevant programs. Through industry advisory councils and relationships with employers, education providers can gain this input. However, education providers only reach the employers that they know, which likely leaves out many employers. Having a central database of employers that can be sorted by industry and that is regularly updated can greatly enhance the connections between industry and education. The database template should include employer name, industry, description of business, headcount range, and a primary contact. The partners should initially share their contacts to populate the database. As partners make new contacts or obtain updated information, they should share this information with the database coordinator. The coordinator should not be responsible for assembling and maintaining the employer data by contacting the employers themselves, but should manage the database with input of partners who are regularly in contact with employers.

1.4. Conduct a periodic survey of employers' needs to aggregate results and report back to education and training providers. An employer survey provides a systematic way for employers to report workforce needs. The most effective surveys are those that focus on the most critical occupations to industries. Taking a more focused approach can increase employer participation, make the survey length more manageable, and improve the quality of the input received. The survey template should ask employers to estimate their hiring needs for these critical occupations, the skills they are seeking for each occupation, and education and training requirements.

CASE STUDIES

TECH VALLEY CONNECTION FOR EDUCATION AND JOBS

The Tech Valley Connection for Education and Jobs was launched in 2009 by a partnership of the Center for Economic Growth (CEG) and GLOBALFOUNDRIES, a semiconductor foundry with a large manufacturing facility in Saratoga County, New York. The initiative aims to bring together the most innovative practices in a large-scale regional educational laboratory that covers 13 counties in eastern New York State. The laboratory model serves as a way to "connect the dots" between all the players in this arena: students, teachers, educational institutions, government agencies, and business and industry. One of the first projects of the initiative was to conduct a survey of over 100 school districts about their existing and desired programs and roadblocks to achieving them. Another project was to create an online connection point for educators, businesses, students, and parents. One of the features of the website is a database of "shovel-ready projects," which are ready-to-implement projects at schools. The intention of this database is to provide businesses with information on how they could participate in projects that provide students with innovative, work-based learning experiences. The most recent project was the launch of a series of videos highlighting local companies that offer STEM careers in the region.

For more information, visit: www.techvalleyed.org

EXXONMOBIL COMMUNITY COLLEGE PETROCHEMICAL INITIATIVE

In 2013, ExxonMobil initiated a workforce training program to enable the Greater Houston Region's nine community colleges to collaborate more closely in an effort to prepare local residents for jobs in the petrochemical sector. The initiative brought together the community colleges to identify occupations critical to the industry, inventory training resources available to support those occupations, document the skills and certifications required for the critical occupations, ascertain training gaps, and share expertise and curricula to fill the training gaps.

The Community College Petrochemical Initiative has evolved into EnergizeHouston in partnership with the Greater Houston Partnership's Upskill Houston and with additional support from ExxonMobil. EnergizeHouston has expanded its collaboration to include school districts in the region as well as scholarships to support training in the key occupations. In addition, the initiative provides in-service training and curriculum development assistance for all instructors that support the critical occupations in the community colleges. In both spring and fall, they hold a Career and Technical Education Conference for school counselors, career and technical education directors, and teachers of career and technical education courses.

For more information, visit: www.gulfcoastcc.org/ccpi.php

2 CONVENE.

Be a regional convener around workforce topics.

Creating mechanisms for information sharing is the next step to enhancing the efficiency of the regional workforce system. We recommend a three-pronged approach:

- An annual, region-wide summit
- Periodic, sub-regional roundtable discussions
- Issue-oriented task forces

PRIORITY PROJECT

❶ Workforce Summit

Each of these approaches provides distinct touch points to gather information that can help identify trends. They also provide avenues for raising awareness of the region's workforce challenges and educating stakeholders about what is being done to address these challenges. Finally, they provide opportunities for stakeholders to come together to network and cultivate relationships.

2.1. Organize an annual workforce summit. Workforce summits create opportunities to share best practices and lessons learned. They also provide opportunities for stakeholders to make connections with each other and exchange information. This type of forum enhances the dissemination of ideas and can play a pivotal role in increasing industry and education alignment. The summit should include presentations on best practices from inside and outside of the region and leave time for breakout sessions where participants can work on tackling challenges together. (*See case study page 11.*)

2.2. Host roundtables for educators and for employers to provide an ongoing forum for sharing information on resources and programs, employers' needs and challenges, and best practices. These roundtables can be organized in partnership with the region's economic development organizations or in sub-regional groups. They should feature pertinent topics such as succession planning to fill talent gaps left by retiring workers, workplace modifications and other strategies to improve employee retention, work-ready programs to support entry-level workers, and management training programs. The roundtables could be industry sector-based (healthcare, nuclear, or cyber) or talent cluster-based (skilled trades, information technology, or management). They could also target particular groups such as school counselors and career and technical education teachers.

2.3. For any widespread issues, assemble a task force to identify solutions and manage the implementation. Through the summit and roundtable discussions, region-wide challenges may be identified. Task forces organized around these challenges can provide a mechanism for resolving some of these issues. The task forces should be composed of key decision-makers from the organizations and employers that are critical to implementation. Having a project orientation and a finite existence can make it easier to recruit people to serve on the task forces.

CASE STUDIES

TOPSKILLS: WORKFORCE SUMMIT FOR OUR REGIONAL ECONOMY

The North Louisiana Economic Partnership (NLEP) covers the 14-parish region that encompasses Shreveport, Monroe, and Natchitoches. The region has a diverse economy anchored by 12 higher education institutions, a historically strong manufacturing sector, and a burgeoning technology sector. Like many regions of the US, North Louisiana's employers face challenges finding talent with the skills they need. The "skills gap" in North Louisiana is further complicated by explosive growth along the Gulf Coast (which attracted talent out of the region) coupled with high profile relocations and expansions with large workforce needs. These projects included the Benteler International Steel Mill, the CSC Technology Center, and Century Link's Technology Center of Excellence.

In an effort to build awareness of the region's key workforce challenges and provide a forum for information exchange, the NLEP organized and held *TOPskills: a Workforce Summit for our Regional Economy*. The format of the summit took a sector-based approach, bringing together industry leaders from the healthcare, technology, manufacturing, and construction sectors. In addition, the summit shared information on industry-education partnerships, career exploration tools, and WorkKeys. The Louisiana Superintendent of Education served as the keynote speaker to discuss the Department of Education's career-ready initiative called JumpStart.

For more information, visit: nlep.org

3 CONNECT.

Create networks that partners can leverage to build a more responsive workforce system.

While the annual summit and the periodic roundtables will provide opportunities for stakeholders to network, having a central point of contact that can serve as a regional connector between employers, education and training providers, and the regional labor force will provide ongoing, systemic support.

PRIORITY PROJECTS

1. Employer engagement in career exploration activities
2. Network of alumni networks

An effective connector must have access to networks. Strategy 1 makes recommendations for building these networks. This strategy is about using those networks to facilitate communication across them and to help stakeholders find what they need from each other's networks. In some ways, this is about being a concierge—listening to stakeholders' needs one at a time and making recommendations using the information clearinghouse and knowledge of the networks.

3.1. Serve as the liaison between employer and education providers to communicate needs and foster greater collaboration. Both employers and education providers have limited time to devote to forging relationships with each other. Yet, these employer-education relationships are essential to a demand-driven workforce system. Creating mechanisms for communication between many employers and many education providers simultaneously can hasten the exchange of needed information. This can be done through the summit and roundtables. Once the information is collected, the connector can distribute the pertinent findings to all relevant parties—not just the parties who attended. In addition, the connector can introduce stakeholders with complementary needs and resources.

3.2. Encourage employers to engage with educational institutions and training providers to create opportunities for work-based learning and for potential employees to be exposed to work environments. Exposure to work environments through plant tours, job shadowing, career days, internships, and apprenticeships can help students and prospective employees gain a better understanding of the industry and develop skills to enhance their career readiness. In addition, work-based learning opportunities can also help pique student interest in STEM careers or in a particular industry while enhancing the relevancy of the subject the students are learning. Both of these types of activities can provide employers with opportunities to develop relationships with students and prospective employees. The role of the connector is to encourage employers to work with educational institutions in defining and organizing these types of activities.

3.3. Assist employers in connecting with prospective employees using the inventory of training resources and programs. Often employers know only of a fraction of the programs that exist to train students and incumbent workers. And many students and incumbent workers know of only a few employers and training programs. Yet, the region has many internship, apprenticeship, and scholarship programs that provide great opportunities for workers to upskill and improve their employment opportunities. Helping employers find the programs that suit their needs will help them strengthen their regional pipeline of talent.

3.4. Forge relationships with alumni groups from regional high schools and higher education institutions to reach alumni currently living outside the region. Employers noted that recruiting people to the region who already had a connection with the area was much easier. It is not uncommon for a resident of the CRO Region to graduate from high school or college, move to a larger metropolitan area for a few years, and then move back home. These "boomerangers" can be a great source of talent for regional employers, but they are currently difficult to identify. Working with alumni groups from high schools and colleges in the area can help create a network of people with connections to the region, some of whom may be looking for the right opportunity to return to the region. (*See case study page 13*.)

3.5. Provide access to a network of employers to help find employment for trailing spouses. Workers that employers recruit from outside of the region and many of the soldiers at Fort Gordon have spouses that are seeking employment in the region. Creating a database of these "trailing spouses" and helping them find employment through the network of regional employers can strengthen the region's ability to both attract and retain talent.

CASE STUDIES

BATON ROUGE AREA CHAMBER OF COMMERCE – TALENT DEVELOPMENT

The Baton Rouge Area Chamber of Commerce (BRAC) launched its Talent Development Program in 2011 as part of its five-year strategic plan. The program focuses on talent retention and talent attraction. The program consists of a talent database, regional relocation resources (R3), and the Baton Rouge Area Intern Network (BRAIN). The talent database is a catalog of resumes of professionals who are seeking to further their careers in the Baton Rouge Area. To populate the database, BRAC works closely with the alumni associations from the region's universities and high schools, including Louisiana State University, Southern University, the University Laboratory School, Baton Rouge High School, Episcopal High School, and McKinley High School. R3 assists area employers with their talent attraction efforts by connecting them with out-of-market candidates, creating tailor-made regional awareness presentations to aid in talent recruitment, leading tours of the region for recruits, and making out-of-market recruitment trips. BRAIN works to increase the number of internships available to students in the area by providing resources to support the employers that create them and the students that are seeking them. An internship job board is one of the resources provided. In addition, BRAC recently launched www.livecapitalized.com, which is designed to be a resource for newcomers to connect and grow roots in the community.

For more information, visit: www.brac.org/ecocomp/talentdev.asp

4 INFORM.

Coordinate activities to raise awareness of opportunities in the region and to change perceptions.

PRIORITY PROJECTS

1. Expand STEM Career Connections
2. Manufacturing Day

One of the most significant barriers that employers in the manufacturing and nuclear industries face is that students are often not choosing careers that support those industries. The reasons for this are many—they hold a negative perception of work in those sectors, their parents encourage them to pursue a different career, they are not aware of the career opportunities available to them in those sectors, they are encouraged to pursue a four-year degree. For these sectors to continue to flourish in the CRO Region, more local students need to choose careers in manufacturing and nuclear. This will take a multi-faceted outreach campaign that involves hands-on activities and even a regional media campaign.

Another challenge employers in the region face is a lack of basic skills. Employers reported that many entry-level workers lack soft skills necessary for a successful career. There are many that cannot pass a drug test or a criminal background check. Others lack basic math and reading skills. Informing students and those who are advising students (parents and career counselors) about what skills and attributes are essential to career success can potentially help students make better choices and find value in learning basic skills.

4.1. Expand STEM Career Connections to reach more students and raise awareness of STEM career opportunities in the region. The Nuclear Workforce Initiative has done a great job organizing multiple events to build awareness of the opportunities in the nuclear industry during National Nuclear Science Week. One of the activities—STEM Career Connections—was expanded to include some manufacturers as well as the nuclear employers. Continuing the expansion to cover all STEM careers, not just those in the nuclear and manufacturing industries, would help the region strengthen its pipeline of STEM talent.

4.2. Plan a regional Manufacturing Day event to raise awareness of all that is made in the CRO Region and to inspire the next generation of manufacturers. The National Association of Manufacturers, the Manufacturing Institute, and its partners organize an annual event to address common misperceptions of manufacturing by giving manufacturers an opportunity to open their doors and show what 21st century manufacturing is. Manufacturing Day will be held on October 2, 2015 (www.mfgday.com). Planning guides and tool kits are available as resources to support the organization of successful events. The CRO Region would benefit from having a coordinate effort to showcase how important the sector is in the region.

4.3. Partner with local media to feature profiles–"Made Here"–that could help change the negative perception that manufacturing and nuclear employers face. Local media outlets could showcase and celebrate what is made in the CRO Region. This would help build residents' awareness of which employers are in the region and what their work environments are like. The "Made Here" series could be print-based or video-based and could be incorporated into education curricula in the region as well.

4.4. Create a teachers/professors in industry program to improve the delivery of STEM education. Exposing teachers and professors to industry can help them better contextualize their lessons and content, making their curriculum delivery more relevant to both industry and students. This type of program is another way to improve industry-education alignment in the region. (*See case study on page 15.*)

4.5. Organize summer opportunities for students to gain soft skills and work experience in a camp-type format. Summer camps can be valuable tools to expose both students and teachers to various work environments and to promote STEM education through hands-on, project-based learning. The National Integrated Cyber Education Research Center has developed a camp to foster interest in cyber education. (*See case study on page 15.*) The Cyber Discovery Model could help the CRO Region support the nascent cybersecurity sector by raising awareness of what the sector is and what skills are needed for a cyber career.

CASE STUDIES

TEACHERS IN INDUSTRY INTERNSHIP

Created through a partnership with North Dakota State University, South East Educational Cooperative, and Greater Fargo Moorhead Economic Development Corporation, the Teachers in Industry program places K-12 teachers in a corporate work environment for a four week internship. The internship gives classroom teachers the opportunity to further develop their understanding and appreciation of the engineering design process through practical work experience. Participation in this course strengthens the teacher's ability to make curriculum content more relevant and applicable when returning to the classroom. The teacher will then deliver content in a more meaningful approach that aligns with the goals of engineering and STEM education as well as state and national standards. Each teacher receives a $2,000 stipend, which is funded by the sponsoring company, the South East Education Cooperative and the ESTEEM Institute. Teachers in the program have been placed at Microsoft, Sanford Health, John Deere Electronic Solutions, Bobcat Company, Ulteig, and Moore Engineering.

For more information, visit: www.gfmedc.com/teachers-connect-industry-four-week-internship

NATIONAL INTEGRATED CYBER EDUCATION RESEARCH CENTER – CYBER DISCOVERY

Part of the Louisiana-based Cyber Innovation Center's mission is to develop a sustainable knowledge-based workforce. To further that mission, the CIC has created the National Integrated Cyber Education Research Center (NICERC).

NICERC has created a professional development program called the Cyber Discovery Model that engages and empowers teachers around cyber and other topics pertaining to science, technology, engineering, and mathematics (STEM). The culmination of the program is a one-week camp in which the participating teachers lead a team of their students in various challenges that involve analysis and investigation. The result of the camp is a heightening of participants' enthusiasm about cyber and STEM fields. The participants then take this enthusiasm and knowledge back to their home campus where it spreads. The Cyber Discovery Model has been so successful that it was awarded a grant from the Department of Homeland Security to be rolled out as a national model.

For more information, visit: www.nicerc.org

5 MARKET.

Develop an external marketing campaign to assist regional employers in attracting talent.

Employers depend on recruitment from outside of the region to fill many of their management, professional, engineering, and cyber positions. This is necessary to avoid widespread poaching among employers.

PRIORITY PROJECTS

1. Shared marketing collateral
2. Digital ambassadors program

The need to recruit from outside labor markets means that most of the regional employers are involved in marketing the region in some way. Providing them with a tool kit and encouraging collaboration among employers around co-marketing opportunities can improve the effectiveness of the external campaign.

5.1. Create and distribute talking points and marketing collateral to regional HR professionals to use for recruiting purposes. The collateral should highlight regional assets, including recreational, cultural, entertainment, and housing. This will provide regional HR professionals with a common base of knowledge and a valuable set of tools to sell the region to prospective employees. (*See case study on page 17.*)

5.2. Create a campaign that communicates the region's job opportunities and highlights its assets/advantages to alumni. As mentioned in Strategy 3.4, regional alumni can be viewed as a group of prospective recruits. Regular communication with this group through a newsletter and through social media can help strengthen alumni connections to the region and help employers identify prospective recruits from this talent pool. This kind of campaign would most likely be implemented in partnership with the regional alumni groups as sharing contact information of alumni could raise privacy concerns.

5.3. Organize a group of digital ambassadors that promote the region as a great place for career opportunities and a great place to live. Digital media provides outlets for hundreds of influencers to affect the perceptions that followers hold of the CRO Region. Connecting with these influencers through a digital ambassadors program provides a mechanism for pushing out information to target audiences within and outside of the region. (*See case study page 17.*)

5.4. Organize groups of regional employers to jointly attend select career fairs and other recruitment events at targeted higher education institutions. Joint marketing at career fairs can provide prospective employees with better knowledge of the range of career opportunities that exist in the region. This kind of collaboration can also reduce employers' recruitment costs. Including a representative that can sell the region and its assets can also be a great value-add to the collaboration.

CASE STUDIES

WORKIT NASHVILLE

To address a shortage of information technology workers in the region, the Nashville Area Chamber of Commerce launched WorkIT Nashville, a recruiting campaign designed to attract technology workers from cities across the country. An important goal of the campaign is creating a more thorough, consistent marketing message that area companies can use to attract out-of-town workers. A 40-page "guidebook" to Nashville has been prepared, outlining key economic indicators, profiling various neighborhoods, and highlighting the city's emerging tech scene. WorkIT Nashville also created a job-matching website and a digital media marketing strategy. The campaign emphasizes Nashville's below-average cost of living and touts the city's well-known entertainment and cultural offerings. To provide the longer-term solution of growing talent within the Nashville area, a further initiative, the "Five Pillars" program, was developed to add tech-related curriculum in area middle and high schools and to create internships for local college students.

For more information, visit: www.talent.workitnashville.com

DIGITAL AMBASSADORS

The Northwest Arkansas Council created the Digital Ambassadors initiative as a way to improve the region's image and to disseminate information about the region in a cost-effective way. The program currently boasts more than 400 individual Digital Ambassadors. Each Digital Ambassador receives emails with new, exciting content to share on Facebook, Twitter, Instagram, and LinkedIn. The content includes information about regional job growth, quality of life amenities, educational achievements, the local economy, and other ways the metro area stands out. Digital Ambassadors are encouraged to share the content so that they can have a positive impact on how the outside world views Northwest Arkansas. The ambassadors earn points based on how often they're active and how they share their messages, and top participants are eligible to win monthly prizes. The program is a good avenue for enhancing the internal image of Northwest Arkansas. It also helps local residents and businesspeople become more aware of the positive aspects of living and working in Northwest Arkansas.

For more information, visit: www.nwacouncil.org/pages/digital-ambassadors

IMPLEMENTATION

While the SRSCRO and their task force led the planning efforts that resulted in the strategy outlined here, the implementation of these strategies requires region-wide involvement. Education, industry, workforce development, and economic development partners must come together to collaborate and move these strategic initiatives forward. Below, we have made recommendations of which group of partners could take the lead on implementing each strategy. We have also suggested a time frame for initiating the projects. The SRSCRO will lead this effort by evaluating their role and responsibilities over the next several months. A plan of action will be developed with the hopes that other partners will roll up their sleeves and help get these regional strategies moving forward.

FIGURE 4. IMPLEMENTATION MATRIX

		LEAD PARTNER	TIMEFRAME					
			Year 1	Year 2	Year 3	Year 4	Year 5	On-Going
1.0	**COLLECT: Serve as a regional clearinghouse of information and resources to support the regional workforce system.**							
1.1.	Develop and maintain an inventory of regional training and education resources, including state programs, K-12, post-secondary, workforce development, apprenticeship, and non-profits.	SRSCRO	■					
1.2.	Develop and maintain a catalog of work-based learning opportunities and employer volunteers that educators can tap into as mechanisms for engaging students, counselors, and parents in hands-on industry experience.	Education Partners	■					
1.3.	Assemble and maintain a regional database of area employers to be a resource for education providers.	Economic Development Partners	■					
1.4.	Conduct a periodic survey of employers' needs to aggregate results and report back to education and training providers.	SRSCRO			■			
2.0	**CONVENE: Be a regional convener around workforce topics.**							
2.1.	Organize an annual workforce summit.	SRSCRO	■					
2.2.	Host roundtables for educators and for employers to provide an ongoing forum for sharing information on resources and programs, employers' needs and challenges, and best practices.	Education Partners	■					
2.3.	For any widespread issues, assemble a task force to identify solutions and manage the implementation.	SRSCRO + Partners		■				

FIGURE 4. IMPLEMENTATION MATRIX *(continued)*

		LEAD PARTNER	TIMEFRAME					
			Year 1	Year 2	Year 3	Year 4	Year 5	On-Going
3.0	**CONNECT: Create networks that partners can leverage to build a more responsive workforce system.**							
3.1.	Serve as the liaison between employer and education providers to communicate needs and foster greater collaboration.	SRSCRO + Partners						■
3.2.	Encourage employers to engage with educational institutions and training providers to create opportunities for work-based learning and for potential employees to be exposed to work environments.	SRSCRO + Partners	■					
3.3.	Assist employers in connecting with prospective employees using the inventory of training resources and programs.	Economic Development Partners						■
3.4.	Forge relationships with alumni groups from regional high schools and higher-education institutions to reach alumni currently living outside the region.	SRSCRO	■					
3.5.	Provide access to a network of employers to help find employment for trailing spouses.	Economic Development Partners		■				
4.0	**INFORM: Coordinate activities to raise awareness of opportunities in the region and to change perceptions.**							
4.1.	Expand STEM Career Connections to reach more students and raise awareness of STEM career opportunities in the region.	SRSCRO	■					
4.2.	Plan a regional Manufacturing Day event to raise awareness of all that is made in the SRSCRO Region and to inspire the next generation of manufacturers.	SRSCRO		■				
4.3.	Partner with local media to feature profiles–Made Here–that could help change the negative perception that manufacturing and nuclear employers face.	Economic Development Partners			■			
4.4.	Create a teachers/professors in industry program to improve the delivery of STEM education.	Education Partners		■				
4.5.	Organize summer opportunities for students to gain soft skills and work experience in a camp-type format.	Education Partners			■			

FIGURE 4. IMPLEMENTATION MATRIX *(continued)*

		LEAD PARTNER	TIMEFRAME					
			Year 1	Year 2	Year 3	Year 4	Year 5	On-Going
5.0	**MARKET: Develop an external marketing campaign to assist regional employers in attracting talent.**							
5.1.	Create and distribute talking points and marketing collateral to regional HR professionals to use for recruiting purposes.	SRSCRO + Partners	■					
5.2.	Create a campaign that communicates the region's job opportunities and highlights its assets/advantages to alumni.	Economic Development Partners		■				
5.3.	Organize a group of digital ambassadors that promote the region as a great place for career opportunities and a great place to live.	SRSCRO + Partners		■				
5.4.	Organize groups of regional employers to jointly attend select career fairs and other recruitment events at targeted higher education institutions.	Economic Development Partners			■			

APPENDIX A: LABOR MARKET PROFILE

This section will provide an overview of the local labor market, with comparisons to the states of Georgia and South Carolina and to the US. Topics addressed in this section include commuting patterns, migration flows, labor force statistics, population trends, educational attainment, age distribution, and factors driving the demand for labor. The quantitative analysis is supplemented by findings from a survey of employers in the region, as well as input from roundtable discussions and interviews with regional stakeholders knowledgeable about the local workforce. Additional details regarding the employer survey are presented in Appendix B: Industry Profiles.

LABORSHED AND LABOR MOBILITY

The CRO Region includes five counties—Aiken, Allendale, Barnwell, Columbia, and Richmond counties. Workers commute across county lines within the region, but the region also draws in thousands of workers from surrounding counties.

To define the true laborshed of the five-county region, commuting patterns data were compiled from the US Census Bureau's Local Employment Dynamics (LED) program. This state-federal partnership combines data from state administrative records with federal data products, such as censuses and surveys, to provide a comprehensive picture of the labor force.

A look at commuting flows (Figure 5) reveals that about 70 percent of the jobs in the CRO Region were filled by local residents in 2011, the most recent year for which data were available at the time of analysis. In addition, the area "imports" more workers than it "exports" with 51,032 people commuting to work from communities outside the region, compared with roughly 49,345 residents of the region commuting to jobs outside the five counties.

FIGURE 5. FLOW OF WORKERS TO/FROM CRO REGION

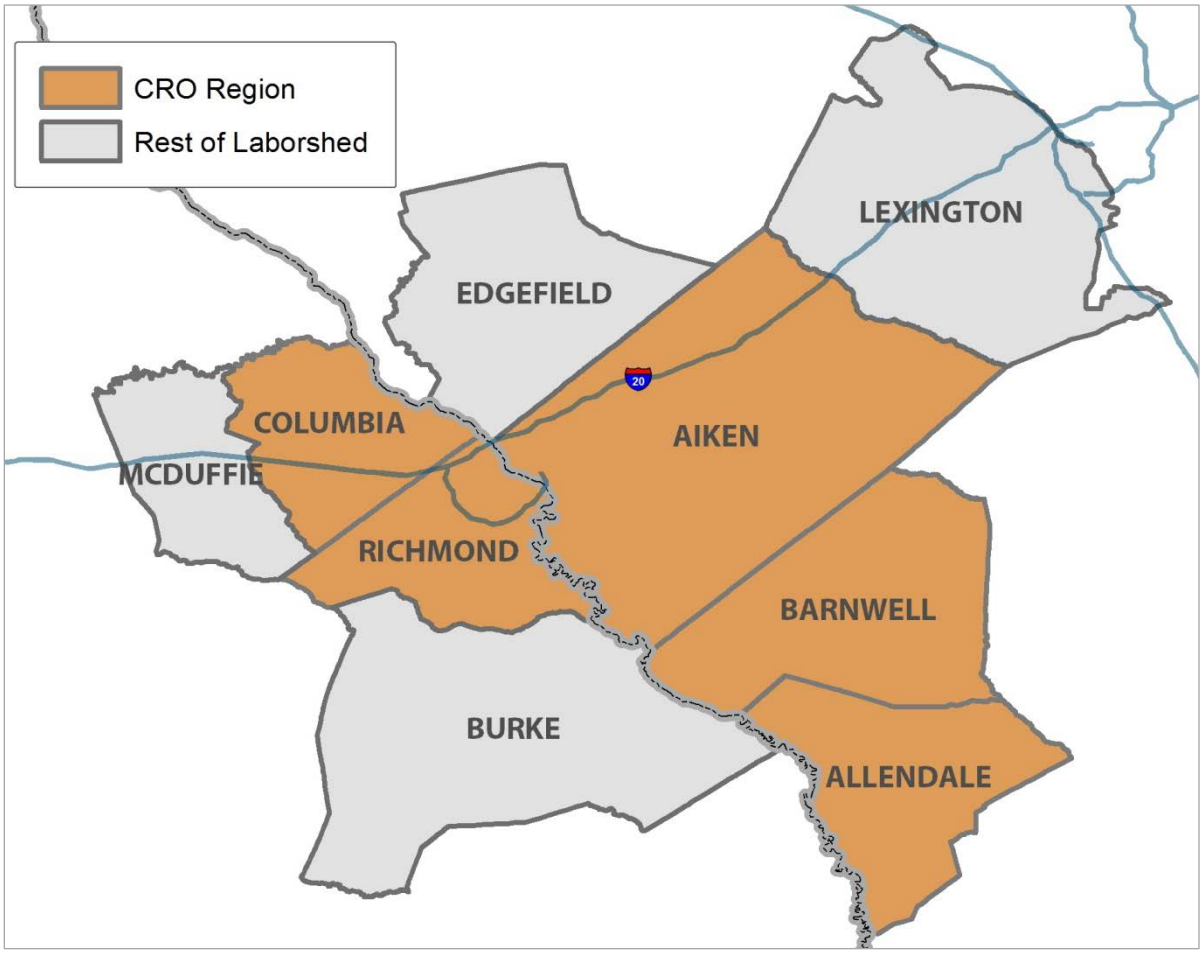
Of the 175,576 workers that held jobs in the CRO Region in 2011, just over 51,000 (29 percent) lived outside the 5-county area.

Of the 173,889 CRO Region residents employed in 2011, almost 50,000 (28 percent) commuted to jobs outside the 5-county region.

*The CRO Region is a net importer of labor, drawing in **1,687 more workers** in 2011 than it exported to surrounding areas.*

Source: US Bureau of Labor Statistics, Local Area Unemployment Statistics (state and county labor market data); US Census Bureau, Current Population Survey (national labor market data).
Note: Overlay arrows are for illustrative purposes and do not indicate directionality of worker flow between home and employment locations.

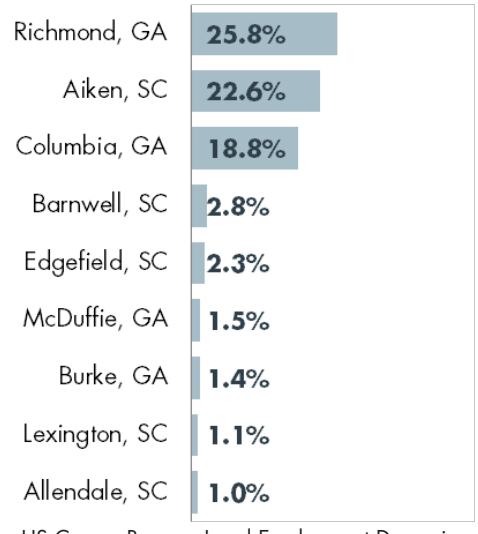
FIGURE 6. LABORSHED



Within the CRO Region, Richmond, Aiken, and Columbia counties are the most populous and are the primary source of labor for employers in the region. Together, these three counties supply 67 percent of the workers employed in the region. The five counties supply about 71 percent. The total civilian labor force for the five-county CRO Region is just over 245,000.

Lexington, Edgefield, McDuffie, and Burke counties are the source of a majority of workers commuting into the region for work. These counties each account for more than one percent of the workers employed in the CRO region. As sources of workers in the region, these counties are included as part of the greater regional laborshed, which has a civilian labor force of 411,311.

FIGURE 7. SHARE OF EMPLOYED WORKERS
COUNTY OF RESIDENCE



Source: US Census Bureau, Local Employment Dynamics.

FIGURE 8. COUNTY OF RESIDENCE
WHERE THE CRO WORKFORCE LIVES

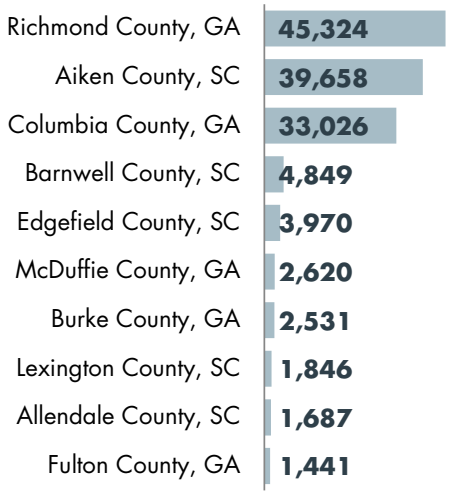
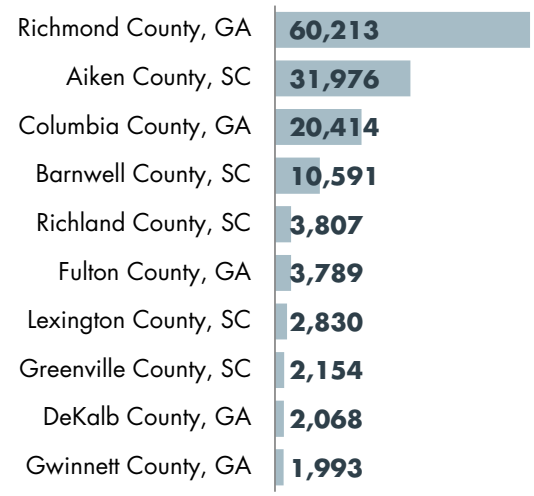


FIGURE 9. COUNTY OF WORK
WHERE THE CRO WORKFORCE WORKS



Source: US Census Bureau, Local Employment Dynamics.

As stated previously, the majority of people who are employed within the CRO Region live within its boundaries. Richmond County is the county of residence for just over 25 percent of the workers employed in the region. Aiken, Columbia, Barnwell, and Edgefield Counties round out the top five counties of residence of workers in the region. About 47 percent of employed residents in the region live in these five cities.

The major employment centers include Richmond, Aiken, Columbia, Barnwell, and Richland Counties. These five cities employ about 73 percent of the workers employed in the five-county CRO Region. Richmond and Barnwell are net importers of workers—more workers are employed in these cities than live. While Aiken, Columbia, and Allendale are net exporters of workers—more employed residents live in these cities than work.

Workers in the CRO Region are highly mobile. Figure 10 shows where employed residents live and work. This "look-up" table summarizes the data extracted from the LED dataset. If you lived in Aiken County (column) and worked in Allendale County (row) in 2011, you were one of 388 county residents who shared the same commuting experience. If you lived in Aiken and worked in Barnwell County, then you were one of 1,054 commuters making this the same journey. Meanwhile, 25,466 Aiken County residents lived and worked all in the same county.

FIGURE 10. DAILY GROSS COMMUTER FLOWS

COUNTY OF JOB	COUNTY OF RESIDENCE: Aiken	Allendale	Barnwell	Columbia	Richmond
Aiken	25,466	136	4,719	1,577	7,760
Allendale	388	786	374	31	108
Barnwell	1,054	422	3,169	50	154
Columbia	1,830	1	1,185	11,615	18,395
Richmond	3,238	5	1,144	7,141	33,796

= number living and working in the same county

Source: US Census Bureau, Local Employment Dynamics.

Not only is labor in the region mobile in terms of commuting patterns, it is also highly mobile in terms of intra-regional migration. Figure 11 shows the county-to-county migration patterns for each county in the CRO Region. Columbia, Richmond, and Aiken have very strong migratory connections as residents move from county-to-county. Aiken, Allendale, and Barnwell also have fairly strong connections.

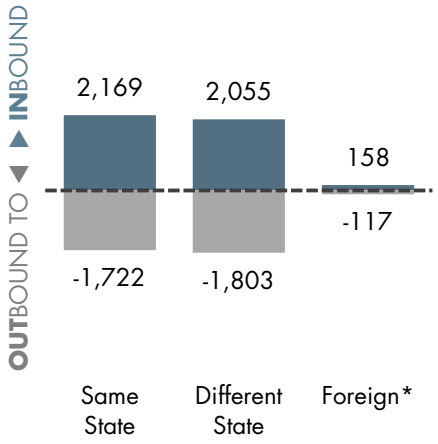
In Aiken and Richmond Counties, more new residents are moving in from out of state. In Columbia, Allendale, and Barnwell, new residents tend to be from the same state.

Overall, the CRO Region's average net in-migration was positive. However, only Columbia and Aiken Counties had a positive net in-migration for the three years analyzed. Richmond, Allendale, and Barnwell Counties have been losing residents, on average.

FIGURE 11. COUNTY-TO-COUNTY MIGRATION,

THREE-YEAR AVERAGE 2009-2011

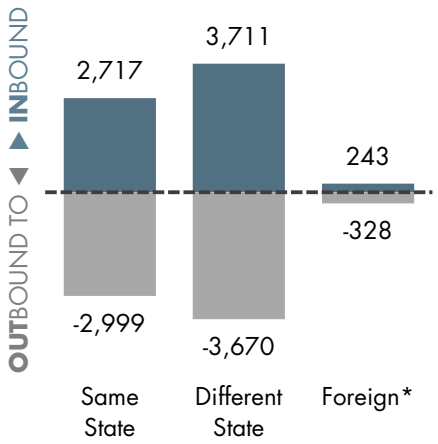
COLUMBIA COUNTY
Gross Migration Flows



Top Migration Flows

County	State	Inbound from	Outbound to	Net Loss/Gain
Richmond County	GA	1,440	1,103	+337
Aiken County	SC	152	174	-22
McDuffie County	GA	76	81	-5
Monterey County	CA	34	11	+23
Fulton County	GA	34	67	-33
Mecklenburg County	NC	20	18	+2
Bell County	TX	45	16	+29
Honolulu County	HI	32	20	+12
Anne Arundel County	MD	35	18	+17
Cumberland County	NC	29	16	+13
Gwinnett County	GA	35	35	+0
Lincoln County	GA	49	31	+18

RICHMOND COUNTY
Gross Migration Flows

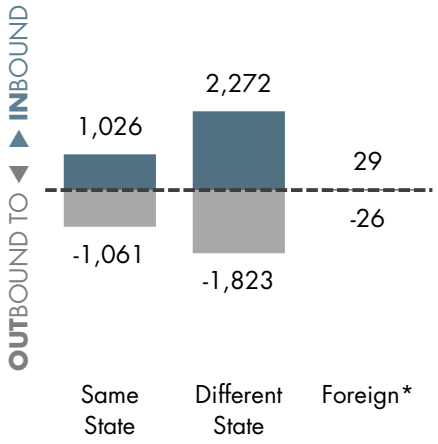


Top Migration Flows

County	State	Inbound from	Outbound to	Net Loss/Gain
Columbia County	GA	1,117	1,508	-390
Aiken County	SC	438	507	-69
Burke County	GA	215	181	+34
Fulton County	GA	126	162	-37
Dekalb County	GA	98	123	-25
Monterey County	CA	97	18	+79
Chatham County	GA	68	86	-18
McDuffie County	GA	86	71	+15
Bell County	TX	68	80	-12
Cobb County	GA	80	78	+2
Richland County	SC	63	77	-14
Jefferson County	GA	77	52	+25

AIKEN COUNTY

Gross Migration Flows

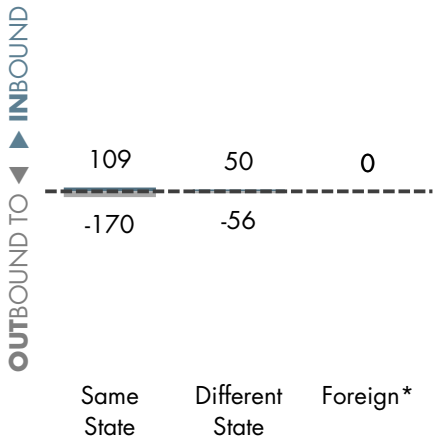


Top Migration Flows

County	State	Inbound from	Outbound to	Net Loss/Gain
Richmond County	GA	507	438	+69
Edgefield County	SC	237	229	+8
Lexington County	SC	145	184	-38
Columbia County	GA	177	150	+27
Richland County	SC	102	133	-31
Barnwell County	SC	89	64	+25
Charleston County	SC	41	55	-14
Saluda County	SC	38	45	-6
Greenville County	SC	34	42	-8
Orangeburg County	SC	40	32	+8
Mecklenburg County	NC	24	32	-8
Beaufort County	SC	24	21	+3

ALLENDALE COUNTY

Gross Migration Flows

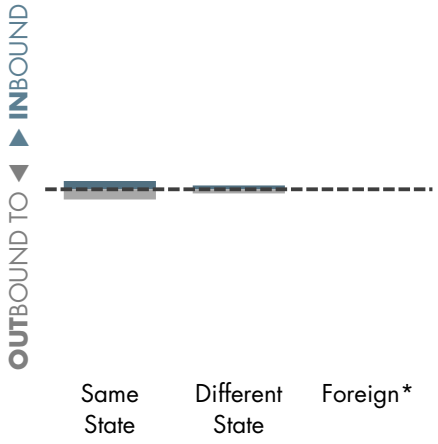


Top Migration Flows

County	State	Inbound from	Outbound to	Net Loss/Gain
Barnwell County	SC	25	37	-12
Hampton County	SC	21	28	-7
Richland County	SC	12	25	-14

BARNWELL COUNTY

Gross Migration Flows



Top Migration Flows

County	State	Inbound from	Outbound to	Net Loss/Gain
Aiken County	SC	64	89	-25
Allendale County	SC	37	25	+12
Bamberg County	SC	34	33	+1
Orangeburg County	SC	23	29	-6

Source: Internal Revenue Service.
*Foreign migration was significantly higher in the initial year of the analysis. Figures reflect the effect of averaging across subsequent years where data were suppressed and/or no migration was shown.

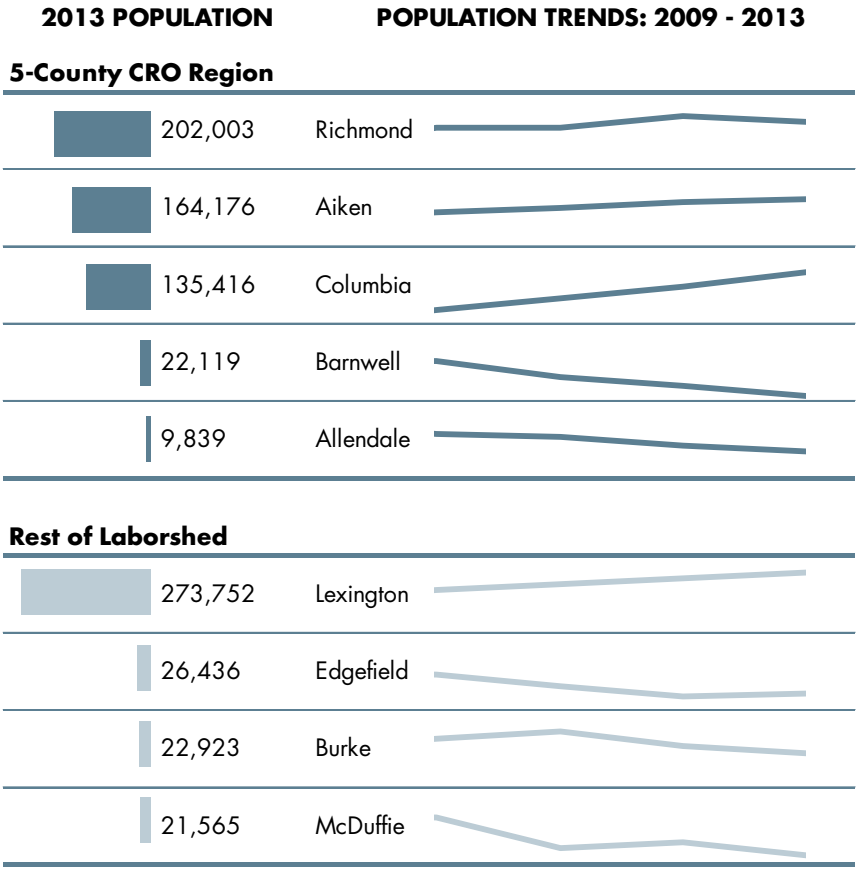
LABOR FORCE CHARACTERISTICS

In 2013, the CRO Region had a population of just over 530,000. Residents of Richmond, Aiken and Columbia Counties account for 94 percent of the population in the CRO Region. Just over 340,000 people reside in the remainder of the laborshed.

The growth rate in Columbia County was the highest in the region, with the population increasing 11.9 percent between 2009 and 2013. Lexington County increased 5.7 percent, Aiken County increased 3.6 percent, and Richmond County increased 1.8 percent.

The rural counties lost population between 2009 and 2013. Allendale County's population decreased by 7.3 percent and Barnwell County's population declined 2.2 percent. Edgefield, Burke, and McDuffie Counties declined 2.2 percent, 0.8 percent, and 1.2 percent respectively.

FIGURE 12. POPULATION TRENDS



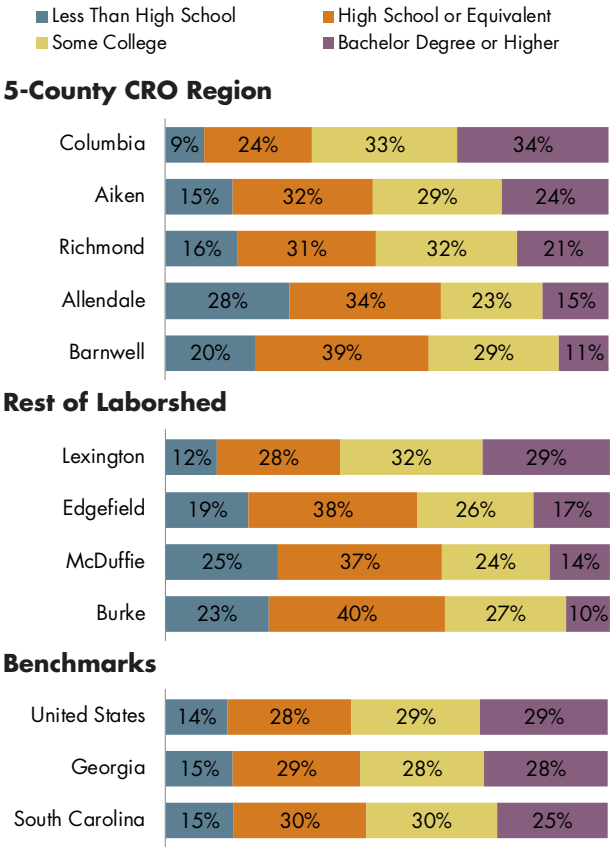
Source: US Census Bureau, Population Estimates Program.

Across the region, key demographic characteristics of the workforce differ greatly from county to county (Figure 13). In Columbia County, about one-third of the population 25 years or older has a high school diploma or less and approximately one-third of the population has earned a bachelor's degree or higher. In Aiken and Richmond Counties, 47 percent has a high school degree or less and just over 20 percent has a bachelor's degree or higher. Allendale and Barnwell Counties have much larger shares of their population with a high school diploma or less (62 percent and 59 percent, respectively) while 15 percent in Allendale and 11 percent in Barnwell earned a bachelor's degree or higher.

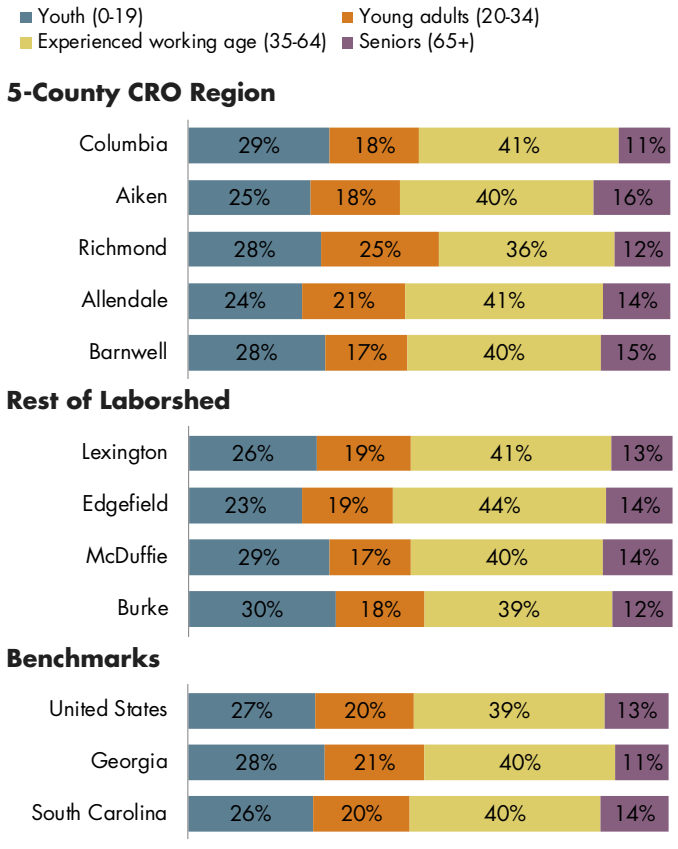
In terms of age distribution, Aiken County has the largest cohort of seniors (65+) while Columbia County has the smallest cohort of seniors. Richmond County has the smallest cohort of experienced working age population (35 to 64); the four other counties in the region have similarly sized working age cohorts. Richmond County also has the largest young adult population (20 to 34); Barnwell County has the smallest. Columbia County has the largest youth cohort while Allendale County has the smallest.

FIGURE 13. DEMOGRAPHIC CHARACTERISTICS

EDUCATIONAL ATTAINMENT



AGE DISTRIBUTION

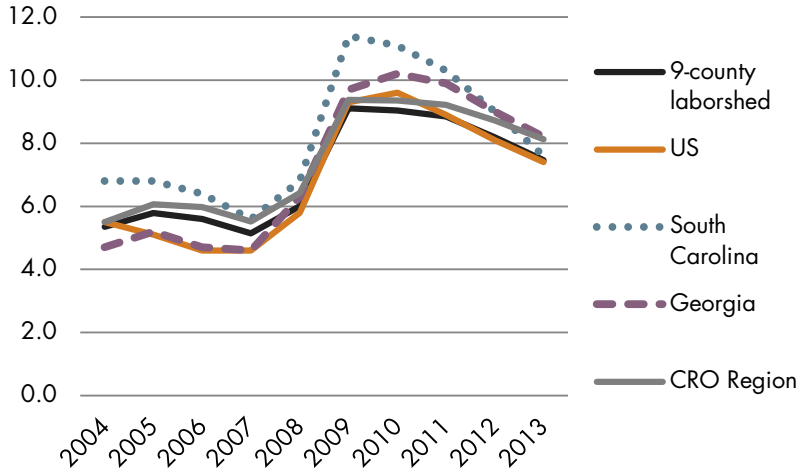


Source: 2009-2013 American Community Survey 5-Year Estimates (DP-05).

Up until the most recent recession, the CRO Region, as well as the laborshed, under-performed the nation in terms of unemployment. Since 2008, the region has tracked national unemployment trends fairly closely.

Within the nine-county laborshed, employers have access to a pool of just over 400,000 workers, about 60 percent of which are located in the CRO Region. Within the CRO Region, Richmond County accounts for the largest share of the workforce, with a civilian labor force of 88,000 in November 2014 (See Figure 15).

FIGURE 14. AVERAGE ANNUAL UNEMPLOYMENT RATES



Source: US Bureau of Labor Statistics, Local Area Unemployment Statistics (state and county labor market data); US Census Bureau, Current Population Survey (national labor market data). Note: State and local figures for November 2014 are preliminary.

In November 2014, the most recent period for which data were available at the time of this analysis, unemployment in the CRO Region and laborshed was 6.7 and 6.3 percent respectively, compared with 5.5 nationally (Figure 15). Rates within the nine-county laborshed varied widely, with Lexington County reporting the lowest rate (5.2 percent) and Allendale County having the highest rate (11.2 percent).

The CRO Region has a labor force participation rate (LFPR) of 58.7 percent and the laborshed has a LFPR of 60.9 percent. Both of these are below the national average of 63.8 percent. These rates are affected by a number of socioeconomic and demographic factors including the number of retirees in the community, stay-at-home spouses, and discouraged workers who are no longer looking for employment. Often, low LFPRs are a signal of slack in the labor market. A low LFPR indicates that a number of working-age residents are choosing not to work and could be available if the right job comes along.

Like unemployment, the LFPRs in the region and laborshed vary widely. Lexington County has the highest rate (67.4 percent). Allendale County has the lowest rate (42.9 percent).

FIGURE 15. LABOR MARKET OVERVIEW

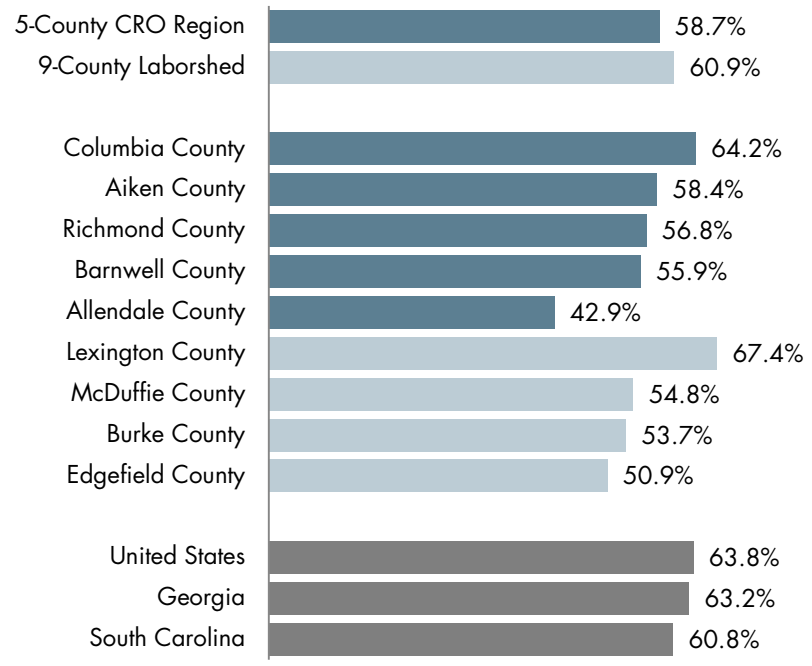
AS OF NOVEMBER 2014

Geography	Civilian labor force	Employed	Unemployed	UE rate
US	156,297,000	147,666,000	8,630,000	5.5
South Carolina	2,184,935	2,046,200	138,735	6.3
Georgia	4,754,214	4,437,458	316,756	6.7
5-County CRO Region	**245,186**	**228,744**	**16,442**	**6.7**
9-County Laborshed	411,311	385,599	25,712	6.3
Counties in Laborshed				
Aiken County	77,329	72,641	4,688	6.1
Allendale County	3,256	2,892	364	11.2
Barnwell County	8,284	7,495	789	9.5
Columbia County	68,212	64,486	3,726	5.5
Richmond County	88,105	81,230	6,875	7.8
Burke County	9,416	8,676	740	7.9
Edgefield County	11,010	10,255	755	6.9
Lexington County	135,688	128,673	7,015	5.2
McDuffie County	10,011	9,251	760	7.6

Source: US Bureau of Labor Statistics, Local Area Unemployment Statistics (state and county labor market data); US Census Bureau, Current Population Survey (national labor market data). Note: State and local figures for November 2014 are preliminary.

FIGURE 16. LABOR FORCE PARTICIPATION RATES

SHARE OF POPULATION AGE 16 YEARS AND OVER



Source: Rough estimates calculated by TIP Strategies using 2009-2013 American Community Survey 5-Year Estimates (DP-03).

DEMAND FACTORS

The CRO Region has a non-military employment base of just over 210,000. In addition, approximately 15,000 active duty soldiers are employed at Fort Gordon.

Like the US, healthcare and social assistance is the largest source of employment in the CRO Region, accounting for 12.4 percent of the total, which is 26,564 jobs. Retail and hospitality together account for 20.6 percent of the total jobs in the region, or 44,186 jobs. The administrative and support services and manufacturing sectors are also significant; each account for about nine percent of total employment (≈ 20,000 jobs). The region's robust nuclear industry falls under the federal government and professional services (contractors) and represents approximately 10,000 jobs.

FIGURE 17. EMPLOYMENT BY INDUSTRY, 2014

NAICS	Code & Description	CRO Region
62	Healthcare & social assistance	26,564
44-45	Retail trade	23,588
72	Lodging, restaurants, & bars	20,598
56	Administrative & support services	20,535
31-33	Manufacturing	19,839
903	Local govt. (incl. public ed. & hospitals)	18,688
902	State govt. (incl. higher ed.)	14,563
23	Construction	12,029
81	Personal & other services	10,608
54	Professional services	9,962
9011	Federal govt. (civilian)	8,272
52	Finance & insurance	5,461
48-49	Transportation & warehousing	4,532
42	Wholesale trade	4,204
71	Arts, entertainment, & recreation	3,761
51	Information	2,991
61	Educational services (private)	2,521
53	Property sales & leasing	2,056
11	Agriculture & forestry	1,075
22	Utilities	789
55	Corporate & regional offices	732
21	Mining (incl. oil & gas)	212

FIGURE 18. DISTRIBUTION OF EMPLOYMENT BY INDUSTRY, 2014

COMPARISON OF CRO REGION WITH LABORSHED, STATES, AND NATION

Shading indicates three largest sectors for each geography

NAICS	Code & Description	CRO Region	Laborshed	South	Georgia	US
62	Healthcare & social assistance	**12.4%**	**10.9%**	9.3%	**10.3%**	**12.6%**
44-45	Retail trade	**11.0%**	**11.7%**	**11.7%**	**11.0%**	**10.6%**
72	Lodging, restaurants, & bars	**9.6%**	9.1%	10.0%	8.8%	8.4%
56	Administrative & support services	9.6%	8.6%	8.0%	7.6%	6.4%
31-33	Manufacturing	9.3%	9.4%	**11.2%**	8.3%	8.2%
903	Local govt. (incl. pub. ed. & hospitals)	8.8%	**10.9%**	**10.3%**	**8.9%**	**9.3%**
902	State govt. (incl. higher ed.)	6.8%	4.9%	4.8%	4.0%	3.5%
23	Construction	5.6%	5.8%	5.3%	4.7%	5.2%
81	Personal & other services	5.0%	5.1%	5.0%	4.5%	4.8%
54	Professional services	4.7%	4.0%	4.6%	6.3%	6.4%
9011	Federal govt. (civilian)	3.9%	2.7%	1.6%	2.3%	1.9%
52	Finance & insurance	2.6%	2.5%	3.5%	4.0%	4.1%
48-49	Transportation & warehousing	2.1%	3.4%	2.9%	4.2%	3.3%
42	Wholesale trade	2.0%	3.0%	3.3%	4.8%	4.0%
71	Arts, entertainment, & recreation	1.8%	1.4%	1.5%	1.3%	1.7%
51	Information	1.4%	1.1%	1.3%	2.4%	1.9%
61	Educational services (private)	1.2%	1.0%	1.7%	2.0%	2.5%
53	Property sales & leasing	1.0%	1.3%	1.6%	1.6%	1.7%
11	Agriculture & forestry	0.5%	1.3%	0.8%	0.9%	1.2%
22	Utilities	0.4%	1.3%	0.6%	0.4%	0.4%
55	Corporate & regional offices	0.3%	0.6%	0.8%	1.4%	1.4%
21	Mining (incl. oil & gas)	0.1%	0.1%	0.1%	0.1%	0.6%

Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.
Note: Excludes military and unclassified employment.

The staffing patterns of the regional industry base yield the occupational structure shown in Figure 19. Office and administrative support is the largest occupational group in the region, followed by sales and related occupations and food preparation occupations. Healthcare practitioners and production occupations round out the top 5 occupational groups. These top 5 occupational groups account for 49 percent of all non-military employment.

Of the 210,000 jobs in the region, 19 percent are considered high skill, requiring a bachelor's degree or higher. Thirty-eight percent of the jobs are considered middle-skill jobs, requiring at least a high school diploma and some training but less than a four-year degree. The remaining 43 percent of the jobs are low-skill.

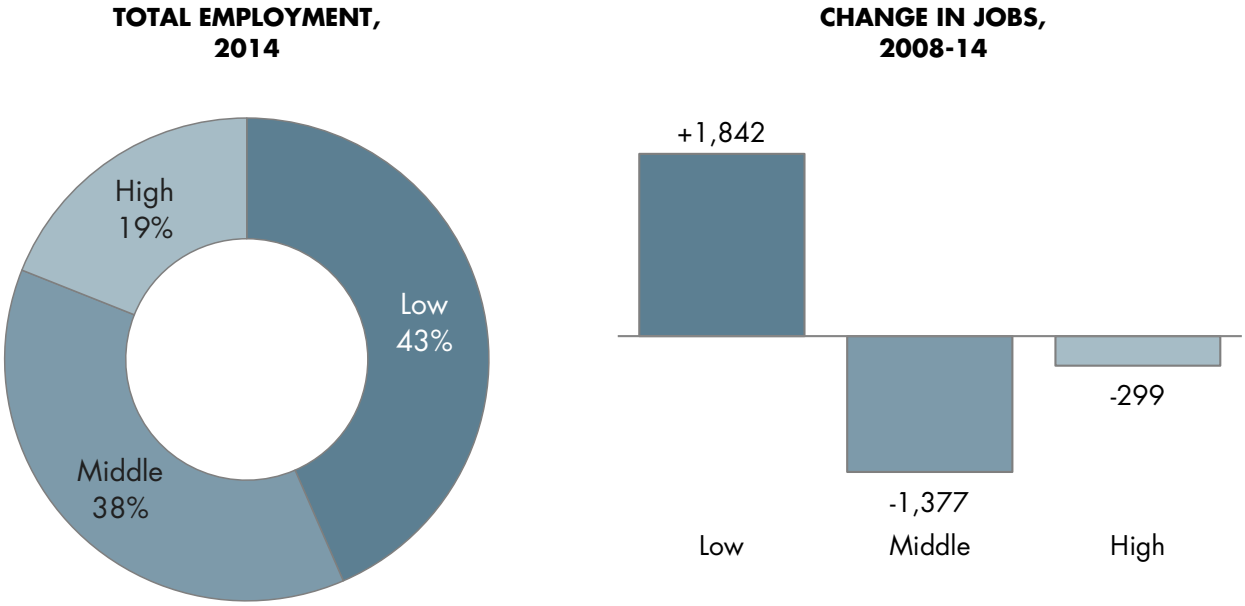
FIGURE 19. EMPLOYMENT BY OCCUPATION, 2014

SOC Code & Description	CRO Region
43 Office and Administrative Support	31,187
41 Sales and Related	21,487
35 Food Preparation and Serving Related	19,665
29 Healthcare Practitioners and Technical	16,898
51 Production	15,446
25 Education, Training, and Library	13,886
53 Transportation and Material Moving	13,445
47 Construction and Extraction	10,784
49 Installation, Maintenance, and Repair	9,382
37 Building & Grnds. Cleaning & Maint.	9,042
11 Management	8,949
39 Personal Care and Service	7,442
13 Business and Financial Operations	6,937
31 Healthcare Support	6,164
33 Protective Service	5,391
17 Architecture and Engineering	5,194
15 Computer and Mathematical	3,327
21 Community and Social Service	3,056
27 Arts, Design, Ent., Sports, and Media	2,501
19 Life, Physical, and Social Science	1,854
23 Legal	982
45 Farming, Fishing, and Forestry	763

Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.
Note: Excludes military and unclassified employment.

Over the last five years, growth in low-skill occupations outpaced that of middle- and high-skill occupations. Low-skill occupations grew by over 1,800 jobs, middle-skill occupations fell by 1,377, and high-skill occupations fell by 299. The share of these segments stayed relatively constant over the five-year period.

FIGURE 20. JOBS BY SKILL LEVEL



Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.

FIGURE 21. OCCUPATIONAL STRENGTHS

TOP LOCATION QUOTIENTS FOR THE CRO REGION

LEGEND: Median hourly earnings: Within +/- 10% of US median 10% below US 10% above US

		CRO Region				Laborshed			
SOC	Description	2014 Jobs	2014 LQ (US = 1.00)	Median Hourly Earnings	Wage Premium > 10% over US Average	2014 Jobs	2014 LQ (US = 1.00)	Median Hourly Earnings	Wage Premium > 10% over US Average
51-9197	Tire Builders	380	14.71	$22.28		1,153	27.62	$20.76	
47-4041	Hazardous Materials Removal Workers	532	8.77	$23.19		567	5.78	$22.87	
29-1029	Dentists, All Other Specialists	73	7.43	$45.44		77	4.87	$46.79	
53-7032	Excavating & Loading Machine & Dragline Operators	470	5.94	$33.24		524	4.09	$31.57	
51-8091	Chemical Plant and System Operators	324	5.56	$27.34		349	3.71	$26.49	
53-2022	Airfield Operations Specialists	52	4.57	$24.28		56	3.07	$23.89	
17-2161	Nuclear Engineers	127	4.56	$37.49		249	5.55	$41.37	
19-4091	Environmental Sci. & Protection Technicians, Incl. Health	236	4.40	$34.30		258	2.97	$33.28	
51-9196	Paper Goods Machine Setters, Operators, and Tenders	597	4.26	$19.62		709	3.13	$20.38	
25-9021	Farm and Home Management Advisors	57	3.67	$22.77		61	2.44	$22.60	
47-2221	Structural Iron and Steel Workers	321	3.45	$26.89		370	2.46	$25.48	
17-2111	H&S Engrs, Ex. Mining Safety Engrs & Inspectors	123	3.41	$40.28		147	2.52	$39.90	
17-3025	Environmental Engineering Technicians	91	3.37	$29.01		103	2.36	$28.87	
17-2051	Civil Engineers	1,413	3.36	$41.80		1,617	2.38	$40.41	
19-3099	Social Scientists and Related Workers, All Other	156	3.10	$39.51		171	2.10	$39.17	
17-2081	Environmental Engineers	249	3.08	$35.73		308	2.35	$35.42	
29-1124	Radiation Therapists	76	3.01	$31.44		88	2.15	$32.06	
51-8031	Water & Wastewater Treatment Plant & Sys. Operators	458	2.80	$32.32		558	2.11	$30.71	
47-2171	Reinforcing Iron and Rebar Workers	68	2.49	$26.39		88	1.99	$24.56	
19-3039	Psychologists, All Other	72	2.45	$44.27		82	1.73	$43.65	
29-2011	Medical and Clinical Laboratory Technologists	573	2.37	$23.40		731	1.87	$23.42	
27-4099	Media & Communication Equipment Workers, All Other	64	2.29	$38.48		70	1.53	$37.89	
51-9023	Mixing & Blending Mach. Setters, Operators, & Tenders	393	2.22	$18.79		517	1.81	$17.84	
49-2091	Avionics Technicians	58	2.17	$26.56		65	1.51	$26.23	
51-9011	Chemical Equipment Operators and Tenders	195	2.15	$29.23		215	1.46	$28.23	
29-1069	Physicians and Surgeons, All Other	1,083	2.10	$56.89		1,293	1.55	$62.44	
17-2141	Mechanical Engineers	815	2.06	$47.94		1,178	1.84	$45.17	

Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.
Notes: Occupations with at least 50 jobs. Occupations paying below the regional median wage ($17.96) were excluded.

As a result of the current industry and occupational structure, the CRO Region demonstrates significant occupational strengths. Figure 21 highlights those occupations with a location quotient (LQ) above 2.00. The occupations listed in this figure are those that have at least 50 jobs and pay more than the region's median hourly wage of $17.96. These 27 occupations demonstrate the region's strengths in nuclear, healthcare, and a number of manufacturing niches, including chemical, paper products, and rubber products manufacturing.

Though the median hourly wage for the CRO Region as a whole is lower than that of the nation ($17.96

ABOUT LOCATION QUOTIENTS (LQS)

Location quotient analysis is a statistical technique used to suggest areas of relative advantage based on a region's employment base. 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:

(local employment in occupation x /
total local employment-all occupations)
(national employment in occupation x /
total national employment-all occupations)

If the local industry and national industry 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 but also point to opportunities for expansion or attraction.

versus $20.06), the median hourly wage in 14 of the 27 occupations listed in Figure 21 are more than ten percent above the nation's. These occupations include a range of manufacturing, nuclear, and other technical occupations. In contrast, most of the healthcare occupations pay more than 10 percent below the nation's median hourly wage.

Over the next five years, healthcare is expected to continue to be a driver of employment growth, with general medical and surgical hospitals, and offices of physicians adding more than 1,300 new jobs. The state and local education and hospitals sector will also contribute to this growth, adding more than 1,500 jobs. Restaurants are also expected to grow by over 900 jobs. Architectural, engineering, and related services, paper product manufacturing, rubber product manufacturing, and accounting services are also expected to be among the fastest growing sectors in the CRO Region.

A number of manufacturing sectors are expected to be among the fastest growing industry sectors in percentage terms. These include the manufacture of other nonmetallic mineral products, engine equipment, wood product, electrical equipment, and paint. This expected growth is an indicator of continued strengthening of the manufacturing sector in the region. Cable programming, office administrative services, specialty hospitals, business schools, and securities brokerage are all expected to grow by more than 35 percent over the next five years.

Registered nursing is the fastest growing occupation in terms of new jobs, with expected growth of 519 new jobs over the next five years. Accountants, civil engineers, and nursing assistants are other middle- and high-skill occupations that rank in the top 10 fastest growing industries. However, high-turnover, low-skill positions such as cashiers, retail salespersons, food preparation workers, and waiters dominate the list of in-demand occupations ranked by total number of openings from 2014 to 2019.

FIGURE 22. TOP 10 INDUSTRIES, BASED ON VARIOUS INDICATORS (CRO REGION)

Net change	FASTEST-GROWING, 2014-19 (#)	Earnings per Worker
+946	General Medical & Surgical Hospitals	$62,549
+915	Restaurants & Other Eating Places	$15,264
+834	Education & Hospitals (State Government)	$57,109
+798	Architectural, Engineering, & Related Services	$94,298
+748	Education & Hospitals (Local Government)	$51,906
+451	Offices of Physicians	$92,189
+357	Converted Paper Product Manufacturing	$77,766
+353	Rubber Product Manufacturing	$68,166
+331	Accounting, Tax Preparation, Bookkeeping, & Payroll Services	$59,690
+330	Other Amusement & Recreation Industries	$29,016

% change	FASTEST-GROWING, 2014-19 (%)	Earnings per Worker
+74%	Other Nonmetallic Mineral Product Manufacturing	$89,866
+52%	Engine, Turbine, & Power Transmission Equipment Manufacturing	$86,392
+46%	Cable & Other Subscription Programming	$42,858
+45%	Veneer, Plywood, & Engineered Wood Product Manufacturing	$72,224
+42%	Office Administrative Services	$25,920
+42%	Electrical Equipment Manufacturing	$94,104
+41%	Paint, Coating, & Adhesive Manufacturing	$106,984
+38%	Specialty (except Psychiatric & Substance Abuse) Hospitals	$45,270
+38%	Business Schools & Computer & Management Training	$68,158
+35%	Securities & Commodity Contracts Intermediation & Brokerage	$123,430

Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.
Note: Excludes industries representing fewer than 50 jobs (CRO Region) or 100 jobs (Laborshed) in 2014.

FIGURE 23. TOP 10 OCCUPATIONS, BASED ON VARIOUS INDICATORS

Net change	FASTEST-GROWING, 2014-19 (New Jobs)	Median hourly earnings
+519	Registered Nurses	$30.98
+426	Combined Food Preparation & Serving Workers, Including Fast Food	$8.63
+385	Customer Service Representatives	$11.80
+224	Personal Care Aides	$8.57
+212	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	$14.71
+178	Accountants & Auditors	$26.12
+174	Waiters & Waitresses	$8.76
+173	Civil Engineers	$41.80
+170	Cooks, Restaurant	$9.75
+160	Nursing Assistants	$10.94

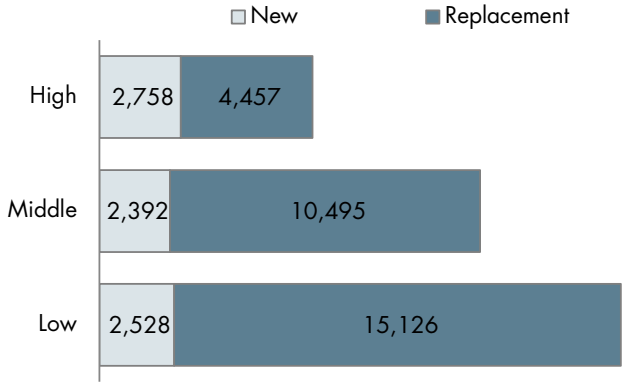
Net change	IN-DEMAND, 2014-19 (# OPENINGS)	Median hourly earnings
+1,546	Cashiers	$8.58
+1,541	Retail Salespersons	$9.30
+1,534	Combined Food Preparation and Serving Workers, Including Fast Food	$8.63
+1,155	Waiters and Waitresses	$8.76
+1,119	Registered Nurses	$30.98
+960	Customer Service Representatives	$11.80
+726	Office Clerks, General	$11.68
+699	Laborers and Freight, Stock, and Material Movers, Hand	$10.96
+522	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$9.22
+453	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	$14.71

Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.
Note: Excludes occupations representing fewer than 50 jobs (CRO Region) or 100 jobs (Laborshed) in Jobs.

This projected industry growth is expected to generate 7,678 new jobs in the CRO Region between 2014 and 2019. In addition, there are expected to be 30,078 replacement jobs over the same period. Replacement jobs are those openings which occur due to turnover, including attrition and retirement. This implies a total number of openings of 37,756, or 7,551 annually, over the next five years.

FIGURE 24. OCCUPATIONAL GROWTH BY SKILL-LEVEL

OPENINGS, 2014-19



Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker.

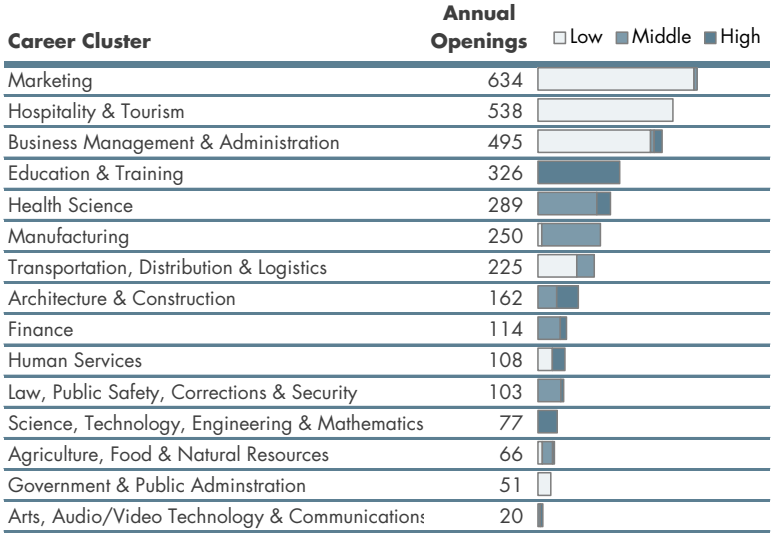
To better understand the CRO Region's specific occupational needs, a deeper dive into occupational drivers was necessary. The drivers examined were new job growth, replacement demand, wage premiums, and the percent of workers over 55 years of age working in that occupation. New jobs and replacement demand were used as indicators of current volume. Wage premiums were used as an indicator that the position may currently be hard to fill. The percent of workers greater than 55 years old was used to indicate a possible wave of retirements in the near to medium term. The resulting list was sorted by skill level in Figure 26 and Figure 27.

In all, the list of high-demand occupations included 93 occupations. The marketing occupations, which include customer service representatives, have the highest number of expected openings. Hospitality and tourism and business management and administration are the next highest-demand career clusters. The demand in these top career clusters is driven by growth in low-skill occupations.

Education and training, health science, and manufacturing are the highest-demand career clusters that require training. Growth in these three clusters is driven by openings in middle- and high-skill occupations.

FIGURE 25. HIGH-DEMAND JOBS BY SKILL LEVEL AND CAREER CLUSTER

Career Cluster	Annual Openings
Marketing	634
Hospitality & Tourism	538
Business Management & Administration	495
Education & Training	326
Health Science	289
Manufacturing	250
Transportation, Distribution & Logistics	225
Architecture & Construction	162
Finance	114
Human Services	108
Law, Public Safety, Corrections & Security	103
Science, Technology, Engineering & Mathematics	77
Agriculture, Food & Natural Resources	66
Government & Public Adminstration	51
Arts, Audio/Video Technology & Communications	20



Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker. TIP Calculations. Note: Excludes occupations with fewer than 100 jobs and fewer than 10 openings.

Figure 26 lists the high-demand, high-skill occupations. This list includes 33 different occupations. The list is dominated by education-related occupations. Healthcare-related occupations include physicians and surgeons, veterinarians, and dentists. Engineering and technical positions include civil, mechanical, electrical, environmental, nuclear, and health and safety engineers. Various types of managers are also included, such as administrative services managers, chief executives, architectural and engineering managers, and industrial production managers.

All but five of these occupations are facing a wave of retirements in the next five to ten years. Civil engineers, chief executives, environmental engineers, and electrical engineers have some of the highest percentages of workers over the age of 55. For the most part, these high-demand, high-skill occupations are not experiencing wage pressures. Notable exceptions are mechanical engineers, industrial production managers, and all other engineers.

FIGURE 26. HIGH-DEMAND, HIGH-SKILL OCCUPATIONS

LEGEND: Median hourly earnings: Within +/- 10% of US median 10% below US 10% above US

SOC	Description	2014 Jobs	Annual Openings (2014-19)	New Demand (2014-19)	Replace-ment Demand (2014-19)	New / Replacement	Median Hourly Earnings	Wage Premium > 10% over US Average
25-1099	Postsecondary Teachers	2,487	67	28	39		$27.90	
25-2021	Elementary School Teachers, Except Specic	2,004	79	32	46		$25.91	
25-2022	Middle Sch.Teachers, Excpt. Special	1,553	64	27	36		$26.14	
17-2051	Civil Engineers	1,413	72	35	38		$41.80	
25-3098	Substitute Teachers	1,109	32	12	20		$8.40	
29-1069	Physicians & Surgeons, All Other	1,083	36	6	30		$56.89	
25-2031	Secndry Sch.Teachers, Excpt. Special	961	35	7	27		$24.51	
17-2141	Mechanical Engineers	815	39	9	30		$47.94	
39-9032	Recreation Workers	622	18	10	8		$16.37	
11-3011	Administrative Services Managers	570	14	5	10		$41.93	
25-3099	Teachers & Instructors, All Other	546	14	4	11		$33.95	
23-1011	Lawyers	544	11	(2)	13		$36.43	
21-2011	Clergy	440	15	6	9		$24.92	
11-1011	Chief Executives	439	12	0	11		$61.75	
11-9032	Edu. Administrators, Elementary & Second.	333	13	3	9		$40.35	
21-1012	Edu.al, Guidance, School, & Vocational C.	325	11	3	7		$23.62	
41-3031	Securities, Commodities, & Financial Svces	320	24	15	9		$37.42	
13-1051	Cost Estimators	305	15	4	11		$29.27	
11-9041	Architectural & Engineering Managers	296	14	6	8		$61.77	
11-3051	Industrial Production Managers	275	6	(1)	7		$52.28	
25-2052	Special Edu. Teachers, Kindergarten & Ele.	273	8	3	5		$24.14	
17-2071	Electrical Engineers	250	13	6	6		$34.83	
17-2081	Environmental Engineers	249	6	(2)	8		$35.73	
21-2021	Directors, Religious Activities & Edu.	247	12	3	9		$17.04	
25-9031	Instructional Coordinators	240	5	3	2		$29.59	
29-1131	Veterinarians	157	11	5	6		$47.23	
17-2199	Engineers, All Other	157	5	2	3		$52.75	
29-1021	Dentists, General	155	8	3	5		$87.77	
27-3042	Tech. Writers	141	6	1	5		$32.71	
17-2161	Nuclear Engineers	127	3	(1)	4		$37.49	
17-2111	H&S Engineers, Excpt. Mining Safety Engir	123	4	(0)	4		$40.28	
21-2099	Religious Workers, All Other	122	4	2	3		$13.13	
27-2041	Music Directors & Composers	116	5	1	3		$21.21	

Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker. TIP Calculations.
Note: Excludes occupations with fewer than 100 jobs and fewer than 10 openings.

The list of high-demand, middle-skill occupations (Figure 27) includes 41 different occupations. This list is dominated by those occupations typically considered blue collar—construction, maintenance, production, and transportation. However, registered nursing does top the list in terms of total openings and new demand. Other healthcare-related occupations include medical transcriptionists, and cardiovascular technologists. Office-related occupations include bookkeeping, executive secretaries, purchasing agents, tax preparers, paralegals, and legal secretaries.

Almost half of the high-demand, middle-skill occupations are facing wage pressures. All of these occupations are in blue collar occupational categories. In 26 occupations, more than 25 percent of the workers are 55 or older. The occupations with the highest percentage of workers over 55 include hazardous materials removal workers, excavating machine operators, and water and wastewater treatment plant operators.

FIGURE 27. HIGH-DEMAND, MIDDLE-SKILL OCCUPATIONS

LEGEND: Median hourly earnings: Within +/- 10% of US median 10% below US 10% above US

SOC	Description	2014 Jobs	Annual Openings (2014-19)	New Demand (2014-19)	Replace-ment Demand (2014-19)	New / Replacement	Median Hourly Earnings	Wage Premium > 10% over US Average
29-1141	Registered Nurses	5,821	224	104	120		$30.98	
49-9071	Maint. & Repair Workers, General	2,836	68	3	65		$16.32	
53-3032	Heavy & Tractor-Trailer Truck Drivers	2,347	46	(7)	52		$18.50	
43-3031	Bookkeeping, Acct., & Auditing Clerks	2,126	51	29	22		$15.17	
47-2031	Carpenters	1,796	39	(27)	66		$20.77	
51-1011	First-Line Supervisors of Production & Op...	1,109	19	(9)	28		$29.19	
33-3051	Police & Sheriff's Patrol Officers	979	36	4	32		$16.25	
33-3012	Correctional Officers & Jailers	946	32	3	29		$14.01	
43-6011	Executive Secretaries & Executive Admin.	844	14	3	11		$20.88	
41-3021	Insurance Sales Agents	708	30	11	18		$21.15	
51-9111	Packaging & Filling Machine Operators...	671	17	(14)	31		$15.24	
49-9041	Industrial Machinery Mechanics	619	24	5	19		$21.84	
51-9196	Paper Goods Machine Setters, Operators..	597	18	11	6		$19.62	
51-9041	Extruding, Forming, Pressing, & Compactin	587	25	(0)	25		$17.36	
47-4041	Hazardous Materials Removal Workers	532	11	(17)	28		$23.19	
33-2011	Firefighters	511	17	1	16		$15.90	
47-2073	Operating Engineers & Other Construction.	483	12	(3)	14		$17.18	
41-9022	Real Estate Sales Agents	481	6	(8)	14		$15.30	
53-7032	Excavating & Loading Machine & Dragline	470	4	(14)	19		$33.24	
51-8031	Water & Wastewater Treatment Plant...	458	16	(6)	22		$32.32	
51-9023	Mixing and Blending Machine Setters...	393	14	0	14		$18.79	
51-9197	Tire Builders	380	22	10	12		$22.28	
49-3031	Bus & Truck Mechanics & Diesel Engine...	365	9	(1)	10		$17.81	
47-2221	Structural Iron & Steel Workers	321	14	(2)	16		$26.89	
13-1023	Purchasing Agents, Except Wholesale, Retc	319	8	1	7		$27.85	
49-3042	Mobile Heavy Equipment Mechanics, Exce	253	7	(5)	12		$29.15	
19-4091	Environmental Science and Protection Tech	236	9	(5)	14		$34.30	
11-9141	Property, Real Estate, & Community Assoc..	235	6	(2)	8		$20.02	
27-2042	Musicians & Singers	231	10	2	8		$19.58	
51-6064	Textile Winding, Twisting, & Drawing Out.	219	3	(14)	17		$12.15	
13-2082	Tax Preparers	203	9	4	5		$15.94	
23-2011	Paralegals & Legal Assistants	202	4	(0)	5		$19.43	
51-9011	Chemical Equipment Operators & Tenders.	195	8	(1)	9		$29.23	
43-6012	Legal Secretaries	185	3	(3)	6		$15.70	
19-4031	Chemical Technicians	160	5	0	5		$24.00	
31-9094	Medical Transcriptionists	148	5	1	3		$17.71	
29-2031	Cardiovascular Technologists & Technician	147	6	4	2		$28.39	
53-3021	Bus Drivers, Transit & Intercity	128	8	6	3		$10.25	
11-9013	Farmers, Ranchers, & Other Agricultural...	128	5	(0)	5		$13.99	
17-3022	Civil Engineering Technicians	113	5	3	3		$25.27	
51-3092	Food Batchmakers	104	5	(2)	6		$15.23	

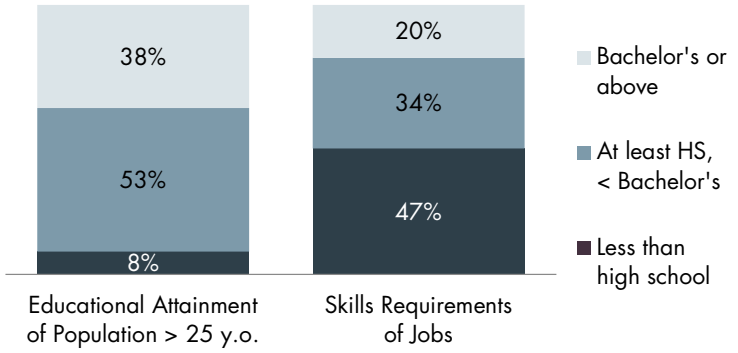
Source: QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2013.4 Class of Worker. TIP Calculations.
Note: Excludes occupations with fewer than 100 jobs and fewer than 10 openings.

INDUSTRY & WORKFORCE ALIGNMENT

While the prior sections examined characteristics of the labor force and drivers of demand, this section looks at the alignment between the region's industry needs and workforce.

A comparison of the educational requirements of the CRO Region's job base and the educational attainment of the population 25 years and older suggests a mismatch. Though 38 percent of the population has a bachelor's degree or higher, only 20 percent of the jobs typically require a four-year degree. This type of mismatch can be an indicator of under-employment if people with degrees take jobs that do not require a degree. It can also signal extra capacity in the labor force, especially if residents with a postsecondary education are currently not working.

FIGURE 28. COMPARISON: LABOR FORCE VS. JOBS
TYPICAL EDUCATION REQUIREMENTS OF REGIONAL JOBS COMPARED TO EDUCATIONAL ATTAINMENT OF POP. > 25



Source: EMSI 2014.3 – QCEW Employees, Non-QCEW, and Self-Employed; 2009-2013 American Community Survey 5-Year Est.

To understand the supply of potential graduates in the region, data on for-credit completions were compiled for all schools within the nine-county laborshed from the National Center for Education Statistics' Integrated Postsecondary Data System (IPEDS). For more information on IPEDS and this analysis, see Appendix B: Industry Profiles.

FIGURE 29. REGIONAL INSTITUTIONS

INSTITUTION	CITY	TYPE	LEVEL
Aiken Technical College	Graniteville	Public	2-year
Augusta School of Massage	Evans	Private for-profit	less-than 2-year
Augusta Technical College	Augusta	Public	2-year
Georgia Military College-Augusta Campus	Martinez	Public	2-year
Georgia Regents University	Augusta	Public	4-year or above
Midlands Technical College	West Columbia	Public	2-year
Miller-Motte Technical College-Augusta	Augusta	Private for-profit	2-year
Paine College	Augusta	Private not-for-profit	4-year or above
University of Phoenix-Augusta Campus	Augusta	Private for-profit	4-year or above
University of South Carolina-Aiken	Aiken	Public	4-year or above
University of South Carolina-Salkehatchie	Allendale	Public	2-year
Virginia College-Augusta	Augusta	Private for-profit	4-year or above

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)
Notes: IPEDS data include only schools eligible to participate in federal financial aid programs. In August 2012, **Augusta State University** merged with **Georgia Health Sciences University** to form **Georgia Regents University** (Wikipedia). **Augusta Area Dietetic Internship-University Hospital** is listed as a program of **Georgia Regents University** on the insitutions website (http://www.gru.edu/alliedhealth/dip/).**Miller-Motte Technical College-Augusta** is included in the file in each year, but only recorded completions in 2012-2013 academic year.

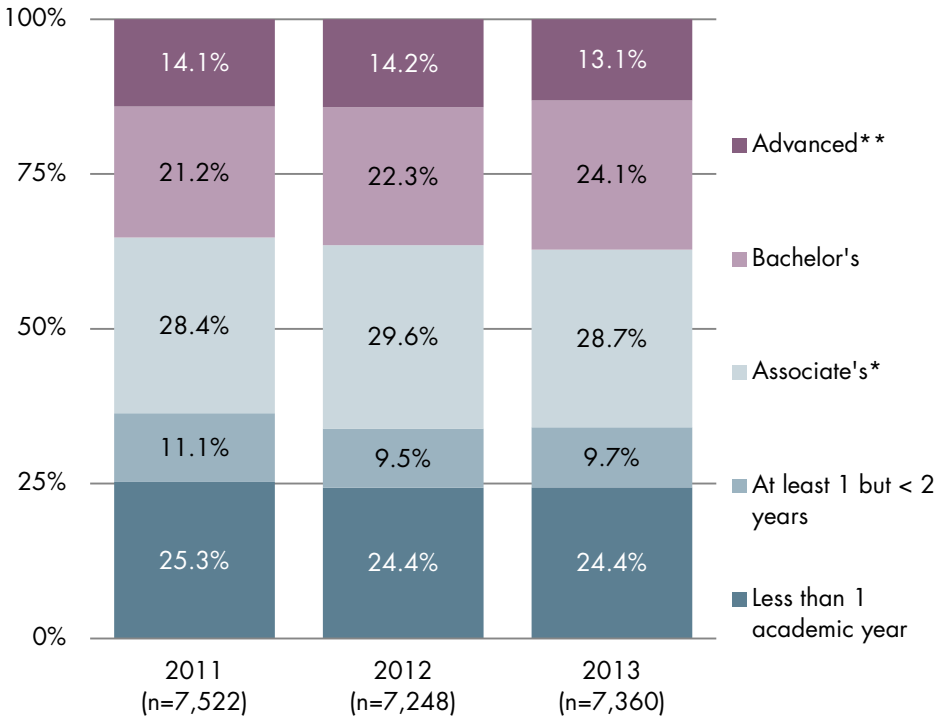
The list included 12 institutions—11 in the CRO Region and 1 in West Columbia. Five institutions are 4-year and seven are 2-year or less. Seven institutions are public.

The 12 institutions included in the analysis conferred an average of **more than 7,300 for-credit awards annually** during the three-year period analyzed. Midland Technical College awards, on average, 2,000 degrees each year. Georgia Regents University awards just under 2,000, and Augusta Technical College awards about 1,300. These three institutions account for just over 70 percent of the region's completions.

Just over one-third of the awards were issued at the four-year level or above (Figure 30). Slightly less than 30 percent were associate's degrees, and about one-third of the awards were less than two-year certificates and awards.

FIGURE 30. COMPLETIONS BY YEAR, INSTITUTION, AND AWARD LEVEL

UNIT ID	INSTITUTION	2011	2012	2013	THREE-YEAR AVERAGE
218353	Midlands Technical College	1,914	2,161	1,935	2,003
482149	Georgia Regents University*	1,927	1,870	1,889	1,895
138956	Augusta Technical College	1,577	1,192	1,357	1,375
217615	Aiken Technical College	740	687	678	702
218645	University of South Carolina-Aiken	507	544	552	534
458256	Virginia College-Augusta	240	347	308	298
384360	Georgia Military College-Augusta Campus	209			209
450474	University of Phoenix-Augusta Campus	135	142	215	164
218681	University of South Carolina-Salkehatchie	146	147	172	155
140720	Paine College	98	100	91	96
447917	Augusta School of Massage	29	58	65	51
460826	Miller-Motte Technical College-Augusta**	0	0	98	33
	Total	**7,522**	**7,248**	**7,360**	**7,377**

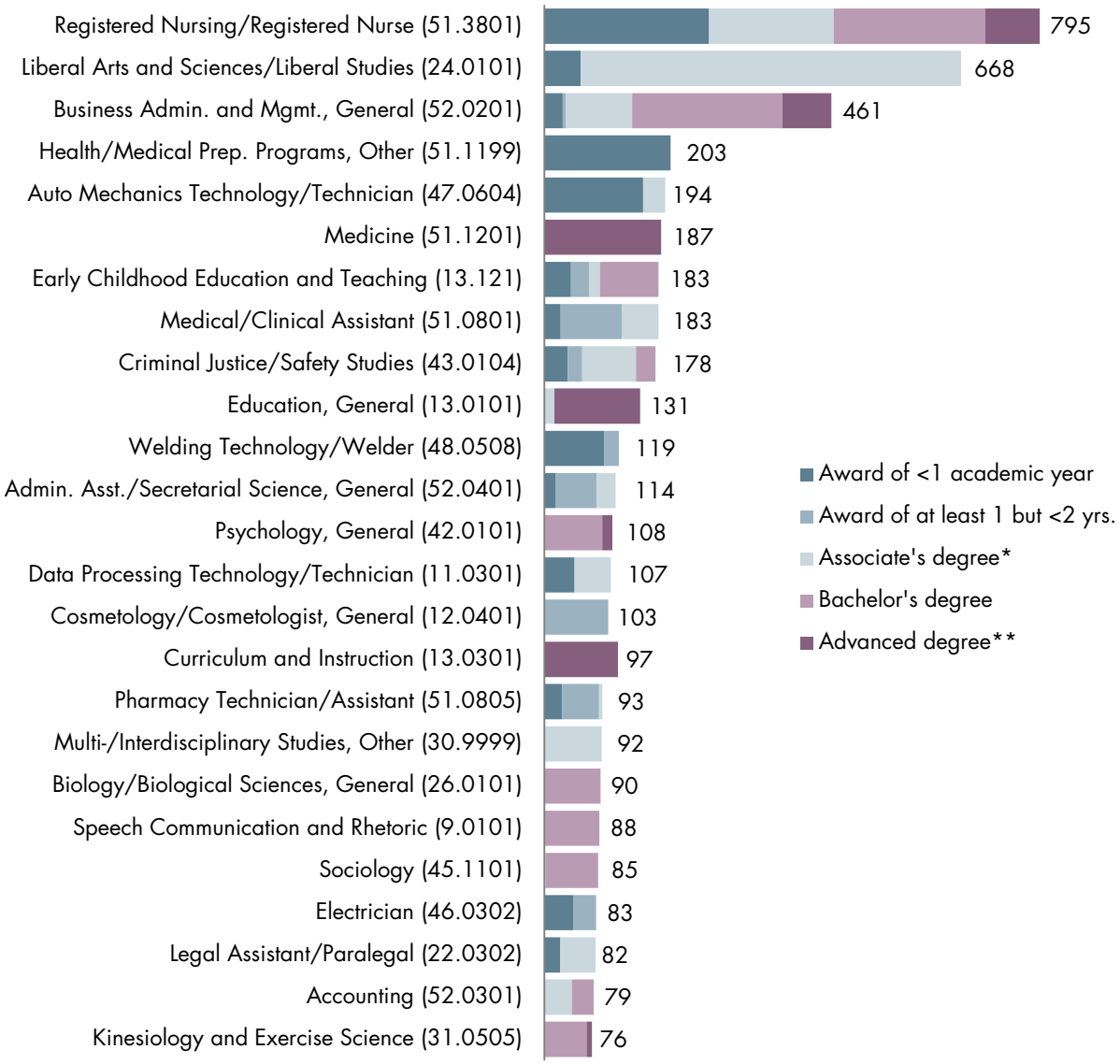


Source: Natl. Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS). Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level.

Figure 31 shows the top 25 fields of study in the region. Registered nursing is the most popular field of study, which aligns well with the highest demand occupation in the healthcare sector. Other popular fields of study that correspond to a high-demand occupation include medicine, education, medical assistant, secretarial science, legal assistant, and accounting. Fields such as business administration and management support a number of different management occupations, many of which are in high-demand.

FIGURE 31. TOP 25 FIELDS OF STUDY BY COMPLETIONS (CIP CODE)

RANKED BY TOTAL NUMBER OF AWARDS



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. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level.

APPENDIX B: INDUSTRY PROFILES

Organizing around industry sectors has proven to be one of the most effective ways to address workforce challenges. The SRSCRO has identified four sectors that are primary economic drivers for the region. Organizing around these sectors will provide the SRSCRO with a mechanism to facilitate employer engagement as well as provide a vehicle for interfacing with the region's workforce training intermediaries, community colleges, school districts, and the many community-based organizations that offer workforce services. This structure can help the region better align its workforce and education assets with industry needs.

The priority sectors identified for this work are:

NUCLEAR

CYBERSECURITY/IT

MANUFACTURING

MEDICAL

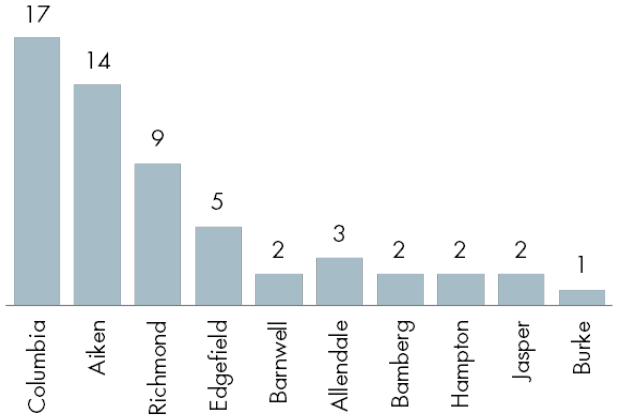
The industry profiles that follow provide a base of knowledge and a common language to support a sector-based approach. Each profile includes a description of how the sector is defined, an overview of employment trends, a list of major employers in the region, key occupations and staffing patterns, demographics (age), regional education and training programs, and regional initiatives and resources.

In addition, real-time labor market information was compiled for each sector and for selected occupations. This labor market information provides insight into the types of job openings that employers are seeking to fill through online recruitment tools. This section documents the top employers posting in the region, the top occupations, the top skills, and the top certifications.

In order to supplement our quantitative analysis, we worked with the SRSCRO and its partners to conduct an online survey of regional employers. The survey asked question about current head count, hiring and training needs, and impressions of the regional workforce.

In all, *57* employers responded to the survey. Almost 70 percent of the responses were from employers in Columbia, Aiken, and Richmond counties.

FIGURE 32. RESPONDENTS BY COUNTY



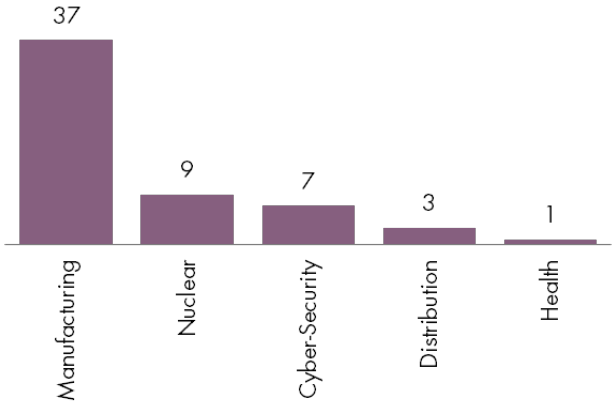
Source: TIP Strategies Employer Survey.

Of the 57 respondents, 37 employers were in the manufacturing sector, nine were in the nuclear sector, seven were in cyber-security, three were related to logistics and distribution, and one was in healthcare.

In all, the respondents employ more than 19,000 full-time employees in the region. In addition, they employ 579 part-time employees, and almost 3,000 contractors.

The results of each sector, where available, are presented in the corresponding industry profile. Results in the healthcare sector are not presented to protect the confidentiality of the single respondent.

FIGURE 33. RESPONDENTS BY COUNTY & HEAD COUNT



Industry	Full-Time	Part-Time	Contract
Nuclear	10,056	229	822
Manufacturing	7,363	122	1,686
Cyber-Security	560		200
Distribution	220	3	35
Healthcare	843	225	205
Total	**19,042**	**579**	**2,948**

Source: TIP Strategies Employer Survey.

NUCLEAR

OVERVIEW. The nuclear industry plays an important role in the region surrounding the Savannah River Site (SRS). Employers in the industry reported employing 10,056 full-time employees, 822 contractors, and 229 part-time employees.

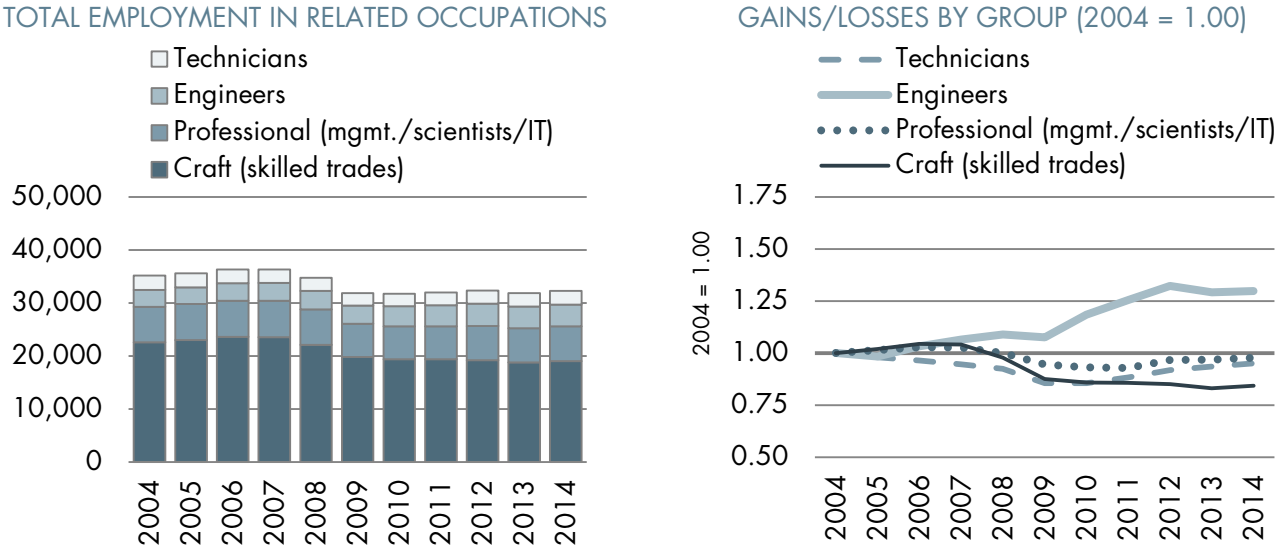
However, industry classification systems do not adequately capture nuclear-related activities, making it difficult to document employment in the sector. Studies conducted by Booz Allen Hamilton for the SRSCRO have helped define the workforce needs for the industry along four categories: professional, engineers, technicians, and craft workers. In the absence of specific industry data, these occupational categories were used in this analysis. Figures do not represent workers in the nuclear industry, but rather provide a sense of the workforce that is available to support the sector.

FIGURE 34. SELECTED EMPLOYERS - NUCLEAR

Company
CB&I AREVA MOX Services
Department of Energy – Environmental Management – Savannah River Operations Office
Department of Energy – National Nuclear Security Administration
EnergySolutions
Parsons
Savannah River Nuclear Solutions
Savannah River Remediation
Southern Nuclear Company

Source: SRSCRO, TIP Strategies research.

FIGURE 35. EMPLOYMENT TRENDS, 2004 TO 2014 - NUCLEAR *(OCCUPATION-BASED)*



Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

NUCLEAR *(CONTINUED)*

KEY OCCUPATIONS. Figure 36 provides an overview of the occupations that support the regional nuclear industry. In the professional category, the region has a high concentration of production clerks and nuclear power reactor operators in comparison to the nation. Industrial production managers is the only occupation in which the median hourly earnings is more than ten percent above the national median. In the technicians category, the region has a high concentration of inspectors, environmental engineering technicians, and nuclear technicians. Chemical technicians, environmental engineering technicians, and control/valve installation and repairers are occupations in which the median hourly earnings is more than ten percent of the US median.

FIGURE 36. SHARE OF EMPLOYMENT IN SELECTED INDUSTRIES – NUCLEAR OCCUPATIONS

INCLUDES 2014 LOCATION QUOTIENT (LQ) AND WAGE RATE COMPARISON RELATIVE TO US

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	2014 Emp. LQ (US = 1.00)	Median Hourly Earnings	Relative to US (US=1.00)	Share of employment in: Nuclear Power Gen. NAICS 221113	Heavy Construction NAICS 2371	Misc. Fab. Metal NAICS 3329	Fed. Govt., Civilian NAICS 9011
PROFESSIONAL										
	49-1011	First-Line Supvsr., Mechanics, Install, & Repair	1,320	1.23	$26.10	0.89	2.3%	1.9%	0.2%	-
	13-1111	Management Analysts	1,245	0.70	$30.58	0.84	0.8%	-	0.1%	1.9%
	43-5061	Production, Planning, & Expediting Clerks	909	1.29	$20.68	0.96	0.3%	0.1%	0.6%	-
	11-9021	Construction Managers	750	0.85	$27.25	0.88	0.1%	1.7%	-	-
	13-1151	Training & Development Specialists	479	0.85	$24.22	0.88	0.4%	-	0.1%	-
★	11-3051	Industrial Production Managers	432	1.06	$49.16	1.14 ●	0.5%	-	1.3%	-
	15-1152	Computer Network Support Specialists	307	0.71	$29.97	1.04	0.1%	0.1%	-	-
	17-2072	Electronics Engineers, Except Computer	295	0.88	$44.02	0.97	0.1%	0.1%	-	1.1%
	15-1133	Software Developers, Systems Software	294	0.31	$31.82	0.66 ×	0.1%	-	-	-
	29-9011	Occupational Health & Safety Specialists	163	1.05	$28.14	0.86	0.3%	0.1%	0.1%	-
	17-3026	Industrial Engineering Technicians	107	0.65	$21.28	0.85	-	-	0.3%	-
	19-2031	Chemists	104	0.49	$34.29	0.99	0.1%	-	-	-
	51-8011	Nuclear Power Reactor Operators	84	4.44	$35.74	0.95	2.3%	-	-	-
	11-9161	Emergency Management Directors	23	0.98	$25.48	0.84	-	-	-	-
	19-2012	Physicists	17	0.39	$47.97	0.91	-	-	-	-
TECHNICIANS										
	51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,580	1.33	$16.23	0.96	0.5%	0.1%	7.0%	-
	17-3023	Electrical & Electronics Eng. Technicians	291	0.84	$29.26	1.04	0.9%	-	0.1%	-
★	19-4031	Chemical Technicians	190	1.21	$23.51	1.13 ●	0.2%	-	0.1%	-
	17-3013	Mechanical Drafters	176	1.12	$21.53	0.87	-	-	0.5%	-
	17-3025	Environmental Engineering Techs.	103	2.36	$28.87	1.30 ●	0.1%	-	-	-
	17-3029	Engineering Techs., Except Drafters, All Other	96	0.58	$30.40	1.05	0.1%	-	0.1%	-
	49-9012	Control/Valve Install. & Repair, Except Mech.Door	95	0.96	$28.69	1.13 ●	2.2%	0.2%	0.2%	-
	19-4051	Nuclear Technicians	39	2.43	$35.90	1.03	1.1%	-	-	-

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. LQs greater than 1.25 are highlighted, as are wage rates above the regional average ($17.96). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (×).

Continued next page

NUCLEAR *(CONTINUED)*

In the engineering category, the region has a high concentration of civil, mechanical, nuclear, and health and safety engineers. Only mechanical engineers earn a wage premium more than ten percent over the US median. In the craft and skill trade category, the region has a high concentration of sheet metal workers, structural metal workers, insulation workers, millwrights, reinforcing iron workers, and boilermakers. Only structural iron metal workers earn a wage premium of more than ten percent.

FIGURE 36. SHARE OF EMPLOYMENT IN SELECTED INDUSTRIES – NUCLEAR OCCUPATIONS (CONT.)

INCLUDES 2014 LOCATION QUOTIENT (LQ) AND WAGE RATE COMPARISON RELATIVE TO US

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	2014 Emp. LQ (US = 1.00)	Median Hourly Earnings	Relative to US (US=1.00)	Share of employment in: Nuclear Power Gen. NAICS 221113	Heavy Construction NAICS 2371	Misc. Fab. Metal NAICS 3329	Fed. Govt., Civilian NAICS 9011
ENGINEERS										
★	17-2051	Civil Engineers	1,617	2.38	$40.41	1.05	1.2%	0.5%	0.2%	-
★	17-2141	Mechanical Engineers	1,178	1.84	$45.17	1.15 ●	0.9%	-	5.4%	0.6%
★	17-2071	Electrical Engineers	498	1.20	$37.30	0.87	4.9%	0.3%	0.3%	-
★	17-2081	Environmental Engineers	308	2.35	$35.42	0.90	0.4%	-	0.1%	-
★	17-2161	Nuclear Engineers	249	5.55	$41.37	0.87	9.7%	-	0.4%	-
★	17-2111	Health & Safety Eng., Except Mine Safety	147	2.52	$39.90	1.05	0.1%	0.5%	0.1%	-
	17-2041	Chemical Engineers	72	0.87	$38.14	0.83	0.1%	-	-	-
	17-2131	Materials Engineers	37	0.63	$38.15	0.91	-	-	0.1%	-
	17-2061	Computer Hardware Engineers	35	0.18	$44.14	0.89	-	-	-	-
CRAFT/SKILLED TRADES										
★	53-3032	Heavy & Tractor-Trailer Truck Drivers	4,593	1.04	$18.32	1.00	-	1.9%	0.1%	-
	47-2061	Construction Laborers	3,618	1.22	$12.93	0.91	0.2%	25.0%	0.1%	-
★	47-2031	Carpenters	2,728	1.12	$18.92	1.09	0.1%	2.4%	0.1%	-
	47-2111	Electricians	1,465	0.97	$18.17	0.78 ×	1.4%	3.1%	0.4%	-
	53-7051	Industrial Truck & Tractor Operators	1,406	1.12	$12.92	0.87	0.1%	0.3%	0.3%	-
	47-2152	Plumbers, Pipefitters, & Steamfitters	1,015	1.02	$17.86	0.77 ×	0.1%	1.9%	0.1%	-
	51-4121	Welders, Cutters, Solderers, & Brazers	936	1.01	$17.57	1.00	0.2%	1.7%	3.0%	-
★	47-2073	Operating Eng. & Other Constr. Equip. Operators	829	0.93	$16.69	0.82	0.1%	9.0%	-	-
	51-4041	Machinists	653	0.67	$17.99	0.95	0.1%	-	4.4%	-
	47-2211	Sheet Metal Workers	513	1.46	$21.18	1.01	-	-	0.8%	-
★	47-2221	Structural Iron & Steel Workers	370	2.46	$25.48	1.16 ●	-	1.6%	0.1%	-
	47-2051	Cement Masons & Concrete Finishers	344	0.91	$16.47	0.95	-	0.7%	-	-
	47-2132	Insulation Workers, Mechanical	173	2.35	$14.60	0.75 ×	-	0.4%	-	-
	49-9044	Millwrights	149	1.53	$22.11	0.92	-	0.2%	0.1%	-
	47-2131	Insulation Workers, Floor, Ceiling, & Wall	101	1.61	$15.67	1.00	-	-	-	-
	47-2171	Reinforcing Iron & Rebar Workers	88	1.99	$24.56	1.00	-	0.1%	-	-
	47-2011	Boilermakers	65	1.64	$24.53	0.88	-	0.5%	0.1%	-
	49-9096	Riggers	29	0.64	$19.69	0.97	-	0.1%	-	-

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. LQs greater than 1.25 are highlighted, as are wage rates above the regional average ($17.96). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (×).

NUCLEAR *(CONTINUED)*

DEMAND. Figure 37 details occupational demand and selected demographic characteristics for each of the key occupations that support the nuclear sector.

In the professional category, first-line supervisors, management analysts, and production clerks are the occupations with the largest number of projected openings. In the technicians category, inspectors, electrical technicians, and chemical technicians are the occupations with the largest number of projected openings. Physicists, emergency management directors, and nuclear technicians are the occupations with the largest share of workers 65 and older.

FIGURE 37. DEMAND FACTORS & DEMOGRAPHICS – NUCLEAR OCCUPATIONS

INCLUDES ESTIMATED ANNUAL OPENINGS, 2014 TO 2019

				Demand Factors		Demographics		
HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	Annual Openings (2014-19)	New jobs	Replacement	% 55+ Years	% 65+ Years	% Male
PROFESSIONAL									
	49-1011	First-Line Supvsr., Mechanics, Install, & Repair	1,320	54	29%	71%	27% ◀	3%	94%
	13-1111	Management Analysts	1,245	38	45%	55%	31% ◀	9% ◀	57%
	43-5061	Production, Planning, & Expediting Clerks	909	30	19%	81%	22%	3%	48%
	11-9021	Construction Managers	750	19	-	100%	26% ◀	6% ◀	92%
	13-1151	Training & Development Specialists	479	19	50%	50%	20%	3%	33%
★	11-3051	Industrial Production Managers	432	10	-	100%	23%	1%	87%
	15-1152	Computer Network Support Specialists	307	9	41%	59%	13%	2%	70%
	17-2072	Electronics Engineers, Except Computer	295	11	27%	73%	24%	4%	92%
	15-1133	Software Developers, Systems Software	294	13	67%	33%	12%	2%	79%
	29-9011	Occupational Health & Safety Specialists	163	6	19%	81%	26% ◀	3%	64%
	17-3026	Industrial Engineering Technicians	107	3	-	100%	25% ◀	5% ◀	82%
	19-2031	Chemists	104	4	18%	82%	26% ◀	5% ◀	66%
	51-8011	Nuclear Power Reactor Operators	84	6	53%	47%	30% ◀	6% ◀	88%
	11-9161	Emergency Management Directors	23	-	-	-	43% ◀	21% ◀	52%
	19-2012	Physicists	17	-	-	-	59% ◀	29% ◀	82%
TECHNICIANS									
	51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,580	47	12%	88%	26% ◀	4%	58%
	17-3023	Electrical & Electronics Eng. Technicians	291	10	34%	66%	24%	2%	83%
★	19-4031	Chemical Technicians	190	6	5%	95%	28% ◀	3%	68%
	17-3013	Mechanical Drafters	176	4	-	100%	21%	3%	84%
	17-3025	Environmental Engineering Techs.	103	3	-	100%	35% ◀	5% ◀	85%
	17-3029	Engineering Techs., Except Drafters, All Other	96	3	25%	75%	26% ◀	5% ◀	83%
	49-9012	Control/Valve Install. & Repair, Except Mech.Door	95	6	44%	56%	31% ◀	5% ◀	92%
	19-4051	Nuclear Technicians	39	3	36%	64%	25% ◀	13% ◀	67%

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. 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+).

Continued next page

NUCLEAR *(CONTINUED)*

In the engineers category, civil, mechanical, and electrical engineers are the occupations with the highest number of openings. In the skilled trades category, truck drivers, construction laborers, and carpenters are the occupations with the highest number of openings. Riggers, computer hardware engineers, and materials engineers are the occupations with the largest share of workers who are 65 and older.

FIGURE 6. DEMAND FACTORS & DEMOGRAPHICS – NUCLEAR OCCUPATIONS (CONT.)

INCLUDES ESTIMATED ANNUAL OPENINGS, 2014 TO 2019

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	Annual Openings (2014-19)	Demand Factors: New jobs	Demand Factors: Replacement	Demographics: % 55+ Years	Demographics: % 65+ Years	Demographics: % Male
ENGINEERS									
★	17-2051	Civil Engineers	1,617	81	47%	53%	32% ◀	7% ◀	88%
★	17-2141	Mechanical Engineers	1,178	52	17%	83%	24%	4%	94%
★	17-2071	Electrical Engineers	498	27	54%	46%	28% ◀	4%	92%
★	17-2081	Environmental Engineers	308	9	-	100%	27% ◀	2%	76%
★	17-2161	Nuclear Engineers	249	11	31%	69%	30% ◀	4%	85%
★	17-2111	Health & Safety Eng., Except Mine Safety	147	5	-	100%	32% ◀	3%	82%
	17-2041	Chemical Engineers	72	3	35%	65%	30% ◀	7% ◀	89%
	17-2131	Materials Engineers	37	-	-	-	27% ◀	13% ◀	89%
	17-2061	Computer Hardware Engineers	35	2	54%	46%	29% ◀	14% ◀	86%
CRAFT/SKILLED TRADES									
★	53-3032	Heavy & Tractor-Trailer Truck Drivers	4,593	107	12%	88%	27% ◀	6% ◀	96%
	47-2061	Construction Laborers	3,618	85	-	100%	15%	3%	96%
★	47-2031	Carpenters	2,728	52	-	100%	19%	3%	98%
	47-2111	Electricians	1,465	30	-	100%	18%	3%	97%
	53-7051	Industrial Truck & Tractor Operators	1,406	50	11%	89%	15%	2%	92%
	47-2152	Plumbers, Pipefitters, & Steamfitters	1,015	60	65%	35%	15%	3%	98%
	51-4121	Welders, Cutters, Solderers, & Brazers	936	27	-	100%	18%	2%	95%
★	47-2073	Operating Eng. & Other Constr. Equip. Operators	829	24	1%	99%	26% ◀	6% ◀	97%
	51-4041	Machinists	653	25	37%	63%	26% ◀	5% ◀	95%
	47-2211	Sheet Metal Workers	513	24	48%	52%	15%	2%	97%
★	47-2221	Structural Iron & Steel Workers	370	16	-	100%	20%	1%	97%
	47-2051	Cement Masons & Concrete Finishers	344	5	-	100%	14%	1%	98%
	47-2132	Insulation Workers, Mechanical	173	7	43%	57%	13%	3%	94%
	49-9044	Millwrights	149	5	42%	58%	33% ◀	3%	97%
	47-2131	Insulation Workers, Floor, Ceiling, & Wall	101	-	-	-	18%	5% ◀	94%
	47-2171	Reinforcing Iron & Rebar Workers	88	2	-	100%	11%	6% ◀	99%
	47-2011	Boilermakers	65	3	-	100%	28% ◀	8% ◀	97%
	49-9096	Riggers	29	-	-	-	35% ◀	17% ◀	97%

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

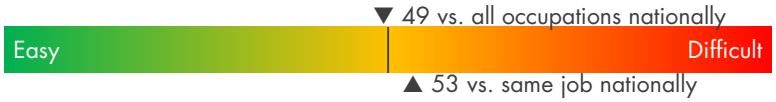
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. Annual openings are an estimate of job openings due to net change in employment and replacement needs (e.g., turnover, retirement). ◀ Indicates significant share of workforce is reaching retirement age (defined here as ≥25% age 55+ and/or ≥ 5% age 65+).

NUCLEAR *(CONTINUED)*

REAL-TIME LABOR MARKET INFORMATION. Figure 38 shows a summary of online job postings in the region. Currently, there are 193 unique job postings for the nuclear industry posted by 45 employers. The vast majority are for engineering jobs in Aiken County. The average salary posted is 90 percent of the US average. Quality assurance and control, instrumentation, software design, and technical support are the most common skills.

FIGURE 38. SUMMARY FOR JOB POSTINGS THAT INCLUDE "NUCLEAR"

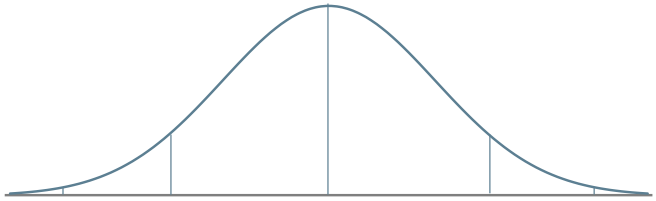
HIRING SCALE



OPENINGS

Current job openings:	193
Direct employers competing:	45
Average posting duration (in days):	54

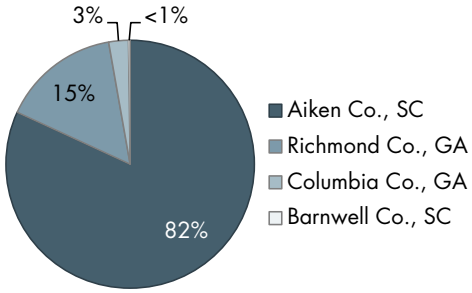
SALARY RANGE



Percentile	10th	25th	50th	75th	90th
Local	$44,300	$58,600	**$74,450**	$90,300	$104,600
National	$46,600	$63,650	**$82,650**	$101,650	$118,700
US=1.00	0.95	0.92	**0.90**	0.89	0.88

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)



TOP 10 COUNTS *(based on 469 postings over the past four months)*

Employers	# postings
AECOM/URS	131
CBI	61
AREVA	33
Weirich Consulting Services, Inc.	21
CBIZ Inc.	19
Energy Solutions	19
Globalpundits Inc/Technology Consultants	19
Department of Energy/Savannah River	14
Army/Army Med. Command/Army Natl. Guard	10
Southern Company	10

Occupations *(SOC-code based)*		# postin
17-2112	Industrial Engineers	5
17-2141	Mechanical Engineers	4
17-2051	Civil Engineers	2
17-2081	Environmental Engineers	2
17-2161	Nuclear Engineers	2
17-2071	Electrical Engineers	1
17-2041	Chemical Engineers	1
51-1011	First-Line Sup. of Prod. and Op. Workers	1
13-1199	Bus. Operations Specialists, All Other	1
17-2111	H&S Engineers, Ex. Mining Safety Eng.	1

Hard Skills	# postings
Quality Assurance	115
Quality control	49
Instrumentation	44
Software design	36
Technical support	28
Process controls	16
FileMaker	16
Software development	15
Preventive maintenance	15
Document control	14

Certifications	# postings
American Society of Mechanical Engineers	39
American National Standards	27
Occupational Safety & Health Admin. Cert.	25
Professional Engineer	19
National Electrical Code	18
Basic Life Support	16
American Concrete Institute	15
National Fire Protection Association Standards	15
American Registry of Radiologic Technologists	13
Driver's License	11

Source: Wanted Analytics; TIP Strategies.

NUCLEAR *(CONTINUED)*

FIGURE 39. REAL-TIME LMI, SELECTED NUCLEAR OCCUPATIONS

17-2051 CIVIL ENGINEERS

HIRING SCALE

▼ 34 vs. all occupations nationally

Easy — Difficult

▲ 7 vs. same job nationally

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$49,100	$65,000	$82,150	$99,300	$115,150
National	$59,150	$70,600	$83,350	$96,100	$107,600
US=1.00	0.83	0.92	0.99	1.03	1.07

OPENINGS

Current job openings:	22
Direct employers competing:	12
Average posting duration (in days):	53

TOP SKILLS

Inspect buildings | Quality assurance | Structural Eng. | Computer-aided design (CAD)/3-D CAD| Technical support | Bentley Microstation | Instrumentation | Non-conformances | Data reduction | Environmental consulting

17-2081 ENVIRONMENTAL ENGINEERS

HIRING SCALE

▼ 49 vs. all occupations nationally

Easy — Difficult

—insufficient data to calculate local hiring scale

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$61,650	$69,200	$77,300	$85,400	$92,950
National	$56,600	$68,950	$82,600	$96,300	$108,600
US=1.00	1.09	1.00	0.94	0.89	0.86

OPENINGS

Current job openings:	19
Direct employers competing:	—
Average posting duration (in days):	45

TOP SKILLS

Bechtel Software SETROUTE | Equip. maint. | C sharp | Bentley Microstation | System development | ESRI ArcGIS/ArcGIS Geostatistical Analyst | Technical support | MS Access| C/C++

17-2161 NUCLEAR ENGINEERS

HIRING SCALE

▼ 48 vs. all occupations nationally

Easy — Difficult

▲ 56 vs. same job nationally

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$98,300	$102,550	$106,850	$111,150	$115,400
National	$90,050	$97,550	$105,850	$114,150	$121,650
US=1.00	1.09	1.05	1.01	0.97	0.95

OPENINGS

Current job openings:	7
Direct employers competing:	4
Average posting duration (in days):	41

TOP SKILLS

Technical support | Quality assurance | Risk assessment | Software design | Hazard assessment | Probabilistic risk assessment software | Preventive maintenance | Performance testing | Instrumentation | Failure rate database

17-2071 ELECTRICAL ENGINEERS

HIRING SCALE

63 vs. all occupations nationally ▼

Easy — Difficult

74 vs. same job nationally ▲

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$69,750	$74,700	$80,100	$85,500	$90,500
National	$64,100	$73,800	$84,600	$95,350	$105,100
US=1.00	1.09	1.01	0.95	0.90	0.86

OPENINGS

Current job openings:	25
Direct employers competing:	15
Average posting duration (in days):	50

TOP SKILLS

Instrumentation | Process controls | Technical support | Electrical systems | Computer aided design (CAD)\Autodesk AutoCAD | Good Manufacturing Practice | Power system modeling | Quality assurance | Bentley Microstation | Lean mfg.

Source: Wanted Analytics; TIP Strategies.

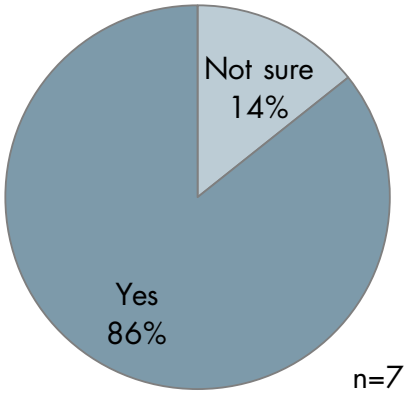
NUCLEAR *(CONTINUED)*

Seven nuclear employers participated in the survey. Of those participants, 86 percent plan to hire additional employees over the next two years. These employers estimated that they will add almost 800 workers. The majority of these workers (67 percent) will be in professional and skilled craft occupations.

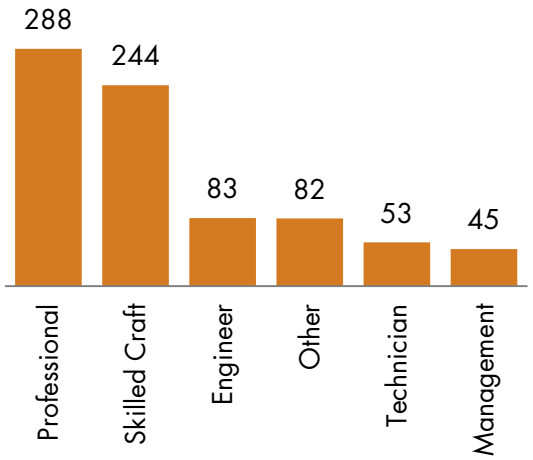
Respondents indicated that most positions take between one and three months to fill. Management and engineering positions take four to six months for some employers.

FIGURE 40. FINDINGS FROM EMPLOYER SURVEY – NUCLEAR FIRMS

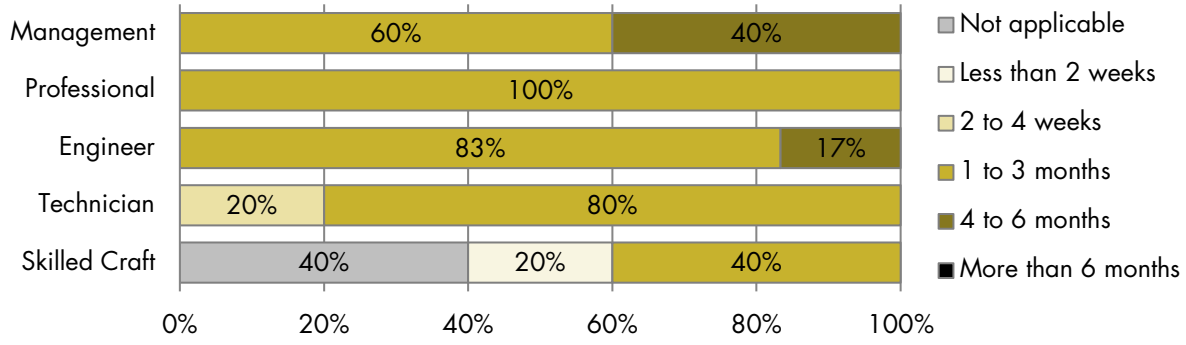
OVER THE NEXT 2 YEARS, DO YOU PLAN TO HIRE ADDITIONAL EMPLOYEES WITHIN THE CRO REGION?



APPROXIMATELY HOW MANY WORKERS DO YOU PLAN TO ADD IN EACH OF THE FOLLOWING CATEGORIES?



APPROXIMATELY HOW LONG DOES IT TYPICALLY TAKE TO FILL A VACANCY FOR EACH OF THE FOLLOWING CLASSIFICATIONS OF WORKERS?



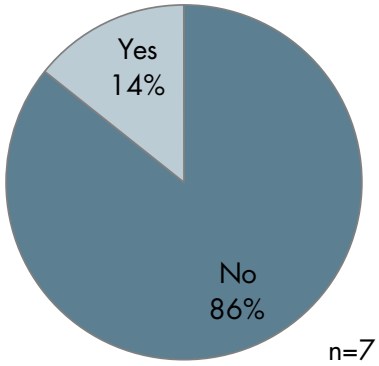
NUCLEAR *(CONTINUED)*

FIGURE 41. FINDINGS FROM EMPLOYER SURVEY—NUCLEAR FIRMS

Few respondents had positions that they could not fill. Though many employers reported that there were occupations and skills that are difficult to find, there was little agreement about which ones. Engineers were cited as difficult to fill for four employers, and information technology was reported difficult to find for three employers. Quality assurance expertise was cited as difficult to find by two respondents.

Overall, nuclear employers rate the regional workforce as fair to good. The reliability of the workforce was ranked highest. The math skills of the workforce received mixed ratings. Job readiness, trainability, and computer skills were ranked lowest.

ARE THERE SPECIFIC OCCUPATIONS WHICH YOU HAVE BEEN UNABLE TO FILL AT ALL?



Information System Security Officer

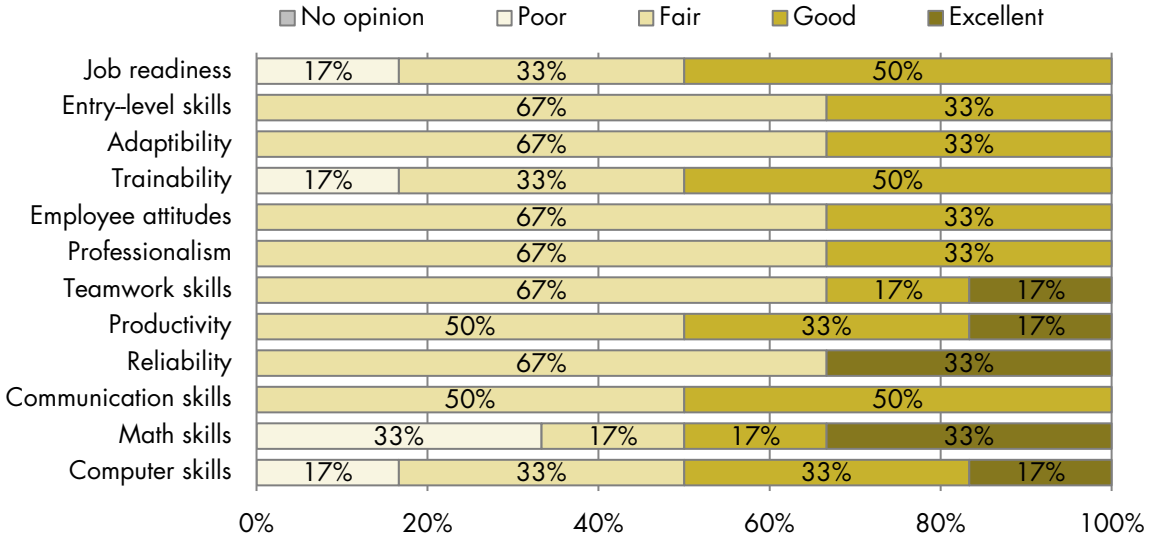
WHICH OCCUPATIONS ARE DIFFICULT TO RECRUIT IN YOUR INDUSTRY?

Construction Field Engineers/Planners
Cyber Security Specialists
Engineers (4) - Civil, Electrical
Fire Protection Engineers
Scientists
System Operators
Training Instructors
Welders
Welding Engineers

WHICH SKILLS ARE DIFFICULT TO FIND IN YOUR INDUSTRY?

Contracting
Engineering
Fire Protection Specialists
Human Resources
Information Technology (3)
Nuclear Criticality Specialists
Soft Skills in Entry Level Positons
Piping Design
Planners
Qual. Assurance (2) - NQA-1 Expertise

HOW WOULD YOU RATE THE REGIONAL WORKFORCE OVERALL ON THE FOLLOWING CHARACTERISTICS?



NUCLEAR *(CONTINUED)*

EDUCATION & TRAINING. Figure 42 and Figure 43 show the wages, the typical requirements for entry into specific occupations, and the for-credit completions from regional postsecondary institutions in fields of study relevant to the nuclear industry's key occupations.

Occupations that support the nuclear industry are, for the most part, relatively high-wage occupations with even the bottom 10th percentile making hourly earnings more than the regional median of $17.96.

Almost all of the occupations are considered to be middle- or high-skill occupations. Middle-skill occupations are those that require a high school diploma and some training but less than a bachelor's degree. High-skill occupations require a bachelor's degree or higher. Even those jobs that do not require a high school diploma require short to moderate-term on-the-job training or apprenticeships.

FIGURE 42. EDUCATION & TRAINING REQUIREMENTS – NUCLEAR OCCUPATIONS

WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

HDO	SOC Code	Description	Hourly Earnings (percentiles) 10th	50th	90th	Typical Requirements for Entry into Occupation: Education	Experience	Training Required For Competency
PROFESSIONAL								
	49-1011	First-Line Supvsr., Mechanics, Install, & Repair	$16.36	$26.10	$41.07	HS or equivalent	< 5 years	None
	13-1111	Management Analysts	$18.29	$30.58	$49.67	Bachelor's	< 5 years	None
	43-5061	Production, Planning, & Expediting Clerks	$12.89	$20.68	$35.04	HS or equivalent	None	Moderate-term OJT
	11-9021	Construction Managers	$19.14	$27.25	$40.08	Bachelor's	None	Moderate-term OJT
	13-1151	Training & Development Specialists	$15.00	$24.22	$40.55	Bachelor's	< 5 years	None
★	11-3051	Industrial Production Managers	$30.05	$49.16	$84.21	Bachelor's	5+ years	None
	15-1152	Computer Network Support Specialists	$17.93	$29.97	$44.54	Associate's	None	None
	17-2072	Electronics Engineers, Except Computer	$29.53	$44.02	$65.36	Bachelor's	None	None
	15-1133	Software Developers, Systems Software	$19.14	$31.82	$48.57	Bachelor's	None	None
	29-9011	Occupational Health & Safety Specialists	$18.42	$28.14	$44.88	Bachelor's	None	Short-term OJT
	17-3026	Industrial Engineering Technicians	$15.44	$21.28	$29.52	Associate's	None	None
	19-2031	Chemists	$20.59	$34.29	$49.12	Bachelor's	None	None
	51-8011	Nuclear Power Reactor Operators	$26.38	$35.74	$45.45	HS or equivalent	None	Long-term OJT
	11-9161	Emergency Management Directors	$16.84	$25.48	$42.19	Bachelor's	5+ years	None
	19-2012	Physicists	$34.84	$47.97	$63.92	Advanced degree	None	None
TECHNICIANS								
	51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	$10.30	$16.23	$24.56	HS or equivalent	None	Moderate-term OJT
	17-3023	Electrical & Electronics Eng. Technicians	$17.99	$29.26	$39.29	Associate's	None	None
★	19-4031	Chemical Technicians	$15.79	$23.51	$33.05	Associate's	None	Moderate-term OJT
	17-3013	Mechanical Drafters	$15.82	$21.53	$34.75	Associate's	None	None
	17-3025	Environmental Engineering Techs.	$15.28	$28.87	$42.23	Associate's	None	None
	17-3029	Engineering Techs., Except Drafters, All Other	$16.37	$30.40	$41.82	Associate's	None	None
	49-9012	Control/Valve Install. & Repair, Except Mech.Door	$13.56	$28.69	$38.50	HS or equivalent	None	Moderate-term OJT
	19-4051	Nuclear Technicians	$27.27	$35.90	$43.07	Associate's	None	Moderate-term OJT

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

Continued next page

NUCLEAR *(CONTINUED)*

FIGURE 42. EDUCATION & TRAINING REQUIREMENTS – NUCLEAR OCCUPATIONS (CONT.)

WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

HDO	SOC Code	Description	Hourly Earnings (percentiles) 10th	50th	90th	Typical Requirements for Entry into Occupation: Education	Experience	Training Required For Competency
ENGINEERS								
★	17-2051	Civil Engineers	$22.92	$40.41	$65.75	Bachelor's	None	None
★	17-2141	Mechanical Engineers	$27.56	$45.17	$71.00	Bachelor's	None	None
★	17-2071	Electrical Engineers	$25.97	$37.30	$54.47	Bachelor's	None	None
★	17-2081	Environmental Engineers	$22.99	$35.42	$57.81	Bachelor's	None	None
★	17-2161	Nuclear Engineers	$32.52	$41.37	$54.42	Bachelor's	None	None
★	17-2111	Health & Safety Eng., Except Mine Safety	$21.50	$39.90	$65.07	Bachelor's	None	None
	17-2041	Chemical Engineers	$27.13	$38.14	$55.14	Bachelor's	None	None
	17-2131	Materials Engineers	$20.74	$38.15	$52.55	Bachelor's	None	None
	17-2061	Computer Hardware Engineers	$30.55	$44.14	$61.14	Bachelor's	None	None
CRAFT/SKILLED TRADES								
★	53-3032	Heavy & Tractor-Trailer Truck Drivers	$12.25	$18.32	$28.59	Non-degree award	None	Short-term OJT
	47-2061	Construction Laborers	$9.30	$12.93	$18.96	Less than HS	None	Short-term OJT
★	47-2031	Carpenters	$12.68	$18.92	$28.01	HS or equivalent	None	Apprenticeship
	47-2111	Electricians	$11.88	$18.17	$27.03	HS or equivalent	None	Apprenticeship
	53-7051	Industrial Truck & Tractor Operators	$8.87	$12.92	$19.71	Less than HS	None	Short-term OJT
	47-2152	Plumbers, Pipefitters, & Steamfitters	$11.91	$17.86	$27.45	HS or equivalent	None	Apprenticeship
	51-4121	Welders, Cutters, Solderers, & Brazers	$12.80	$17.57	$25.50	HS or equivalent	None	Moderate-term OJT
★	47-2073	Operating Eng. & Other Constr. Equip. Operators	$12.18	$16.69	$27.28	HS or equivalent	None	Moderate-term OJT
	51-4041	Machinists	$10.73	$17.99	$26.46	HS or equivalent	None	Long-term OJT
	47-2211	Sheet Metal Workers	$12.28	$21.18	$29.42	HS or equivalent	None	Apprenticeship
★	47-2221	Structural Iron & Steel Workers	$18.19	$25.48	$36.19	HS or equivalent	None	Apprenticeship
	47-2051	Cement Masons & Concrete Finishers	$11.91	$16.47	$25.18	Less than HS	None	Moderate-term OJT
	47-2132	Insulation Workers, Mechanical	$10.48	$14.60	$20.88	HS or equivalent	None	Apprenticeship
	49-9044	Millwrights	$15.09	$22.11	$31.65	HS or equivalent	None	Apprenticeship
	47-2131	Insulation Workers, Floor, Ceiling, & Wall	$9.46	$15.67	$25.01	Less than HS	None	Short-term OJT
	47-2171	Reinforcing Iron & Rebar Workers	$17.70	$24.56	$35.62	HS or equivalent	None	Apprenticeship
	47-2011	Boilermakers	$16.41	$24.53	$35.26	HS or equivalent	None	Apprenticeship
	49-9096	Riggers	$11.66	$19.69	$28.98	HS or equivalent	None	Short-term OJT

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

NUCLEAR *(CONTINUED)*

FIGURE 43. RELEVANT COMPLETIONS – NUCLEAR OCCUPATIONS

THREE-YEAR ANNUAL AVERAGE OF DEGREES/AWARDS CONFERRED, 2011-2013

CIP Code	Field of Study	Degrees/awards by level: Certificate (< 1 year)	Certificate (≥1 yr., < 2 yrs.)	Associate's*	Bachelor's	Advanced**	Annual average degrees/awards conferred (all levels)
PROFESSIONAL							
52.0201	Business Administration and Management, General	29	5	106	241	79	461
11.0901	Computer Systems Networking/Telecomm.	16		11			27
11.1001	Network and System Administration/Administrator	31		9	1		41
40.0501	Chemistry, General				18		18
52.0101	Business/Commerce, General	18					18
11.0201	Computer Programming/Programmer, General	8		9			18
41.0205	Nuclear/Nuclear Power Technology/Technician	16					16
11.0202	Computer Programming, Specific Applications	8					8
15.1001	Construction Engineering Technology/Technician			8			8
11.0103	Information Technology			6			6
40.0801	Physics, General				3		3
43.0301	Homeland Security			2			2
52.1001	General			2	1		3
52.0205	Operations Management and Supervision			1	1		2
ENGINEERS							
14.0102	Pre-Engineering***	6					6
TECHNICIAN							
15.0303	Electrical/Electronic and Comm. Engineering Tech.	18		24			42
15.1401	Nuclear Engineering Technology/Technician			27			27
51.0916	Radiation Protection/Health Physics Technician	6		17			23
15.0101	Architectural Engineering Technology/Technician	12		10			22
41.0205	Nuclear/Nuclear Power Technology/Technician	16					16
15.1302	CAD/CADD Drafting and/or Design Tech.		5				5
15.0615	Chemical Engineering Technology/Technician	5					5
41.0301	Chemical Technology/Technician	3	1				4
15.1306	Mechanical Drafting and CAD/CADD	2					2
CRAFT							
48.0508	Welding Technology/Welder	96	23				119
46.0302	Electrician	47	36				83
47.0303	Industrial Mechanics and Maintenance Technology	15	18	19			52
48.0501	Machine Tool Technology/Machinist	4	2	6			12
48.0503	Machine Shop Technology/Assistant	8	2				10
46.0201	Carpentry/Carpenter	1					1

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys; National Crosswalk Service Center; TIP Strategies. IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level. ***No engineering related completions were reported by the analyzed schools, except a small number of Pre-Engineering (CIP 14.0102) awards at Aiken Technical College.

NUCLEAR *(CONTINUED)*

SELECTED INITIATIVES & RESOURCES. The following resources were identified that could support the sector.

Nuclear Workforce Initiative (NWI®). The NWI was established in response to a 2009 survey of nuclear employers that identified the industry's growing need for new workers. Recognizing the importance of the industry to the region, the initiative brings together the region's private and government employers, educational institutions, and economic development entities. The initiative's purpose is to ensure there is an adequately trained workforce to meet the demands of the industry. This is achieved by facilitating collaboration between NWI partners that foster regional educational attainment, economic growth, and job opportunities. The NWI's goals include promoting nuclear and STEM career paths; aligning educational and training entity curricula and certification requirements to the job skill needs of nuclear employers; and advancing the mission of the initiative through outreach and collaborations at the regional and national level.

American Nuclear Society (ANS), Savannah River Section. The ANS is a not-for-profit, international, scientific, and educational membership organization established to unify the professional activities within the various fields of nuclear science and technology. The core purpose of the ANS Savannah River Section is to promote the awareness and understanding of the application of nuclear science and technology locally (in the Central Savannah River Area (CSRA)), nationally, and globally. Each year the Section awards the Benjamin Memorial Scholarship for $1,500 to a high school or first year technical student to use towards the pursuit of STEM education.

Nuclear Engineering Technology (NET), Augusta Technical College. The NET program is designed to address the nuclear industry's increasing need for a well-trained nuclear workforce. The program is a planned sequence of courses that meets the defined educational requirements of the Institute of Nuclear Power Operations (INPO) Uniform Curriculum Guide, a curriculum to standardize associate's degree nuclear training across the nation.

Nuclear Quality Systems, Aiken Technical College. Aiken Tech offers an associate's degree with a major in Nuclear Quality Systems. This provides the skills necessary to perform quality assurance and quality control duties for construction, operation, maintenance, and manufacturing activities. Quality control focuses on practices, techniques, and inspections in the fields of mechanical technology, electrical technology, and instruments and control technology. Quality assurance (QA) focuses on types of quality systems and standards, programmatic compliance audits, continuous improvement processes, management of QA records and documentation, and problem solving and critical thinking.

Manufacturing & Technology Training Center (MTTC), Aiken Technical College. The MTTC was created in 2007 in partnership with BAE Systems to provide a direct response to the needs of industry. Training is offered at the 30,000 square foot facility in a range of programs that support local sectors, including a blended learning program (web-delivered and hands-on training) in Maintenance & Plant Operations, which can also be applied towards an associate's in Industrial Technology at Aiken Tech. Other options available through the MTTC include simulation and training for process operators, entry-level process technician training, customized lab technician training, fire and safety training, process improvement, and a range of tests designed to assess job applicants on their knowledge of basic systems.

Construction and Industrial Training, Aiken Technical College. Aiken Tech offers a number of continuing education programs that support the sector's "craft" occupations, including formal programs (Forklift Operator and Welding

Certification) and online options (Chemical Plant Operator, Chemical Lab Tech, Electrical/Mechanical Maintenance, Instrumentation and Controls).

Construction and Industrial Updates, Augusta Technical College. Continuing Education courses offered include: National Electrical Code Update, Residential/Light Commercial Contractors Update, Master Plumber Update, Welding Refresher Training, Master Electrician Update, and Conditioned Air Contractor Update.

Young Leadership Program, Associated General Contractors (AGC) of Georgia, Inc. AGC Georgia's members represent over 500 of the top general contractors, residential/light commercial builders, construction managers, design builders, municipal-utility contractors, heavy and highway contractors, specialty contractors, service providers, and suppliers comprising the state's commercial construction industry. AGC Georgia's Young Leadership Program (YLP) offers young people a platform to enhance their leadership skills, engage in new learning opportunities, and build relationships with others in the construction community.

Go Build Georgia. The Go Build Georgia Foundation is the private arm of the public-private partnership of the Go Build Georgia program undertaken by the Georgia Department of Economic Development's Workforce division. The Foundation was established to support the Go Build Georgia program by rolling out an educational campaign using television, print, online and social media outlets, and promotional events. The goal is to educate students and the workforce at large about the program and drive them to the Go Build Georgia website where they can learn about opportunities in the skilled trades.

North American Young Generation in Nuclear (NAYGN). NAYGN is a networking organization for young professionals in the nuclear industry. It provides professional development, public information, knowledge transfer, and recruiting opportunities. The volunteer-based organization is facilitated by a board of directors and has over 100 local chapters in the US, Canada, and Mexico. There are five chapters based in South Carolina (AECOM, Fort Mill; Fluor Nuclear Power, Greenville; Virgil C Summer Nuclear Station, Jenkinsville; Westinghouse, Rock Hill; Westinghouse, Columbia).

Health Physics Society (HPS). HPS was founded in 1956 and is dedicated to ensuring health physicists have the information and capabilities required to manage the beneficial uses of ionizing radiation while protecting workers and the public from potential hazards. The Savannah River Chapter has over 300 members and 14 affiliate members in the CSRA. The group provides support to those interested in health physics and/or radiation protection by organizing meetings and technical seminars.

Citizens for Nuclear Technology Awareness (CNTA). Founded in the CSRA with over 400 members, CNTA is a nonprofit, grassroots organization dedicated to providing educational programs and factual information about the benefits and risks of nuclear technologies. CNTA works to inform elected officials and the public to support the development of new nuclear missions for the SRS and the CSRA. Their initiatives include using public meetings and a Speakers Bureau to inform the public about the economic importance of the SRS; participating in public hearings on issues related to SRS and formally commenting on Department of Energy (DOE) plans for the Site; sponsoring the annual Edward Teller Lecture, which provides internationally recognized experts an opportunity to speak about nuclear topics in Augusta, SC; and updating members on current nuclear issues through their Up and Atom Breakfast meetings and their periodic newsletter, *Aware!*.

MANUFACTURING

OVERVIEW. The manufacturing sector accounted for nearly 33,000 jobs in the nine-county laborshed in 2014. Like the nation, the sector has been shedding jobs, with manufacturing employment down nearly 8,800 jobs from 2004. However, employment in the sector remains above the national average in the region, as evidenced by its LQ of 1.11. This figure rises to 1.27 if the five-county CRO Region is considered independently.

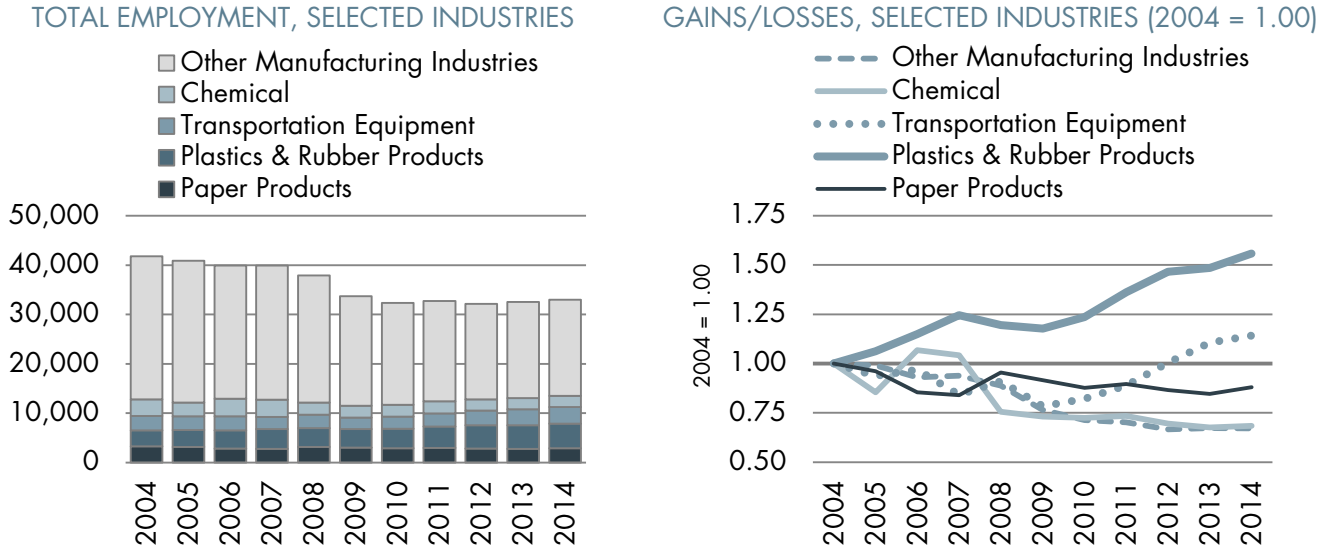
Employment in the sector is spread across multiple segments, with 12 industries (at the three-digit NAICS level) employing more than 1,000 workers each across the nine counties. The figures below profile trends in four of the largest: plastics and rubber products (NAICS 326), chemicals (NAICS 325), paper products (NAICS 322), and transportation equipment (NAICS 326). Together, these four industries accounted for more than 13,500 jobs, slightly more than 40 percent of manufacturing employment in the laborshed. Of these, two industry segments—plastics and rubber and transportation equipment—have experienced growth relative to their 2004 employment levels.

FIGURE 44. SELECTED EMPLOYERS – MANUFACTURING

Company	Location
Bridgestone	Aiken
Club Car	Columbia
Covidien	Richmond
Collum's Lumber Products	Allendale
Craine Merchandising Systems	Barnwell
EZ GO Textron	Richmond
FPL Food LLC	Richmond
Georgia Pacific	Allendale
International Paper	Richmond
John Deere	Columbia
Kimberly Clark	Aiken
Kronotex	Barnwell
Morgan Thermal Ceramics	Richmond
MTU America	Aiken
Quad Graphics	Columbia

Source: SRSCRO, TIP Strategies research.

FIGURE 45. EMPLOYMENT TRENDS, 2004 TO 2014 – MANUFACTURING *(INDUSTRY–BASED)*



Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

MANUFACTURING *(CONTINUED)*

KEY OCCUPATIONS. The manufacturing industry's key occupations were categorized into four groups: production; installation, maintenance, and repair; transportation and material moving; and engineering and technical.

The region has considerably high concentrations of workers in a number of different key occupations, including tire builders, extruding machine operators, chemical plant operators, and health and safety engineers. The majority of the production and transportation and material moving occupations make less than the regional median hourly earnings. However, most of the installation, maintenance, and repair and all of the engineering and technical occupations have median hourly earnings above the regional average for all occupations. Seven of the key manufacturing occupations are earning wage premiums more than ten percent of the US average. These are packaging machine workers, paper goods machine workers, cutting machine workers, chemical equipment workers, mechanical engineers, all other engineers, and chemical technicians.

FIGURE 46. SHARE OF EMPLOYMENT IN SELECTED INDUSTRIES – MANUFACTURING OCCUPATIONS

INCLUDES 2014 LOCATION QUOTIENT (LQ) AND WAGE RATE COMPARISON RELATIVE TO US

HDO	SOC Code	Description	Jobs in CRO 9-County Labor shed (2014)	2014 Emp. LQ (US = 1.00)	Median Hourly Earnings	Relative to US (US=1.00)	Share of employment in: Paper NAICS 322	Chemicals NAICS 325	Plastics/Rubber NAICS 326	Transp. Equip. NAICS 336
PRODUCTION										
	51-2092	Team Assemblers	4,798	1.81	$12.12	0.89	5.0%	1.8%	14.2%	26.4%
★	51-1011	First-Line Supvsr., Production & Operating Workers	1,918	1.33	$27.75	1.06	4.4%	4.3%	3.5%	3.9%
	51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,580	1.33	$16.23	0.96	2.5%	1.7%	6.3%	2.4%
★	51-9197	Tire Builders	1,153	27.62	$20.76	1.09	-	-	16.6%	-
	51-9198	Helpers--Production Workers	1,150	1.09	$9.23	0.83	3.2%	1.1%	0.4%	0.8%
★	51-9111	Packaging & Filling Machine Workers	937	1.02	$14.60	1.15 ●	2.1%	7.1%	0.3%	-
	51-4121	Welders, Cutters, Solderers, & Brazers	936	1.01	$17.57	1.00	-	0.1%	0.1%	5.5%
★	51-9041	Extruding, Forming, & Compacting Machine	888	5.25	$16.17	1.06	1.8%	1.2%	13.4%	0.4%
★	51-9196	Paper Goods Machine Workers	709	3.13	$20.38	1.22 ●	21.8%	-	-	-
	51-4041	Machinists	653	0.67	$17.99	0.95	0.4%	0.3%	0.7%	2.0%
★	51-9023	Mixing & Blending Machine Workers	517	1.81	$17.84	1.09	1.6%	7.5%	3.7%	0.0%
	51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	402	0.88	$12.43	0.86	0.7%	0.1%	1.5%	1.5%
★	51-9032	Cutting & Slicing Machine Workers	380	2.60	$17.95	1.17 ●	2.8%	-	1.2%	-
	51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	367	8.02	$14.38	0.94	0.1%	1.1%	0.9%	0.1%
	51-8091	Chemical Plant & System Operators	349	3.71	$26.49	1.01	0.7%	15.5%	-	-
	51-4072	Molding, Coremaking, & Casting, Metal/Plastic	256	0.85	$13.50	0.99	0.3%	0.1%	2.9%	1.0%
	51-9121	Coating, Painting, & Spraying Machine Workers	235	1.09	$15.62	1.05	1.3%	0.1%	0.5%	1.1%
★	51-9011	Chemical Equipment Workers	215	1.46	$28.23	1.23 ●	0.4%	8.5%	0.1%	-
	51-2041	Structural Metal Fabricators & Fitters	186	0.98	$15.23	0.87	-	-	-	2.3%
	51-4122	Welding, Soldering, & Brazing Machine	148	1.13	$17.64	1.07	-	-	-	2.3%

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
★ Identified as a high demand occupation (HDO), see page 35. Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (×).
Continued next page

MANUFACTURING *(CONTINUED)*

FIGURE 46. SHARE OF EMPLOYMENT IN SELECTED INDUSTRIES – MFG. OCCUPATIONS (CONT.)

INCLUDES 2014 LOCATION QUOTIENT (LQ) AND WAGE RATE COMPARISON RELATIVE TO US

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	2014 Emp. LQ (US = 1.00)	Median Hourly Earnings	Relative to US (US=1.00)	Share of employment in: Paper NAICS 322	Chemicals NAICS 325	Plastics/Rubber NAICS 326	Transp. Equip. NAICS 336
INSTALLATION, MAINTENANCE & REPAIR										
★	49-9071	Maintenance & Repair Workers, General	4,186	1.24	$16.03	0.94	3.5%	4.0%	2.3%	1.5%
	47-2111	Electricians	1,465	0.97	$18.17	0.78 ×	1.0%	0.7%	0.4%	0.4%
	49-1011	First-Line Supvsr., Mechanics, Install, & Repair	1,320	1.23	$26.10	0.89	0.7%	0.8%	0.4%	0.3%
★	49-9041	Industrial Machinery Mechanics	1,295	1.64	$21.98	0.96	3.9%	2.5%	1.7%	1.2%
	47-2211	Sheet Metal Workers	513	1.46	$21.18	1.01	-	-	-	0.5%
	49-3093	Tire Repairers & Changers	343	1.35	$10.63	0.94	-	-	0.6%	-
	49-9043	Maintenance Workers, Machinery	203	0.90	$18.26	0.91	0.5%	0.4%	0.5%	0.2%
	49-2094	Elec./Electronics Repair, Commercial & Ind. Equip.	188	1.13	$25.19	0.98	0.5%	0.4%	0.1%	-
	49-9044	Millwrights	149	1.53	$22.11	0.92	1.0%	-	-	0.0%
TRANSPORTATION & MATERIAL MOVING										
★	53-7062	Laborers/Freight, Stock, & Material Movers, Hand	8,458	1.45	$11.14	0.96	4.3%	2.0%	2.2%	3.6%
★	53-3032	Heavy & Tractor-Trailer Truck Drivers	4,593	1.04	$18.32	1.00	0.7%	1.6%	0.3%	0.6%
	53-3033	Light Truck or Delivery Services Drivers	2,769	1.36	$12.67	0.91	0.3%	0.3%	0.2%	0.2%
	53-7051	Industrial Truck & Tractor Operators	1,406	1.12	$12.92	0.87	3.2%	1.2%	0.7%	0.9%
	53-7064	Packers & Packagers, Hand	1,377	0.81	$9.40	0.98	1.5%	0.7%	0.6%	0.8%
	53-1021	First-Line Supvsr., Helpers & Material Movers, Hand	535	1.29	$22.84	1.04	0.3%	0.2%	0.1%	0.3%
	53-7063	Machine Feeders & Offbearers	259	0.98	$13.76	1.01	0.6%	0.1%	0.2%	0.1%
	53-7011	Conveyor Operators & Tenders	156	1.53	$11.20	0.76 ×	0.7%	0.0%	-	-
ENGINEERING & TECHNICAL										
★	17-2141	Mechanical Engineers	1,178	1.84	$45.17	1.15 ●	0.6%	1.0%	2.1%	2.8%
	15-1151	Computer User Support Specialists	1,014	0.68	$18.50	0.83	0.1%	0.1%	0.1%	0.2%
	17-2112	Industrial Engineers	607	1.08	$34.57	0.90	1.1%	1.0%	1.5%	1.5%
	15-1121	Computer Systems Analysts	601	0.46	$29.84	0.78 ×	0.1%	0.2%	0.1%	0.5%
	15-1142	Network & Computer Systems Admin.	555	0.61	$32.62	0.92	0.2%	0.3%	0.0%	0.1%
	17-3023	Electrical & Electronics Eng. Technicians	291	0.84	$29.26	1.04	0.1%	0.2%	0.1%	0.2%
★	17-2199	Engineers, All Other	198	0.60	$50.68	1.17 ●	0.1%	0.1%	-	0.2%
★	19-4031	Chemical Technicians	190	1.21	$23.51	1.13 ●	0.1%	3.4%	0.2%	-
	17-3013	Mechanical Drafters	176	1.12	$21.53	0.87	-	-	0.1%	0.5%
★	17-2111	Health & Safety Eng., Except Mine Safety	147	2.52	$39.90	1.05	0.1%	0.6%	0.0%	0.2%
	17-3026	Industrial Engineering Technicians	107	0.65	$21.28	0.85	0.2%	0.3%	0.4%	0.3%
	19-2031	Chemists	104	0.49	$34.29	0.99	0.1%	0.9%	0.1%	-
	17-2041	Chemical Engineers	72	0.87	$38.14	0.83	0.1%	1.0%	0.2%	-

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. LQs greater than 1.25 are highlighted, as are wage rates above the regional average ($17.96). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (×).

MANUFACTURING *(CONTINUED)*

DEMAND. Figure 47 provides an overview of the demand for workers in the manufacturing industry as well as key demographic characteristics.

The key occupations with the highest number of expected openings are team assemblers, maintenance and repair workers, laborers, and truck drivers. Particularly in the key production occupations, most of the openings are replacement jobs.

Many of the key occupations in engineering and technical as well as maintenance and repair have large shares of workers who are 55 or older.

FIGURE 47. DEMAND FACTORS & DEMOGRAPHICS – MANUFACTURING OCCUPATIONS

INCLUDES ESTIMATED ANNUAL OPENINGS, 2014 TO 2019

HDO	SOC Code	Description	Jobs in CRO 9-County Labored (2014)	Demand Factors: Annual Openings (2014-19)	Demand Factors: New jobs	Demand Factors: Replacement	Demographics: % 55+ Years	Demographics: % 65+ Years	Demographics: % Male
PRODUCTION									
	51-2092	Team Assemblers	4,798	109	4%	96%	17%	2%	60%
★	51-1011	First-Line Supvsr., Production & Operating Workers	1,918	34	-	100%	23%	2%	83%
	51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	1,580	47	12%	88%	26% ◀	4%	58%
★	51-9197	Tire Builders	1,153	62	50%	50%	11%	0%	90%
	51-9198	Helpers–Production Workers	1,150	34	9%	91%	15%	3%	79%
★	51-9111	Packaging & Filling Machine Workers	937	30	-	100%	16%	2%	46%
	51-4121	Welders, Cutters, Solderers, & Brazers	936	27	-	100%	18%	2%	95%
★	51-9041	Extruding, Forming, & Compacting Machine	888	43	20%	80%	17%	1%	83%
★	51-9196	Paper Goods Machine Workers	709	19	40%	60%	20%	2%	77%
	51-4041	Machinists	653	25	37%	63%	26% ◀	5% ◀	95%
★	51-9023	Mixing & Blending Machine Workers	517	21	15%	85%	17%	1%	91%
	51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	402	5	-	100%	19%	4%	76%
★	51-9032	Cutting & Slicing Machine Workers	380	11	27%	73%	22%	1%	79%
	51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	367	10	-	100%	24%	1%	67%
	51-8091	Chemical Plant & System Operators	349	14	-	100%	25% ◀	1%	95%
	51-4072	Molding, Coremaking, & Casting, Metal/Plastic	256	7	44%	56%	20%	2%	76%
	51-9121	Coating, Painting, & Spraying Machine Workers	235	5	-	100%	16%	2%	85%
★	51-9011	Chemical Equipment Workers	215	9	-	100%	24%	2%	91%
	51-2041	Structural Metal Fabricators & Fitters	186	9	-	100%	19%	3%	93%
	51-4122	Welding, Soldering, & Brazing Machine	148	6	19%	81%	17%	3%	93%

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. 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+).
Continued next page

MANUFACTURING *(CONTINUED)*

FIGURE 47. DEMAND FACTORS & DEMOGRAPHICS – MANUFACTURING OCCUPATIONS (CONT.)

INCLUDES ESTIMATED ANNUAL OPENINGS, 2014 TO 2019

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	Demand Factors: Annual Openings (2014-19)	Demand Factors: New jobs	Demand Factors: Replacement	Demographics: % 55+ Years	Demographics: % 65+ Years	Demographics: % Male
INSTALLATION, MAINTENANCE & REPAIR									
★	49-9071	Maintenance & Repair Workers, General	4,186	120	20%	80%	27% ◀	5% ◀	96%
	47-2111	Electricians	1,465	30	-	100%	18%	3%	97%
	49-1011	First-Line Supvsr., Mechanics, Install, & Repair	1,320	54	29%	71%	27% ◀	3%	94%
★	49-9041	Industrial Machinery Mechanics	1,295	58	28%	72%	26% ◀	3%	97%
	47-2211	Sheet Metal Workers	513	24	48%	52%	15%	2%	97%
	49-3093	Tire Repairers & Changers	343	17	6%	94%	8%	1%	96%
	49-9043	Maintenance Workers, Machinery	203	6	47%	53%	28% ◀	2%	97%
	49-2094	Elec./Electronics Repair, Commercial & Ind. Equip.	188	5	-	100%	24%	3%	97%
	49-9044	Millwrights	149	5	42%	58%	33% ◀	3%	97%
TRANSPORTATION & MATERIAL MOVING									
★	53-7062	Laborers/Freight, Stock, & Material Movers, Hand	8,458	406	27%	73%	14%	3%	81%
★	53-3032	Heavy & Tractor-Trailer Truck Drivers	4,593	107	12%	88%	27% ◀	6% ◀	96%
	53-3033	Light Truck or Delivery Services Drivers	2,769	73	26%	74%	24%	7% ◀	94%
	53-7051	Industrial Truck & Tractor Operators	1,406	50	11%	89%	15%	2%	92%
	53-7064	Packers & Packagers, Hand	1,377	60	25%	75%	15%	3%	40%
	53-1021	First-Line Supvsr., Helpers & Material Movers, Hand	535	25	31%	69%	18%	3%	81%
	53-7063	Machine Feeders & Offbearers	259	13	55%	45%	15%	2%	59%
	53-7011	Conveyor Operators & Tenders	156	7	31%	69%	16%	3%	87%
ENGINEERING & TECHNICAL									
★	17-2141	Mechanical Engineers	1,178	52	17%	83%	24%	4%	94%
	15-1151	Computer User Support Specialists	1,014	40	56%	44%	13%	1%	70%
	17-2112	Industrial Engineers	607	23	12%	88%	26% ◀	4%	82%
	15-1121	Computer Systems Analysts	601	30	65%	35%	18%	2%	66%
	15-1142	Network & Computer Systems Admin.	555	19	49%	51%	11%	1%	79%
	17-3023	Electrical & Electronics Eng. Technicians	291	10	34%	66%	24%	2%	83%
★	17-2199	Engineers, All Other	198	6	33%	67%	31% ◀	9% ◀	89%
★	19-4031	Chemical Technicians	190	6	5%	95%	28% ◀	3%	68%
	17-3013	Mechanical Drafters	176	4	-	100%	21%	3%	84%
★	17-2111	Health & Safety Eng., Except Mine Safety	147	5	-	100%	32% ◀	3%	82%
	17-3026	Industrial Engineering Technicians	107	3	-	100%	25% ◀	5% ◀	82%
	19-2031	Chemists	104	4	18%	82%	26% ◀	5% ◀	66%
	17-2041	Chemical Engineers	72	3	35%	65%	30% ◀	7% ◀	89%

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

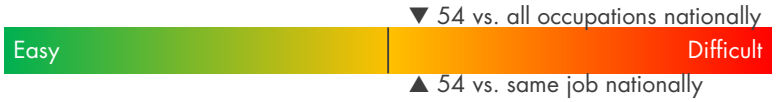
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. Annual openings are an estimate of job openings due to net change in employment and replacement needs (e.g., turnover, retirement). ◀ Indicates significant share of workforce ia reaching retirement age (defined here as ≥25% age 55+ and/or ≥ 5% age 65+).

MANUFACTURING *(CONTINUED)*

REAL-TIME LABOR MARKET INFORMATION. Figure 48 shows a summary of online job postings in the region. Currently, there are 185 unique job postings for the manufacturing industry posted by 37 employers. Sixty-one percent are for jobs in Richmond County. The average salary posted is 91 percent of the US average.

FIGURE 48. SUMMARY FOR JOB POSTINGS CLASSIFIED AS MANUFACTURING (NAICS 31)

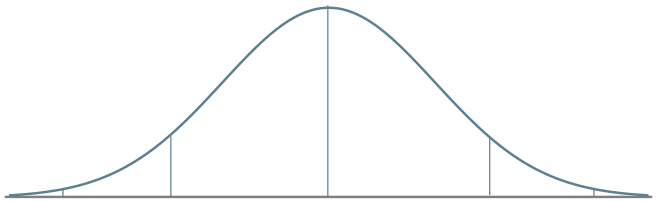
HIRING SCALE



OPENINGS

Current job openings:	185
Direct employers competing:	37
Average posting duration (in days):	54

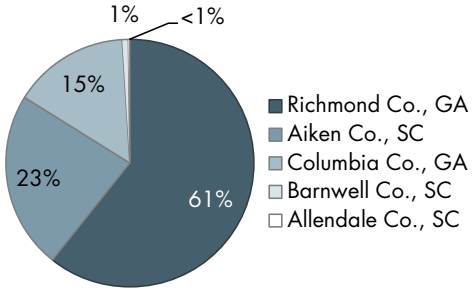
SALARY RANGE



Percentile	10th	25th	50th	75th	90th
Local	$36,850	$48,700	**$61,950**	$75,150	$87,000
National	$39,750	$53,100	**$67,950**	$82,800	$96,150
US=1.00	0.93	0.92	**0.91**	0.91	0.90

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)



TOP 10 COUNTS *(based on 509 postings over past four months)*

Employers	# postings
Textron	87
Lockheed Martin	65
Covidien	38
AREVA	27
Augusta Sportswear	26
John Deere	24
GlaxoSmithKline	23
International Paper	19
Northrop Grumman	19
Eli Lilly	17

Occupations *(SOC-code based)*	# postings
17-2112 Industrial Engineers	56
51-1011 First-Line Sup., Production/Op. Workers	39
17-2141 Mechanical Engineers	18
49-9071 Maintenance and Repair Workers, Gen.	16
15-1151 Computer User Support Specialists	16
15-1142 Network and Computer Systems Admin.	13
11-3121 Human Resources Managers	12
15-1121 Computer Systems Analysts	11
17-2071 Electrical Engineers	11
49-1011 First-Line Sup., Mechanics/Install/Repair	10

Hard Skills	# postings
Security administration	73
Quality Assurance	56
Good Manufacturing Practice	50
Process controls	42
Software design	26
Preventive maintenance	25
Technical support	25
Computer Aided Design	21
Quality Systems	21
Electrical systems	21

Certifications	# postings
Top Secret Sensitive Compartmented Information	66
Driver's License	27
Technology Solutions Delivery - Infrastructure	21
Occupational Safety & Health Admin. Cert.	14
HAZMAT	14
Certified Info. Systems Security Professional	13
Commercial Driver's License	11
Cisco Certified Network Associate	10
Assistant Instructor	9
Cisco Certified Network Associate Voice	8

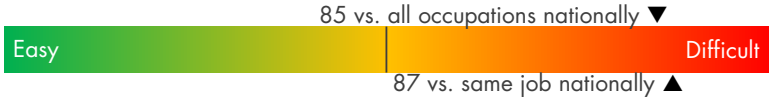
Source: Wanted Analytics; TIP Strategies

MANUFACTURING *(CONTINUED)*

FIGURE 49. REAL-TIME LMI, SELECTED MANUFACTURING OCCUPATIONS

17-2112 INDUSTRIAL ENGINEERS

HIRING SCALE



SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$67,800	$74,350	$81,650	$88,950	$95,550
National	$59,350	$68,150	$77,900	$87,650	$96,400
US=1.00	1.14	1.09	1.05	1.01	0.99

OPENINGS

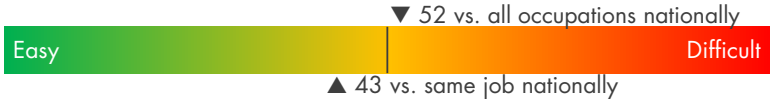
Current job openings:	101
Direct employers competing:	44
Average posting duration (in days):	54

TOP SKILLS

Quality assurance | Process controls | Quality control | Instrumentation | Good Manufacturing Practice | Preventive maintenance | Technical support | Quality Systems | Computer aided design (CAD)/Autodesk AutoCAD

51-1011 FIRST-LINE SUPERVISORS, PRODUCTION AND OPERATING WORKERS

HIRING SCALE



SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$47,450	$62,050	$78,200	$94,400	$108,950
National	$34,900	$45,850	$58,000	$70,150	$81,100
US=1.00	1.36	1.35	1.35	1.35	1.34

OPENINGS

Current job openings:	51
Direct employers competing:	30
Average posting duration (in days):	44

TOP SKILLS

Good Manufacturing Practice | Quality assurance Lean mfg. | Process controls | Quality control | Instrumentation | Enterprise resource planning software | Quality systems | Preventive maint. | Process control sys. software | Plant maintenance

17-2141 MECHANICAL ENGINEERS

HIRING SCALE

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$59,200	$68,050	$77,700	$87,300	$96,150
National	$60,000	$68,600	$78,100	$87,600	$96,200
US=1.00	0.99	0.99	0.99	1.00	1.00

OPENINGS

Current job openings:	30
Direct employers competing:	17
Average posting duration (in days):	50

TOP SKILLS

Comp. aided design (CAD)/Autodesk/SolidWorks | Instrumentation | Quality assurance | Mech. design | Preventive maint. | Electrical systems | Software design | Product eng. | Process controls | Computerized maint. mgmt. sys. | Bentley Microstation

49-9071 MAINTENANCE AND REPAIR WORKERS, GENERAL

HIRING SCALE

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$26,600	$30,800	$35,500	$40,200	$44,450
National	$23,100	$29,150	$35,850	$42,550	$48,550
US=1.00	1.15	1.06	0.99	0.94	0.92

OPENINGS

Current job openings:	68
Direct employers competing:	50
Average posting duration (in days):	43

TOP SKILLS

Excavators | Preventive maint./PM | PM inspections | Computerized maint. mgmt. system | Electrical systems | Traffic control | Good Manufacturing Practice | Sanders/FarmBooks Acctng. Software | Work order | Electrical repairs | Bldg. automation

Source: Wanted Analytics; TIP Strategies.

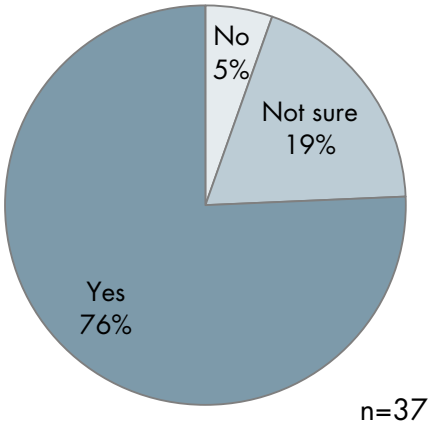
MANUFACTURING *(CONTINUED)*

Thirty-seven manufacturers participated in the employer survey. Of those participants, 76 percent plan to hire additional employees over the next two years. These employers estimated that they will add more than 1,500 workers. The majority of these workers (82 percent) will be in unskilled (730) and skilled (515) occupations.

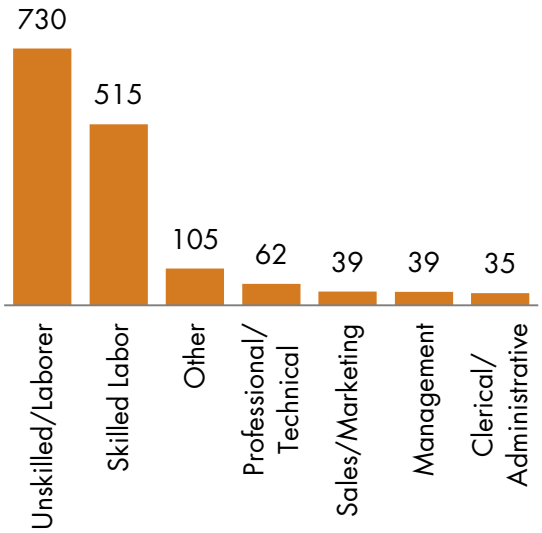
Respondents indicated that management, professional/technical, sales/marketing, and skilled labor can be hard to fill, with some employers reporting that openings in these classifications can take more than six months to fill. Most found that these positions could be filled in one to three months. Unskilled and clerical openings most often take less than a month to fill, but not more than three months.

FIGURE 50. FINDINGS FROM EMPLOYER SURVEY – MANUFACTURING FIRMS

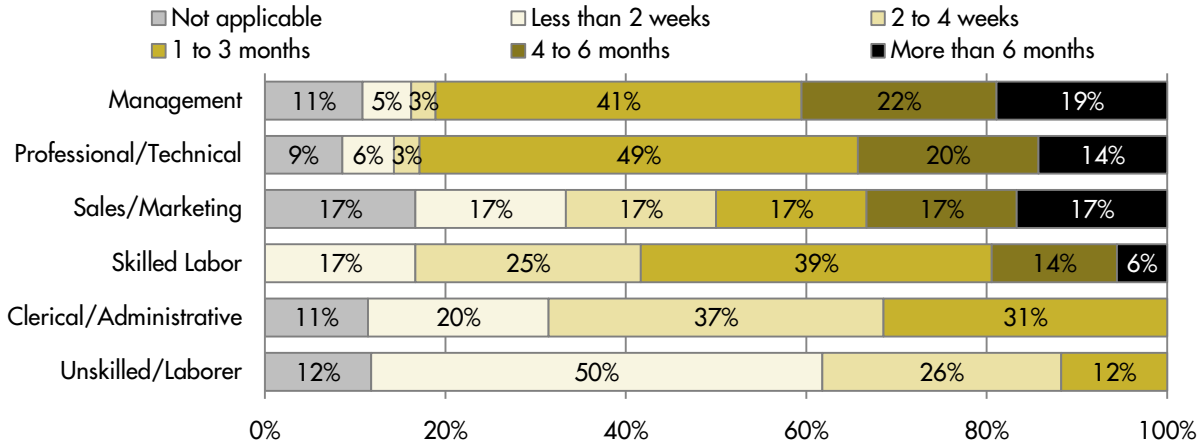
OVER THE NEXT 2 YEARS, DO YOU PLAN TO HIRE ADDITIONAL EMPLOYEES WITHIN THE CRO REGION?



APPROXIMATELY HOW MANY WORKERS DO YOU PLAN TO ADD IN EACH OF THE FOLLOWING CATEGORIES?



APPROXIMATELY HOW LONG DOES IT TYPICALLY TAKE TO FILL A VACANCY FOR EACH OF THE FOLLOWING CLASSIFICATIONS OF WORKERS?



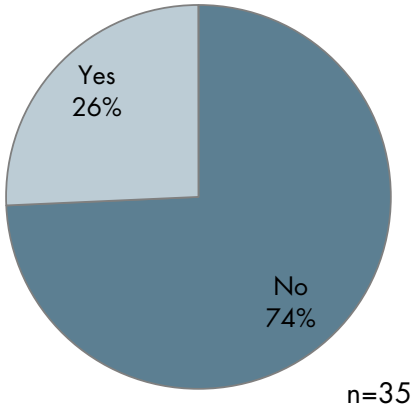
MANUFACTURING *(CONTINUED)*

FIGURE 51. FINDINGS FROM EMPLOYER SURVEY—MANUFACTURING FIRMS

Nine respondents reported that they had occupations they were unable to fill and many respondents reported they had difficulty recruiting for certain occupations and finding certain skills. Professional/technical positions, engineering, and management were cited as the most difficult positions to recruit in manufacturing. Knowledge of engineering and enterprise software as well as mechanics/machinery are skills that were most often cited as difficult to find.

The respondents in the manufacturing industry rate the regional workforce as good to excellent. Employee attitudes, professionalism, trainability, and reliability ranked the highest. Computer and math skills were ranked the lowest.

ARE THERE SPECIFIC OCCUPATIONS WHICH YOU HAVE BEEN UNABLE TO FILL AT ALL?



Industrial Electrician
Field Service Manager
Ammonia Refrigeration Tech
Technicians
Materials Roles
Marketing
Saw Filer
Millwright
Maintenance Planner

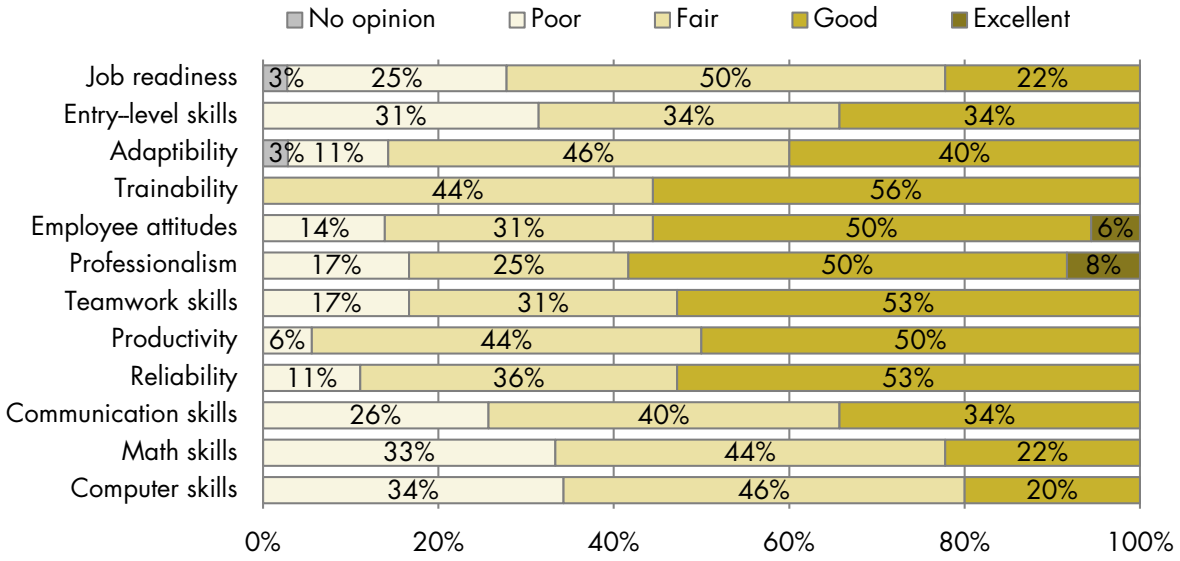
WHICH OCCUPATIONS ARE DIFFICULT TO RECRUIT IN YOUR INDUSTRY?

CNC Prog.—Mac. Set Up	Plant Manager
Electrician (2)	Professional/Technical (15)
Engineer (9)—Automotive, Elec., R & D Engine	Quality Control (4)
Machine Operators (2)	Sales (3)
Maintenance (4)	Skilled Assemblers
Maintenance Technician (3)	Supply Chain
Management (8)	Technical Sales
Materials Mgmt./Planning	Welder/Fabricator
Metallurgist	

WHICH SKILLS ARE DIFFICULT TO FIND IN YOUR INDUSTRY?

Accounting/Payroll	Product Specific Skills/ Knowledge (2)
Ammonia/Refrigeration	Professional/Technical (4)
Chemistry	Quality Inspectors
Competent, Reliable Worker (3)	Read & Interpret Drawings (Correctly) (GD&T)
Elec. (Indust./ Instrumentation/Diagnostic/ Other) (6)	Recycling of metals
Engine Diagnostic Testing	Rotocasting
Engineering (2)	Siemens Controls
Forklift Operators	Software (ERP, AutoCAD, SAP, Sage, ProE) (5)
General Computer/IT (3)	Technical Programmer (3)
Maintenance (2)	Technical Skills
Management	Vibration analyst
Mathematics (2)	Weaving
Mechanic/Machinery (7)	Welding/Fabricating (3)

HOW WOULD YOU RATE THE REGIONAL WORKFORCE OVERALL ON THE FOLLOWING CHARACTERISTICS?



MANUFACTURING *(CONTINUED)*

EDUCATION & TRAINING. Figure 52 shows the wages and the typical requirements for entry into specific occupations.

The production and transportation and material moving occupations are more likely to be lower-wage, lower-skill jobs. The maintenance and repair occupations and engineering and technical occupations, for the most part, make more than the regional median hourly earnings and are considered middle- or high-skill occupations.

FIGURE 52. EDUCATION & TRAINING REQUIREMENTS – MANUFACTURING OCCUPATIONS

WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

HDO	SOC Code	Description	Hourly Earnings (percentiles) 10th	50th	90th	Typical Requirements for Entry into Occupation: Education	Experience	Training Required For Competency
PRODUCTION								
	51-2092	Team Assemblers	$8.60	$12.12	$18.74	HS or equivalent	None	Moderate-term OJT
★	51-1011	First-Line Supvsr., Production & Operating Workers	$17.05	$27.75	$44.30	Non-degree award	< 5 years	None
	51-9061	Inspectors, Testers, Sorters, Samplers, & Weighers	$10.30	$16.23	$24.56	HS or equivalent	None	Moderate-term OJT
★	51-9197	Tire Builders	$12.72	$20.76	$28.40	HS or equivalent	None	Moderate-term OJT
	51-9198	Helpers--Production Workers	$7.43	$9.23	$14.14	Less than HS	None	Short-term OJT
★	51-9111	Packaging & Filling Machine Workers	$8.98	$14.60	$23.23	HS or equivalent	None	Moderate-term OJT
	51-4121	Welders, Cutters, Solderers, & Brazers	$12.80	$17.57	$25.50	HS or equivalent	None	Moderate-term OJT
★	51-9041	Extruding, Forming, & Compacting Machine	$12.22	$16.17	$20.72	HS or equivalent	None	Moderate-term OJT
★	51-9196	Paper Goods Machine Workers	$12.65	$20.38	$32.08	HS or equivalent	None	Moderate-term OJT
	51-4041	Machinists	$10.73	$17.99	$26.46	HS or equivalent	None	Long-term OJT
★	51-9023	Mixing & Blending Machine Workers	$11.78	$17.84	$25.62	HS or equivalent	None	Moderate-term OJT
	51-4031	Cutting, Punching, & Press Machine, Metal/Plastic	$9.22	$12.43	$18.96	HS or equivalent	None	Moderate-term OJT
★	51-9032	Cutting & Slicing Machine Workers	$11.62	$17.95	$23.16	HS or equivalent	None	Short-term OJT
	51-6091	Extruding/Forming Machine, Synth. & Glass Fibers	$9.13	$14.38	$21.86	HS or equivalent	None	Moderate-term OJT
	51-8091	Chemical Plant & System Operators	$20.75	$26.49	$34.87	HS or equivalent	None	Long-term OJT
	51-4072	Molding, Coremaking, & Casting, Metal/Plastic	$9.73	$13.50	$20.45	HS or equivalent	None	Moderate-term OJT
	51-9121	Coating, Painting, & Spraying Machine Workers	$10.97	$15.62	$21.96	HS or equivalent	None	Moderate-term OJT
★	51-9011	Chemical Equipment Workers	$16.71	$28.23	$35.85	HS or equivalent	None	Moderate-term OJT
	51-2041	Structural Metal Fabricators & Fitters	$10.67	$15.23	$23.10	HS or equivalent	None	Moderate-term OJT
	51-4122	Welding, Soldering, & Brazing Machine	$12.75	$17.64	$23.64	HS or equivalent	None	Moderate-term OJT

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

Continued next page

MANUFACTURING *(CONTINUED)*

FIGURE 52. EDUCATION & TRAINING REQUIREMENTS – MANUFACTURING OCCUPATIONS (CONT.)

WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

HDO	SOC Code	Description	Hourly Earnings (percentiles) 10th	50th	90th	Typical Requirements for Entry into Occupation: Education	Experience	Training Required For Competency
INSTALLATION, MAINTENANCE & REPAIR								
★	49-9071	Maintenance & Repair Workers, General	$9.78	$16.03	$28.01	HS or equivalent	None	Long-term OJT
	47-2111	Electricians	$11.88	$18.17	$27.03	HS or equivalent	None	Apprenticeship
	49-1011	First-Line Supvsr., Mechanics, Install, & Repair	$16.36	$26.10	$41.07	HS or equivalent	< 5 years	None
★	49-9041	Industrial Machinery Mechanics	$14.90	$21.98	$30.48	HS or equivalent	None	Long-term OJT
	47-2211	Sheet Metal Workers	$12.28	$21.18	$29.42	HS or equivalent	None	Apprenticeship
	49-3093	Tire Repairers & Changers	$8.20	$10.63	$14.42	HS or equivalent	None	Short-term OJT
	49-9043	Maintenance Workers, Machinery	$13.15	$18.26	$28.64	HS or equivalent	None	Moderate-term OJT
	49-2094	Elec./Electronics Repair, Commercial & Ind. Equip.	$17.49	$25.19	$37.58	Non-degree award	None	Long-term OJT
	49-9044	Millwrights	$15.09	$22.11	$31.65	HS or equivalent	None	Apprenticeship
TRANSPORTATION & MATERIAL MOVING								
★	53-7062	Laborers/Freight, Stock, & Material Movers, Hand	$8.18	$11.14	$19.47	Less than HS	None	Short-term OJT
★	53-3032	Heavy & Tractor-Trailer Truck Drivers	$12.25	$18.32	$28.59	Non-degree award	None	Short-term OJT
	53-3033	Light Truck or Delivery Services Drivers	$8.21	$12.67	$28.20	HS or equivalent	None	Short-term OJT
	53-7051	Industrial Truck & Tractor Operators	$8.87	$12.92	$19.71	Less than HS	None	Short-term OJT
	53-7064	Packers & Packagers, Hand	$7.95	$9.40	$16.38	Less than HS	None	Short-term OJT
	53-1021	First-Line Supvsr., Helpers & Material Movers, Hand	$13.89	$22.84	$34.50	HS or equivalent	< 5 years	None
	53-7063	Machine Feeders & Offbearers	$9.23	$13.76	$19.71	Less than HS	None	Short-term OJT
	53-7011	Conveyor Operators & Tenders	$8.42	$11.20	$17.90	Less than HS	None	Short-term OJT
ENGINEERING & TECHNICAL								
★	17-2141	Mechanical Engineers	$27.56	$45.17	$71.00	Bachelor's	None	None
	15-1151	Computer User Support Specialists	$10.68	$18.50	$30.49	Some college	None	Moderate-term OJT
	17-2112	Industrial Engineers	$23.60	$34.57	$52.47	Bachelor's	None	None
	15-1121	Computer Systems Analysts	$18.42	$29.84	$46.37	Bachelor's	None	None
	15-1142	Network & Computer Systems Admin.	$20.61	$32.62	$51.63	Bachelor's	None	None
	17-3023	Electrical & Electronics Eng. Technicians	$17.99	$29.26	$39.29	Associate's	None	None
★	17-2199	Engineers, All Other	$30.81	$50.68	$68.57	Bachelor's	None	None
★	19-4031	Chemical Technicians	$15.79	$23.51	$33.05	Associate's	None	Moderate-term OJT
	17-3013	Mechanical Drafters	$15.82	$21.53	$34.75	Associate's	None	None
★	17-2111	Health & Safety Eng., Except Mine Safety	$21.50	$39.90	$65.07	Bachelor's	None	None
	17-3026	Industrial Engineering Technicians	$15.44	$21.28	$29.52	Associate's	None	None
	19-2031	Chemists	$20.59	$34.29	$49.12	Bachelor's	None	None
	17-2041	Chemical Engineers	$27.13	$38.14	$55.14	Bachelor's	None	None

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

MANUFACTURING *(CONTINUED)*

Figure 53 shows the for-credit completions from regional postsecondary institutions in fields of study relevant to the manufacturing industry's key occupations. Due to the absence of a four-year engineering program in the region, there are few graduates with a bachelor's degree or higher in fields of study that support the key manufacturing occupations. Of the fields of study identified in this figure, welding, electrician, industrial mechanics, electrical engineering technician, and network administrator are the most popular fields of study relevant to the manufacturing industry. There are, however, non-credit programs offered at the region's postsecondary institutions that support the industry that would not be captured in this dataset.

FIGURE 53. RELEVANT COMPLETIONS – MANUFACTURING OCCUPATIONS

THREE-YEAR ANNUAL AVERAGE OF DEGREES/AWARDS CONFERRED, 2011-2013

CIP Code	Field of Study	Degrees/awards by level: Certificate (< 1 year)	Certificate (≥ 1 yr., < 2 yrs.)	Associate's*	Bachelor's	Advanced**	Annual average degrees/awards conferred (all levels)
PRODUCTION							
48.0508	Welding Technology/Welder	96	23				119
48.0503	Machine Shop Technology/Assistant	8	2				10
48.0501	Machine Tool Technology/Machinist	3	2	6			11
41.0301	Chemical Technology/Technician	3	1				4
52.0205	Operations Management and Supervision			1	1		2
INSTALLATION, MAINTENANCE & REPAIR							
46.0302	Electrician	47	36				83
47.0303	Industrial Mechanics and Maint. Technology	15	18	19			52
47.0105	Industrial Electronics Technology/Technician	5	20				25
47.0104	Computer Installation and Repair Technology/Technician	14					14
52.0205	Operations Management and Supervision			1	1		2
ENGINEERING & TECHNICAL							
14.0102	Pre-Engineering***	6					6
15.0303	Electrical, Electronic and Comm. Engineering Tech.	18		24			42
11.0901	Computer Systems Networking and Telecommunications	16		11			27
11.1001	Network and System Administration/Administrator	31		9	1		41
40.0501	Chemistry, General				18		18
11.0101	Computer and Information Sciences, General			4	13		17
11.0103	Information Technology			6			6
15.1302	CAD/CADD Drafting and/or Design Technology/Technician		5				5
41.0301	Chemical Technology/Technician	3	1				4
15.1306	Mechanical Drafting and CAD/CADD	2					2

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys; National Crosswalk Service Center; TIP Strategies. IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level. ***No engineering related completions were reported by the analyzed schools, except a small number of Pre-Engineering (CIP 14.0102) awards at Aiken Technical College.

MANUFACTURING *(CONTINUED)*

SELECTED INITIATIVES & RESOURCES.

South Carolina Manufacturers Alliance (SCMA). The SCMA provides a vehicle for all manufacturers to advocate their interests at the legislative, regulatory, and executive levels in South Carolina. The SCMA has a number of divisions including an Automotive Council, Chemistry Council, and Textile Council, as well as two geographically oriented divisions: the ACE Basin Council (listed separately) and the Lowcountry Manufacturers Council.

ACE Basin Manufacturers Council. The ACE Basin Council is an initiative of the SCMA that provides a regional voice for manufacturers. Membership is open to manufacturers in Aiken, Allendale, Bamberg, Barnwell, Calhoun, Hampton, and Orangeburg Counties. The mission of the council is to enhance the competitiveness, promote development, and positively impact the manufacturing sector of the ACE Basin region of South Carolina.

Manufacturer's Exchange, Augusta Metro Chamber of Commerce. The Chamber's Manufacturer's Exchange meets quarterly to share information about the needs of and conditions within the manufacturing sector and to share best practices. Recently, the exchange participated in a coalition headed by the Chamber to successfully oppose a proposed Energy Excise Tax on manufacturing in Augusta-Richmond County.

South Carolina Manufacturing Certification program, SC Technical College System. Offered at each of the state's 16 technical schools, including Aiken Technical College, this program teaches advanced manufacturing skills and offers an industry-recognized national certification upon completion. Full funding is available for South Carolina residents who have a silver-level WorkKeys certification, are unemployed or underemployed or would like to change careers, and can pass a drug screening and background check.

Georgia Association of Manufacturers (GAM). GAM is the statewide trade association that represents all of Georgia's manufacturing businesses in legislative, regulatory, and public relations matters. Founded in 1900, GAM also provides seminars, services, and guidance to manufacturers on a wide range of issues, including human resources, workforce development, public utility rates and energy, safety and health, employee benefits, environmental quality, and taxation.

Southeast Lumber Manufacturers Association. The Southeastern Lumber Manufacturers Association (SLMA) is a trade association that represents solid sawn lumber manufacturing operations, lumber remanufacturing operations, lumber treating operations, and their suppliers in 17 states throughout the southeast.

Georgia Manufacturing Appreciation Week (April 13-17, 2015)—Student Design Competition. Created by the Technical College System of Georgia and the Georgia Department of Economic Development, Manufacturing Appreciation Week recognizes the contribution of manufacturing to the state's economy. As part of the event, students throughout the state are invited to submit artwork depicting the importance of manufacturing to their lives and communities. Winners are announced at the Governor's Award Luncheon and the top finalists in each group receive scholarships. The Manufacturer of the Year is also announced during the luncheon. The honor is given to companies in small, medium, and large manufacturer categories that exhibit a high degree of corporate responsibility, economic impact on Georgia, and workforce excellence.

Industrial Training Programs, Augusta Technical College. Augusta Tech's industrial training programs were designed to support local manufacturers. The programs include a Programmable Logic Controllers series as well as an Advanced Manufacturing Assessment and Training program, which includes an assessment of skills and individualized target training.

Manufacturing and Technology Center at Aiken Technical College. The MTTC was created in 2007 in partnership with BAE Systems to provide a direct response to the needs of industry. Training is offered at the 30,000 square foot facility in a range of programs that support local sectors, including a blended learning program (web-delivered and hands-on training) in Maintenance & Plant Operations, which can also be applied towards an associate's in Industrial Technology at Aiken Tech. Other options available through the MTTC include simulation and training for process operators, entry-level process technician training, customized lab technician training, fire and safety training, process improvement, and a range of tests designed to assess job applicants on their knowledge of basic systems.

Georgia Skills Roadshow Initiative. This initiative is intended to highlight the skills employers need now and in the future, and discuss how businesses and schools can build partnerships that will allow students to get skills-based instruction in real-world settings. Presenters at a February 2015 event in Fayette County, GA included representatives of Grenzebach (a German–based manufacturer of automated systems with a facility in Newnan), Atlanta Technical College, and Go Build Georgia, as well as Christoph Sanders, General Consul of the Federal Republic of Germany. The Road Show will visit communities throughout Georgia in 2015 to promote discussions about work-based learning/apprenticeship programs, and their importance in building a future workforce to meet industry needs while helping to ensure the state's economic success.

South Carolina Manufacturing Extension Partnership (SCMEP). A private, nonprofit group, the SCMEP provides resources to small and medium-size South Carolina businesses. Services include strategy coaching, training, and tools provided by a team of manufacturing specialists who average more than 20 years of experience. Their goal is to help businesses strengthen leadership, develop competencies, drive growth, and eliminate waste. The SCMEP is an affiliate of the National Institute of Standards & Technology and operates under the Department of Commerce. The organization is headquartered in Columbia and operates a Business Learning Center in Greenville.

South Carolina Lean Alliance (SCLA). The SCLA's goal is to provide a place for companies to work together and expand access to and understanding of lean manufacturing principals. The membership-based organization is coordinated by the SCMEP and its 120 member companies which are broken into five regions including a CSRA chapter. Chapters organize monthly meetings at member facilities, providing an opportunity to benchmark and learn about improvement methodologies. The SCLA publishes a quarterly e-newsletter, conducts an annual benchmark survey, and sponsors Lean manufacturing training events for members. Alliance events consist of a facility presentation on recent improvement projects, a factory tour to showcase the improvements in action, and then an open discussion to further highlight successes and opportunities. Recent event topics include 5S Workplace Organization, Lean Leader Development, Six Sigma Project Management, and A3 Problem Solving.

CYBERSECURITY/IT

OVERVIEW. The regional cybersecurity sector is anchored by activities at Fort Gordon, which include the National Security Agency's joint service facility, the US Army Cyber Command, US Army Cyber Center of Excellence, the Seventh Signal Command, and the Aerial Intelligence, Surveillance, and Reconnaissance. With expected growth in each of these activities, the region's cybersecurity sector, both defense and non-defense, is poised for growth.

Like other sub-sectors of information technology (IT), cybersecurity cuts across multiple industry sectors from retail to finance. While the regional cybersecurity sector is dominated by the aforementioned defense-related activities, the region's nuclear, manufacturing and healthcare sectors also have cybersecurity needs.

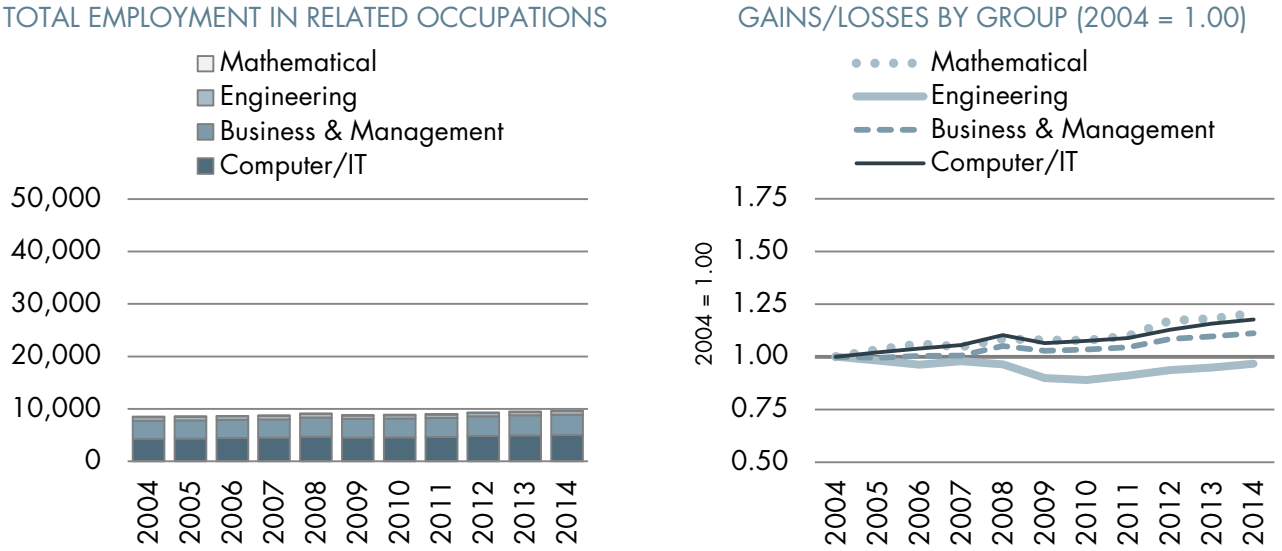
FIGURE 54. SELECTED EMPLOYERS – CYBERSECURITY/IT

Company	Location
Academy Solutions Group, LLC	Columbia
Angelo Group	Columbia
Booz-Allen Hamilton	Columbia
Drayton, Drayton & Lamar (DDL)	Columbia
JANUS Research Group, Inc.	Columbia
L-3 Communications	Columbia
NCI Information Systems	Columbia
National Security Agency	Columbia
Northrop Grumman	Columbia
Sabre Systems, Inc.	Columbia

Source: SRSCRO, TIP Strategies research.

Like the nuclear sector, industry classification systems do not adequately capture cyber-related activities. As a result, specific employment numbers are not available for the sector. However, key occupations were defined using the Council on Cybersecurity's Cybersecurity Workforce Handbook. Figures presented in this profile do not represent workers in the cybersecurity industry, but rather provide a sense of the non-military workforce that is available to support the sector.

FIGURE 55. EMPLOYMENT TRENDS, 2004 TO 2014 – CYBERSECURITY/IT *(OCCUPATION-BASED)*



Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

CYBERSECURITY/IT *(CONTINUED)*

KEY OCCUPATIONS. The cybersecurity occupational structure can be split into four categories: business/management, computer/IT, mathematical, and engineering. For the most part, the nine-county region has a fairly low concentration of workers in cybersecurity-related occupations in comparison to the US. However, the number of workers in many of the cyber occupations shows that there is an adequate supply of workers to accommodate growth in the sector. The more technical cyber occupations—computer and information systems managers, information security analysts, computer research scientists, statisticians, and computer hardware engineers—have low concentrations and low counts.

FIGURE 56. SHARE OF EMPLOYMENT IN SELECTED INDUSTRIES – CYBERSECURITY/IT OCCUPATIONS

INCLUDES 2014 LOCATION QUOTIENT (LQ) AND WAGE RATE COMPARISON RELATIVE TO US

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	2014 Emp. LQ (US = 1.00)	Median Hourly Earnings	Relative to US (US=1.00)	Share of employment in: Computer Systems NAICS 5415	Fed. Govt., Civilian NAICS 9011	Manufacturing NAICS 31-33	Finance & Ins. NAICS 52
BUSINESS/MANAGEMENT										
	13-2011	Accountants & Auditors	2,257	0.70	$24.81	0.81	0.8%	0.5%	0.4%	1.2%
	13-1111	Management Analysts	1,245	0.70	$30.58	0.84	1.7%	1.9%	0.1%	0.9%
	11-3021	Computer & Info. Systems Managers	378	0.47	$44.31	0.75 ×	2.6%	0.1%	0.1%	0.4%
COMPUTERS/IT										
	15-1151	Computer User Support Specialists	1,014	0.68	$18.50	0.83	7.0%	-	0.1%	0.5%
	15-1131	Computer Programmers	625	0.77	$27.92	0.78 ×	9.4%	-	0.1%	0.3%
	15-1121	Computer Systems Analysts	601	0.46	$29.84	0.78 ×	8.7%	-	0.1%	0.8%
	15-1132	Software Developers, Applications	564	0.34	$37.30	0.84	9.6%	-	0.1%	0.5%
	15-1142	Network & Computer Systems Admin.	555	0.61	$32.62	0.92	3.5%	-	0.2%	0.4%
	15-1199	Computer Occupations, All Other	384	0.75	$34.59	0.88	1.3%	2.6%	-	0.1%
	15-1152	Computer Network Support Specialists	307	0.71	$29.97	1.04	2.2%	-	-	0.3%
	15-1133	Software Developers, Systems Software	294	0.31	$31.82	0.66 ×	4.6%	-	-	0.2%
	15-1143	Computer Network Architects	209	0.59	$31.00	0.68 ×	2.6%	-	-	0.2%
	15-1134	Web Developers	188	0.52	$21.15	0.76 ×	3.6%	-	-	0.1%
	15-1141	Database Administrators	148	0.51	$31.67	0.84	1.1%	-	-	0.2%
	15-1122	Information Security Analysts	106	0.54	$32.45	0.76 ×	0.9%	-	-	0.3%
	15-1111	Computer & Info. Research Scientists	21	0.33	$41.64	0.82	0.1%	-	-	-
MATHEMATICAL										
	15-2031	Operations Research Analysts	88	0.47	$23.80	0.66 ×	0.3%	0.2%	-	0.2%
	15-2041	Statisticians	25	0.37	$29.35	0.77 ×	0.1%	-	-	-
	15-2021	Mathematicians	<10	0.49	—	—	-	-	-	-
	15-2099	Mathematical Science Occupations, All Other	<10	0.67	—	—	-	-	-	-
ENGINEERING										
	17-2112	Industrial Engineers	607	1.08	$34.57	0.90	0.3%	-	1.2%	-
	17-2061	Computer Hardware Engineers	35	0.18	$44.14	0.89	0.6%	-	-	-

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. LQs greater than 1.25 are highlighted, as are wage rates above the regional average ($17.96). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (×).

Continued next page

CYBERSECURITY/IT *(CONTINUED)*

DEMAND. Demand projections for cyber-related occupations are low, reflecting historic growth patterns rather than the significant growth that is scheduled to occur at Fort Gordon. Yet, a look at current trends in the regional workforce can be informative. In most of the computer/IT occupations, openings are from new growth rather than replacement jobs. This means that the sector is growing regionally in addition to the growth at Fort Gordon. In addition, a few key occupations are facing a wave of retirements in their existing pool of workers. These occupations include management analysts, operations research, industrial engineers, and computer hardware engineers.

FIGURE 57. DEMAND FACTORS & DEMOGRAPHICS – CYBERSECURITY/IT OCCUPATIONS

INCLUDES ESTIMATED ANNUAL OPENINGS, 2014 TO 2019

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	Demand Factors: Annual Openings (2014-19)	Demand Factors: New jobs	Demand Factors: Replacement	Demographics: % 55+ Years	Demographics: % 65+ Years	Demographics: % Male
BUSINESS/MANAGEMENT									
	13-2011	Accountants & Auditors	2,257	127	39%	61%	22%	5% ◀	38%
	13-1111	Management Analysts	1,245	38	45%	55%	31% ◀	9% ◀	57%
	11-3021	Computer & Info. Systems Managers	378	15	60%	40%	17%	1%	69%
COMPUTERS/IT									
	15-1151	Computer User Support Specialists	1,014	40	56%	44%	13%	1%	70%
	15-1131	Computer Programmers	625	23	25%	75%	16%	2%	76%
	15-1121	Computer Systems Analysts	601	30	65%	35%	18%	2%	66%
	15-1132	Software Developers, Applications	564	26	69%	31%	11%	1%	79%
	15-1142	Network & Computer Systems Admin.	555	19	49%	51%	11%	1%	79%
	15-1199	Computer Occupations, All Other	384	8	-	100%	16%	1%	71%
	15-1152	Computer Network Support Specialists	307	9	41%	59%	13%	2%	70%
	15-1133	Software Developers, Systems Software	294	13	67%	33%	12%	2%	79%
	15-1143	Computer Network Architects	209	7	47%	53%	11%	2%	78%
	15-1134	Web Developers	188	8	60%	40%	11%	3%	71%
	15-1141	Database Administrators	148	6	52%	48%	18%	3%	60%
	15-1122	Information Security Analysts	106	7	70%	30%	22%	5% ◀	73%
	15-1111	Computer & Info. Research Scientists	21	-	-	-	48% ◀	24% ◀	71%
MATHEMATICAL									
	15-2031	Operations Research Analysts	88	5	55%	45%	26% ◀	6% ◀	55%
	15-2041	Statisticians	25	-	-	-	41% ◀	20% ◀	52%
	15-2021	Mathematicians	<10	-	-	-	-	-	-
	15-2099	Mathematical Science Occupations, All Other	<10	-	-	-	-	-	-
ENGINEERING									
	17-2112	Industrial Engineers	607	23	12%	88%	26% ◀	4%	82%
	17-2061	Computer Hardware Engineers	35	2	54%	46%	29% ◀	14% ◀	86%

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

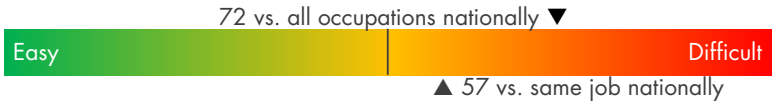
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. Annual openings are an estimate of job openings due to net change in employment and replacement needs (e.g., turnover, retirement). ◀ Indicates significant share of workforce is reaching retirement age (defined here as ≥25% age 55+ and/or ≥ 5% age 65+).

CYBERSECURITY/IT *(CONTINUED)*

REAL-TIME LMI. Figure 58 shows a summary of online job postings in the region for cyber jobs. Currently, there are 159 unique job postings for the cybersecurity industry posted by 34 employers. The vast majority are for jobs in Columbia County. The average salary posted is 87 percent of the US average.

FIGURE 58. SUMMARY FOR JOB POSTINGS THAT INCLUDE "CYBER"

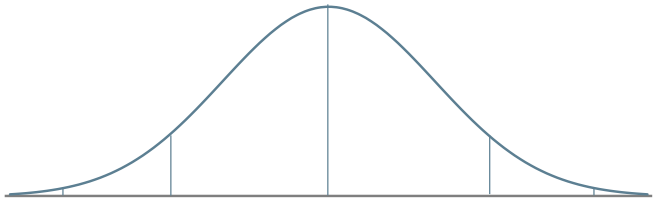
HIRING SCALE



OPENINGS

Current job openings:	159
Direct employers competing:	34
Average posting duration (in days):	51

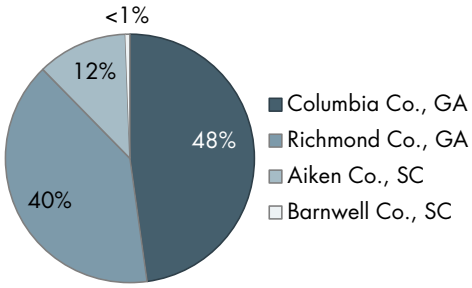
SALARY RANGE



Percentile	10th	25th	50th	75th	90th
Local	$46,700	$63,850	**$82,900**	$101,950	$119,100
National	$52,700	$73,100	**$95,750**	$118,400	$138,800
US=1.00	0.89	0.87	**0.87**	0.86	0.86

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)



TOP 10 COUNTS *(based on 341 postings over past four months)*

Employers	# postings
L-3 Communications/L-3 Natl. Security Solutions	72
TASC	45
Army/Dept. of Defense/Army Installation Mgmt.	27
Academy Solutions Group, LLC	17
Booz Allen Hamilton	17
Northrop Grumman	17
Parsons Corporation	16
NCI Information Systems, Inc.	11
National Security Agency/NSA	10
Engineering Solutions and Products, Inc.	9

Occupations *(SOC-code based)*	# postings
15-1122 Information Security Analysts	46
25-3021 Self-Enrichment Education Teachers	28
15-1143 Computer Network Architects	28
15-1142 Network and Computer Systems Admin.	28
33-3021 Detectives and Criminal Investigators	26
15-2031 Operations Research Analysts	24
27-3091 Interpreters and Translators	20
15-1121 Computer Systems Analysts	17
13-1199 Business Op. Specialists, All Other	14
15-1151 Computer User Support Specialists	13

Hard Skills	# postings
Signals Intelligence	87
Computer Network	86
Cyber security	76
Information assurance	31
Information security	25
Quality control	25
Network Security	23
Firewall	22
C4ISR*	22
Microsoft SharePoint	22

Certifications	# postings
Top Secret Sensitive Compartmented Information	200
National Security Agency	38
Cisco Certified Network Associate	38
Certified Ethical Hacker	24
Teaching English as a Second Language	19
Certified Info. Systems Security Professional	19
CompTIA Security+	16
Cisco Certified Network Professional	13
DoD 8570 Certification	12
VMware Certified Professional	11

Source: Wanted Analytics; TIP Strategies *C4ISR = Command, control, communications, computers, intelligence, surveillance, & reconnaissance

CYBERSECURITY/IT *(CONTINUED)*

FIGURE 59. REAL-TIME LMI, SELECTED CYBERSECURITY/IT OCCUPATIONS

15-1122 INFORMATION SECURITY ANALYST

HIRING SCALE

92 vs. all occupations nationally ▼

Easy — Difficult

94 vs. same job nationally ▲

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$65,550	$73,350	$81,800	$90,250	$98,050
National	$79,250	$91,700	$105,500	$119,350	$131,800
US=1.00	0.83	0.80	0.78	0.76	0.74

OPENINGS

Current job openings:	24
Direct employers competing:	18
Average posting duration (in days):	51

TOP SKILLS

Info. security | Info. assurance | Network security | Cyber security | Computer Network | Firewall | Intrusion detection | Linux | Natl. Institute of Standards & Tech.| Computer forensic | Application security | Nessus | System admin.

15-1143 COMPUTER NETWORK ARCHITECTS

Hiring scale

77 vs. all occupations nationally ▼

Easy — Difficult

—insufficient data to calculate local hiring scale

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$52,050	$60,350	$69,400	$78,450	$86,750
National	$58,800	$73,400	$89,600	$105,850	$120,450
US=1.00	0.89	0.82	0.77	0.74	0.72

OPENINGS

Current job openings:	30
Direct employers competing:	—
Average posting duration (in days):	52

TOP SKILLS

Signals intelligence | Computer Network | Open source technology | Wide Area Network | Local Area Network | FS Poly | Voice over internet protocol | Network design | Avaya | Open Systems Interconnection | MS SharePoint

15-1142 NETWORK AND COMPUTER SYSTEMS ADMINISTRATORS

HIRING SCALE

83 vs. all occupations nationally ▼

Easy — Difficult

76 vs. same job nationally ▲

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$57,550	$63,450	$70,000	$76,550	$82,450
National	$58,250	$70,400	$83,950	$97,500	$109,700
US=1.00	0.99	0.90	0.83	0.79	0.75

OPENINGS

Current job openings:	91
Direct employers competing:	46
Average posting duration (in days):	54

TOP SKILLS

Linux | VMware software | Structured query language | UNIX | System admin. | Tech. support | Storage Area Network | Info. assurance | MS SQL Server | Virtualization | MS Active Directory | Network security | Trans. Control Protocol

15-2031 OPERATIONS RESEARCH ANALYSTS

HIRING SCALE

71 vs. all occupations nationally ▼

Easy — Difficult

—insufficient data to calculate local hiring scale

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$49,800	$54,850	$60,250	$65,650	$70,700
National	$41,850	$53,300	$66,050	$78,800	$90,250
US=1.00	1.19	1.03	0.91	0.83	0.78

OPENINGS

Current job openings:	16
Direct employers competing:	—
Average posting duration (in days):	47

TOP SKILLS

Computer Network | FS Poly | MS Visual Basic/ Visual Basic for Apps | Inspection Selection System | Work order | EDI X12 | File Transfer Protocol | Disk Operating System | Microsoft SQL Server | Structured query language | Technical support

Source: Wanted Analytics; TIP Strategies.

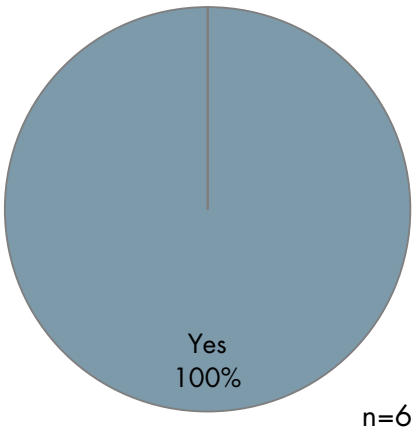
CYBERSECURITY/IT *(CONTINUED)*

Six cybersecurity firms participated in the employer survey. Of those participants, all plan to hire additional employees over the next two years. These employers estimated that they will add more than 150 workers. The majority of these workers (59 percent) will be in professional occupations, which include engineers, administrator, and analyst positions.

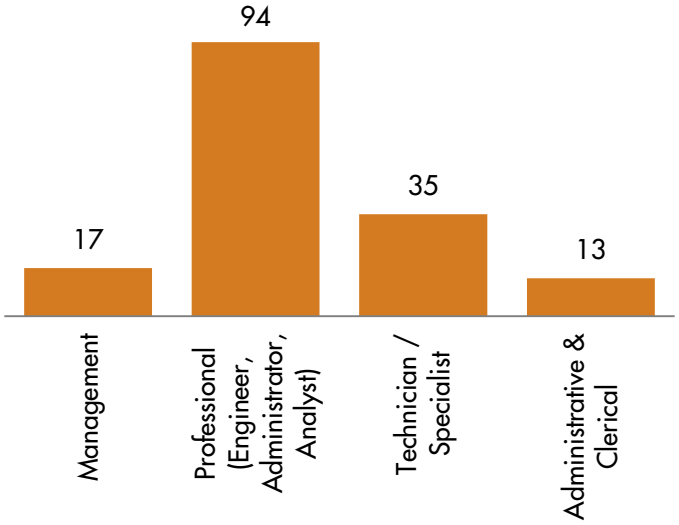
One respondent reported that they had an occupation they were unable to fill—a professional proposal writer. Many respondents reported they had difficulty recruiting for certain occupations and finding certain skills. Upper management was cited by two respondents as difficult to recruit. Engineering skills were most often mentioned as difficult to find.

FIGURE 60. FINDINGS FROM EMPLOYER SURVEY – CYBERSECURITY FIRMS

OVER THE NEXT 2 YEARS, DO YOU PLAN TO HIRE ADDITIONAL EMPLOYEES WITHIN THE CRO REGION?



APPROXIMATELY HOW MANY WORKERS DO YOU PLAN TO ADD IN EACH OF THE FOLLOWING CATEGORIES?



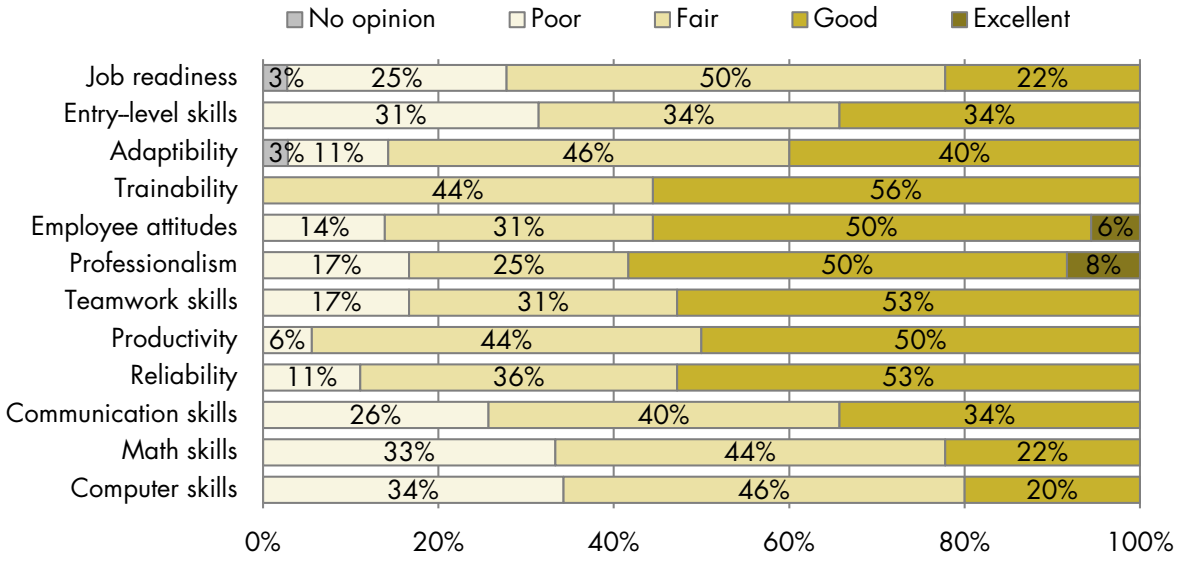
WHICH OCCUPATIONS ARE DIFFICULT TO RECRUIT IN YOUR INDUSTRY?	WHICH SKILLS ARE DIFFICULT TO FIND IN YOUR INDUSTRY?
Computer Engineers	Computer Scientist
Computer Scientist	Cyber Analysis
Cyber Expertise	Digital Artist
Digital Artist	Engineering
Intelligence	Engineers - Communications
IT Professionals	Engineers - Electronic Warfare
Proposal Writers	Engineers - Spectrum RF
Sales	Sales
Upper Management (2)	Software Developers
	Management
	Writing

CYBERSECURITY/IT *(CONTINUED)*

FIGURE 61. FINDINGS FROM EMPLOYER SURVEY – CYBERSECURITY FIRMS

The respondents in the cybersecurity industry rate the regional workforce as fair to good. Employee attitudes and professionalism ranked the highest. Computer and math skills as well as entry-level skills were ranked the lowest.

HOW WOULD YOU RATE THE REGIONAL WORKFORCE OVERALL ON THE FOLLOWING CHARACTERISTICS?



CYBERSECURITY/IT *(CONTINUED)*

EDUCATION & TRAINING. Figure 62 shows the wages and the typical requirements for entry into specific occupations.

All of the cyber-related occupations are considered high-skill, requiring a bachelor's degree or higher. Many of the occupations have entry-level openings. Information security analysts and database administrators often require some work experience. Computer and information systems managers and computer network architects require five or more years of work experience.

FIGURE 62. EDUCATION & TRAINING REQUIREMENTS – CYBERSECURITY/IT OCCUPATIONS

WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

HDO	SOC Code	Description	Hourly Earnings (percentiles) 10th	50th	90th	Typical Requirements for Entry into Occupation: Education	Experience	Training Required For Competency
BUSINESS/MANAGEMENT								
	11-3021	Computer & Info. Systems Managers	$27.92	$44.31	$65.65	Bachelor's	5+ years	None
	13-1111	Management Analysts	$18.29	$30.58	$49.67	Bachelor's	< 5 years	None
	13-2011	Accountants & Auditors	$16.06	$24.81	$40.71	Bachelor's	None	None
COMPUTERS/IT								
	15-1111	Computer & Info. Research Scientists	$24.01	$41.64	$61.66	Advanced degree	None	None
	15-1121	Computer Systems Analysts	$18.42	$29.84	$46.37	Bachelor's	None	None
	15-1122	Information Security Analysts	$20.89	$32.45	$50.93	Bachelor's	< 5 years	None
	15-1131	Computer Programmers	$17.73	$27.92	$44.37	Bachelor's	None	None
	15-1132	Software Developers, Applications	$21.99	$37.30	$54.41	Bachelor's	None	None
	15-1133	Software Developers, Systems Software	$19.14	$31.82	$48.57	Bachelor's	None	None
	15-1134	Web Developers	$14.12	$21.15	$34.75	Associate's	None	None
	15-1141	Database Administrators	$18.63	$31.67	$48.77	Bachelor's	< 5 years	None
	15-1142	Network & Computer Systems Admin.	$20.61	$32.62	$51.63	Bachelor's	None	None
	15-1143	Computer Network Architects	$21.06	$31.00	$46.72	Bachelor's	5+ years	None
	15-1151	Computer User Support Specialists	$10.68	$18.50	$30.49	Some college	None	Moderate-term OJT
	15-1152	Computer Network Support Specialists	$17.93	$29.97	$44.54	Associate's	None	None
	15-1199	Computer Occupations, All Other	$23.56	$34.59	$49.91	Bachelor's	None	None
MATHEMATICAL								
	15-2021	Mathematicians	-	-	-	Advanced degree	None	None
	15-2031	Operations Research Analysts	$15.92	$23.80	$36.45	Bachelor's	None	None
	15-2041	Statisticians	$19.54	$29.35	$45.60	Advanced degree	None	None
	15-2099	Mathematical Science Occupations, All Other	-	-	-	Bachelor's	None	None
ENGINEERING								
	17-2061	Computer Hardware Engineers	$30.55	$44.14	$61.14	Bachelor's	None	None
	17-2112	Industrial Engineers	$23.60	$34.57	$52.47	Bachelor's	None	None

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

CYBERSECURITY/IT *(CONTINUED)*

In the region, there are few existing programs that support the cyber sector. Data processing technology and network and system administration are the most popular computer-related fields. Computer systems networking and computer programming also graduate about 20 students each year. The rest of the computer-related fields of study are very general and may not match well with the specific cyber-skills required by regional employers in the sector.

Accounting and general business fields of study are fairly popular in the region, but are also in high-demand in other industries and other regions as well. This implies that there may be a high degree of competition for top graduates in these fields.

FIGURE 63. RELEVANT COMPLETIONS – CYBERSECURITY/IT OCCUPATIONS

THREE-YEAR ANNUAL AVERAGE OF DEGREES/AWARDS CONFERRED, 2011-2013

CIP Code	Field of Study	Degrees/awards by level: Certificate (< 1 year)	Certificate (≥1 yr., < 2 yrs.)	Associate's*	Bachelor's	Advanced**	Annual average degrees/awards conferred (all levels)
COMPUTER AND MATHEMATICAL							
11.0301	Data Processing Technology/Technician	48		58			106
11.1001	Network and System Administration/Administrator	31		9	1		41
11.0901	Computer Systems Networking/Telecomm.	16		11			27
11.0201	Computer Programming/Programmer, General	8		9			18
11.0101	Computer and Information Sciences, General			4	13		17
27.0301	Applied Mathematics, General				14		14
11.0202	Computer Programming, Specific Applications	8					8
27.0101	Mathematics, General				7		7
11.0103	Information Technology			6			6
26.1102	Biostatistics					4	4
30.0801	Mathematics and Computer Science				2		2
BUSINESS/MANAGEMENT							
52.0301	Accounting			44	35		79
52.1201	Management Information Systems, General				21		21
52.0305	Accounting and Business/Management				3		3
52.0205	Operations Management and Supervision			1	1		2

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys; National Crosswalk Service Center; TIP Strategies. IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level.

CYBERSECURITY/IT *(CONTINUED)*

SELECTED INITIATIVES & RESOURCES.

CSRA Alliance for Fort Gordon. The CSRA Alliance is a nonprofit formed by business leaders and elected officials who intended to build on the strong bond already in existence between Fort Gordon and the surrounding communities. The Alliance's mission is to enhance the economic value of the community by demonstrating the potential for Fort Gordon to grow existing missions and take on new missions. In addition, the Alliance promotes economic development through partnerships capitalizing on the information technology, communications, and medical expertise prominent at Fort Gordon.

Alliance for Cybersecurity Education (ACE). The goal of ACE is to promote cyber education in secondary schools and its integration into postsecondary education, so as facilitate a workforce directly achieving the needs of the cyber community. They do this by designing certified secondary education curricula. The partnership was developed by economic development entities including the Augusta Metro and Columbia County Chambers of Commerce; educational institutions including the Aiken Technical College, Georgia Regents University, and the Columbia and Richmond Counties School Systems; as well as the CSRA Alliance and Fort Gordon. ACE also positions the CSRA as a resource and partner with NSA-Georgia, the Cyber Center of Excellence, and Fort Gordon in cyber expertise.

Information Systems Security Association (ISSA). ISSA is a nonprofit, international organization providing educational forums, publications, and peer interaction opportunities to information security professionals and practitioners. Its mission is to enhance the knowledge, skills, and professional growth of its members. The Greater Augusta Chapter meets quarterly and provides security professionals with an opportunity to network, share ideas, and receive technical training.

Technology Association of Georgia (TAG). With over 26,000 members and 200 events per year, TAG's mission is to educate, promote, influence, and unite those in the technology sector. Along with member networking events, the organization is an advocate for positive public policy change and works with government leaders to develop and enact polices and legislation that will bolster the growth of the technology community. In addition, TAG partners with city, regional, and state chambers of commerce to promote the companies and people that comprise the industry.

theClubhou.se. TheClubhou.se is a nonprofit which provides a space for technology professionals in Augusta, GA. Based out of a historic schoolhouse built in 1802, the space is divided into a wing for learning and prototyping and a space for co-working and business incubation. The organization believes in the power of businesses to impact the community; in the first two years of operation they housed over 25 start ups and created a $5 million annual economic impact in Greater Augusta.

Microsoft IT Academy (Georgia). Developed through a partnership between Microsoft and the Georgia Department of Education, the Academy is designed to provide students with technology skills necessary to acquire certification and be competitive in today's workplace. This is achieved through curricula design, IT Readiness resources, and training opportunities.

Computer Science Teachers Association (CSTA). CSTA supports and promotes the teaching of science and other computing disciplines through K-12 education using seminars and training. This is achieved by providing opportunities for teacher and students to better understand the computing disciplines and to more successfully prepare themselves to teach and learn.

MEDICAL

OVERVIEW. The medical sector employs almost 33,000 workers in the nine-county region. The medical sector grew 20 percent between 2004 and 2014 and employs the largest number of workers of any industry sector in the region. Yet the relative concentration of employment in the industry is slightly less than that of the US as evidenced by an LQ of 0.91. The five-county CRO region has an LQ of 1.04, which means that the share of employment in this sector is slightly above that of the nation.

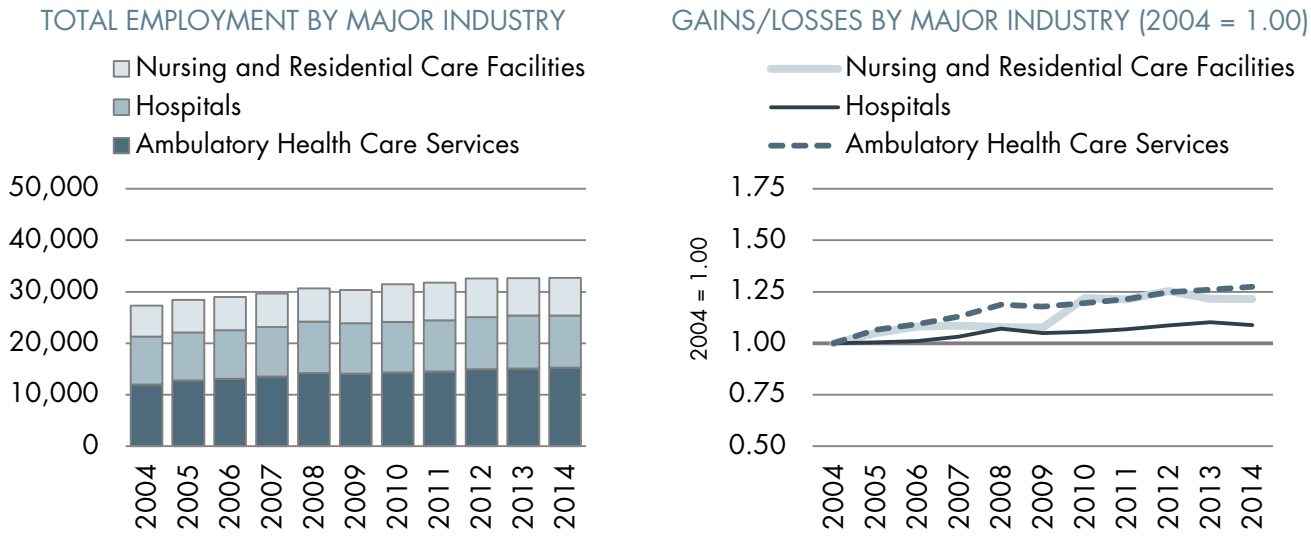
FIGURE 64. SELECTED EMPLOYERS – MEDICAL

Company	Location
Aiken Regional Medical Centers	Aiken
Georgia Regents Health System	Richmond/Columbia
HCA/Doctors Hospital	Richmond
Trinity Hospital of Augusta	Richmond
University Healthcare System	Richmond/Columbia
VA Medical Center	Richmond

Source: SRSCRO, TIP Strategies research.

The medical sector is comprised of three primary sectors: ambulatory health care services (NAICS 621); hospitals (NAICS 622); and nursing and residential (NAICS 623). The largest segment is ambulatory health care services, which accounts for 47 percent of all employment in the region. This segment is also the fastest growing.

FIGURE 65. EMPLOYMENT TRENDS, 2004 TO 2014 – MEDICAL *(INDUSTRY–BASED)*



Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

MEDICAL *(CONTINUED)*

KEY OCCUPATIONS. Healthcare occupations can be categorized as professional/technical, support, and management and administrative. The nine-county region has a higher than average concentration of workers in 15 different occupations (LQ>1.25). The occupations with the highest relative concentrations are ambulance drivers and EMTs (LQ>2.00). The concentrations of psychiatric aides and physical therapy aides is particularly low (LQ<0.65). There is also a low concentration of family and general practitioners (LQ = 0.78).

The wages in most of the occupations in the professional/technical category and in some of the occupations in the management and administrative category are higher than the regional median hourly earnings. Occupations in the healthcare support category are lower wage jobs with the exception of physical therapy aides and all other healthcare support workers.

FIGURE 66. SHARE OF EMPLOYMENT IN SELECTED INDUSTRIES – MEDICAL OCCUPATIONS

INCLUDES 2014 LOCATION QUOTIENT (LQ) AND WAGE RATE COMPARISON RELATIVE TO US

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	2014 Emp. LQ (US = 1.00)	Median Hourly Earnings	Relative to US (US=1.00)	Share of employment in: Outpatient Svcs. NAICS 621	Hospitals NAICS 622	Residential Care NAICS 623
HEALTHCARE - PROFESSIONAL/TECHNICAL									
★	29-1141	Registered Nurses	8,507	1.30	$30.48	0.96	8.9%	34.3%	7.6%
	29-2061	Licensed Practical/Vocational Nurses	2,605	1.47	$18.70	0.93	4.7%	3.4%	11.2%
★	29-1069	Physicians & Surgeons, All Other	1,293	1.55	$62.44	0.71 ×	4.5%	2.2%	-
	29-2041	Emergency Medical Techs. & Paramedics	1,234	2.12	$14.91	0.99	4.3%	0.7%	-
	29-2052	Pharmacy Technicians	1,232	1.39	$14.03	0.98	0.2%	1.1%	-
	29-1051	Pharmacists	879	1.25	$56.53	0.99	0.2%	1.1%	-
	29-2011	Medical & Clinical Laboratory Technologists	731	1.87	$23.42	0.83	1.7%	2.9%	-
	29-2034	Radiologic Technologists	631	1.33	$25.87	0.97	1.3%	2.2%	-
	29-2021	Dental Hygienists	506	1.07	$28.95	0.83	2.6%	-	-
	29-1126	Respiratory Therapists	505	1.77	$25.28	0.93	0.2%	2.9%	0.2%
	29-2012	Medical & Clinical Laboratory Technicians	463	1.21	$19.10	1.05	1.3%	1.2%	-
	29-2071	Medical Records & Health Info. Technicians	440	0.98	$17.37	1.03	0.9%	1.0%	0.5%
	29-1123	Physical Therapists	430	0.85	$38.69	1.00	1.4%	1.1%	0.4%
	29-2055	Surgical Technologists	422	1.75	$17.43	0.85	0.8%	2.1%	-
	29-1171	Nurse Practitioners	395	1.40	$42.50	0.95	1.9%	0.8%	0.1%
★	29-1021	Dentists, General	278	0.88	$85.03	1.17 ●	1.5%	-	-
	29-1062	Family & General Practitioners	256	0.78	$70.21	0.85	0.9%	0.1%	-
	29-2099	Health Technologists & Technicians, All Other	247	1.06	$18.48	0.90	0.8%	0.9%	-
	29-1031	Dietitians & Nutritionists	242	1.51	$17.27	0.64 ×	0.4%	0.6%	0.3%
★	29-2031	Cardiovascular Technologists & Techs.	219	1.75	$26.03	1.02	0.3%	1.1%	-

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. LQs greater than 1.25 are highlighted, as are wage rates above the regional average ($17.96). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (×).

Continued next page

FIGURE 66. SHARE OF EMPLOYMENT IN SELECTED INDUSTRIES –MEDICAL OCCUPATIONS (CONT.)

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	2014 Emp. LQ (US = 1.00)	Median Hourly Earnings	Relative to US (US=1.00)	Share of employment in: Outpatient Svcs. NAICS 621	Hospitals NAICS 622	Residential Care NAICS 623
HEALTHCARE SUPPORT									
	31-1014	Nursing Assistants	3,999	1.12	$11.14	0.93	2.2%	8.4%	28.6%
	31-1011	Home Health Aides	2,448	1.06	$9.59	0.96	2.3%	0.1%	9.9%
	31-9092	Medical Assistants	1,417	0.99	$13.33	0.93	7.6%	1.2%	0.4%
	31-9091	Dental Assistants	877	1.15	$15.87	0.95	5.3%	-	-
	31-9099	Healthcare Support Workers, All Other	360	1.45	$17.97	1.09	0.5%	0.9%	0.2%
	31-9097	Phlebotomists	281	1.06	$11.84	0.82	1.1%	0.5%	-
★	31-9094	Medical Transcriptionists	232	1.20	$17.38	1.08	0.5%	0.5%	-
	31-1015	Orderlies	204	1.50	$10.92	0.94	0.1%	0.6%	0.7%
	31-2021	Physical Therapist Assistants	155	0.87	$25.68	1.00	0.6%	0.4%	0.3%
	31-9093	Medical Equipment Preparers	114	0.90	$13.92	0.91	0.2%	0.6%	-
	31-2022	Physical Therapist Aides	74	0.62	$11.64	1.00	0.3%	0.2%	0.1%
	31-1013	Psychiatric Aides	57	0.31	$11.53	0.95	-	0.2%	0.2%
MANAGEMENT & ADMINISTRATIVE									
★	43-9061	Office Clerks, General	7,686	0.99	$11.72	0.87	2.3%	1.0%	0.8%
★	43-4051	Customer Service Representatives	7,242	1.22	$12.11	0.81	0.7%	0.5%	0.1%
★	43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	6,019	0.96	$14.32	0.91	1.2%	0.7%	0.5%
	11-1021	General & Operations Managers	4,520	0.91	$37.50	0.81	0.6%	0.2%	0.6%
	43-1011	First-Line Supvsr., Office & Admin. Support	3,472	1.01	$20.04	0.83	1.6%	0.5%	0.3%
★	43-3031	Bookkeeping, Accounting, & Auditing Clerks	3,444	0.80	$15.26	0.89	0.6%	0.2%	0.3%
	43-4171	Receptionists & Information Clerks	2,471	0.98	$11.67	0.91	5.5%	0.6%	1.0%
	43-3021	Billing & Posting Clerks	1,255	1.00	$13.83	0.85	2.0%	0.5%	0.1%
★	43-6011	Exec. Secretaries/Admin. Assistants	1,235	0.65	$20.93	0.88	0.3%	0.3%	0.1%
	43-6013	Medical Secretaries	887	0.69	$15.44	1.01	3.3%	1.2%	0.1%
★	11-3011	Administrative Services Managers	774	1.14	$40.18	1.02	0.2%	0.3%	0.2%
	11-9111	Medical & Health Services Managers	771	1.02	$39.03	0.90	1.4%	2.0%	0.9%
	43-4111	Interviewers, Except Eligibility & Loan	293	0.56	$14.95	1.02	0.1%	0.7%	-

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. LQs greater than 1.25 are highlighted, as are wage rates above the regional average ($17.96). Marker indicates median hourly wages ≥110% of US (●) or ≤80% of US (×).

MEDICAL *(CONTINUED)*

DEMAND. Figure 67 shows demand factors and select demographic characteristics for the key medical occupations.

Registered nurses and licensed practical/vocational nurses (LVNs) are by far the highest-demand occupations. With LVNs, this demand is largely driven by high turnover in the industry as 63 percent of the demand is for replacement jobs rather than new jobs. Physicians and surgeons was also identified as an area of high demand because a large number of doctors have reached or will reach retirement age in the next five to ten years. Family and general practitioners and dentists are facing a similar situation with the aging of their workforce. Surgical technologists, health technologists, pharmacy technicians, psychiatric aides, home health aides, and physical therapy aides are facing particularly high growth in new jobs.

FIGURE 67. DEMAND FACTORS & DEMOGRAPHICS – MEDICAL OCCUPATIONS

INCLUDES ESTIMATED ANNUAL OPENINGS, 2014 TO 2019

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	Demand Factors: Annual Openings (2014-19)	Demand Factors: New jobs	Demand Factors: Replacement	Demographics: % 55+ Years	Demographics: % 65+ Years	Demographics: % Male
HEALTHCARE - PROFESSIONAL/TECHNICAL									
★	29-1141	Registered Nurses	8,507	346	49%	51%	24%	4%	7%
	29-2061	Licensed Practical/Vocational Nurses	2,605	106	37%	63%	24%	4%	6%
★	29-1069	Physicians & Surgeons, All Other	1,293	45	21%	79%	27% ◄	8% ◄	62%
	29-2041	Emergency Medical Techs. & Paramedics	1,234	85	55%	45%	8%	1%	59%
	29-2052	Pharmacy Technicians	1,232	43	68%	32%	11%	2%	19%
	29-1051	Pharmacists	879	42	44%	56%	22%	6% ◄	42%
	29-2011	Medical & Clinical Laboratory Technologists	731	30	32%	68%	22%	3%	23%
	29-2034	Radiologic Technologists	631	22	56%	44%	17%	2%	23%
	29-2021	Dental Hygienists	506	33	55%	45%	16%	1%	3%
	29-1126	Respiratory Therapists	505	18	56%	44%	17%	1%	28%
	29-2012	Medical & Clinical Laboratory Technicians	463	27	50%	50%	22%	3%	24%
	29-2071	Medical Records & Health Info. Technicians	440	23	45%	55%	23%	5% ◄	9%
	29-1123	Physical Therapists	430	25	53%	47%	11%	1%	25%
	29-2055	Surgical Technologists	422	16	72%	28%	12%	1%	19%
	29-1171	Nurse Practitioners	395	19	57%	43%	23%	3%	6%
★	29-1021	Dentists, General	278	15	46%	54%	34% ◄	12% ◄	69%
	29-1062	Family & General Practitioners	256	11	30%	70%	28% ◄	9% ◄	59%
	29-2099	Health Technologists & Technicians, All Other	247	8	69%	31%	18%	2%	31%
	29-1031	Dietitians & Nutritionists	242	7	57%	43%	19%	2%	7%
★	29-2031	Cardiovascular Technologists & Techs.	219	9	64%	36%	16%	2%	22%

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. 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 ia reaching retirement age (defined here as ≥25% age 55+ and/or ≥ 5% age 65+).

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FIGURE 67. DEMAND FACTORS & DEMOGRAPHICS – MEDICAL OCCUPATIONS (CONT.)

HDO	SOC Code	Description	Jobs in CRO 9-County Laborshed (2014)	Demand Factors: Annual Openings (2014-19)	Demand Factors: New jobs	Demand Factors: Replacement	Demographics: % 55+ Years	Demographics: % 65+ Years	Demographics: % Male
HEALTHCARE SUPPORT									
	31-1014	Nursing Assistants	3,999	158	48%	52%	19%	4%	10%
	31-1011	Home Health Aides	2,448	167	68%	32%	21%	6% ◀	10%
	31-9092	Medical Assistants	1,417	65	54%	46%	12%	2%	6%
	31-9091	Dental Assistants	877	42	53%	47%	12%	1%	4%
	31-9099	Healthcare Support Workers, All Other	360	10	23%	77%	19%	3%	20%
	31-9097	Phlebotomists	281	15	61%	39%	13%	2%	15%
★	31-9094	Medical Transcriptionists	232	8	34%	66%	20%	2%	5%
	31-1015	Orderlies	204	8	47%	53%	20%	5% ◀	12%
	31-2021	Physical Therapist Assistants	155	9	60%	40%	12%	3%	19%
	31-9093	Medical Equipment Preparers	114	6	57%	43%	20%	4%	15%
	31-2022	Physical Therapist Aides	74	5	62%	38%	13%	7% ◀	19%
	31-1013	Psychiatric Aides	57	5	73%	27%	17%	9% ◀	-
MANAGEMENT & ADMINISTRATIVE									
★	43-9061	Office Clerks, General	7,686	242	29%	71%	25%	7% ◀	18%
★	43-4051	Customer Service Representatives	7,242	386	44%	56%	14%	2%	28%
★	43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	6,019	175	55%	45%	29% ◀	7% ◀	4%
	11-1021	General & Operations Managers	4,520	144	36%	64%	22%	3%	72%
	43-1011	First-Line Supvsr., Office & Admin. Support	3,472	148	40%	60%	22%	4%	30%
★	43-3031	Bookkeeping, Accounting, & Auditing Clerks	3,444	92	60%	40%	30% ◀	8% ◀	10%
	43-4171	Receptionists & Information Clerks	2,471	109	35%	65%	23%	7% ◀	7%
	43-3021	Billing & Posting Clerks	1,255	51	51%	49%	20%	4%	9%
★	43-6011	Exec. Secretaries/Admin. Assistants	1,235	26	36%	64%	30% ◀	7% ◀	4%
	43-6013	Medical Secretaries	887	48	74%	26%	27% ◀	6% ◀	3%
★	11-3011	Administrative Services Managers	774	23	41%	59%	29% ◀	5% ◀	62%
	11-9111	Medical & Health Services Managers	771	38	47%	53%	28% ◀	4%	25%
	43-4111	Interviewers, Except Eligibility & Loan	293	10	38%	62%	22%	6% ◀	18%

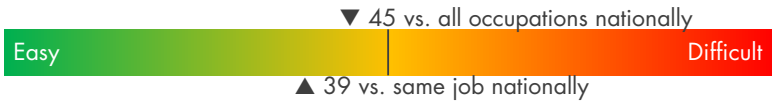
Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.
Notes: ★ Indicates occupation was identified as a high demand occupation (HDO), see page 35. Annual openings are an estimate of job openings due to net change in employment and replacement needs (e.g., turnover, retirement). ◀ Indicates significant share of workforce ia reaching retirement age (defined here as ≥25% age 55+ and/or ≥ 5% age 65+).

MEDICAL *(CONTINUED)*

REAL-TIME LMI. Figure 68 shows a summary of online job postings in the region for medical jobs. Currently, there are 1,572 unique job postings for the medical industry posted by 248 employers. The vast majority are for jobs in Richmond County. The average salary posted is 107 percent of the US average.

FIGURE 68. SUMMARY FOR JOB POSTINGS SPECIFIYING MEDICAL/HEALTH FUNCTIONAL AREA

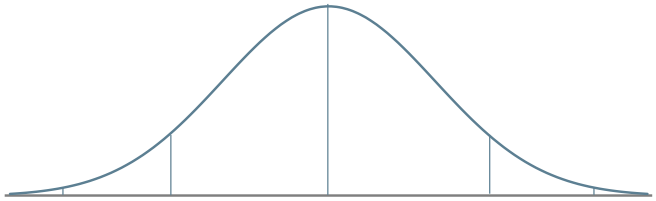
HIRING SCALE



OPENINGS

Current job openings:	1,572
Direct employers competing:	248
Average posting duration (in days):	48

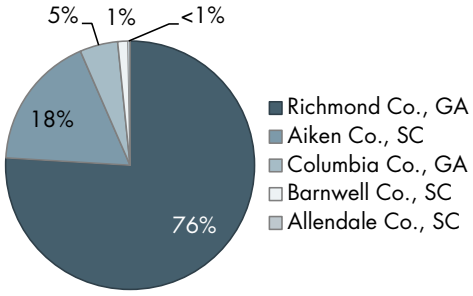
SALARY RANGE



Percentile	10th	25th	50th	75th	90th
Local	$48,600	$66,850	**$87,150**	$107,400	$125,650
National	$45,850	$62,550	**$81,100**	$99,650	$116,300
US=1.00	1.06	1.07	**1.07**	1.08	1.08

GEOGRAPHIC DISTRIBUTION

Share of postings by county (past four months)



TOP 10 COUNTS *(based on 3,921 postings over past four months)*

Employers	# postings
HCA - The Healthcare Company	397
Doctors Hospital	350
Dept. of Veterans Affairs/VA Medical Center	218
University Health System, Inc.	217
Community Health Systems Inc/CHS-Home Care	177
MCG Health System	147
Army/Army Install. Mgmt./Army Med. Command	111
United Health Services	99
WellStar	92
Fresenius Medical Care	87

Occupations *(SOC-code based)*		# postings
29-1141	Registered Nurses	1,522
11-9111	Medical and Health Services Managers	270
29-2061	Licensed Practical/Licensed Voc. Nurses	184
31-1014	Nursing Assistants	160
31-9092	Medical Assistants	99
43-6013	Medical Secretaries	93
29-2071	Medical Records/Health Info. Techs.	83
29-1051	Pharmacists	78
29-1069	Physicians and Surgeons, All Other	77
29-1123	Physical Therapists	72

Hard Skills	# postings
Pediatrics	350
Behavioral health	300
Critical care	298
Geriatrics	290
Robotic surgery	262
Emergency room	170
Patient Electronic Medical Record	158
Medical information	145
Quality Assurance	142
Quality control	114

Certifications	# postings
Certified Registered Nurse	1,721
Basic Life Support	1,251
Advanced Cardiac Life Support	507
Certification in Cardiopulmonary Resuscitation	466
Licensed Practical Nurse	294
Board Certified	213
Pediatric Advanced Life Support	211
Certified in Nursing Administration	182
Driver's License	144
Basic Cardiac Life Support	136

Source: Wanted Analytics; TIP Strategies.

MEDICAL *(CONTINUED)*

FIGURE 69. REAL-TIME LMI, SELECTED MEDICAL OCCUPATIONS

29-1141 REGISTERED NURSES

HIRING SCALE

▼ 45 vs. all occupations nationally

Easy — Difficult

▲ 39 vs. same job nationally

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$63,800	$68,400	$73,500	$78,550	$83,150
National	$58,850	$65,200	$72,300	$79,350	$85,750
US=1.00	1.08	1.05	1.02	0.99	0.97

OPENINGS

Current job openings:	573
Direct employers competing:	94
Average posting duration (in days):	48

TOP SKILLS

Critical care | Behavioral health | Robotic surgery | Geriatrics | Pediatrics | Emergency room | Quality assurance | Hemodialysis | Medical info. | 20/20 software | Patient electronic med. record | Quality control | Utilization review | Cath lab

11-9111 MEDICAL AND HEALTH SERVICES MANAGERS

HIRING SCALE

76 vs. all occupations nationally ▼

Easy — Difficult

▲ 58 vs. same job nationally

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$74,550	$81,450	$89,100	$96,750	$103,650
National	$68,300	$80,550	$94,100	$107,700	$119,950
US=1.00	1.09	1.01	0.95	0.90	0.86

OPENINGS

Current job openings:	105
Direct employers competing:	51
Average posting duration (in days):	46

TOP SKILLS

Behavioral health | ICD-10/ICD-9 | Quality control | Geriatrics | Network reporting | Clinical review | Hemodialysis | Pediatrics | Critical care | Emergency room | Quality Assurance |Private Practice | Patient Electronic Medical Record

29-2061 LICENSED VOCATIONAL/LICENSED PRACTICAL NURSES

HIRING SCALE

▼ 21 vs. all occupations nationally

Easy — Difficult

▲ 6 vs. same job nationally

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$41,600	$43,750	$46,150	$48,550	$50,750
National	$37,100	$41,150	$45,700	$50,250	$54,350
US=1.00	1.12	1.06	1.01	0.97	0.93

OPENINGS

Current job openings:	59
Direct employers competing:	28
Average posting duration (in days):	48

TOP SKILLS

Pediatrics | Hemodialysis | Quality control | Acute rehabilitation | Quality assurance | Geriatrics | 20/20 software | Clinical review | Equipment maintenance | IV Therapy | Critical care | Emergency room | ICD-10/ICD-9

31-1014 NURSING ASSISTANTS

HIRING SCALE

▼ 9 vs. all occupations nationally

Easy — Difficult

▲ 5 vs. same job nationally

SALARY RANGE

Percentile	10th	25th	50th	75th	90th
Local	$23,000	$24,250	$25,650	$27,050	$28,300
National	$18,350	$21,550	$25,150	$28,700	$31,950
US=1.00	1.25	1.13	1.02	0.94	0.89

OPENINGS

Current job openings:	65
Direct employers competing:	28
Average posting duration (in days):	42

TOP SKILLS

Geriatrics | Behavioral health | Medical info. | Critical care | Food preparation | Pediatrics| Resume processing | Emergency room | Equipment maintenance | Acute rehabilitation

Source: Wanted Analytics; TIP Strategies.

MEDICAL *(CONTINUED)*

EDUCATION & TRAINING. Figure 70 provides an overview of the earnings and typical training requirements for the key medical occupations.

The professional/technical healthcare occupations are largely middle- and high-skill and pay more than the regional median hourly earnings. On the other hand, many of the support and management and administrative occupations are low skill and pay less than the regional median hourly earnings. With the exception of management, most of the key medical occupations can be entry-level positions.

FIGURE 70. EDUCATION & TRAINING REQUIREMENTS – MEDICAL OCCUPATIONS

WITH HOURLY EARNINGS FOR SELECTED PERCENTILES, INCLUDING MEDIAN (50TH)

HDO	SOC Code	Description	Hourly Earnings (percentiles) 10th	50th	90th	Typical Requirements for Entry into Occupation: Education	Experience	Training Required For Competency
HEALTHCARE - PROFESSIONAL/TECHNICAL								
★	29-1141	Registered Nurses	$20.60	$30.48	$40.62	Associate's	None	None
	29-2061	Licensed Practical/Vocational Nurses	$13.54	$18.70	$23.84	Non-degree award	None	None
★	29-1069	Physicians & Surgeons, All Other	$25.96	$62.44	$120.20	Advanced degree	None	Intern/residency
	29-2041	Emergency Medical Techs. & Paramedics	$9.69	$14.91	$21.75	Non-degree award	None	None
	29-2052	Pharmacy Technicians	$9.39	$14.03	$19.80	HS or equivalent	None	Moderate-term OJT
	29-1051	Pharmacists	$38.08	$56.53	$70.92	Advanced degree	None	None
	29-2011	Medical & Clinical Laboratory Technologists	$14.71	$23.42	$33.44	Bachelor's	None	None
	29-2034	Radiologic Technologists	$17.66	$25.87	$35.05	Associate's	None	None
	29-2021	Dental Hygienists	$20.78	$28.95	$36.30	Associate's	None	None
	29-1126	Respiratory Therapists	$17.17	$25.28	$32.69	Associate's	None	None
	29-2012	Medical & Clinical Laboratory Technicians	$11.93	$19.10	$29.36	Associate's	None	None
	29-2071	Medical Records & Health Info. Technicians	$11.24	$17.37	$27.17	Non-degree award	None	None
	29-1123	Physical Therapists	$24.99	$38.69	$52.51	Advanced degree	None	None
	29-2055	Surgical Technologists	$11.59	$17.43	$24.01	Non-degree award	None	None
	29-1171	Nurse Practitioners	$25.43	$42.50	$55.65	Advanced degree	None	None
★	29-1021	Dentists, General	$47.38	$85.03	$143.86	Advanced degree	None	None
	29-1062	Family & General Practitioners	$33.56	$70.21	$126.47	Advanced degree	None	Intern/residency
	29-2099	Health Technologists & Technicians, All Other	$12.04	$18.48	$27.39	HS or equivalent	None	None
	29-1031	Dietitians & Nutritionists	$10.95	$17.27	$33.26	Bachelor's	None	Intern/residency
★	29-2031	Cardiovascular Technologists & Techs.	$12.93	$26.03	$37.52	Associate's	None	None

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

Continued next page

MEDICAL *(CONTINUED)*

FIGURE 70. EDUCATION & TRAINING REQUIREMENTS – MEDICAL OCCUPATIONS (CONT.)

HDO	SOC Code	Description	Hourly Earnings (percentiles) 10th	50th	90th	Typical Requirements for Entry into Occupation: Education	Experience	Training Required For Competency
HEALTHCARE SUPPORT								
	31-1014	Nursing Assistants	$8.56	$11.14	$16.05	Non-degree award	None	None
	31-1011	Home Health Aides	$7.96	$9.59	$11.82	Less than HS	None	Short-term OJT
	31-9092	Medical Assistants	$9.60	$13.33	$18.98	Non-degree award	None	None
	31-9091	Dental Assistants	$11.75	$15.87	$21.41	Non-degree award	None	None
	31-9099	Healthcare Support Workers, All Other	$11.13	$17.97	$24.40	HS or equivalent	None	None
	31-9097	Phlebotomists	$8.98	$11.84	$16.79	Non-degree award	None	None
★	31-9094	Medical Transcriptionists	$12.01	$17.38	$22.64	Non-degree award	None	None
	31-1015	Orderlies	$8.31	$10.92	$14.70	HS or equivalent	None	Short-term OJT
	31-2021	Physical Therapist Assistants	$12.85	$25.68	$34.48	Associate's	None	None
	31-9093	Medical Equipment Preparers	$10.25	$13.92	$20.76	HS or equivalent	None	Moderate-term OJT
	31-2022	Physical Therapist Aides	$8.65	$11.64	$17.52	HS or equivalent	None	Short-term OJT
	31-1013	Psychiatric Aides	$8.39	$11.53	$17.45	HS or equivalent	None	Short-term OJT
MANAGEMENT & ADMINISTRATIVE								
★	43-9061	Office Clerks, General	$8.04	$11.72	$17.71	HS or equivalent	None	Short-term OJT
★	43-4051	Customer Service Representatives	$8.08	$12.11	$18.64	HS or equivalent	None	Short-term OJT
★	43-6014	Secretaries/Admin. Asst., Exc. Legal, Med., & Exec.	$9.66	$14.32	$20.97	HS or equivalent	None	Short-term OJT
	11-1021	General & Operations Managers	$18.51	$37.50	$79.93	Bachelor's	< 5 years	None
	43-1011	First-Line Supvsr., Office & Admin. Support	$13.08	$20.04	$32.63	HS or equivalent	< 5 years	None
★	43-3031	Bookkeeping, Accounting, & Auditing Clerks	$9.74	$15.26	$21.99	HS or equivalent	None	Moderate-term OJT
	43-4171	Receptionists & Information Clerks	$8.07	$11.67	$16.59	HS or equivalent	None	Short-term OJT
	43-3021	Billing & Posting Clerks	$10.12	$13.83	$19.90	HS or equivalent	None	Short-term OJT
★	43-6011	Exec. Secretaries/Admin. Assistants	$14.67	$20.93	$29.83	HS or equivalent	< 5 years	None
	43-6013	Medical Secretaries	$10.58	$15.44	$21.60	HS or equivalent	None	Moderate-term OJT
★	11-3011	Administrative Services Managers	$21.33	$40.18	$80.19	Bachelor's	< 5 years	None
	11-9111	Medical & Health Services Managers	$23.36	$39.03	$63.13	Bachelor's	None	None
	43-4111	Interviewers, Except Eligibility & Loan	$11.03	$14.95	$19.36	HS or equivalent	None	Short-term OJT

Source: EMSI 2014.3 – QCEW Employees, Non-QCEW Employees, and Self-Employed.

MEDICAL *(CONTINUED)*

The medical sector is well-supported by the regional education and training institutions. Registered nursing is the top field of study and has graduates from programs across award levels from nursing prep to advanced degrees. Medicine, pharmacy technician, LVN, and dentistry round out the top five fields of study in the professional/technical category. Medical assistant, medical insurance coding specialist, dental assistant, and nursing assistant are the most popular fields of study in the support category.

FIGURE 71. RELEVANT COMPLETIONS – MEDICAL OCCUPATIONS

THREE-YEAR ANNUAL AVERAGE OF DEGREES/AWARDS CONFERRED, 2011-2013

CIP Code	Field of Study	Degrees/awards by level: Certificate (< 1 year)	Certificate (≥1 yr., < 2 yrs.)	Associate's*	Bachelor's	Advanced**	Annual average degrees/awards conferred (all levels)
HEALTHCARE - PROFESSIONAL/TECHNICAL							
51.3801	Registered Nursing/Registered Nurse	264		200	243	87	795
51.1201	Medicine					187	187
51.0805	Pharmacy Technician/Assistant	28	60	5			93
51.3901	Licensed Practical/Vocational Nurse Training		41	34			75
51.0401	Dentistry					63	63
51.0707	Health Information/Medical Records Tech.	41	3	17			61
51.0713	Medical Insurance Coding Specialist/Coder	19	37				56
51.0904	Emergency Medical Technician/Paramedic	51	4				56
51.0602	Dental Hygiene/Hygienist	9		19	22		51
51.0908	Respiratory Care Therapy/Therapist	2		22	22		46
51.0909	Surgical Technology/Technologist		30	12			42
51.2308	Physical Therapy/Therapist					34	34
51.3805	Family Practice Nurse/Nursing					33	33
51.0907	Medical Radiologic Technology/Science - Radiation Therapist			23	6	1	30
51.1005	Clinical Laboratory Science/Medical Tech.				15	10	25
51.1004	Clinical/Medical Laboratory Technician	2		21			23
51.0911	Radiologic Technology/Science - Radiographer			17			17
51.3808	Nursing Science					13	13
51.3101	Dietetics/Dietitian					11	11
51.0901	Cardiovascular Technology/Technologist			7			7
51.3809	Pediatric Nurse/Nursing					5	5
51.3814	Critical Care Nursing					4	4
51.3899	RN, Nursing Admin., Research/Clinical Nursing, Other					3	3

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys; National Crosswalk Service Center; TIP Strategies. IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level.

Continued next page

MEDICAL *(CONTINUED)*

FIGURE 71. RELEVANT COMPLETIONS – MEDICAL OCCUPATIONS (CONT.)

THREE-YEAR ANNUAL AVERAGE OF DEGREES/AWARDS CONFERRED, 2011-2013

CIP Code	Field of Study	Degrees/awards by level: Certificate (< 1 year)	Certificate (≥1 yr., < 2 yrs.)	Associate's*	Bachelor's	Advanced**	Annual average degrees/awards conferred (all levels)
HEALTHCARE - SUPPORT							
51.0801	Medical/Clinical Assistant	26	99	58			183
51.0713	Medical Insurance Coding Specialist/Coder	19	37				56
51.0601	Dental Assisting/Assistant		49				49
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide	47					47
51.0806	Physical Therapy Technician/Assistant	4		12			16
51.0716	Medical Admin./Exec. Assistant and Medical Secretary	13					13
51.0708	Medical Transcription/Transcriptionist	1					1
MANAGEMENT & ADMINISTRATIVE							
52.0201	Business Administration and Management, General	29	5	106	241	79	461
52.0401	Admin. Assistant and Secretarial Science, General	18	66	30			114
52.0302	Accounting and Bookkeeping	12	16	23			51
51.0702	Hospital/Health Care Facilities Administration/Mgmt.				38		38
52.0408	General Office Occupations and Clerical Services	36	1				38
51.0714	Medical Insurance Specialist/Medical Biller			31			31
51.0706	Health Info./Medical Records Admin./Administrator				14	12	26
52.0101	Business/Commerce, General	18					18
51.0705	Medical Office Management/Administration			18			18
52.0801	Finance, General				13		13
51.0716	Medical Admin./Exec. Assistant and Medical Secretary	13					13
44.0401	Public Administration					12	12
51.2201	Public Health, General					8	8
52.0701	Entrepreneurship/Entrepreneurial Studies	6					6
51.0718	Long Term Care Administration/Management				2		2

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys; National Crosswalk Service Center; TIP Strategies. IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. *Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years." **Advanced-level completions represent all awards above the bachelor's-degree level.

MEDICAL *(CONTINUED)*

SELECTED INITIATIVES & RESOURCES.

Richmond County Medical Society. The Richmond County branch of the Medical Association of Georgia (part of the American Medical Association) includes physicians from Richmond, Burke, Columbia, Jefferson, McDuffie, Taliaferro, Warren, Washington, and Wilkes Counties. Monthly meetings are held to address issues and exchange ideas. An Annual Legislative Meeting is also held by the organization and the Society created "Project Access" to provide temporary medical assistance to local residents.

Georgia Hospital Association (GNA). A nonprofit trade association, GNA aims to improve institutional health care services and patient care. They provide information and education on issues such as access to healthcare and clinical care updates, effective hospital management, and compliance with high-level accreditation. GNA is a member of the American Hospital Association and sponsors the Partnership for Health and Accountability (PHA), which is a statewide collaborative that brings together health care providers and community agencies and individuals. The PHA includes representation from groups like hospitals, physicians, state health officials, legislators and businesses. The organization's goal is to support healthy communities.

South Carolina Hospital Association (SCHA). A private nonprofit organization, SCHA has around 100 member hospitals and health systems and about 900 personal members. The aim of the organization is to support the creation of a world-class healthcare delivery system by fostering high quality patient care and serving as advocates for the hospital community. They achieve this through numerous initiatives such as: AccessHealth SC, which supports communities in providing healthcare services for low-income uninsured people; myschospital.org, a resource for reliable, consistent information about hospitals; SCHA Solutions, which helps hospitals find the best price on business solutions and workforce solutions to meet hospitals' special needs; and advocacy at the state and federal level.

Life Sciences Business Development Center (LSBDC). The LSBDC is an incubator dedicated to supporting entrepreneurs and new companies. Based at Georgia Health Sciences University, the incubator provides entrepreneurial suites which include a wet laboratory, clean or culture room space, office space, and equipment. The incubator is supported by the Georgia Medical Center Authority and the OneGeorgia Authority and is managed by the Medical College of Georgia (MCG) Office of Technology Transfer and Economic Development. An Advisory Board of over 20 business leaders, scientists, and administrators provide advice and assistance on policies for running the incubator. In addition, the LSDBC Board of Business Counselors volunteers to assist tenant companies.

HOSA. HOSA (previously Health Occupations Students of America) is a national student organization that aims to promote career opportunities in the health care industry and enhance the delivery of quality healthcare to all people. HOSA is endorsed by the US Department of Education and the Health Science Education (HSE) Division of the Association for Career & Technical Education (ACTE). Both Georgia and South Carolina have state-level HOSA associations, which help members with career planning and readiness, developing leadership skills, participating in community service activities, and by providing networking opportunities with health professionals.

Healthcare Science Technology Educators Association, Inc. (HSTEA). HSTEA's mission is to serve as a resource and network for educators in healthcare science technology fields. They aim to have a positive impact in building the future of healthcare. They achieve this through advocacy, networking, professional development, awards, discounts on publications, and national representation.

OTHER RESOURCES

Georgia Research Alliance (GRA). The GRA is a nonprofit organization founded in 1990 that partners with universities throughout the state (including Georgia Regents University in Augusta) and is "closely aligned" with Georgia's Department of Economic Development. GRA's objective is to expand research and commercialization capacity in Georgia's universities in order to launch new companies, create high-value jobs and transform lives. This is accomplished in four interrelated ways: 1) recruiting world-class scientists to Georgia universities, 2) investing in state-of-the-art research technology for university labs, 3) fueling the commercialization of university-based discoveries and inventions, and 4) forging and strengthening alliances among universities and industry to make Georgia more economically competitive. In 2013, GRA Ventures, the organization's commercialization arm, created GRA Industry Fellows (an initiative to connect industry experts with university faculty) and the Commercialization Council (a group of successful entrepreneurs and economic development advisors helping to expand the GRA Ventures program).

Career, Technical, and Agricultural Education (CTAE), Georgia Department of Education (GaDOE). The CTAE Division of the GaDOE oversees the state's career pathways program which encompasses 17 career clusters, including manufacturing. Career-related education begins with career awareness and exploration in middle school and culminates with work-based learning, providing students the opportunity to receive credit while working in an environment related to their career pathway. Educators are supported by the CTAE Resource Network, a nonprofit consortium operated by federal funds. Among the services offered through the network is Georgia C-NET, a statewide student database that allows work-based learning coordinators to create individual training plans utilizing the job titles and tasks lists available via ONET. In addition to facilitating the creation of customized training plans, C-NET allows users to track progress and keep complete histories of employer/student information, while streamlining performance reporting to the GaDOE.

ReadySC. Established in 1961, ReadySC is one of the oldest and most experienced workforce training programs in the US. They work with 16 technical colleges in South Carolina, to provide customized training for new and expanding business and industry at little or no cost to qualifying companies. Services include recruitment solutions, curriculum development, and training support. Qualified firms must be providing a sufficient number of jobs that are permanent, pay competitive wages, and provide health insurance benefits.

Apprenticeship Carolina. The aim of Apprenticeship Carolina is to ensure employers have access to the information and technical assistance they need to create demand-driven registered apprenticeship programs. They provide apprenticeship consultants, at no cost to the employer, to guide companies through the registered apprenticeship development process. Apprenticeship Carolina is a division of the SC Technical College System.

Project Lead the Way (PLTW). PLTW provides in-school STEM curriculum for middle and high school students. They help students develop the skills needed to succeed in the job market. Along with designing curricula that helps students develop critical-reasoning and problem-solving skills, PLTW fosters networking between students and professionals from local industries who supplement the real-world aspect of the curriculum through mentorships and workplace experience.

ACT WorkKeys. In 2015 the South Carolina General Assembly passed a law requiring all 11th grade students to take the ACT WorkKeys assessment. The test measures reading, mathematics, and finding information skills, particularly real-world skills that employers seek in everyday situations. Students who successfully complete the assessment may earn a certificate that can help them find summer jobs, part-time work, and/or internships. The State of Georgia also promotes the use of WorkKeys as an assessment tool, though they have not mandated its use in schools. The WorkKeys assessment was widely used in the WorkReady Community program when it was launched in 2006, but is less actively promoted at this time.

APPENDIX C: DATA & METHODOLOGY

CLASSIFICATION SYSTEMS

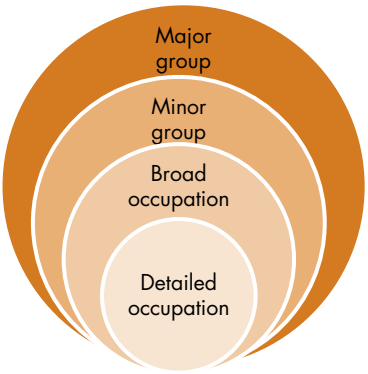
Much of the analysis presented in this report relies on three separate classification systems. A brief overview of each is presented below.

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.

STANDARD OCCUPATIONAL CLASSIFICATION SYSTEM

SOC STRUCTURE



SOC EXAMPLE

Major group 51-0000 Production occupations

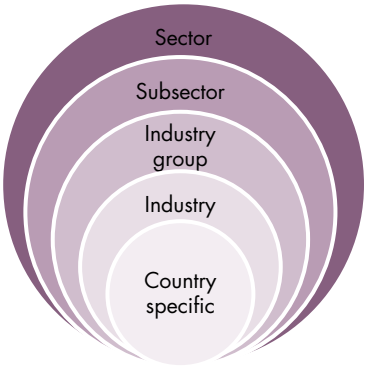
Minor group 51-2000 Assemblers & fabricators

Broad occupation 51-2090 Miscellaneous assemblers & fabricators

Detailed occupation 51-2092 Team assemblers

NORTH AMERICAN INDUSTRIAL CLASS. SYSTEM

NAICS STRUCTURE



NAICS EXAMPLE

Sector 31-33 Manufacturing

Subsector 336 Transportation equipment manufacturing

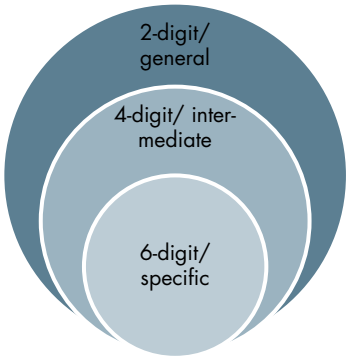
Industry group 3361 Motor vehicle manufacturing

Industry 33611 Automobiles & light duty motor vehicles, incl. chassis

Country-specific 336111 Automobiles & light duty motor vehicles, incl. chassis

CLASSIFICATION OF INSTRUCTIONAL PROGRAMS

CIP STRUCTURE



CIP EXAMPLE

General 14. Engineering

Intermediate 14.08 Civil engineering

Specific 14.0802 Geotechnical engineering

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

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.

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.

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

DATA SOURCE	ABBRV.	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

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.