



Slippery Rock University's  
**WORKFORCE  
CHARACTERISTICS  
TECHNICAL REPORT**

A report for Pennsylvania's  
State System of Higher Education

2016



---

# CONTENTS

<b>5</b>	<b>1. Introduction</b>
6	1.1 Pennsylvania’s State System of Higher Education Gap Analysis Project
7	1.2 Goal of the Workforce Characteristics Report
<b>9</b>	<b>2. Pennsylvania’s State System Learner Origin</b>
10	2.1 Slippery Rock University’s Learner Origin
<b>12</b>	<b>3. Summary of Slippery Rock University Workforce Region</b>
13	3.1 Defining Slippery Rock University’s Workforce Region
<b>15</b>	<b>4. Labor Market of Slippery Rock University’s Workforce Region</b>
16	4.1 Employment Projections
<b>18</b>	<b>5. Industries in Slippery Rock University’s Workforce Region</b>
19	5.1 Top Employers in Slippery Rock University’s Workforce Region
<b>21</b>	<b>6. Occupations in Slippery Rock University’s Workforce Region</b>
21	6.1 Skilled Occupations
22	6.2 Top Skilled Occupations in Slippery Rock University’s Workforce Region
25	6.3 Key Skilled High Demand Occupations Aligning to University-level Education
29	6.4 Industry Staffing Patterns for Key Skilled High Demand Occupations in Slippery Rock University’s Workforce Region
31	6.5 Key Skilled High Demand Occupational Profiles

---

**38** **7. Demographic and Socio-economic Indicators of Slippery Rock University’s Workforce Region**

38 7.1 Demographics of Slippery Rock University’s Workforce Region

40 7.2 Socio-economic Indicators of Slippery Rock University’s Workforce Region

**44** **8. Next Steps**

**45** **Data Sources**

**46** **Appendix A: Methodology for Identifying State System University Workforce Regions**

**52** **Appendix B: Pennsylvania State and County Enrollment and Employment**

**54** **Appendix C: Industry Projections 2014-2024 for Slippery Rock University’s Workforce Region**

**64** **Appendix D: Occupation Projections 2014-2024 for Slippery Rock University’s Workforce Region**

**91** **About The State System’s Gap Analysis Project**

## GLOSSARY OF TERMS

The following descriptions provide a point of reference to understand terminology as well as the types of data and analysis undertaken in this study, reflecting historic and contemporary narratives.

**Industry Change:** A measure of the change in employment within an industry, used to identify whether an industry is growing or declining, as well as the rate of change. Projected changes lay out expectations of growth/decline for specific industries.

**Job Postings:** The number of unique (de-duplicated) online postings for a job in a given occupation.

**Location Quotient:** A comparative statistic used to calculate the relative employment concentration of a given industry or occupation against the average employment of the industry in a larger geography (for example, countrywide). Industries with a higher location quotient (usually greater than 1.2) indicate that the region has a comparative advantage or specialization in the production of that good or service or has a high degree of specialization within its workforce. For example, in Silicon Valley, we would expect the concentration of computer programming occupations to be greater than the rest of the US, giving rise to the conclusion that Silicon Valley has a comparative advantage in the computer programming workforce.

**New and Replacement Jobs:** A demand-side estimate of the number of job openings in an occupation that result from new job growth as well as replacement demand. Replacement demand comprises occupation job leavers based on separations, retirement, and death.

**Occupation Jobs:** A measure of employment within an occupation category, used to identify which occupations have been growing or declining, as well as the rate of change. Projected changes lay out expectations of growth/decline for specific occupation categories.

**State System Learner Capture Rate:** The percentage of State System enrolled learners from a specific county that are attending a given Pennsylvania State System university. State System universities typically capture a higher proportion of State System enrolled learners from counties in proximity to the institution.

**State System Learner Share:** Represents the contribution of learners from a defined geographic area that are enrolled in a State System university.

**Sub-regions:** A geographic area within Pennsylvania defined for more focused workforce and education gap analyses. Sub-regions were determined primarily on Partnerships for Regional Economic Performance (PREP) boundaries. PREP is Pennsylvania's network of business assistance partners designed to help companies start, grow, and prosper. Please refer to Appendix A for mapping of the Sub-regions and PREP boundaries.

## ACRONYMS USED

**ACS:** American Community Survey

**BLS:** Bureau of Labor Statistics

**EMSI:** Economic Modeling Specialists International

**CEW:** Center on Education and the Workforce (Georgetown University)

**IPEDS:** Integrated Postsecondary Education Data System

**LAUS:** Local Area Unemployment Statistics

**LEHD:** Longitudinal Employment and Housing Dynamics

**NCES:** National Center for Education Statistics

**OES:** Occupational Employment Statistics

**O\*NET:** Occupational Network

**PUMS:** Public Use Microdata Sample

**QCEW:** Quarterly Census of Employment and Wages

**SAIPE:** Small Area Income and Poverty Estimates

**USDOE:** US Department of Education

**USDOL:** US Department of Labor

# 1. INTRODUCTION

Pennsylvania’s State System of Higher Education (State System) comprises 14 universities, four branch campuses, multiple regional centers and the McKeever Environmental Learning Center.<sup>1</sup> The universities are located in rural, suburban, and small-town settings around Pennsylvania. The State System’s two educational hubs (with locations in Harrisburg, the Dixon University Center, and Philadelphia, State System @ Center City) offer academic programs through a consortium of public and private colleges and universities. Per Act 188 of 1982, the State System’s mission “is the provision of instruction for undergraduate and graduate students to and beyond the master’s degree in the liberal arts and sciences, and in the applied fields, including the teaching profession.” In doing so, the State System’s purpose is “to provide high quality education at the lowest possible cost to students.”<sup>2</sup> Analysis and understanding of the economy and workforce the State System supports, as well as future demands for talent advances the State System’s mission and philosophy—a key component of this report. Further, it enables effective and targeted strategies and decision-making, grounded in data-driven evidence.

Like all institutions of higher education, the State System’s universities face challenges in their effort to identify and quantify program needs for Pennsylvania residents and businesses that demand talent. They must account for the changing economic and workforce dynamics within the region they support, such as industry and occupation growth/decline, as well as the changing quality of the area’s workforce. Furthermore, as technology progresses, a growing need to address increasingly complex and specialized occupational tasks requires additional customization to education. As a result, education institutions are increasingly called upon to incorporate relevant courses that meet the needs of students and businesses in their service area—a departure from traditional supply-based education towards a more employer demand-driven model.

A fundamental challenge for any higher education system is to first understand the characteristics of the economy and workforce it supports. This study and

---

1 One of the State System’s entities, System-wide Functions and Services, is primarily located at the Dixon University Center in Harrisburg and includes: System-wide shared administrative services; System leadership functions of the Chancellor and Board of Governors; some System-wide initiatives and grants managed on behalf of the universities; and the academic, student, and facilities support for the multi-university sites in Harrisburg and Philadelphia.

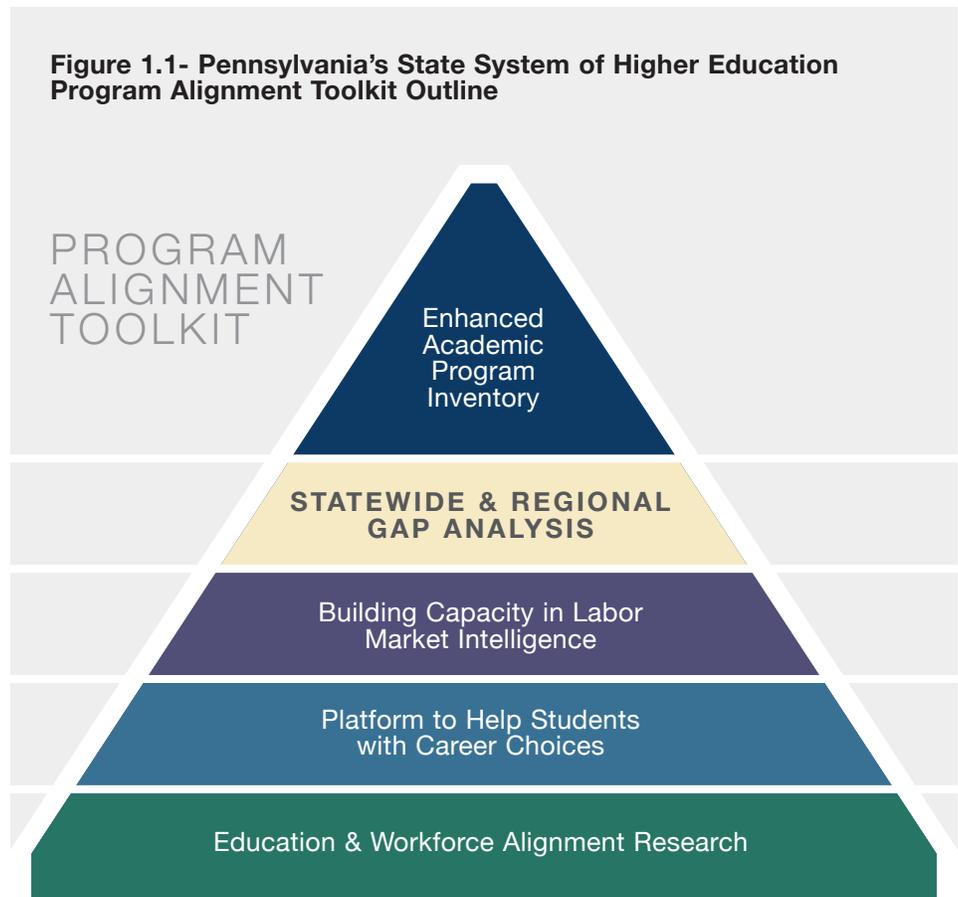
2 Source: The State System’s Economic and Employment Impact on the Commonwealth of Pennsylvania – released April 15, 2015.

the broader set of deliverables under the State System’s Supply/Demand Gap Analysis Project—hereinafter, Gap Analysis Project—will assist universities and education planners by providing an infrastructure of resources for internal planning, as well as external engagement. Understanding key economic aspects of the geography helps to better align policy and strategic direction in order to continue supporting the talent needs of Pennsylvania.

## 1.1 Pennsylvania’s State System of Higher Education Gap Analysis Project

In a fast-changing economic and social environment that is also experiencing rising costs for higher education, institutions are increasingly called upon to align their programs to the changing needs of the economy.

In response to improving career outcomes for its learners, Pennsylvania’s State System of Higher Education (State System) has produced a Program Alignment Toolkit—a central clearinghouse for key academic planning



---

information, developed in response to the State System's Strategic Plan "Rising to the Challenge 2020." The Program Alignment Toolkit helps provide multiple perspectives of how higher education can connect to the state's economy and lead to career success for students. A key component of this toolkit is the development of a statewide and regional gap analysis. Other high impact strategies that are a part of the State System's Program Alignment Toolkit are presented in Figure 1.1. The ultimate goal of this plan is to assist the State System's fourteen universities to increase their individual and collective impact on Pennsylvania's economy.

## **1.2 Goal of the Workforce Characteristics Report**

The State System's Gap Analysis Project produced both a Workforce Characteristics Report and a Supply/Demand Gap Analysis Report for both the state and five sub-regions. The Workforce Characteristics Report contains a set of economic, workforce, demographic, and socio-economic information to contextualize the supply/demand gap analysis. The Supply/Demand Gap Analysis Report for Pennsylvania and its sub-regions provides a data-driven perspective of employer demand (new and replacement jobs by occupation in the state) and higher education supply (degree production by major program). The data sources utilized for the State System's Gap Analysis Project are diverse including Bureau of Labor Statistics (BLS), U.S. Census Bureau, American Community Survey (ACS), System Research Office, National Center for Education Statistics (NCES, Integrated Postsecondary Education Data System), IMPLAN (Input/Output Model), and Economic Modeling Specialists International (EMSI). Ultimately, the reports generated from this project will assist the State System universities with strategic engagement, program development and evaluation, student engagement, and marketing.

The intentions of this Workforce Characteristics Report are fourfold.

- First, it provides a baseline reporting structure to evaluate workforce characteristics at the state level and sub-region level within Pennsylvania, which can be repeated in the future.
- Second, it identifies sub-regions within Pennsylvania that will be used to conduct regionally specific analysis in subsequent reports.
- Third, it builds on CEW's State System degree production report. The Workforce Characteristics Report is a data-driven analysis and discussion of trends in Pennsylvania's economy, including projections of industry and occupational employment, key skilled high demand occupations, and changes in socio-economic characteristics.

- 
- Finally, this report creates the foundation to construct the State System's Gap Analysis reports for the state and its regions and complements the content of the supply/demand gap analysis reports.

While the main body of this report provides a high level summary, the Appendices provide an abundance of information for those seeking additional detail. Appendix A provides a map of the state sub-region boundaries along with PREP and WIA boundaries. Appendix B provides detail on the employment and enrollment by each county in Pennsylvania. Appendix C provides nearly 300 detailed industry employment projections for the region along with a measure of competitiveness for each industry. Lastly, Appendix D provides a description of occupation levels and employment projections for over 400 detailed occupations.

## 2. PENNSYLVANIA'S STATE SYSTEM LEARNER ORIGIN

This section provides an overview of where State System learners come from within Pennsylvania. It is then compared to where Pennsylvania's workforce is employed. This information is combined with other relevant economic data to define sub-regions as well as university workforce regions—adding valuable geographic granularity to the State System's program alignment toolkit.

Pennsylvania's total four year institution enrollment in 2013 was approximately 618,700 learners. Of this, the Pennsylvania State System of Higher Education comprised 112,225 enrolled learners—of which almost 90% were Pennsylvania residents.<sup>3</sup> Based on analysis of the workforce size and the origin of learners, some counties within the Commonwealth appear to provide a higher or lower share of learners to the State System compared to other counties—indicating that learners in some counties are more prone to attending a State System university, compared to other counties. The map below (Figure 2.1) illustrates workforce size and the origin of Pennsylvania resident learners enrolled in Pennsylvania's State System of Higher Education. Counties that exceeded +/-1% difference of learners to workforce are found in Table 2.1 and Table 2.2. For example, Chester County provides a higher percentage of State System learners, compared to its workforce size, whereas Philadelphia County provides a low percentage of learners.

**Table 2.1 – Counties with Higher Share of State System Learners vs. Workforce**

County	State System Students from County	% of State System Students from PA	County Workforce	% of PA Workforce	Difference in Share
Chester	5,996	6.2%	272,270	4.3%	1.9%
Erie	3,469	3.6%	134,343	2.1%	1.5%
Monroe	2,532	2.6%	79,673	1.2%	1.4%

Source: Pennsylvania's State System of Higher Education Research Office, Bureau of Labor Statistics

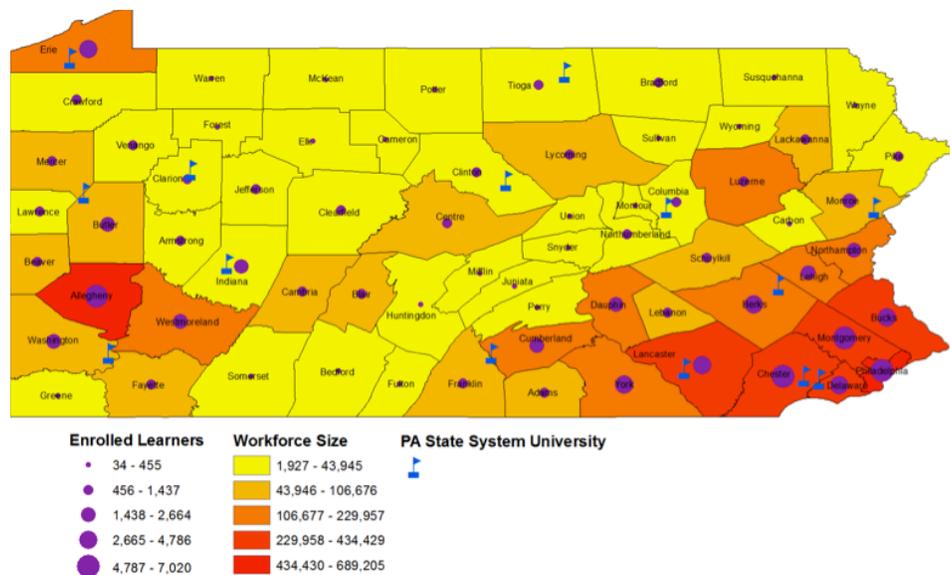
<sup>3</sup> Based on Fall 2013 enrollment.

**Table 2.2 – Counties with Lower Share of State System Learners vs. Workforce**

County	State System Students from County	% of State System Students from PA	County Workforce	% of PA Workforce	Difference in Share
Montgomery	5,401	5.6%	434,429	6.8%	-1.2%
Allegheny	7,020	7.3%	644,822	10.1%	-2.8%
Philadelphia	5,263	5.5%	689,205	10.8%	-5.3%

Source: Pennsylvania's State System of Higher Education Research Office, Bureau of Labor Statistics

**Figure 2.1 – State System Learner Origin and Workforce Size County**

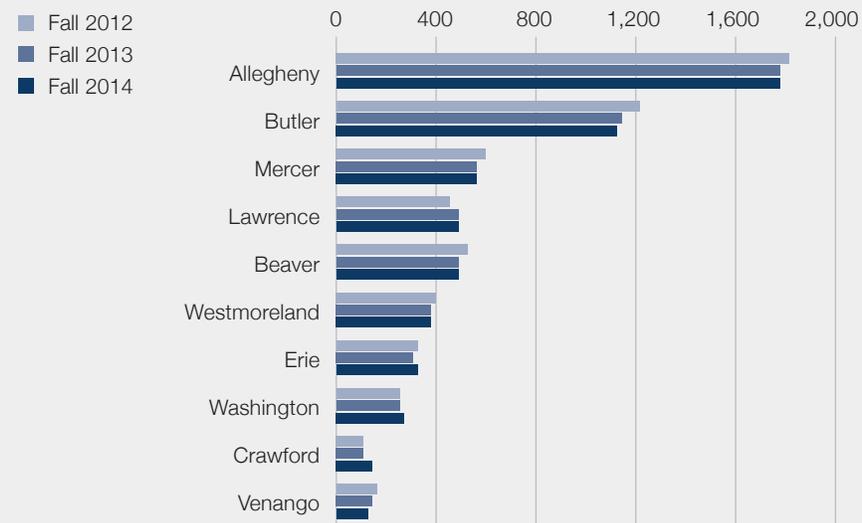


Source: Pennsylvania's State System of Higher Education, Oxford Economics mapping

## 2.1 Slippery Rock University's Learner Origin

Slippery Rock University learners, originally from Pennsylvania, come from nearly every county in the state. The vast majority of learners, however, come from counties that are in the northwest and southwest region. The top 10 learner enrollment counties account for about 75% of resident enrollment in Slippery Rock University. Figure 2.2 shows the Pennsylvania resident fall enrollment numbers between 2012 and 2014 for the top 10 counties. Table 2.3 provides enrollment detail for the top 10 counties.

**Figure 2.2 – Slippery Rock University Learner Enrollment by County**



Source: Pennsylvania's State System of Higher Education

**Table 2.3 Slippery Rock University Learner Enrollment by County**

County	Fall 2012	Fall 2013	Fall 2014
Allegheny	1,811	1,774	1,781
Butler	1,213	1,145	1,131
Mercer	589	567	563
Lawrence	461	485	486
Beaver	519	480	480
Westmoreland	390	376	389
Erie	317	300	333
Washington	252	261	267
Crawford	104	117	140
Venango	158	143	132

Source: Pennsylvania's State System of Higher Education

### 3. SUMMARY OF SLIPPERY ROCK UNIVERSITY WORKFORCE REGION

Located in Butler County, Pennsylvania, Slippery Rock University (SRU) supports the western region of Pennsylvania’s State System of Higher Education. It provides a breadth of degree programs and serves a student population of about 8,500 learners, of which about 89% are Pennsylvania residents.<sup>4</sup>

The following sections outline the supporting data used to select SRU’s Pennsylvania workforce region—defined as Butler, Allegheny, Mercer, Lawrence, Beaver, and Westmoreland counties. Subsequent sections provide a brief analysis of economic, workforce, demographic and socio-economic information. The purpose of providing this analysis is to gain better insight into how the workforce region has changed over the past several years, as well as projections of how the area will continue to change over the next several years.

#### A BRIEF NOTE ON DEVELOPING THE WORKFORCE REGION

Part of the geographic research and analysis involves central place theory—a geographical theory that seeks to explain the location and connectedness of economic activity. More specifically, this research seeks to quantify the interconnectedness of local economies surrounding the State System universities. This is measured by workforce commuting and economic activity (i.e. industry production, supply chains, sales, etc.). An additional aspect involves the geographic connection between the university’s learners. The university’s ability to draw learners from the surrounding region helps contextualize the geographic footprint of the institution.

The full details of this process are described in Appendix A.

---

4 Based on Average Fall Enrollment 2012-2014.

### 3.1 Defining Slippery Rock University’s Workforce Region

The main factors used to identify the university-specific workforce region involved evaluation of commuting patterns, learner capture rate, and economic activity (business demand and household demand). The aim is to identify the workforce region that surrounds the university and is consequently supported by the university, while also being inclusive of less populated rural counties. A workforce region is defined as: a labor market area or an economically integrated region within which residents can find jobs within a reasonable commuting distance or can change their employment without changing their place of residence.<sup>5</sup>

The counties in the region were identified using a multi-step process. Table 3.1 provides a shortened snapshot of two iterations, with the final selection of counties highlighted in green.<sup>6</sup>

When taken in the context of regional economic activity, about 68% of regional demand for goods and services are produced by businesses located within the region. This indicates that regional business activity is locally contained. Similarly, 92% of household demand is satisfied by local production, meaning that households are not traveling outside the region to purchase goods or services to consume.

**Table 3.1 – Slippery Rock Workforce Region Commuting Patterns, Learner Capture Rate, and Economic Activity**

County Combination	Job Share of People Living in the Region	Job Share of People Employed in the Region	Business Demand	Household Demand	Learner Capture Rate
Butler, Allegheny, Mercer	0.80	0.66	0.68	0.91	0.47
Butler, Allegheny, Mercer, Lawrence	0.82	0.70	0.68	0.91	0.54
Butler, Allegheny, Mercer, Lawrence, Beaver, Westmoreland	0.88	0.82	0.68	0.92	0.65

Sources: US Census - LEHD, Minnesota IMPLAN Group, Pennsylvania’s State System of Higher Education

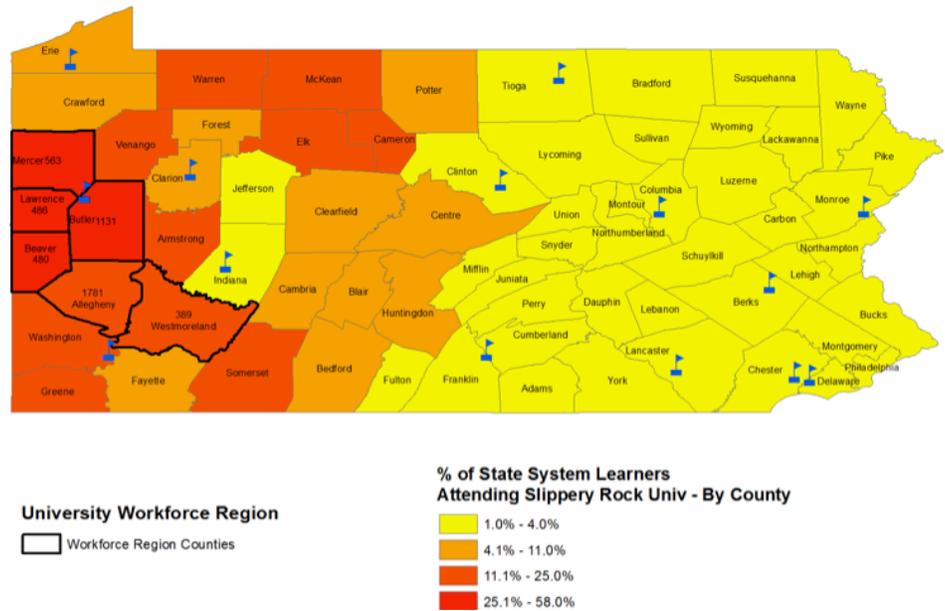
5 Bureau of Labor Statistics: Labor Market Area.

6 As mentioned in the methodology, no threshold values were explicitly set for each region. Rather the iterations sought to reasonably optimize each factor to meet the criteria for defining an economic area—recognizing the primary driving factor is workforce commuting.

The majority of SRU workforce region residents also work in the region (88%). This reflects a very strong centralized connection between workers and economic activity in a region that has nearly 1.1 million jobs. Additionally, learners at SRU originate from nearby surrounding counties. When looking at the percentage of learners attending State System universities, 65% (the capture rate) of State System learners in SRU's workforce region attend SRU.

Figure 3.1 illustrates learner capture rates for SRU's workforce region. This provides a strong indication of whether State System learners within the region ultimately attend SRU. Counties highlighted in yellow indicate that learners enrolled in a State System University are not generally going to SRU, whereas counties highlighted in dark orange or red indicate that SRU has a relatively high capture rate of State System enrolled learners.

**Figure 3.1 – Slippery Rock Workforce Region Learner Origin by Percent of Total State System Student Population**



Source: Pennsylvania's State System of Higher Education and Oxford Economics tabulations

# 4. LABOR MARKET OF SLIPPERY ROCK UNIVERSITY'S WORKFORCE REGION

The following sections provide a brief analysis of economic, workforce, demographic and socio-economic information. The purpose of providing this analysis is to gain better insight into how Slippery Rock University's workforce region has changed over the past several years, as well as projections of how the region will continue to change over the next several years. Table 4.1 provides a high level comparative summary of key workforce and economic indicators between Slippery Rock University's workforce region and Pennsylvania.

**Table 4.1 – Summary of SRU's Workforce Region and Pennsylvania Workforce Characteristics**

<b>Workforce Characteristic</b>	<b>SRU Workforce Region</b>	<b>Pennsylvania</b>	<b>Source</b>
Population	2.2 million	12.7 million	2009-2013 American Community Survey 5-Year Estimates
Employed	1.06 million	5.6 million	2014 BLS Quarterly Census of Employment and Wages
Unemployed	60,900	370,000	2014 BLS Local Area Unemployment Statistics
Unemployment Rate	5.5%	5.8%	2014 BLS Local Area Unemployment Statistics
Poverty Rate	12.6%	13.7%	2013 Census Small Area Income and Poverty Estimates
Business Establishments	57,900	347,000	2014 BLS Quarterly Census of Employment and Wages
Educational Attainment (25+ Population with Bachelor's or Higher)	30.9%	27.4%	2009-2013 American Community Survey 5-Year Estimates
Bachelor's or Higher Completions	24,000	137,000	Integrated Postsecondary Education Data System 3-Year Average AY2010-11 to AY2012-13
Projected Jobs 2024	1.14 million	6.2 million	Oxford Economics Projections 2024

---

The analysis in the following sections is broken into three key sections, namely:

**1. Industries** – an evaluation of historic and current changes in sector employment, as well as top employers in the state.

**2. Occupations** – an evaluation of historic and projected changes in occupations, as well as more detailed analysis of key skilled occupations that align to university education.

- Top Skilled Occupations: largest skilled employed occupations and new & replacement job demand.
- Key Skilled High Demand Occupations: five key skilled occupations and new & replacement job demand.
- Job Posting Analytics: analysis of job postings vs. hires for five key skilled high demand occupations.
- Industry Staffing Patterns: industry employment breakdown for five key skilled high demand occupations.
- Key Occupational Profiles: regional demographic profile for five key skilled high demand occupations.

**3. Demographics and Socio-economic Indicators** – an evaluation of the demographic profile of the population of Slippery Rock University's workforce region. Also, a brief analysis of three key socio-economic indicators—educational attainment, unemployment, and poverty.

Each section is designed to provide additional context to the economic environment for the universities to consider broader aspects of strategic vision and program planning. Each section also provides the data-driven preparation for the next phase of research—namely the Supply/Demand Gap Analysis Report.

## **4.1 Employment Projections**

Currently, the industry and occupation employment projections available from Pennsylvania's Department of Labor and Industry reflect the time period from 2012–2022 and therefore do not incorporate much of the post-recession recovery that has taken place between 2012 and 2014. In order to capture recovery and reflect current employment data, the State System used 4-digit NAICS (industry) and 5-digit SOC (occupation) projections to 2024 at the county level for Pennsylvania. The projections incorporate Quarterly Census of Employment and Wages (QCEW) data through 2014, and therefore contain the most recent employment data that further reflects the economic recovery.

---

See Appendix C for 4-digit industry projections and Appendix D for 5-digit occupation projections.

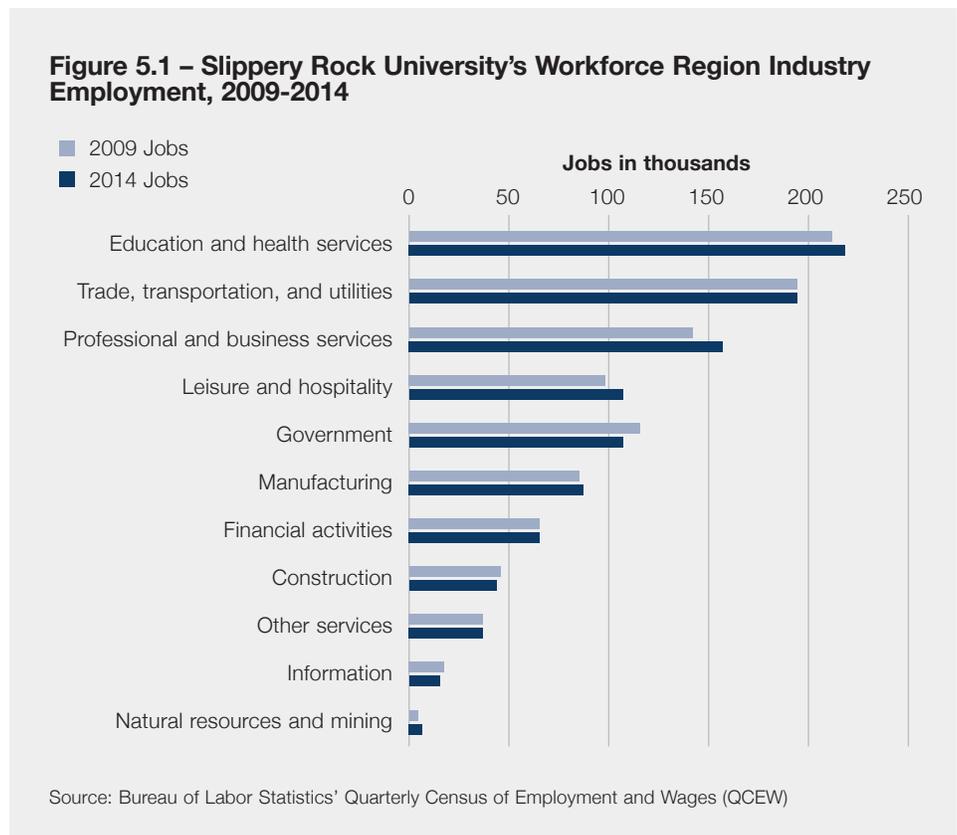
Oxford Economics, a premier economic modeling and consulting firm, produced the projections. By updating projections, Oxford Economics provided insight into new job growth which better measures occupational demand over the next 10 years.

The next section provides an analysis of industries in Slippery Rock University's workforce region with a focus on the post-recession recovery period 2009 to 2014, as well as top employers in the region.

# 5. INDUSTRIES IN SLIPPERY ROCK UNIVERSITY'S WORKFORCE REGION

Over the five years of 2009 to 2014, Slippery Rock University's (SRU) workforce region experienced job growth in many service-based sectors. Sectors such as education and health services; professional and business services; and leisure and hospitality added a combined 29,800 new jobs between 2009 and 2014. Government experienced the largest nominal employment loss, while other job losses occurred within information, construction, and other services. Overall, the economy added about 22,400 jobs during the recovery period, 2009 to 2014. This growth reflects the recovery period for Pennsylvania from one of the worst recessions since the Great Depression—the Great Recession which lasted from 2007 to 2009.

Figure 5.1 illustrates historic and current employment, while Table 5.1 provides data on broad industry categories by employment, growth, and percent change.



**Table 5.1 – Slippery Rock University’s Workforce Region Industry Employment, 2009-2014**

Industry Employment	2009 Jobs	2014 Jobs	Absolute Change 09-14	% Change 09-14
<b>Total, all industries</b>	<b>1,007,861</b>	<b>1,030,234</b>	<b>22,373</b>	<b>2.2%</b>
Education and health services	210,240	216,706	6,466	3.1%
Trade, transportation, and utilities	192,689	192,830	141	0.1%
Professional and business services	140,243	156,073	15,830	11.3%
Leisure and hospitality	98,220	105,653	7,433	7.6%
Government	114,385	105,209	-9,176	-8.0%
Manufacturing	84,538	85,896	1,358	1.6%
Financial activities	64,541	66,082	1,541	2.4%
Construction	44,825	44,123	-702	-1.6%
Other services	36,905	36,350	-555	-1.5%
Information	17,819	15,812	-2,007	-11.3%
Natural resources and mining	3,433	5,502	2,069	60.3%

Source: Bureau of Labor Statistics’ Quarterly Census of Employment and Wages (QCEW)

## 5.1 Top Employers in Slippery Rock University’s Workforce Region

Amongst the top employers within SRU’s workforce region, education and health service establishments comprise a majority of the list. Other top employers in the region include federal, state, and local government as well several manufacturing and retail establishments.

Major employers in SRU’s workforce region are listed in Table 5.2 on the next page.

While this section focused on the places where people in SRU’s workforce region work, the next section builds a perspective of occupational employment. This perspective describes the types of jobs people have in SRU’s workforce region and identifies the skills and characteristics of those people.

**Table 5.2: Top Employers in Slippery Rock University's Workforce Region**

<b>Establishment Name</b>
AK Steel
Allegheny County
Butler Healthcare Providers
Federal Government
FirstEnergy Nuclear Operating
General Electric
Giant Eagle
ISS Facility Services
Jameson Memorial Hospital
New Castle Area School District
Passavant Memorial Homes
PNC Bank
Sharon Pennsylvania Hospital
State Government
United Parcel Service
University of Pittsburgh
UPMC Horizon
UPMC Presbyterian Shadyside
Valley Medical Facilities
Wal-Mart
Western Penn Allegheny Health
Westinghouse Electric
Westminster College
Westmoreland County
Westmoreland Regional Hospital

Source: Pennsylvania Department of Labor and Industry Quarterly Census of Employment and Wages (QCEW)

## 6. OCCUPATIONS IN SLIPPERY ROCK UNIVERSITY'S WORKFORCE REGION

The workforce within the region can be evaluated from many different angles in order to build a deeper profile of the qualities and attributes of workers. The next five sub-sections provide insight into the qualities of SRU's workforce region, answering questions such as:

- What are the largest skilled occupations employed within the region?
- What are the key skilled high demand occupations that typically align to university-level education?
- Within the key skilled high demand occupations what is the current market demand in terms of jobs postings and hires?
- What sectors typically employ the key skilled high demand occupations?
- What type of demographic is typically found in key skilled high demand occupations?

Each perspective provides data-driven content for the universities to consider when engaging businesses, learners and program planners.

### 6.1 Skilled Occupations

The O\*NET program is the nation's primary source of occupational information. Essential to the project is the O\*NET database, containing information on hundreds of standardized and occupation-specific descriptors.<sup>7</sup>

For this analysis a "skilled" occupation is defined as an occupation in O\*NET Job Zones Three, Four, or Five. A Job Zone is a group of occupations that are similar in how much education people need to do the work, how much related experience people need to do the work, and how much on-the-job training people need to do the work.<sup>8</sup>

Most occupations in Job Zone Three require training in vocational schools, related on-the-job experience, or an associate's degree. Most occupations in

---

<sup>7</sup> <http://www.onetcenter.org/overview.html>

<sup>8</sup> <https://www.onetonline.org/help/online/zones>

Job Zone Four require a four-year bachelor's degree, but some do not. Most occupations in Job Zone Five require graduate school. For example, they may require a master's degree, and some require a Ph.D., M.D., or J.D. (law degree). For a more detailed description of O\*NET Job Zones and training requirements see Appendix D.

For the five key skilled high demand occupations, over 50% of those employed have attained an associate's degree or higher and are generally associated with university-level education.

## **6.2 Top Skilled Occupations in Slippery Rock University's Workforce Region**

Top skilled occupations in the region are driven by industry composition. Medical centers employ a cadre of health professionals, while enterprise management companies employ a range of business professionals. Given the dominating presence of trade, transportation and utilities; education and health services; and professional and business services establishments in SRU's workforce region, top skilled occupations include: teachers, nurses, sales representatives, managers, and assistants. Figure 6.1 and Table 6.1 highlight the top 20 skilled occupations in the region, 10-year job growth projections, and new and replacement jobs.<sup>9</sup>

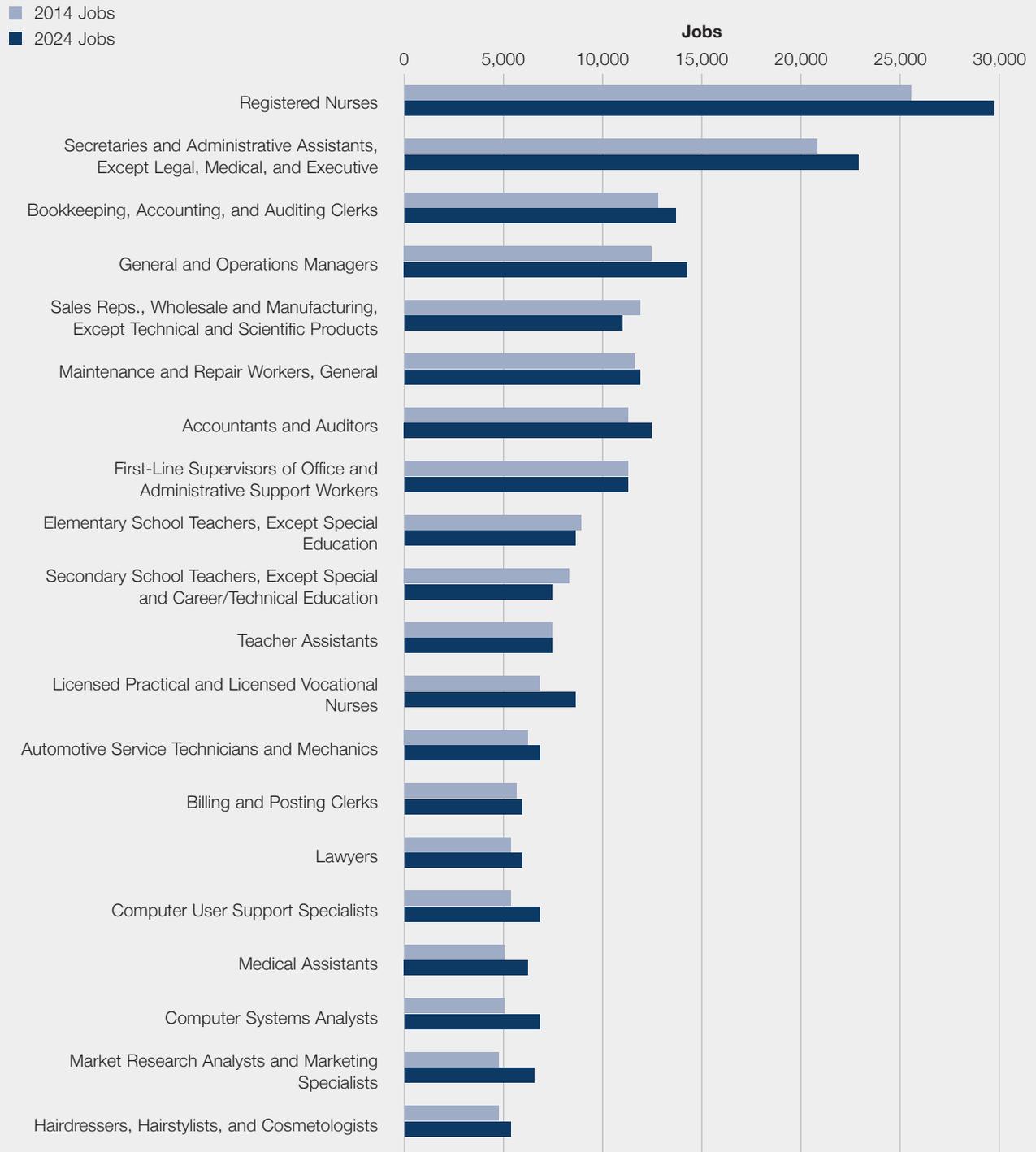
An important aspect to distinguish skilled occupations, in this sub-section, is that post-secondary education is not necessarily a pre-requisite for employment. However, a high percentage of those employed in the skilled occupation have a post-secondary education.

The next section provides a more narrow view of skilled occupations, focusing specifically on occupations that align to university-level education and have high demand for new and replacement jobs.

---

<sup>9</sup> New and replacement job change takes into account demand for occupations based on: industry growth (new jobs), occupation productivity, workforce ageing, migration and other factors that would contribute to new and replacement job openings.

**Figure 6.1 – Largest Skilled Occupations in SRU’s Workforce Region and Projections, 2014-2024**



Source: BLS (QCEW and OES); Pennsylvania Department of Labor & Industry; Oxford Economics Projections

**Table 6.1 – Largest Skilled Occupations in SRU’s Workforce Region and Projections, 2014-2024**

<b>SOC Code</b>	<b>Occupation Title</b>	<b>2014 Jobs</b>	<b>2024 Jobs</b>	<b>10-year New and Replacement Demand</b>
29-1141	Registered Nurses	25,458	29,434	9,132
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	20,538	22,737	4,867
43-3031	Bookkeeping, Accounting, and Auditing Clerks	12,814	13,626	2,080
11-1021	General and Operations Managers	12,422	14,265	4,054
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	11,730	10,844	1,839
49-9071	Maintenance and Repair Workers, General	11,563	11,725	2,710
13-2011	Accountants and Auditors	11,333	12,416	4,856
43-1011	First-Line Supervisors of Office and Administrative Support Workers	11,224	11,312	2,777
25-2021	Elementary School Teachers, Except Special Education	8,960	8,414	1,708
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	8,249	7,398	1,958
25-9041	Teacher Assistants	7,327	7,342	1,836
29-2061	Licensed Practical and Licensed Vocational Nurses	6,857	8,575	3,529
49-3023	Automotive Service Technicians and Mechanics	6,287	6,863	2,404
43-3021	Billing and Posting Clerks	5,464	5,831	1,472
23-1011	Lawyers	5,329	6,045	1,625
15-1151	Computer User Support Specialists	5,202	6,908	2,638
31-9092	Medical Assistants	5,113	6,159	2,073
15-1121	Computer Systems Analysts	4,935	6,892	2,830
13-1161	Market Research Analysts and Marketing Specialists	4,836	6,410	2,348
39-5012	Hairdressers, Hairstylists, and Cosmetologists	4,832	5,349	1,884

Source: BLS (QCEW and OES); Pennsylvania Department of Labor & Industry; Oxford Economics Projections

## 6.3 Key Skilled High Demand Occupations Aligning to University-level Education

Occupation demand can represent different perspectives of employment need. One perspective evaluates demand due to growth of new jobs. It also represents the need for replacement jobs. When combined, new and replacement job projections provide a more realistic perspective of labor demand.

To support the occupational demand for new and replacement jobs, this analysis also evaluates real-time job posting data. By measuring the number of unique job postings for a specific job title, which is then translated into an occupation classification, it is possible to gauge real-time demand—another perspective of employment need. The number of unique postings provides guidance on real-time changes in occupations that companies may be seeking to hire. As with all datasets, job posting data have caveats. Discrepancies between postings and actual hires can be challenging to measure—wherein a job posting may not result in a hire for one occupation, but another job posting for a different occupation may result in multiple hires.<sup>10</sup>

This section looks at both perspectives—occupation demand using projections of new and replacement jobs as well as real-time job postings—in order to draw specific insight into occupation demand within SRU’s workforce region.

### 6.3.1 New and Replacement Demand for Key Skilled High Demand Occupations

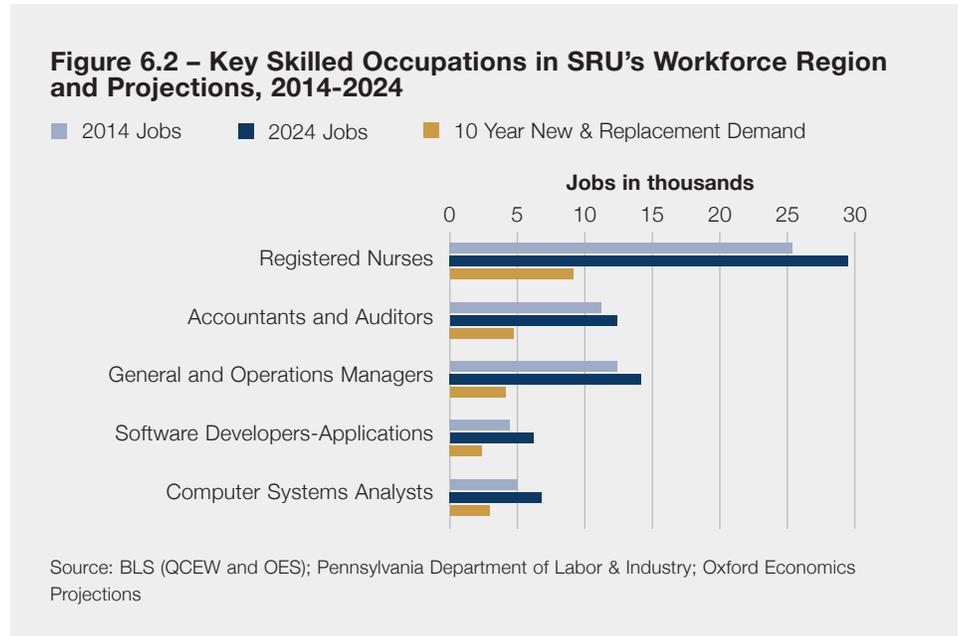
Many skilled occupations exist in Pennsylvania. Demand for new and replacement jobs for key skilled high demand occupations that tie more closely to university-level programs are typically determined by the sheer size of the employment within the occupation and the demographic characteristics of those who are currently employed—specifically age. For example, Pennsylvania businesses employ approximately 54,400 accountants and auditors. Projections indicate that new employment for accountants and auditors will increase to about 60,000 by 2024—5,600 new jobs in 10 years. However, 47% of the employed accountants and auditors are over the age of 45, meaning that many of the currently employed accountants and auditors will likely retire over the next 10 years. This retirement will drive up the need to replace outgoing

---

<sup>10</sup> When evaluating jobs postings, a specific caveat focuses on net openings and jobs filled (i.e. openings that result in an opportunity for a new entrant, rather than normal job turn wherein a worker moves to a different company in the region and their vacant job is filled by yet another incumbent worker at another company).

accountants and auditors with new workers—hence the reason we see nearly 23,700 new and replacement jobs (5,600 new and 18,100 replacement) for the occupation over the next 10 years.<sup>11</sup>

Figure 6.2 and Table 6.2 outline the five key skilled high demand occupations for new and replacement jobs over the next 10 years, specifically: registered nurses, accountants and auditors, general and operations managers, computer system analysts, and software developers-applications.<sup>12</sup>



**Table 6.2 – Key Skilled Occupations in SRU’s Workforce Region and Projections, 2014-2024**

SOC Code	Occupation Title	2014 Jobs	2024 Jobs	10 Year New & Replacement Demand
29-1141	Registered Nurses	25,458	29,434	9,132
13-2011	Accountants and Auditors	11,333	12,416	4,856
11-1021	General and Operations Managers	12,422	14,265	4,054
15-1132	Software Developers-Applications	4,539	6,184	2,292
15-1121	Computer Systems Analysts	4,935	6,892	2,830

Source: BLS (QCEW and OES); Pennsylvania Department of Labor & Industry; Oxford Economics Projections

11 Retirement is only one of the metrics factored into new and replacement jobs. Other metrics include out-migration and death.  
 12 Teachers (elementary and secondary) were found in the top skilled high demand occupations. However, the analysis focuses on private sector jobs and opportunities.

While this section focused on 10-year new and replacement demand, the next section highlights the importance of current demand using real-time job posting analytics.

### 6.3.2 Real-Time Job Postings for Key Skilled High Demand Occupations

Analysis of job postings for key skilled high demand occupations generally supports the findings from Section 6.3.1. Between July 2014 and July 2015 approximately 3,600 unique (de-duplicated) job postings appeared in SRU’s Workforce Region for the top five key skilled high demand occupations (registered nurses, accountants and auditors, general and operations managers, computer system analysts, and software developers-applications). Sizable job postings include: registered nurses (1,112 unique postings per month), and software developers-applications (759 unique postings per month).

Table 6.3 provides details on the average monthly job postings and the estimated average monthly hires between July 2014 and July 2015 for the key skilled occupations.

Job posting analytics also provide insight into the skills and certifications that employers seek from qualified job candidates. Individuals seeking jobs in the key skilled high demand occupations would increase their competitiveness by demonstrating skill proficiency and/or certifications. The following lists specific unique skills or certifications for each occupation that employers demand.

**Table 6.3 – Job Postings and Hires for Key Skilled High Demand Occupations in Pennsylvania**

<b>Occupation</b>	<b>Average Monthly Postings (Jul 2014 - Jul 2015)</b>	<b>Estimated Average Monthly Hires (Jul 2014 - Jul 2015)</b>	<b>Ratio of Postings to Hires</b>
Registered Nurses	1,112	906	1.2
Software Developers-Applications	759	185	4.1
Accountants and Auditors	713	519	1.4
General and Operations Managers	541	644	0.8
Computer Systems Analysts	512	185	2.8

Source: Economic Modeling Specialists International (EMSI)

---

### **Registered Nurses**

*Unique skills:* acute care, surgery, schedule/record keeping

*Certifications:* Cardiopulmonary Resuscitation (CPR), Basic Life Support (BLS), Advanced Life Support (ALS), Registered Nurse (RN) license

### **Accountants and Auditors**

*Unique skills:* audits, finance, Generally Accepted Accounting Principles (GAAP)

*Certifications:* Certified Public Accountant (CPA)

### **Computer Systems Analysts**

*Unique skills:* information systems, SAP software, SQL programming, Oracle databases

*Certifications:* security clearance, Certified Information Systems Security Professional (CISSP), Microsoft certified professional, Certified Information Systems Auditor (CISA)

### **Software Developers-Applications**

*Unique skills:* software engineering, C++ programming language, API's, Java programming language

*Certifications:* security clearance, Microsoft certified professional, Certified Information Systems Security Professional (CISSP)

### **General and Operations Managers**

*Unique skills:* inventory management, payroll, recruiting/staffing, budgeting, meetings/presentations

*Certifications:* Six Sigma, Project Management Professional (PMP)

This list of skills and certifications do not encompass the entirety of skills and certifications that may be required for different industry sectors and job functions. However, these skills reflect the general online job posting minimum qualifications for those seeking to apply to one of the occupations.

The next section builds a broader sense of which industry sectors typically employ each of the top five skilled high demand occupations.

## 6.4 Industry Staffing Patterns for Key Skilled High Demand Occupations in Slippery Rock University's Workforce Region

Understanding which industries employ key skilled occupations is helpful when engaging businesses as well as communicating programs and potential career opportunities to learners. Also knowing the industries that predominately employ certain occupations can help align program planning.

The following tables show the staffing patterns for the key skilled high demand occupations by identifying the top five industries that employ each respective key skilled high demand occupation within the region. For each occupation, the table contains:

- The number of the occupation jobs in each respective industry in 2014 (e.g. general medical and surgical hospitals employ 14,101 registered nurses);
- The percent of the occupation's employment in the region that is employed in the industry (e.g. the 14,101 registered nurses employed in general medical and surgical hospitals represent nearly 55% of the total registered nurse workforce in the region);
- The percent of the industry sector's employment that is made up of the occupation (e.g. the 14,101 registered nurses make up about 27% of employment within general medical and surgical hospitals).

### Staffing Patterns for Registered Nurses Employed in SRU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
General Medical and Surgical Hospitals	14,101	55.4%	27.2%
Offices of Physicians	2,298	9.0%	9.4%
Home Health Care Services	1,982	7.8%	21.0%
Nursing Care Facilities (Skilled Nursing Facilities)	1,638	6.4%	9.9%
Specialty (except Psychiatric and Substance Abuse) Hospitals	1,115	4.4%	27.6%

Source: Bureau of Labor Statistics – OES & QCEW Annual Data

### Staffing Patterns for General and Operations Managers Employed in SRU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Management of Companies and Enterprises	1,001	8.1%	2.7%
Wholesale Electronic Markets and Agents and Brokers	337	2.7%	3.5%
Restaurants and Other Eating Places	320	2.6%	0.5%
Depository Credit Intermediation	296	2.4%	1.2%
Architectural, Engineering, and Related Services	257	2.1%	1.4%

Source: Bureau of Labor Statistics – OES & QCEW Annual Data

### Staffing Patterns for Accountants and Auditors Employed in SRU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	3,013	26.6%	38.6%
Management of Companies and Enterprises	1,883	16.6%	5.0%
Other Financial Investment Activities	413	3.6%	8.9%
Insurance Carriers	356	3.1%	2.4%
Depository Credit Intermediation	324	2.9%	1.3%

Source: Bureau of Labor Statistics – OES & QCEW Annual Data

### Staffing Patterns for Software Developers-Applications Employed in SRU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Computer Systems Design and Related Services	1,381	30.4%	10.0%
Insurance Carriers	637	14.0%	4.2%
Management of Companies and Enterprises	511	11.3%	1.4%
Software Publishers	271	6.0%	18.7%
Employment Services	201	4.4%	1.2%

Source: Bureau of Labor Statistics – OES & QCEW Annual Data

## Staffing Patterns for Computer Systems Analysts Employed in SRU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Computer Systems Design and Related Services	1,766	35.8%	12.8%
Management of Companies and Enterprises	892	18.1%	2.4%
Insurance Carriers	420	8.5%	2.8%
Wholesale Electronic Markets and Agents and Brokers	264	5.3%	2.7%
Depository Credit Intermediation	227	4.6%	0.9%

Source: Bureau of Labor Statistics – OES & QCEW Annual Data

The above data establishes the top sectors where the key skilled high demand occupations are employed. However, to further place the perspective of these occupation profiles, it is important to consider the types of people who generally fill these roles. The next section contains a demographic profile for people from Pennsylvania who work in these key skilled occupations.

### 6.5 Key Skilled High Demand Occupational Profiles

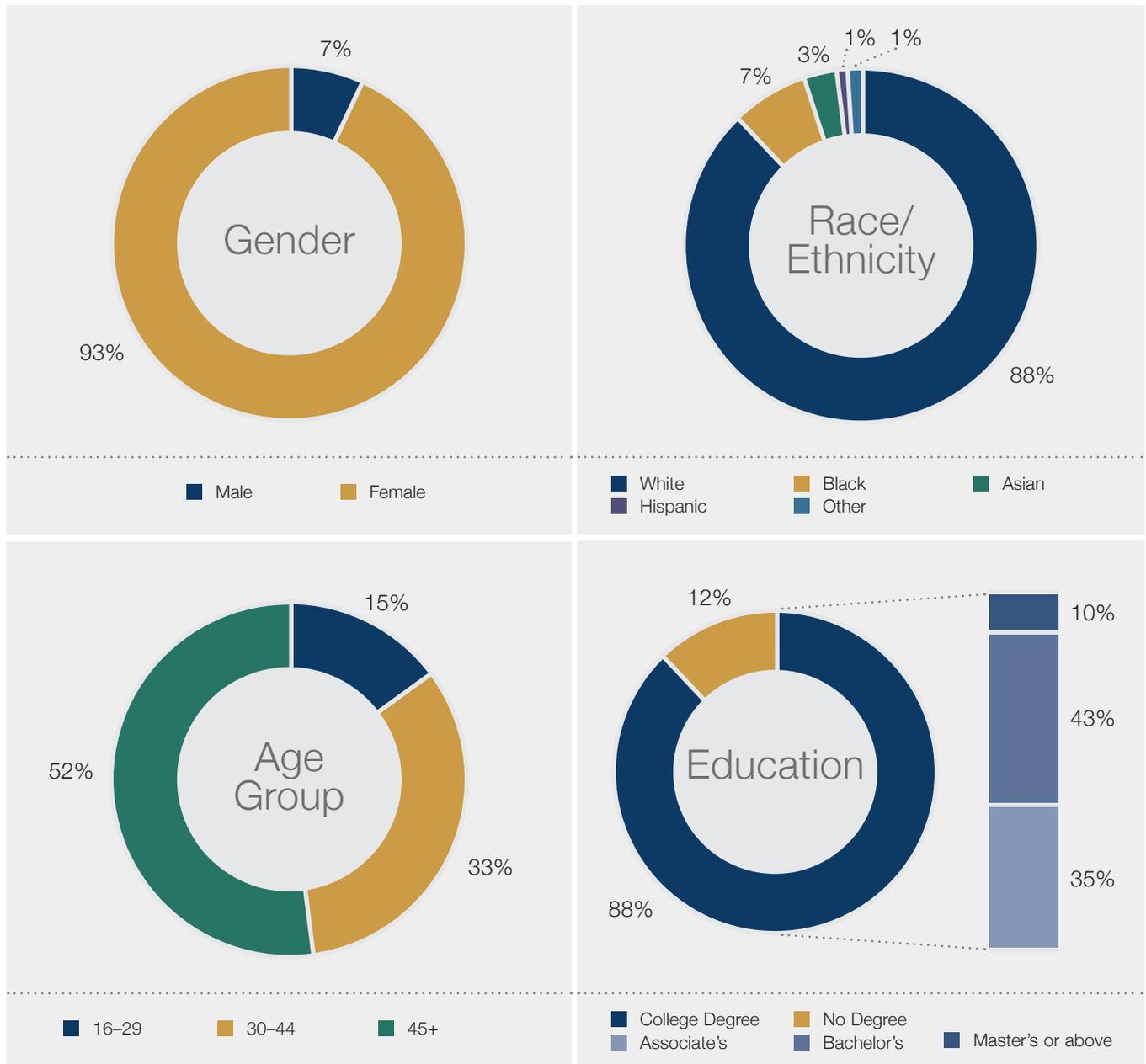
In addition to understanding the industries that employ key skilled high demand occupations, another lens to view key skilled high demand occupations focuses on the characteristics of those employed. The following section outlines the demographics for people from Pennsylvania who work in these key skilled occupations by showing each occupation's composition by gender, race/ethnicity, age, and education. This lends further insight into who generally works in the career and answers questions such as:

- Are women or men typically found in the occupation?
- Do certain races/ethnicities occupy larger shares of the occupation?
- What is the age distribution of the occupation?
- What is the educational attainment of workers in the occupation?

For comparative purposes, the demographic composition for the entire population of SRU's workforce region is further described in Section 7 of the report.

## REGISTERED NURSES IN PENNSYLVANIA

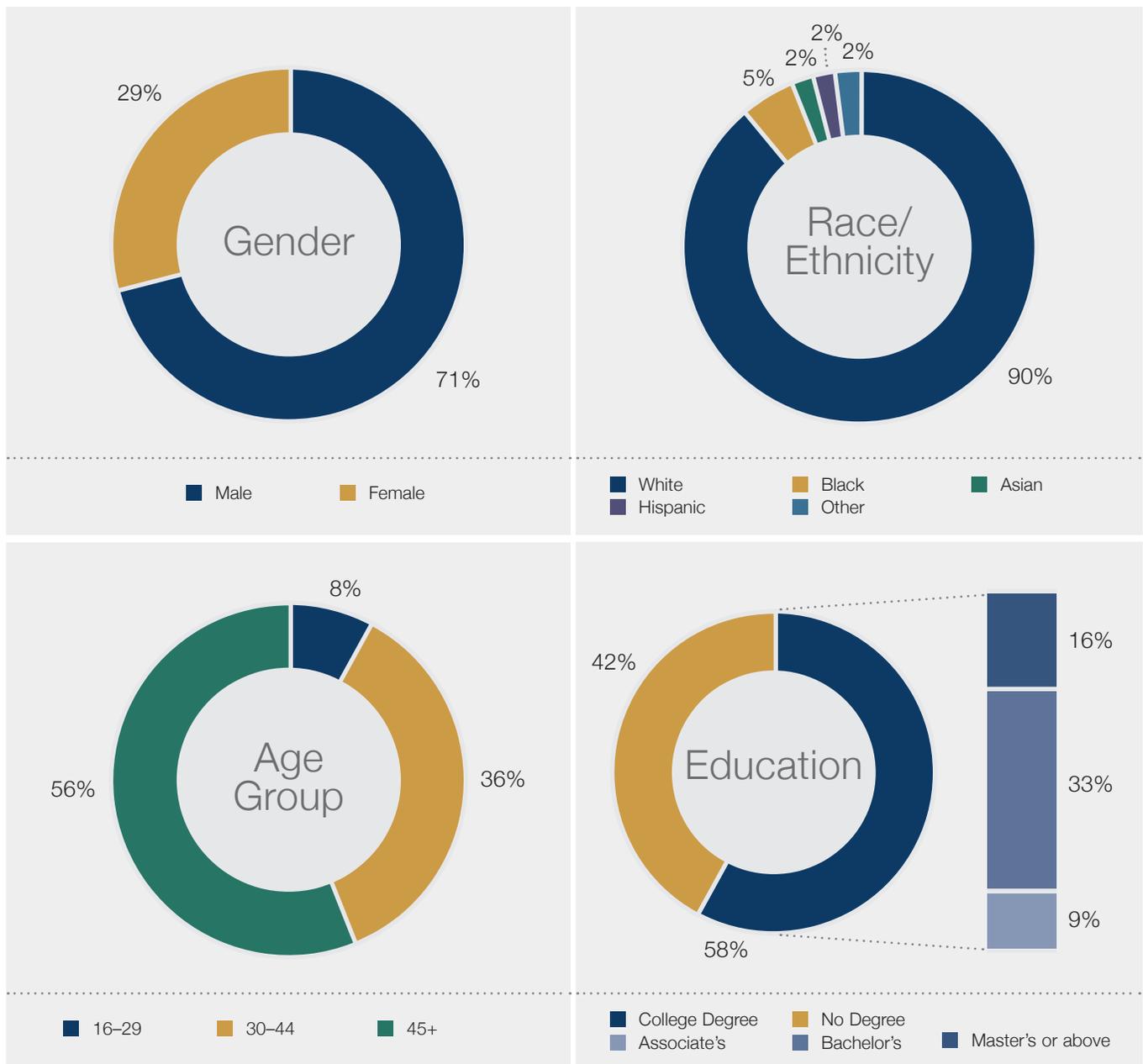
The demographic profile of registered nurses is largely dominated by white females. Age distribution indicates that registered nurses are a more mature cohort of workers (45 years and older), which can put increasing pressure on replacement jobs due to retirements over the next 10 years. Nearly 90% of registered nurses have an associate's degree or higher indicating that this is a highly educated occupation.



Source: U.S. Census - American Community Survey (ACS) 2009-2013 5-year file

## GENERAL AND OPERATIONS MANAGERS IN PENNSYLVANIA

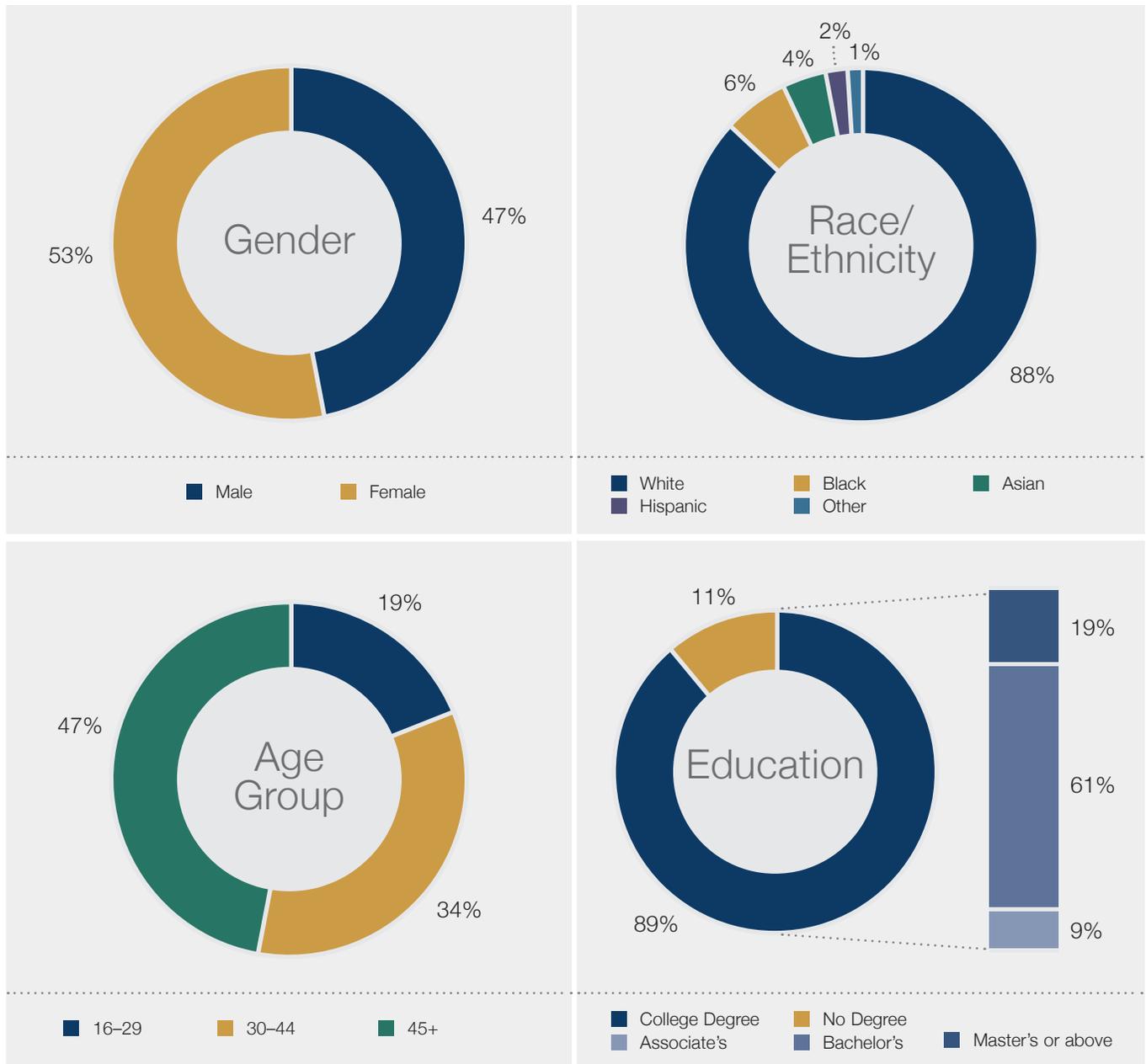
General and operations managers are typically male, though females occupy almost 30% of the employed population. The majority of those in this occupation are white. This occupation is represented by a more mature cohort of workers (45 years and older), though mid-career workers also occupy a significant proportion of the employment. Nearly 60% of general and operations managers have an associate's degree or higher.



Source: U.S. Census - American Community Survey (ACS) 2009-2013 5-year file

## ACCOUNTANTS AND AUDITORS IN PENNSYLVANIA

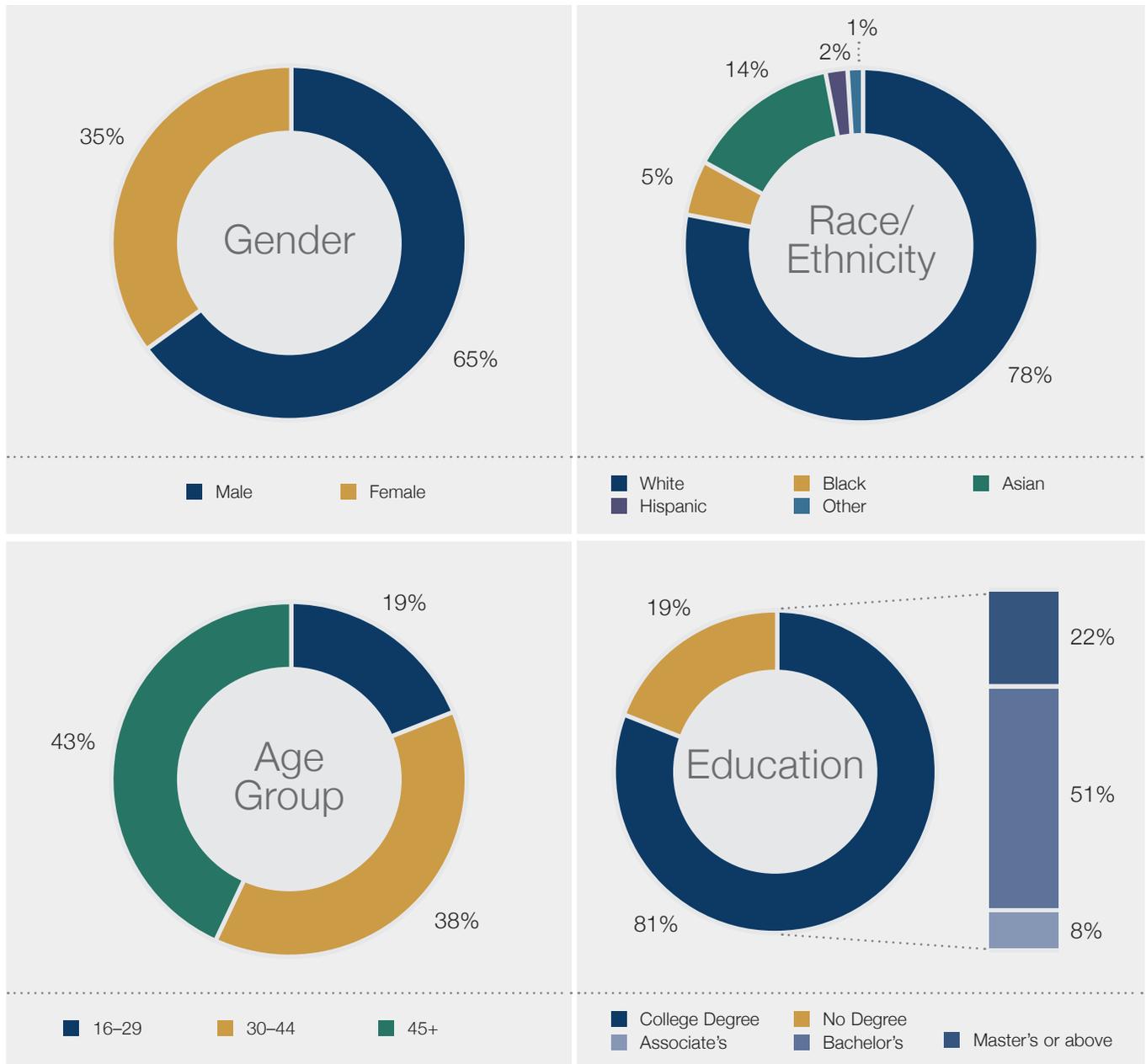
Accountants and auditors are fairly equally split between male and female, though a slightly higher percent of employed accountants and auditors are female. A high proportion of white individuals are found in the occupation. Additionally, the age distribution is fairly even between entry-level and mature workers, indicating that the occupation provides good opportunities for first destinations of recent college graduates. Nearly 90% of accountants and auditors have an associate's degree or higher indicating that this is a highly educated occupation.



Source: U.S. Census - American Community Survey (ACS) 2009-2013 5-year file

## COMPUTER SYSTEMS ANALYSTS IN PENNSYLVANIA

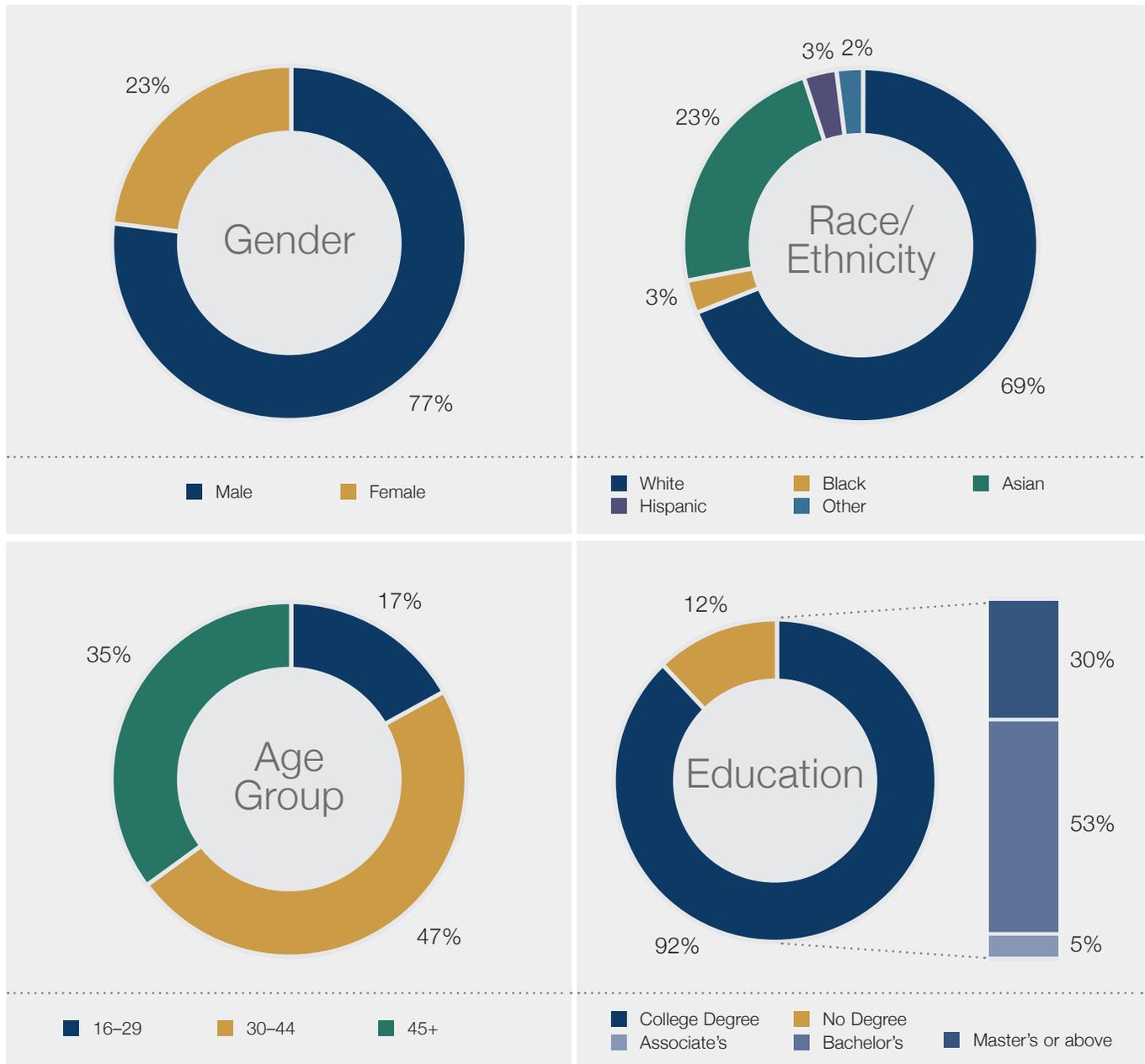
Computer systems analysts show a larger proportion of males in the occupation compared to females. While still represented by a larger share of white workers, a significant number of Asian workers are found in the occupation, making this occupation more diverse than the average Pennsylvania demographic makeup. The age composition of this occupation indicates that a higher proportion of younger (16-29) and mid-career (30-44) workers make up the workforce. Over 80% of computer systems analysts have an associate's degree or higher indicating that this is a highly educated occupation.



Source: U.S. Census - American Community Survey (ACS) 2009-2013 5-year file

## SOFTWARE DEVELOPERS-APPLICATIONS IN PENNSYLVANIA

Software developers-applications show a larger proportion of males in the occupation compared to females. While still represented by a larger share of white workers, a significant number of Asian workers are found in the occupation, making this occupation more diverse than the average Pennsylvania demographic makeup. The age composition of this occupation indicates that a high proportion of mid-career (30-44) workers make up the workforce. Nearly 90% of software developers-applications have an associate's degree or higher indicating that this is a highly educated occupation.



Source: U.S. Census - American Community Survey (ACS) 2009-2013 5-year file

---

The final section of this report explores SRU's workforce region demographic and socio-economic characteristics. While not tied to a specific occupation, the analysis further contextualizes the region's population and workforce.

---

## **7. DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS OF SLIPPERY ROCK UNIVERSITY'S WORKFORCE REGION**

This section provides further information about the demographic and socio-economic composition of SRU's Workforce Region in order to better understand the characteristics of the population. An additional focus evaluates changes in age cohorts for university-age residents.

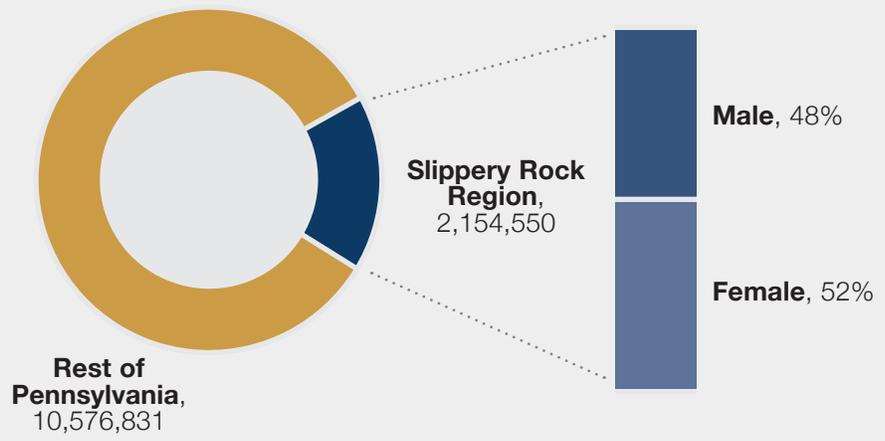
Analysis of three socio-economic indicators—education, unemployment, and poverty—also provides insight into the segment of the population that may be considered economically disadvantaged. Areas with high proportions of economically disadvantaged learners may require additional considerations in education and financial support.

### **7.1 Demographics of Slippery Rock University's Workforce Region**

The SRU workforce region has a population of about 2.2 million people. As shown in Figure 7.1, females make up a slightly larger share of the population compared to males. Figure 7.2 illustrates that the majority of the region is represented by a White demographic, with Blacks representing the next largest group, followed by Asians.

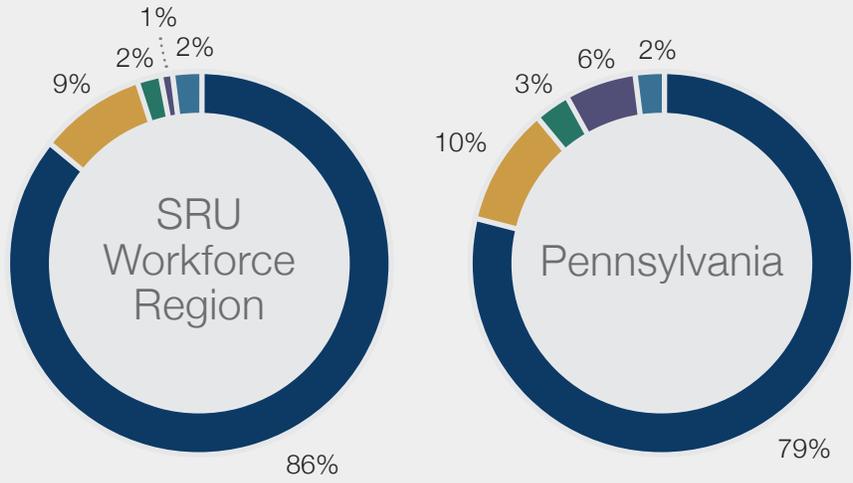
Fall 2014 data from the State System Research Office indicates that approximately 83% (90,966) of learners within the State System are traditional students—ages 18- to 22-year-old high school graduates—and 17% (18,640) are adult learners. A view of the change in population by age demographic indicates a diminishing number in the traditional age cohort and a growing rate of adults aged 25 to 34 years old. As illustrated in figure 7.3, the 10 to 19 year old cohort population declined by nearly 17,400 people between 2010 and 2014—a 7% decline. Conversely, the 25-34 year old cohort increased nearly 10%, or 24,700 people, over the same time period. This demographic shift presents an opportunity to incorporate a broader university recruitment strategy.

**Figure 7.1 – Slippery Rock University’s Workforce Region Population and Gender Distribution**



Source: U.S. Census - ACS

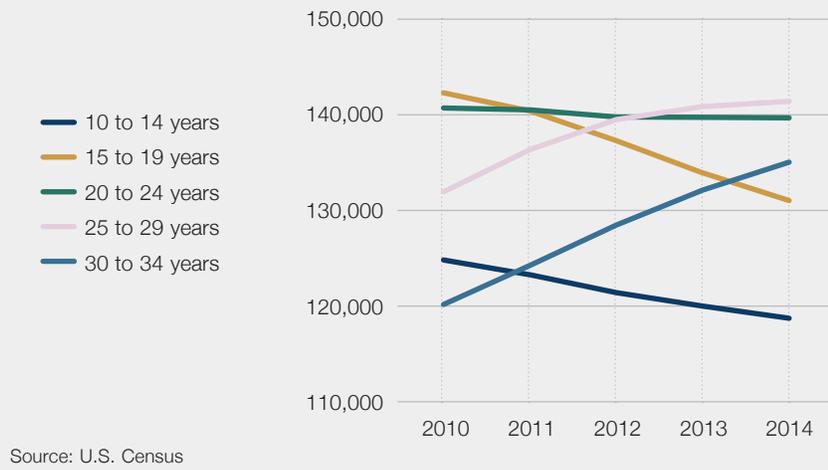
**Figure 7.2 – Slippery Rock University’s Workforce Region Race/Ethnicity Composition**



■ White   ■ Black   ■ Asian   ■ Hispanic   ■ Other

Source: U.S. Census - American Community Survey (ACS) 2009-2013 5-year file

**Figure 7.3 – Slippery Rock University’s Workforce Region Changes in Population of Age Cohorts**



The next sub-section further explores the shifting socio-economic characteristics in SRU’s workforce region by identifying three inter-related variables.

## **7.2 Socio-economic Indicators of Slippery Rock University’s Workforce Region**

This final section outlines three key socio-economic variables—educational attainment, poverty, and unemployment. Poverty data provides understanding on relative income inequality within an area. If poverty rates decline, then the standard of living, social inclusion, and equality of opportunity are typically considered to be increasing. Economic opportunities are often linked with access to jobs and training. Regions with high unemployment indicate the population is unable to find work or is not adequately trained to perform work in the jobs available within the region.

### **7.2.1 Educational Attainment in Slippery Rock University’s Workforce Region**

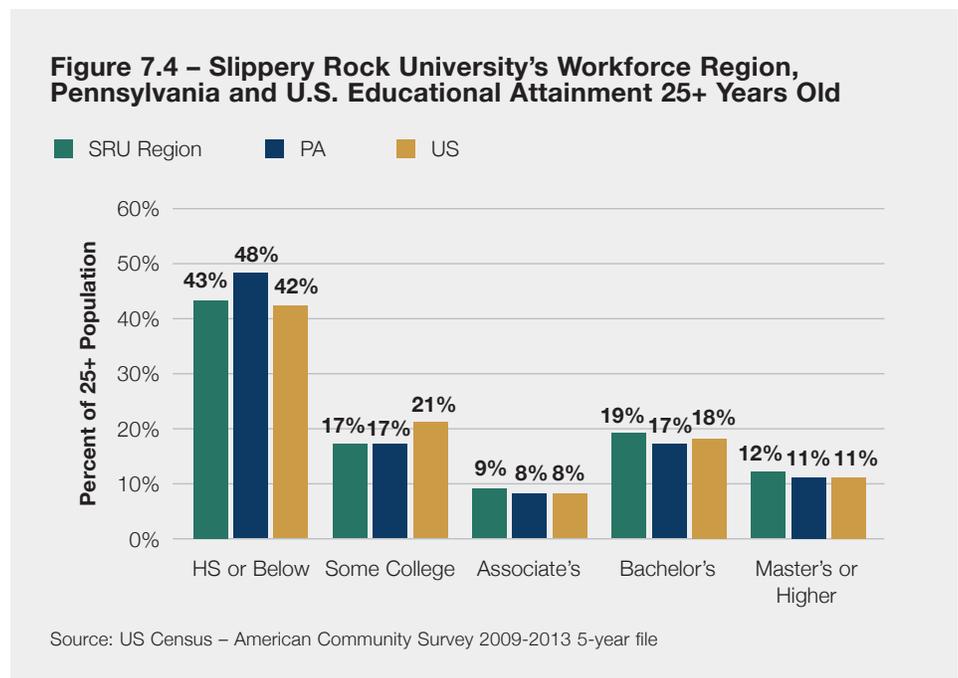
The levels of educational attainment of a population indicate several characteristics in an economy. Areas with better educated workers earn higher wages, are more productive and can typically adjust more quickly to changing economic conditions. Additionally, an educated workforce is less likely to be

unemployed, require social assistance, and more likely to lead a healthier lifestyle—aspects that bolster value in an economy.<sup>13, 14</sup>

A view of educational attainment in SRU's workforce region indicates that more than half (57%) of those over 25 years old have had some post-secondary education or higher. Some college is defined by ACS as having some college, but less than one year or one or more years of college credit, but no degree. This is near the national average of 58% of the population having had at least some post-secondary education or higher.

When comparing degree completion, SRU's workforce region is above the national average for the proportion of the population with an associate's degree, bachelor's degree and master's degrees or higher.

Figure 7.4 compares the educational attainment of the 25 years and older population in the U.S., Pennsylvania, and SRU's workforce region.



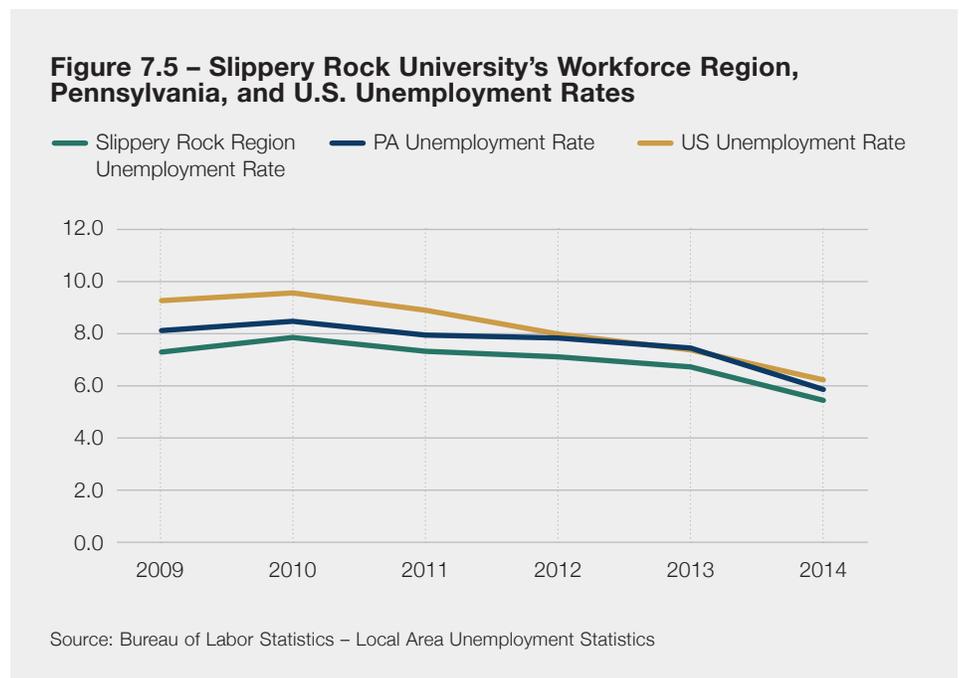
13 Feinstein et. al. (2006), "The effects of education on health: Concepts, evidence and policy implications: A review for the OECD Center for Educational Research and Innovation (CERI)", unpublished manuscript, OECD, Paris.

14 Mitra, Dana (2011), "Pennsylvania's Best Investment: The Social and Economic Benefits of Public Education." Report published for the Education Law Center.

## 7.2.2 Unemployment and Poverty in Slippery Rock University's Workforce Region

SRU's workforce region unemployment rate—5.5% in 2014—has trended closely with the state and national unemployment rate since 2009 but remained below both the state and national average. This suggests that opportunities for dislocated workers on average are roughly better in the region compared to the rest of the nation.

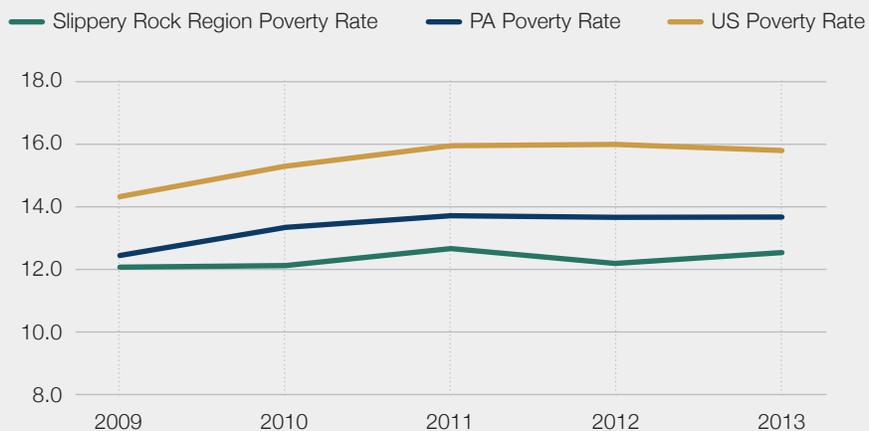
Figure 7.5 shows the convergence of the unemployment rates of SRU's workforce region, Pennsylvania, and the U.S. from 2009 to 2014.



In SRU's workforce region, the poverty rate trended upward since 2009 but declined slightly from 2011 to 2012. The region's poverty rate is below the state poverty rate and the U.S. average.<sup>15</sup> Given the lower poverty rate compared with the nation, there is an underlying assumption that the compensation associated with the jobs in SRU's workforce region may be higher than the national average.

<sup>15</sup> Poverty estimates are based on U.S. Census Bureau's Small Area Income and Poverty Estimates data series. Calculations comprise the total number of individuals (all ages) in the geography, divided by the number of individuals (all ages) that are classified as being in poverty.

**Figure 7.6 – Slippery Rock University’s Workforce Region, Pennsylvania, and U.S. Poverty Rates**



Source: U.S. Census – Small Area Income & Poverty Estimates (SAIPE)

Figure 7.6 compares the poverty rates of SRU’s workforce region, Pennsylvania, and the U.S. from 2009 to 2013.

When unemployment and poverty are evaluated together, a significant decline in unemployment to pre-recession levels, coupled with a small uptick in the poverty rate, suggests an underlying cause that is contributing to marginally increased poverty rates. This cause may be associated with the quality of new jobs that have emerged since the recession, which have done little to abate poverty rates, despite decreasing unemployment.

Although the poverty rate indicates an overall small increasing trend, the unemployment rate shows a decreasing trend, meaning a larger proportion of the workforce is either employed or is no longer seeking employment.

---

## 8. NEXT STEPS

This report sets the foundation for program planning by accomplishing three key tasks:

- Defining the university's workforce region.
- Describing key economic, workforce, and demographic attributes in the regional economy.
- Forecasting the demand for skilled occupations.

The next steps for research to support Pennsylvania's State System of Higher Education Program Alignment Toolkit are the development of an education supply and workforce demand gap analysis. Key data-driven aspects in the gap analysis research include:

- Development of an education program to occupation crosswalk.
- Analysis of completion data from the State System institutions as well as other institutions in the university's workforce region.
- Comparison of the occupation forecasts against the recent completions of education programs.
- Identification of programs that may require expansion or development, as well as programs that indicate a potential surplus of talent within the region.

---

# DATA SOURCES

Bureau of Labor Statistics (BLS):

- QCEW - Quarterly Census of Employment & Wages (Bureau of Labor Statistics) - <http://www.bls.gov/cew/>
- OES – Occupational Employment Statistics (Bureau of Labor Statistics) - <http://www.bls.gov/oes/>
- LAUS – Local Area Unemployment Statistics (Bureau of Labor Statistics) - <http://www.bls.gov/lau/>

U.S. Census Bureau (Census):

- LEHD – Longitudinal Employer-Household Dynamics - <http://lehd.census.gov/>
- ACS – American Community Survey - <http://www.census.gov/acs/www/>
- SAIPE – Small Area Income and Poverty Estimates - <http://www.census.gov/did/www/saipe/>

National Center for Education Statistics (NCES):

- IPEDS – Integrated Postsecondary Education Data System (National Center for Education Statistics) - <https://nces.ed.gov/ipeds/>

Pennsylvania Department of Labor and Industry (PADLI):

- CWIA – Center for Workforce Information & Analysis (PA Department of Labor & Industry) – [www.paworkstats.pa.gov](http://www.paworkstats.pa.gov)

O\*NET Resource Center (O\*NET)

- Job Zones [www.onetonline.org/help/online/zones](http://www.onetonline.org/help/online/zones)

Economic Modeling Specialists International (EMSI)

# APPENDIX A: METHODOLOGY FOR IDENTIFYING STATE SYSTEM UNIVERSITY WORKFORCE REGIONS

## Introduction

Economic and workforce analysis is best undertaken at a geographic level that reflects how the economic market operates. In order to effectively analyze a relevant market area, a systematic approach to define the geography should be completed. This report provides a university-specific workforce characteristics analysis based on a defined workforce region. The following outlines the methodology for identifying university workforce regions.

A workforce region is defined as: a labor market area or an economically integrated region within which residents can find jobs within a reasonable commuting distance or can change their employment without changing their place of residence.<sup>16</sup> When determining a workforce region, there is no universal approach.<sup>17</sup> Given the target audience for the workforce region—State System universities—the context used to define the region should reflect multiple regional characteristics that the universities are tasked to support, while still conforming to the broader definition of what is often called a functional economic market area (FEMA). A FEMA is best described as an area that contains key economic markets. These economic markets best reflect drivers of the local economy such as the workforce and inter-industry business activity. For the purposes of this analysis, three drivers are measured in order to best define workforce regions, specifically:

- 1. Workforce flows** (primary input) - measured through commuting patterns.
- 2. Learner origin** (secondary input) - measured by the proportion of state system learners from a given county who are attending the university.
- 3. Economic activity** (secondary input) - measured through inter-industry

---

<sup>16</sup> Bureau of Labor Statistics: Labor Market Area.

<sup>17</sup> *Functional Economic Market Areas: An economic note*. Communities and Local Government. February 2010. <http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/documents/localgovernment/pdf/1469713.pdf>

exchange within the region and consumer purchasing activity within the region using an input-output model.

Further information on each of the measurements is detailed later.

## Geographic Consideration

In order to define regions for State System universities, county-level data provide the best units of economic and workforce information. As such, county groupings serve as the best structure for describing the regions.

However, no one county is identical. Each county has different industry and workforce structures, as well as different learner populations. Additionally, some universities are located in areas that are near large metropolitan areas, while other universities are not. Therefore, a blanket approach of setting threshold primary driver values when defining a workforce region for each university would ultimately favor universities located near large metropolitan areas. In order to allow for broader geographic coverage, three specific considerations were taken into account:

### **1. Percent of commuters working and/or living in the workforce region.**

Specifically, small population counties that contain a State System university do not contain a large workforce. Furthermore, the commuting flows of the workforce may seemingly favor the county containing the State System University. However, if a reasonable proportion of in commuters and out commuters (generally 10% or more) are traveling to work in contiguous counties, then these counties were included in the workforce region of the university.<sup>18</sup>

**2. Inclusiveness of counties in Pennsylvania.** The State System seeks to include all counties as part of the Rising to the Challenge Strategy. However, given the small population and workforce counties that exist across Pennsylvania, combined with many State System universities located within geographic proximity of these small counties, a second criterion of learner “capture rate” is used. The capture rate is simply the proportion of State System enrolled learners within a county that are attending a given

---

<sup>18</sup> The contiguous region approach employs the U.S. Department of Labor, Bureau of Labor Statistics’ (BLS) Small Labor Market Areas’ criteria to designating a labor market area. However, the 25% threshold set by the BLS was relaxed in order to adhere to an additional criterion of inclusiveness, wherein every county in Pennsylvania is assigned to at least one university. To meet this criteria, the proportion of county-level State System learner enrollment within PA attending the university was also included to identify a contiguous geographic area that captures both labor shed and county-level learner enrollment density (i.e. a percentage of State System learners from within the county and nearby counties that are attending the university—a “capture rate”).

---

State System university. For example, about 75% of State System enrolled learners from Erie County attend Edinboro University. Therefore Edinboro's capture rate for Erie County is 75%.

**3. Level of inter-industry exchange and ability to satisfy household demand for goods and services.** To provide additional context to regional economic activity and ensure that a final regional description can be considered a functional economic market area (FEMA), input-output modeling is used. In short, an input-output model is an inter-industry accounting framework, wherein a proportion of demand for inputs by one industry is satisfied through the production of an output by another industry within a supply chain. Regions with well-developed supply chains and integrated markets typically retain a higher proportion inter-industry trade, thus reducing the level of economic leakage. Similarly, the ability for a region's businesses to satisfy the demand for household consumption reduces economic leakage. This analysis considers both inter-industry exchange (called "output supply/demand") and household consumption (called "household supply/demand").

## Process

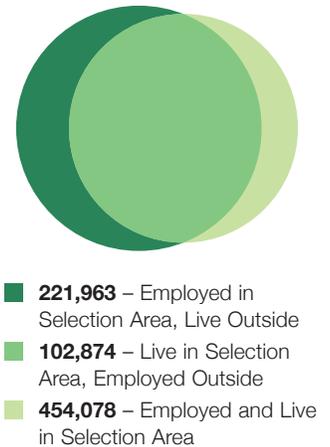
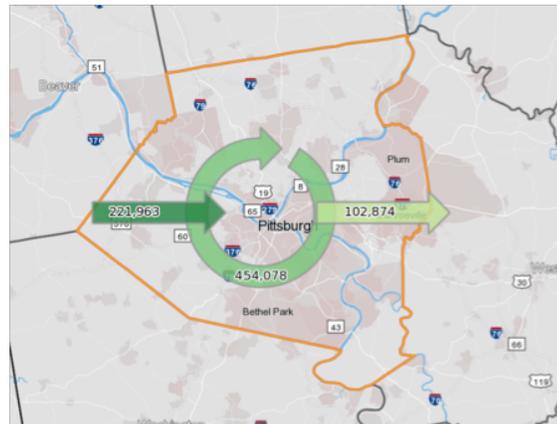
Given the workforce/commute, learner and economic variances that exist within the different geographies across Pennsylvania, an iterative process is used to define the workforce region. This multiple step, iterative process seeks to maximize the primary driver value (workforce flows), while adhering to the guiding principles of a functional economic area. It also ensures that each county in Pennsylvania is assigned to at least one university workforce region— from which the secondary driver values (learner capture rate and economic activity) were used. The process can be broken into the following steps for each driver:

### Workforce Flows:

Defined by commuting patterns, workforce flows represent the flow of workers into and out of the region. The following two illustrations for Allegheny County provide better understanding of commuting flows. The map indicates the commuting flow of workers. In short, 454,000 people who live in the county also work in the county. Additionally, almost 222,000 workers commute into Allegheny County for work, while nearly 103,000 county residents commute outside of Allegheny for their jobs.

When these numbers are converted into percentages, we find that

## Inflow/Outflow Job Counts in 2013



Source: U.S. Census Bureau – Longitudinal Employment and Housing Dynamics 2013

67% of people who work in Allegheny county live in Allegheny County  $((454,078+221,963)/454,078 = 67.2\%)$ . This is represented by the darker green circle and center shaded area of the Venn diagram. Another way to describe this is that more than 30% of the jobs in Allegheny County are filled by workers outside of the county (i.e. in commuters).

Additionally, we find that 81.5% of people who live in Allegheny County work in the county  $((454,078+102,874)/454,078 = 81.5\%)$ . This is represented by the lighter green circle and center shaded area of the Venn diagram. Another way to describe this is less than 20% of Allegheny County's employed residents commute outside of the county for their job (i.e. out commuters).

When defining the workforce region for a University, the analysis begins with the county that the University is located, followed by:

- Identification of the top counties (by percent) of in commuters, using a cut-off of 10%.
- Identification of the top counties (by percent) of out commuters, using a cut-off of 10%.

The counties identified in these initial steps were carried forward to the next set of criterion (i.e. inclusiveness and proportion of learner capture rates).

---

### **Learner Capture Rates and Inclusiveness:**

Characterized by the proportion of State System enrolled learners from a given Pennsylvania county who are attending a given State System university, the learner capture rate indicates how well the university is providing education to learners within a geographic proximity. This second set of criteria helps to shape the regional backdrop of learners supported within a contiguous area around the university. Not to be confused with the headcount of where a University's learners are coming from, this analysis is specifically designed to broaden the contiguous region to help ensure inclusiveness of other counties (many of which are often low population areas).

Counties were selected based on two criteria for learner origin. First, to evaluate each county, we consider the total number of State System learners who come from each respective county. We sum all students enrolled in the State System for each county and then calculate the share of students going to each State System university. Although a particular county may not contribute a large proportion of total State System students, this method ensured inclusiveness based upon each respective county's relative contribution. Second, to consider the university perspective, we calculate where the majority of learners come from within Pennsylvania for each respective university. This ensured that Chester County, for example, was included as part of Millersville's workforce region even though a majority of learners in Chester County do not attend Millersville University. Greater weight was given to the first criteria to ensure inclusiveness of all counties. Note that counties must be contiguous in order to conform to the definition of a workforce region.

### **Economic Activity and Concentration:**

Concurrently, we measured the economic activity of the region using supply/demand ratios for businesses and households. After each workforce region was defined using the criteria for commuting and learner origin, the gross commodity demand was calculated for that region using IMPLAN. Gross commodity demand is the total demand for supply chain products and services by businesses in the region. The Output Supply/Demand ratio represents the percent of industry demand for supply chain products and services that are satisfied by businesses in the region. The Household Supply/Demand ratio represents the percent of household demand for goods and services that are satisfied by businesses in the region. For example, when defining Bloomsburg University's workforce region several county combinations were evaluated. The fourth iteration included Columbia, Montour, Luzerne, and Northumberland. The supply/demand ratios for businesses and households were 54% and

84% respectively. In the fifth iteration, Northampton was added to the region. Although this did increase the learner origin measure (marginally), it actually reduced the supply/demand ratios for businesses and households to 53% and 79% respectively. This indicated that Northampton was not as connected to the region economically as the other counties and it was not included in the workforce region as a result.

**Table A.1 – State System Workforce Region by University**

<b>University</b>	<b>Counties</b>
Bloomsburg University	Columbia, Montour, Luzerne, Northumberland, Union, Sullivan, Snyder, Schuylkill
California University	Washington, Allegheny, Fayette, Westmoreland, Greene
Cheyney University	Chester, Delaware, Philadelphia, Montgomery
Clarion University	Clarion, Armstrong, Butler, Venango, Jefferson, Forest, Elk, Allegheny
East Stroudsburg University	Monroe, Northampton, Lackawanna, Pike, Wayne, Carbon, Lehigh
Edinboro University	Erie, Crawford, Warren, McKean
Indiana University	Indiana, Allegheny, Westmoreland, Cambria, Armstrong, Blair, Bedford, Somerset, Jefferson
Kutztown University	Berks, Lehigh, Montgomery, Northampton, Schuylkill, Chester, Bucks
Lock Haven University	Clinton, Lycoming, Centre, Clearfield, Cameron, Mifflin, Juniata
Mansfield University	Tioga, Bradford, Potter, Susquehanna, Wyoming
Millersville University	Lancaster, Dauphin, Chester, York, Lebanon
Shippensburg University	Cumberland, Franklin, Dauphin, York, Perry, Huntingdon, Fulton, Adams
Slippery Rock University	Butler, Allegheny, Mercer, Lawrence, Beaver, Westmoreland
West Chester University	Chester, Delaware, Philadelphia, Montgomery, Bucks

Source: Oxford Economics modeling and tabulations

# APPENDIX B: PENNSYLVANIA STATE AND COUNTY ENROLLMENT AND EMPLOYMENT

County	Fall 2014 Enrollment in Slippery Rock University	2014 QCEW Employment
Adams	31	34,139
Allegheny	1,781	683,111
Armstrong	129	17,582
Beaver	480	52,811
Bedford	16	15,397
Berks	43	166,792
Blair	48	58,233
Bradford	16	24,568
Bucks	52	250,889
Butler	1,131	84,472
Cambria	81	53,915
Cameron	10	2,015
Carbon	3	16,974
Centre	48	67,147
Chester	53	240,469
Clarion	63	13,586
Clearfield	72	29,938
Clinton	6	13,043
Columbia	9	24,974
Crawford	140	31,113
Cumberland	50	126,939
Dauphin	58	176,004
Delaware	33	216,261
Elk	53	14,994
Erie	333	124,095
Fayette	75	39,979
Forest	5	2,053
Franklin	33	56,715
Fulton	4	4,807
Greene	25	14,844
Huntingdon	14	12,343

<b>County</b>	<b>Fall 2014 Enrollment in Slippery Rock University</b>	<b>2014 QCEW Employment</b>
Indiana	42	32,653
Jefferson	25	15,435
Juniata	2	6,146
Lackawanna	13	97,259
Lancaster	67	225,673
Lawrence	486	29,500
Lebanon	16	48,869
Lehigh	33	180,757
Luzerne	39	140,329
Lycoming	34	53,197
McKean	39	15,770
Mercer	563	48,028
Mifflin	6	15,544
Monroe	24	52,933
Montgomery	72	472,655
Montour	6	15,578
Northampton	34	105,825
Northumberland	18	27,985
Perry	10	7,661
Philadelphia	39	640,987
Pike	12	10,748
Potter	18	5,291
Schuylkill	11	50,049
Snyder	6	15,522
Somerset	42	24,398
Sullivan	1	1,772
Susquehanna	3	9,281
Tioga	18	12,973
Union	4	16,597
Venango	132	19,251
Warren	47	15,031
Washington	267	86,961
Wayne	6	14,651
Westmoreland	389	132,312
Wyoming	6	10,181
York	71	172,145
<b>Total Pennsylvania</b>	<b>7,496</b>	<b>5,643,676</b>

Source: Enrollment - Pennsylvania State System of Higher Education Website, Employment - BLS QCEW

---

# **APPENDIX C: INDUSTRY PROJECTIONS 2014-2024 FOR SLIPPERY ROCK UNIVERSITY'S WORKFORCE REGION**

A common measure of industry competitiveness is through the use of a location quotient statistic. Location quotients (LQ) provide a relative perspective on local comparative advantages in specific industry classifications by comparing employment within a local or state economy to a larger geographic area (e.g. nation). On its own, the analysis achieves little. However, when evaluated jointly with the employment data and growth, one gains a sense of the industry sectors that might benefit from efforts to align educational opportunities with economic development (i.e. industries that State System universities may consider engaging in larger conversations about aligning employer and educational needs).

To interpret results, LQs equal to 1 indicate that the area's industry concentration is equal the national concentration of the same industry. Industries with a higher location quotient (usually greater than 1.2) indicate that an area has a relatively higher concentration of jobs in the sector and therefore concludes that the area has a comparative advantage or specialization in the production of that good or service, compared to the national average. Note: High employment industries do not necessarily result in large location quotients, as this is a comparative statistic. The following table provides the industry LQs at the 4-digit NAICS level in SRU's workforce region. Included in the table are the number of jobs in 2014 and the projected job growth/decline in 2024.

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
<b>Total</b>	<b>All Industries</b>	<b>1,057,818</b>	<b>1,135,293</b>	<b>7.3%</b>	<b>1.0</b>
1111	Oilseed and Grain Farming	47	54	14.9%	0.1
1112	Vegetable and Melon Farming	119	122	2.5%	0.2
1113	Fruit and Tree Nut Farming	34	38	11.8%	0.0
1114	Greenhouse, Nursery, and Floriculture Production	185	170	-8.1%	0.2
1119	Other Crop Farming	30	34	13.3%	0.1
1121	Cattle Ranching and Farming	145	168	15.9%	0.1
1122	Hog and Pig Farming	2	2	0.0%	0.0
1123	Poultry and Egg Production	52	57	9.6%	0.2
1124	Sheep and Goat Farming	13	15	15.4%	1.1
1129	Other Animal Production	40	36	-10.0%	0.3
1131	Timber Tract Operations	16	19	18.8%	0.3
1132	Forest Nurseries and Gathering of Forest Products	2	3	50.0%	0.1
1133	Logging	11	14	27.3%	0.0
1141	Fishing	3	4	33.3%	0.1
1142	Hunting and Trapping	5	6	20.0%	0.4
1151	Support Activities for Crop Production	109	120	10.1%	0.0
1152	Support Activities for Animal Production	83	71	-14.5%	0.4
1153	Support Activities for Forestry	27	33	22.2%	0.2
2111	Oil and Gas Extraction	1,847	2,493	35.0%	1.2
2121	Coal Mining	432	473	9.5%	0.8
2123	Nonmetallic Mineral Mining and Quarrying	599	578	-3.5%	0.9
2131	Support Activities for Mining	2,193	2,373	8.2%	0.6
2211	Electric Power Generation, Transmission and Distribution	3,138	2,956	-5.8%	0.8
2212	Natural Gas Distribution	1,554	1,606	3.3%	1.7
2213	Water, Sewage and Other Systems	3,145	3,498	11.2%	1.9
2361	Residential Building Construction	4,945	6,249	26.4%	1.0
2362	Nonresidential Building Construction	5,443	6,380	17.2%	1.0
2371	Utility System Construction	3,758	4,621	23.0%	1.0
2372	Land Subdivision	356	411	15.4%	1.1
2373	Highway, Street, and Bridge Construction	4,399	5,335	21.3%	1.4
2379	Other Heavy and Civil Engineering Construction	754	988	31.0%	0.9
2381	Foundation, Structure, and Building Exterior Contractors	4,637	4,795	3.4%	0.8
2382	Building Equipment Contractors	12,935	14,597	12.8%	0.9
2383	Building Finishing Contractors	4,729	4,922	4.1%	0.9
2389	Other Specialty Trade Contractors	5,237	6,566	25.4%	1.2
3111	Animal Food Manufacturing	105	104	-1.0%	0.2

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3112	Grain and Oilseed Milling	96	70	-27.1%	0.2
3113	Sugar and Confectionery Product Manufacturing	780	870	11.5%	1.4
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	1,098	1,213	10.5%	0.8
3115	Dairy Product Manufacturing	705	672	-4.7%	0.7
3116	Animal Slaughtering and Processing	439	426	-3.0%	0.1
3118	Bakeries and Tortilla Manufacturing	2,038	2,088	2.5%	0.9
3119	Other Food Manufacturing	446	509	14.1%	0.3
3121	Beverage Manufacturing	847	907	7.1%	0.6
3122	Tobacco Manufacturing	93	109	17.2%	0.9
3131	Fiber, Yarn, and Thread Mills	5	4	-20.0%	0.0
3132	Fabric Mills	164	117	-28.7%	0.4
3133	Textile and Fabric Finishing and Fabric Coating Mills	25	26	4.0%	0.1
3141	Textile Furnishings Mills	92	99	7.6%	0.2
3149	Other Textile Product Mills	433	454	4.8%	0.9
3152	Cut and Sew Apparel Manufacturing	79	73	-7.6%	0.1
3159	Apparel Accessories and Other Apparel Manufacturing	95	72	-24.2%	1.1
3162	Footwear Manufacturing	11	9	-18.2%	0.1
3169	Other Leather and Allied Product Manufacturing	5	6	20.0%	0.1
3211	Sawmills and Wood Preservation	284	359	26.4%	0.4
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	325	439	35.1%	0.6
3219	Other Wood Product Manufacturing	986	1,247	26.5%	0.6
3222	Converted Paper Product Manufacturing	787	692	-12.1%	0.4
3231	Printing and Related Support Activities	3,198	2,685	-16.0%	0.9
3241	Petroleum and Coal Products Manufacturing	2,261	2,146	-5.1%	2.7
3251	Basic Chemical Manufacturing	1,078	968	-10.2%	1.0
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	807	684	-15.2%	1.1
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	12	11	-8.3%	0.0
3254	Pharmaceutical and Medicine Manufacturing	257	210	-18.3%	0.1
3255	Paint, Coating, and Adhesive Manufacturing	731	662	-9.4%	1.6
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	500	497	-0.6%	0.6
3259	Other Chemical Product and Preparation Manufacturing	748	811	8.4%	1.2
3261	Plastics Product Manufacturing	3,365	3,386	0.6%	0.8
3262	Rubber Product Manufacturing	574	568	-1.0%	0.6
3271	Clay Product and Refractory Manufacturing	1,191	1,116	-6.3%	3.9
3272	Glass and Glass Product Manufacturing	1,831	2,062	12.6%	2.9
3273	Cement and Concrete Product Manufacturing	1,057	1,115	5.5%	0.8

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3274	Lime and Gypsum Product Manufacturing	273	292	7.0%	2.5
3279	Other Nonmetallic Mineral Product Manufacturing	387	441	14.0%	0.7
3311	Iron and Steel Mills and Ferroalloy Manufacturing	7,005	6,689	-4.5%	9.9
3312	Steel Product Manufacturing from Purchased Steel	1,951	1,744	-10.6%	4.2
3313	Alumina and Aluminum Production and Processing	580	672	15.9%	1.3
3314	Nonferrous Metal (except Aluminum) Production and Processing	1,313	1,175	-10.5%	2.7
3315	Foundries	2,193	2,326	6.1%	2.2
3321	Forging and Stamping	1,717	1,875	9.2%	2.2
3322	Cutlery and Handtool Manufacturing	337	302	-10.4%	1.1
3323	Architectural and Structural Metals Manufacturing	4,198	4,586	9.2%	1.5
3324	Boiler, Tank, and Shipping Container Manufacturing	863	916	6.1%	1.1
3325	Hardware Manufacturing	94	94	0.0%	0.5
3326	Spring and Wire Product Manufacturing	309	321	3.9%	0.9
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	4,628	4,729	2.2%	1.6
3328	Coating, Engraving, Heat Treating, and Allied Activities	1,706	1,727	1.2%	1.6
3329	Other Fabricated Metal Product Manufacturing	1,490	1,422	-4.6%	0.7
3331	Agriculture, Construction, and Mining Machinery Manufacturing	786	717	-8.8%	0.4
3332	Industrial Machinery Manufacturing	660	685	3.8%	0.8
3333	Commercial and Service Industry Machinery Manufacturing	566	422	-25.4%	0.8
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	673	675	0.3%	0.7
3335	Metalworking Machinery Manufacturing	3,605	3,352	-7.0%	2.6
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	547	475	-13.2%	0.7
3339	Other General Purpose Machinery Manufacturing	3,163	3,469	9.7%	1.6
3341	Computer and Peripheral Equipment Manufacturing	447	418	-6.5%	0.4
3342	Communications Equipment Manufacturing	1,121	833	-25.7%	1.5
3343	Audio and Video Equipment Manufacturing	14	11	-21.4%	0.1
3344	Semiconductor and Other Electronic Component Manufacturing	1,362	1,112	-18.4%	0.5
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	4,388	4,639	5.7%	1.5
3346	Manufacturing and Reproducing Magnetic and Optical Media	8	5	-37.5%	0.1
3351	Electric Lighting Equipment Manufacturing	243	262	7.8%	0.7
3353	Electrical Equipment Manufacturing	3,307	3,534	6.9%	3.0
3359	Other Electrical Equipment and Component Manufacturing	667	698	4.6%	0.7
3362	Motor Vehicle Body and Trailer Manufacturing	513	550	7.2%	0.5
3363	Motor Vehicle Parts Manufacturing	257	208	-19.1%	0.1
3364	Aerospace Product and Parts Manufacturing	126	113	-10.3%	0.0

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3365	Railroad Rolling Stock Manufacturing	1,964	2,082	6.0%	9.3
3366	Ship and Boat Building	97	110	13.4%	0.1
3369	Other Transportation Equipment Manufacturing	30	37	23.3%	0.1
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	482	496	2.9%	0.3
3372	Office Furniture (including Fixtures) Manufacturing	327	347	6.1%	0.4
3379	Other Furniture Related Product Manufacturing	13	13	0.0%	0.0
3391	Medical Equipment and Supplies Manufacturing	2,677	2,525	-5.7%	1.1
3399	Other Miscellaneous Manufacturing	1,261	1,309	3.8%	0.6
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	3,138	3,495	11.4%	1.2
4232	Furniture and Home Furnishing Merchant Wholesalers	585	647	10.6%	0.7
4233	Lumber and Other Construction Materials Merchant Wholesalers	1,885	1,980	5.0%	1.2
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	4,411	4,492	1.8%	0.9
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	1,594	1,706	7.0%	1.6
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	2,024	1,997	-1.3%	0.8
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	1,754	2,025	15.5%	1.0
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	4,515	4,801	6.3%	0.9
4239	Miscellaneous Durable Goods Merchant Wholesalers	2,737	3,061	11.8%	1.2
4241	Paper and Paper Product Merchant Wholesalers	598	592	-1.0%	0.6
4242	Drugs and Druggists' Sundries Merchant Wholesalers	317	267	-15.8%	0.2
4243	Apparel, Piece Goods, and Notions Merchant Wholesalers	199	223	12.1%	0.2
4244	Grocery and Related Product Merchant Wholesalers	4,482	4,904	9.4%	0.8
4245	Farm Product Raw Material Merchant Wholesalers	19	23	21.1%	0.0
4246	Chemical and Allied Products Merchant Wholesalers	1,094	1,074	-1.8%	1.1
4247	Petroleum and Petroleum Products Merchant Wholesalers	549	583	6.2%	0.7
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	863	1,085	25.7%	0.6
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	1,277	1,197	-6.3%	0.5
4251	Wholesale Electronic Markets and Agents and Brokers	9,684	9,529	-1.6%	1.4
4411	Automobile Dealers	10,706	12,065	12.7%	1.2
4412	Other Motor Vehicle Dealers	630	682	8.3%	0.6
4413	Automotive Parts, Accessories, and Tire Stores	3,522	3,655	3.8%	0.9
4421	Furniture Stores	1,430	1,485	3.8%	0.9
4422	Home Furnishings Stores	1,684	1,734	3.0%	0.9
4431	Electronics and Appliance Stores	3,247	2,937	-9.5%	0.9
4441	Building Material and Supplies Dealers	7,514	7,806	3.9%	0.9

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4442	Lawn and Garden Equipment and Supplies Stores	1,109	1,125	1.4%	1.0
4451	Grocery Stores	20,049	17,681	-11.8%	1.0
4452	Specialty Food Stores	1,279	1,116	-12.7%	0.7
4453	Beer, Wine, and Liquor Stores	1,304	1,484	13.8%	1.1
4461	Health and Personal Care Stores	9,080	9,098	0.2%	1.2
4471	Gasoline Stations	6,774	7,318	8.0%	1.0
4481	Clothing Stores	9,034	8,558	-5.3%	1.1
4482	Shoe Stores	1,521	1,577	3.7%	1.0
4483	Jewelry, Luggage, and Leather Goods Stores	1,142	1,056	-7.5%	1.1
4511	Sporting Goods, Hobby, and Musical Instrument Stores	4,451	4,835	8.6%	1.1
4512	Book Stores and News Dealers	720	698	-3.1%	1.0
4521	Department Stores	11,168	10,684	-4.3%	1.0
4529	Other General Merchandise Stores	11,512	11,831	2.8%	0.8
4531	Florists	662	447	-32.5%	1.4
4532	Office Supplies, Stationery, and Gift Stores	2,166	1,946	-10.2%	1.0
4533	Used Merchandise Stores	1,483	1,884	27.0%	1.2
4539	Other Miscellaneous Store Retailers	2,350	2,323	-1.1%	1.0
4541	Electronic Shopping and Mail-Order Houses	4,273	5,409	26.6%	1.7
4542	Vending Machine Operators	324	312	-3.7%	1.1
4543	Direct Selling Establishments	485	455	-6.2%	0.5
4811	Scheduled Air Transportation	2,208	2,338	5.9%	0.7
4812	Nonscheduled Air Transportation	329	366	11.2%	1.1
4832	Inland Water Transportation	256	243	-5.1%	1.2
4841	General Freight Trucking	5,929	6,708	13.1%	0.8
4842	Specialized Freight Trucking	3,737	4,582	22.6%	1.1
4851	Urban Transit Systems	2,403	2,641	9.9%	1.3
4852	Interurban and Rural Bus Transportation	182	183	0.5%	1.1
4853	Taxi and Limousine Service	337	343	1.8%	0.5
4854	School and Employee Bus Transportation	5,484	6,119	11.6%	2.9
4855	Charter Bus Industry	722	778	7.8%	3.1
4859	Other Transit and Ground Passenger Transportation	825	963	16.7%	1.1
4862	Pipeline Transportation of Natural Gas	185	196	5.9%	0.8
4869	Other Pipeline Transportation	73	98	34.2%	1.2
4871	Scenic and Sightseeing Transportation, Land	205	257	25.4%	1.9
4872	Scenic and Sightseeing Transportation, Water	82	71	-13.4%	0.7
4879	Scenic and Sightseeing Transportation, Other	2	2	0.0%	0.1
4881	Support Activities for Air Transportation	1,093	1,150	5.2%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4882	Support Activities for Rail Transportation	366	447	22.1%	1.5
4883	Support Activities for Water Transportation	313	325	3.8%	0.4
4884	Support Activities for Road Transportation	925	1,336	44.4%	1.1
4885	Freight Transportation Arrangement	797	965	21.1%	0.5
4889	Other Support Activities for Transportation	247	319	29.1%	1.0
4911	Postal Service	5,960	4,100	-31.2%	1.3
4921	Couriers and Express Delivery Services	5,109	5,720	12.0%	1.3
4922	Local Messengers and Local Delivery	184	174	-5.4%	0.4
4931	Warehousing and Storage	5,175	6,174	19.3%	0.9
5111	Newspaper, Periodical, Book, and Directory Publishers	3,022	2,630	-13.0%	0.9
5112	Software Publishers	1,450	1,671	15.2%	0.6
5121	Motion Picture and Video Industries	1,763	1,780	1.0%	0.6
5122	Sound Recording Industries	72	69	-4.2%	0.6
5151	Radio and Television Broadcasting	1,570	1,827	16.4%	0.9
5152	Cable and Other Subscription Programming	60	54	-10.0%	0.1
5171	Wired Telecommunications Carriers	5,236	4,579	-12.5%	1.1
5172	Wireless Telecommunications Carriers (except Satellite)	485	322	-33.6%	0.4
5174	Satellite Telecommunications	17	15	-11.8%	0.2
5179	Other Telecommunications	302	224	-25.8%	0.5
5182	Data Processing, Hosting, and Related Services	828	622	-24.9%	0.4
5191	Other Information Services	2,384	2,985	25.2%	0.9
5211	Monetary Authorities-Central Bank	5	4	-20.0%	0.0
5221	Depository Credit Intermediation	24,244	22,516	-7.1%	1.8
5222	Nondepository Credit Intermediation	2,426	2,015	-16.9%	0.5
5223	Activities Related to Credit Intermediation	972	768	-21.0%	0.4
5231	Securities and Commodity Contracts Intermediation and Brokerage	1,726	1,812	5.0%	0.5
5232	Securities and Commodity Exchanges	4	6	50.0%	0.1
5239	Other Financial Investment Activities	4,634	7,124	53.7%	1.4
5241	Insurance Carriers	14,996	15,800	5.4%	1.6
5242	Agencies, Brokerages, and Other Insurance Related Activities	7,814	9,040	15.7%	1.0
5251	Insurance and Employee Benefit Funds	6	5	-16.7%	0.3
5311	Lessors of Real Estate	4,313	4,712	9.3%	0.9
5312	Offices of Real Estate Agents and Brokers	1,277	1,301	1.9%	0.6
5313	Activities Related to Real Estate	2,903	2,841	-2.1%	0.6
5321	Automotive Equipment Rental and Leasing	1,415	1,652	16.7%	1.0
5322	Consumer Goods Rental	871	984	13.0%	0.7
5323	General Rental Centers	167	173	3.6%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	1,243	1,478	18.9%	1.1
5331	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	106	98	-7.5%	0.6
5411	Legal Services	11,073	12,237	10.5%	1.3
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	7,804	8,473	8.6%	1.0
5413	Architectural, Engineering, and Related Services	18,432	20,477	11.1%	1.7
5414	Specialized Design Services	943	1,307	38.6%	1.0
5415	Computer Systems Design and Related Services	13,748	19,998	45.5%	1.0
5416	Management, Scientific, and Technical Consulting Services	10,182	12,284	20.6%	1.1
5417	Scientific Research and Development Services	7,038	9,119	29.6%	1.4
5418	Advertising, Public Relations, and Related Services	3,407	3,812	11.9%	0.9
5419	Other Professional, Scientific, and Technical Services	4,218	4,781	13.3%	0.8
5511	Management of Companies and Enterprises	37,526	41,202	9.8%	2.2
5611	Office Administrative Services	777	665	-14.4%	0.2
5612	Facilities Support Services	920	1,317	43.2%	0.9
5613	Employment Services	16,966	19,155	12.9%	0.6
5614	Business Support Services	6,313	5,719	-9.4%	0.9
5615	Travel Arrangement and Reservation Services	1,002	894	-10.8%	0.7
5616	Investigation and Security Services	9,990	10,406	4.2%	1.5
5617	Services to Buildings and Dwellings	13,841	14,632	5.7%	0.9
5619	Other Support Services	2,090	2,608	24.8%	0.9
5621	Waste Collection	1,444	1,842	27.6%	1.1
5622	Waste Treatment and Disposal	684	788	15.2%	0.7
5629	Remediation and Other Waste Management Services	1,233	1,374	11.4%	1.2
6111	Elementary and Secondary Schools	47,582	44,766	-5.9%	0.8
6112	Junior Colleges	5,224	4,865	-6.9%	0.9
6113	Colleges, Universities, and Professional Schools	30,737	31,329	1.9%	1.4
6114	Business Schools and Computer and Management Training	175	201	14.9%	0.3
6115	Technical and Trade Schools	1,018	1,105	8.5%	0.9
6116	Other Schools and Instruction	1,947	2,132	9.5%	0.7
6117	Educational Support Services	484	557	15.1%	0.4
6211	Offices of Physicians	24,329	26,318	8.2%	1.2
6212	Offices of Dentists	6,051	6,601	9.1%	0.9
6213	Offices of Other Health Practitioners	10,198	13,423	31.6%	1.7
6214	Outpatient Care Centers	6,670	8,821	32.2%	1.1
6215	Medical and Diagnostic Laboratories	2,212	2,404	8.7%	1.1
6216	Home Health Care Services	9,454	13,661	44.5%	1.0

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
6219	Other Ambulatory Health Care Services	4,572	4,920	7.6%	2.0
6221	General Medical and Surgical Hospitals	51,854	55,400	6.8%	1.2
6222	Psychiatric and Substance Abuse Hospitals	2,001	2,013	0.6%	1.1
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	4,034	5,129	27.1%	2.1
6231	Nursing Care Facilities (Skilled Nursing Facilities)	16,509	18,736	13.5%	1.2
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	10,108	10,355	2.4%	1.8
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	9,180	11,227	22.3%	1.4
6239	Other Residential Care Facilities	1,989	2,488	25.1%	1.5
6241	Individual and Family Services	18,718	24,624	31.6%	1.1
6242	Community Food and Housing, and Emergency and Other Relief Services	874	939	7.4%	0.7
6243	Vocational Rehabilitation Services	1,849	2,185	18.2%	0.7
6244	Child Day Care Services	6,116	7,014	14.7%	1.0
7111	Performing Arts Companies	847	876	3.4%	0.9
7112	Spectator Sports	1,470	1,659	12.9%	1.4
7113	Promoters of Performing Arts, Sports, and Similar Events	1,531	1,665	8.8%	1.6
7114	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	67	79	17.9%	0.4
7115	Independent Artists, Writers, and Performers	101	132	30.7%	0.2
7121	Museums, Historical Sites, and Similar Institutions	2,165	2,468	14.0%	1.2
7131	Amusement Parks and Arcades	2,182	2,737	25.4%	1.5
7132	Gambling Industries	850	732	-13.9%	0.4
7139	Other Amusement and Recreation Industries	8,936	9,732	8.9%	0.9
7211	Traveler Accommodation	7,002	7,228	3.2%	0.5
7212	RV (Recreational Vehicle) Parks and Recreational Camps	285	330	15.8%	0.6
7213	Rooming and Boarding Houses	32	38	18.8%	0.3
7223	Special Food Services	7,244	8,439	16.5%	1.5
7224	Drinking Places (Alcoholic Beverages)	3,774	3,920	3.9%	1.3
7225	Restaurants and Other Eating Places	69,762	75,133	7.7%	0.9
8111	Automotive Repair and Maintenance	6,560	7,016	7.0%	1.0
8112	Electronic and Precision Equipment Repair and Maintenance	914	931	1.9%	1.2
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1,195	1,324	10.8%	0.8
8114	Personal and Household Goods Repair and Maintenance	484	535	10.5%	0.9
8121	Personal Care Services	7,269	8,046	10.7%	1.4
8122	Death Care Services	1,645	1,649	0.2%	1.5
8123	Drycleaning and Laundry Services	2,154	2,037	-5.4%	0.9
8129	Other Personal Services	2,214	2,627	18.7%	1.0

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
8131	Religious Organizations	1,706	1,760	3.2%	1.2
8132	Grantmaking and Giving Services	1,093	1,072	-1.9%	1.0
8133	Social Advocacy Organizations	1,475	1,540	4.4%	0.9
8134	Civic and Social Organizations	5,920	6,193	4.6%	1.9
8139	Business, Professional, Labor, Political, and Similar Organizations	3,584	3,684	2.8%	1.1
8141	Private Households	837	701	-16.2%	0.4
9211	Executive, Legislative, and Other General Government Support	23,689	22,711	-4.1%	1.0
9221	Justice, Public Order, and Safety Activities	4,063	3,549	-12.7%	0.3
9231	Administration of Human Resource Programs	1,268	1,183	-6.7%	0.2
9241	Administration of Environmental Quality Programs	816	772	-5.4%	0.3
9251	Administration of Housing Programs, Urban Planning, and Community Development	930	841	-9.6%	1.5
9261	Administration of Economic Programs	1,648	1,523	-7.6%	0.4
9281	National Security and International Affairs	883	834	-5.5%	0.2

Source: Bureau of Labor Statistics, Occupational Employment Statistics (OES), Pennsylvania Department of Labor & Industry, Oxford Economics Projections

# APPENDIX D: OCCUPATION PROJECTIONS 2014-2024 FOR SLIPPERY ROCK UNIVERSITY'S WORKFORCE REGION

For this analysis a “skilled” occupation is defined as an occupation in O\*NET Job Zones<sup>19</sup> Three, Four or Five. Most occupations in Job Zone Three require training in vocational schools, related on-the-job experience, or an associate’s degree.

The O\*NET program is the nation’s primary source of occupational information. Central to the project is the O\*NET database, containing information on hundreds of standardized and occupation-specific descriptors. The database, which is available to the public at no cost, is continually updated by surveying a broad range of workers from each occupation.<sup>20</sup>

## **JOB ZONE ONE: Little or No Preparation Needed**

- *Education* – Some of these occupations may require a high school diploma or GED certificate.
- *Related Experience* – Little or no previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a waiter or waitress even if he/she has never worked before.
- *Job Training* – Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.
- *Job Zone Examples* – These occupations involve following instructions and helping others. Examples include taxi drivers, amusement and recreation attendants, counter and rental clerks, nonfarm animal caretakers, continuous mining machine operators, and waiters/ waitresses.

## **JOB ZONE TWO: Some Preparation Needed**

- *Education* – These occupations usually require a high school diploma.

---

<sup>19</sup> <https://www.onetonline.org/help/online/zones>

<sup>20</sup> <http://www.onetcenter.org/overview.html>

- *Related Experience* – Some previous work-related skill, knowledge, or experience is usually needed. For example, a teller would benefit from experience working directly with the public.
- *Job Training* – Employees in these occupations need anywhere from a few months to one year of working with experienced employees. A recognized apprenticeship program may be associated with these occupations.
- *Job Zone Examples* – These occupations often involve using your knowledge and skills to help others. Examples include sheet metal workers, forest fire fighters, customer service representatives, physical therapist aides, salespersons (retail), and tellers.

### **JOB ZONE THREE: Medium Preparation Needed**

- *Education* – Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree.
- *Related Experience* – Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
- *Job Training* – Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers. A recognized apprenticeship program may be associated with these occupations.
- *Job Zone Examples* – These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include food service managers, electricians, agricultural technicians, legal secretaries, occupational therapy assistants, and medical assistants.

### **JOB ZONE FOUR: Considerable Preparation Needed**

- *Education* – Most of these occupations require a four-year bachelor's degree, but some do not.
- *Related Experience* – A considerable amount of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.

- 
- *Job Training* – Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.
  - *Job Zone Examples* – Many of these occupations involve coordinating, supervising, managing, or training others. Examples include accountants, sales managers, database administrators, teachers, chemists, art directors, and cost estimators.

### **JOB ZONE FIVE: Extensive Preparation Needed**

- *Education* – Most of these occupations require graduate school. For example, they may require a master’s degree, and some require a Ph.D., M.D., or J.D. (law degree).
- *Related Experience* – Extensive skill, knowledge, and experience are needed for these occupations. Many require more than five years of experience. For example, surgeons must complete four years of college and an additional five to seven years of specialized medical training to be able to do their job.
- *Job Training* – Employees may need some on-the-job training, but most of these occupations assume that the person will already have the required skills, knowledge, work-related experience, and/or training.
- *Job Zone Examples* – These occupations often involve coordinating, training, supervising, or managing the activities of others to accomplish goals. Very advanced communication and organizational skills are required. Examples include librarians, lawyers, sports medicine physicians, wildlife biologists, school psychologists, surgeons, treasurers, and controllers.

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
<b>Total</b>	<b>All Occupations</b>	<b>NA</b>	<b>1,057,818</b>	<b>1,135,293</b>	<b>7.3%</b>	<b>375,013</b>
11-1011	Chief Executives	5	2,156	2,050	-4.9%	406
11-1021	General and Operations Managers	4	12,422	14,265	14.8%	4,054
11-1031	Legislators	4	291	219	-24.7%	5
11-2011	Advertising and Promotions Managers	4	126	109	-13.5%	25
11-2021	Marketing Managers	4	1,162	1,298	11.7%	388
11-2022	Sales Managers	4	1,980	1,990	0.5%	437
11-2031	Public Relations and Fundraising Managers	4	360	333	-7.5%	50
11-3011	Administrative Services Managers	3	1,617	1,589	-1.7%	220
11-3021	Computer and Information Systems Managers	4	2,385	3,102	30.1%	1,065
11-3031	Financial Managers	4	3,397	3,291	-3.1%	522
11-3051	Industrial Production Managers	4	1,158	1,116	-3.6%	225
11-3061	Purchasing Managers	4	454	410	-9.7%	59
11-3071	Transportation, Storage, and Distribution Managers	4	537	609	13.4%	204
11-3111	Compensation and Benefits Managers	4	186	161	-13.4%	32
11-3121	Human Resources Managers	4	763	926	21.4%	361
11-3131	Training and Development Managers	4	202	249	23.3%	101
11-9021	Construction Managers	4	1,245	1,580	26.9%	516
11-9031	Education Administrators, Preschool and Childcare Center/Program	4	318	328	3.1%	95
11-9032	Education Administrators, Elementary and Secondary School	5	1,250	1,127	-9.8%	290
11-9033	Education Administrators, Postsecondary	5	1,115	1,043	-6.5%	245
11-9039	Education Administrators, All Other	5	141	169	19.9%	67
11-9041	Architectural and Engineering Managers	5	1,271	1,368	7.6%	426
11-9051	Food Service Managers	3	1,171	1,291	10.2%	356
11-9061	Funeral Service Managers	3	122	113	-7.4%	28
11-9071	Gaming Managers	3	14	12	-14.3%	1
11-9081	Lodging Managers	3	131	149	13.7%	75
11-9111	Medical and Health Services Managers	5	2,703	2,844	5.2%	798
11-9121	Natural Sciences Managers	5	343	430	25.4%	172
11-9131	Postmasters and Mail Superintendents	3	231	150	-35.1%	18
11-9141	Property, Real Estate, and Community Association Managers	4	663	770	16.1%	278
11-9151	Social and Community Service Managers	4	1,015	1,153	13.6%	371
11-9161	Emergency Management Directors	4	65	53	-18.5%	1
11-9199	Managers, All Other	4	1,650	1,822	10.4%	531

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	4	45	48	6.7%	19
13-1021	Buyers and Purchasing Agents, Farm Products	4	61	62	1.6%	17
13-1022	Wholesale and Retail Buyers, Except Farm Products	3	833	775	-7.0%	170
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	4	2,701	2,715	0.5%	592
13-1031	Claims Adjusters, Examiners, and Investigators	4	2,630	2,778	5.6%	928
13-1032	Insurance Appraisers, Auto Damage	3	147	180	22.4%	86
13-1041	Compliance Officers	4	2,034	2,380	17.0%	769
13-1051	Cost Estimators	4	1,874	2,058	9.8%	821
13-1071	Human Resources Specialists	4	3,807	4,525	18.9%	1,531
13-1075	Labor Relations Specialists	4	1,061	834	-21.4%	86
13-1081	Logisticians	4	897	1,103	23.0%	326
13-1111	Management Analysts	4	4,392	5,359	22.0%	1,698
13-1121	Meeting, Convention, and Event Planners	4	573	750	30.9%	265
13-1131	Fundraisers	4	558	670	20.1%	237
13-1141	Compensation, Benefits, and Job Analysis Specialists	4	815	741	-9.1%	108
13-1151	Training and Development Specialists	4	2,195	2,479	12.9%	719
13-1161	Market Research Analysts and Marketing Specialists	4	4,836	6,410	32.5%	2,348
13-1199	Business Operations Specialists, All Other	4	3,258	3,243	-0.5%	371
13-2011	Accountants and Auditors	4	11,333	12,416	9.6%	4,856
13-2021	Appraisers and Assessors of Real Estate	4	260	232	-10.8%	11
13-2031	Budget Analysts	4	322	350	8.7%	163
13-2041	Credit Analysts	4	551	601	9.1%	214
13-2051	Financial Analysts	4	2,540	3,007	18.4%	1,132
13-2052	Personal Financial Advisors	4	1,498	2,088	39.4%	869
13-2053	Insurance Underwriters	4	1,050	1,132	7.8%	491
13-2061	Financial Examiners	4	328	360	9.8%	137
13-2071	Credit Counselors	4	413	493	19.4%	169
13-2072	Loan Officers	3	3,189	3,472	8.9%	1,166
13-2081	Tax Examiners and Collectors, and Revenue Agents	3	570	477	-16.3%	138
13-2082	Tax Preparers	3	475	419	-11.8%	88
13-2099	Financial Specialists, All Other	4	849	793	-6.6%	57
15-1111	Computer and Information Research Scientists	5	57	61	7.0%	11
15-1121	Computer Systems Analysts	4	4,935	6,892	39.7%	2,830
15-1122	Information Security Analysts	4	534	818	53.2%	367
15-1131	Computer Programmers	4	3,001	3,971	32.3%	1,953

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
15-1132	Software Developers, Applications	4	4,539	6,184	36.2%	2,292
15-1133	Software Developers, Systems Software	4	2,235	2,271	1.6%	306
15-1134	Web Developers	3	839	1,128	34.4%	426
15-1141	Database Administrators	4	1,125	1,459	29.7%	566
15-1142	Network and Computer Systems Administrators	4	3,013	2,882	-4.3%	386
15-1143	Computer Network Architects	4	810	942	16.3%	262
15-1151	Computer User Support Specialists	3	5,202	6,908	32.8%	2,638
15-1152	Computer Network Support Specialists	4	1,154	1,233	6.8%	299
15-1199	Computer Occupations, All Other	4	1,351	1,614	19.5%	502
15-2011	Actuaries	4	306	405	32.4%	198
15-2031	Operations Research Analysts	5	554	668	20.6%	244
15-2041	Statisticians	5	398	540	35.7%	280
17-1011	Architects, Except Landscape and Naval	4	862	1,007	16.8%	450
17-1012	Landscape Architects	4	230	300	30.4%	142
17-1021	Cartographers and Photogrammetrists	4	59	63	6.8%	16
17-1022	Surveyors	4	445	500	12.4%	172
17-2011	Aerospace Engineers	4	325	453	39.4%	213
17-2021	Agricultural Engineers	4	21	29	38.1%	14
17-2031	Biomedical Engineers	4	233	227	-2.6%	57
17-2041	Chemical Engineers	4	306	300	-2.0%	83
17-2051	Civil Engineers	4	3,320	3,755	13.1%	1,340
17-2061	Computer Hardware Engineers	4	257	232	-9.7%	34
17-2071	Electrical Engineers	4	1,697	1,960	15.5%	684
17-2072	Electronics Engineers, Except Computer	4	818	709	-13.3%	94
17-2081	Environmental Engineers	5	818	987	20.7%	406
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	4	247	255	3.2%	88
17-2112	Industrial Engineers	4	1,737	1,750	0.7%	601
17-2131	Materials Engineers	4	365	450	23.3%	223
17-2141	Mechanical Engineers	4	2,328	2,349	0.9%	900
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	4	60	55	-8.3%	18
17-2161	Nuclear Engineers	4	394	479	21.6%	220
17-2171	Petroleum Engineers	4	189	283	49.7%	162
17-2199	Engineers, All Other	4	684	884	29.2%	339
17-3011	Architectural and Civil Drafters	4	1,265	1,344	6.2%	384
17-3012	Electrical and Electronics Drafters	3	312	274	-12.2%	11
17-3013	Mechanical Drafters	3	797	695	-12.8%	72

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
17-3019	Drafters, All Other	3	72	88	22.2%	27
17-3021	Aerospace Engineering and Operations Technicians	4	1	2	100.0%	1
17-3022	Civil Engineering Technicians	3	667	765	14.7%	266
17-3023	Electrical and Electronics Engineering Technicians	3	983	817	-16.9%	77
17-3024	Electro-Mechanical Technicians	3	158	141	-10.8%	30
17-3025	Environmental Engineering Technicians	4	323	420	30.0%	182
17-3026	Industrial Engineering Technicians	3	325	327	0.6%	83
17-3027	Mechanical Engineering Technicians	3	439	509	15.9%	176
17-3029	Engineering Technicians, Except Drafters, All Other	3	521	674	29.4%	283
17-3031	Surveying and Mapping Technicians	3	427	530	24.1%	197
19-1012	Food Scientists and Technologists	4	32	35	9.4%	14
19-1013	Soil and Plant Scientists	5	35	46	31.4%	25
19-1021	Biochemists and Biophysicists	5	445	710	59.6%	401
19-1022	Microbiologists	5	264	382	44.7%	206
19-1023	Zoologists and Wildlife Biologists	5	52	46	-11.5%	9
19-1029	Biological Scientists, All Other	5	76	78	2.6%	26
19-1031	Conservation Scientists	4	88	101	14.8%	42
19-1032	Foresters	4	37	35	-5.4%	10
19-1041	Epidemiologists	5	21	18	-14.3%	1
19-1042	Medical Scientists, Except Epidemiologists	5	1,091	1,494	36.9%	664
19-1099	Life Scientists, All Other	5	23	26	13.0%	8
19-2012	Physicists	5	39	31	-20.5%	1
19-2021	Atmospheric and Space Scientists	4	17	15	-11.8%	2
19-2031	Chemists	4	1,105	1,388	25.6%	640
19-2032	Materials Scientists	5	83	93	12.0%	35
19-2041	Environmental Scientists and Specialists, Including Health	4	709	891	25.7%	409
19-2042	Geoscientists, Except Hydrologists and Geographers	4	286	338	18.2%	154
19-2043	Hydrologists	4	37	34	-8.1%	9
19-2099	Physical Scientists, All Other	5	44	36	-18.2%	1
19-3011	Economists	5	112	131	17.0%	57
19-3022	Survey Researchers	5	443	429	-3.2%	128
19-3031	Clinical, Counseling, and School Psychologists	5	1,012	1,055	4.2%	349
19-3039	Psychologists, All Other	5	68	86	26.5%	38
19-3041	Sociologists	5	29	31	6.9%	18
19-3051	Urban and Regional Planners	5	295	313	6.1%	159

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
19-3091	Anthropologists and Archeologists	5	13	17	30.8%	6
19-3093	Historians	5	13	10	-23.1%	0
19-3099	Social Scientists and Related Workers, All Other	4	70	68	-2.9%	12
19-4011	Agricultural and Food Science Technicians	3	19	15	-21.1%	4
19-4021	Biological Technicians	4	733	964	31.5%	473
19-4031	Chemical Technicians	3	935	1,162	24.3%	524
19-4041	Geological and Petroleum Technicians	4	135	190	40.7%	122
19-4051	Nuclear Technicians	3	237	277	16.9%	145
19-4061	Social Science Research Assistants	4	158	218	38.0%	132
19-4091	Environmental Science and Protection Technicians, Including Health	4	403	520	29.0%	298
19-4092	Forensic Science Technicians	4	21	21	0.0%	9
19-4093	Forest and Conservation Technicians	3	54	61	13.0%	33
19-4099	Life, Physical, and Social Science Technicians, All Other	3	386	406	5.2%	181
21-1011	Substance Abuse and Behavioral Disorder Counselors	5	1,386	1,362	-1.7%	370
21-1012	Educational, Guidance, School, and Vocational Counselors	5	1,998	1,960	-1.9%	431
21-1013	Marriage and Family Therapists	5	208	262	26.0%	100
21-1014	Mental Health Counselors	5	2,004	2,114	5.5%	658
21-1015	Rehabilitation Counselors	5	1,231	1,564	27.1%	679
21-1019	Counselors, All Other	5	155	151	-2.6%	30
21-1021	Child, Family, and School Social Workers	4	2,727	3,016	10.6%	927
21-1022	Healthcare Social Workers	5	1,447	1,796	24.1%	686
21-1023	Mental Health and Substance Abuse Social Workers	5	1,836	2,110	14.9%	789
21-1029	Social Workers, All Other	5	163	162	-0.6%	36
21-1091	Health Educators	4	518	563	8.7%	187
21-1092	Probation Officers and Correctional Treatment Specialists	4	576	536	-6.9%	147
21-1093	Social and Human Service Assistants	4	4,027	4,286	6.4%	1,460
21-1094	Community Health Workers	4	207	210	1.4%	56
21-1099	Community and Social Service Specialists, All Other	4	244	254	4.1%	69
21-2011	Clergy	5	369	435	17.9%	156
21-2021	Directors, Religious Activities and Education	4	311	363	16.7%	191
21-2099	Religious Workers, All Other	4	83	65	-21.7%	10
23-1011	Lawyers	5	5,329	6,045	13.4%	1,625
23-1012	Judicial Law Clerks	5	165	171	3.6%	40

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
23-1021	Administrative Law Judges, Adjudicators, and Hearing Officers	5	102	87	-14.7%	6
23-1022	Arbitrators, Mediators, and Conciliators	5	59	75	27.1%	25
23-1023	Judges, Magistrate Judges, and Magistrates	5	38	32	-15.8%	2
23-2011	Paralegals and Legal Assistants	3	2,189	2,797	27.8%	979
23-2091	Court Reporters	3	154	147	-4.5%	34
23-2093	Title Examiners, Abstractors, and Searchers	3	597	661	10.7%	198
23-2099	Legal Support Workers, All Other	3	100	95	-5.0%	13
25-1011	Business Teachers, Postsecondary	5	1,063	1,237	16.4%	334
25-1021	Computer Science Teachers, Postsecondary	5	487	578	18.7%	164
25-1022	Mathematical Science Teachers, Postsecondary	5	675	714	5.8%	141
25-1031	Architecture Teachers, Postsecondary	5	114	141	23.7%	43
25-1032	Engineering Teachers, Postsecondary	5	611	751	22.9%	231
25-1041	Agricultural Sciences Teachers, Postsecondary	5	82	70	-14.6%	1
25-1042	Biological Science Teachers, Postsecondary	5	841	877	4.3%	166
25-1043	Forestry and Conservation Science Teachers, Postsecondary	5	29	25	-13.8%	0
25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	5	184	208	13.0%	52
25-1052	Chemistry Teachers, Postsecondary	5	348	392	12.6%	97
25-1053	Environmental Science Teachers, Postsecondary	5	67	65	-3.0%	9
25-1054	Physics Teachers, Postsecondary	5	236	284	20.3%	83
25-1061	Anthropology and Archeology Teachers, Postsecondary	5	73	69	-5.5%	7
25-1062	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	5	102	114	11.8%	27
25-1063	Economics Teachers, Postsecondary	5	253	296	17.0%	81
25-1064	Geography Teachers, Postsecondary	5	75	84	12.0%	20
25-1065	Political Science Teachers, Postsecondary	5	251	272	8.4%	60
25-1066	Psychology Teachers, Postsecondary	5	541	583	7.8%	125
25-1067	Sociology Teachers, Postsecondary	5	359	450	25.3%	145
25-1069	Social Sciences Teachers, Postsecondary, All Other	5	105	130	23.8%	42
25-1071	Health Specialties Teachers, Postsecondary	5	1,535	1,531	-0.3%	230
25-1072	Nursing Instructors and Teachers, Postsecondary	5	710	699	-1.5%	97
25-1081	Education Teachers, Postsecondary	5	799	799	0.0%	122
25-1082	Library Science Teachers, Postsecondary	5	75	89	18.7%	25
25-1111	Criminal Justice and Law Enforcement Teachers, Postsecondary	5	128	124	-3.1%	16
25-1112	Law Teachers, Postsecondary	5	123	137	11.4%	32

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-1113	Social Work Teachers, Postsecondary	5	139	129	-7.2%	11
25-1121	Art, Drama, and Music Teachers, Postsecondary	5	1,099	1,346	22.5%	412
25-1122	Communications Teachers, Postsecondary	5	350	401	14.6%	104
25-1123	English Language and Literature Teachers, Postsecondary	5	1,035	1,031	-0.4%	156
25-1124	Foreign Language and Literature Teachers, Postsecondary	5	412	467	13.3%	118
25-1125	History Teachers, Postsecondary	5	336	366	8.9%	81
25-1126	Philosophy and Religion Teachers, Postsecondary	5	333	364	9.3%	82
25-1191	Graduate Teaching Assistants	5	328	389	18.6%	110
25-1192	Home Economics Teachers, Postsecondary	5	25	21	-16.0%	0
25-1193	Recreation and Fitness Studies Teachers, Postsecondary	5	224	223	-0.4%	33
25-1194	Vocational Education Teachers, Postsecondary	3	1,045	929	-11.1%	45
25-1199	Postsecondary Teachers, All Other	5	964	1,177	22.1%	358
25-2011	Preschool Teachers, Except Special Education	3	2,226	2,748	23.5%	1,161
25-2012	Kindergarten Teachers, Except Special Education	4	945	870	-7.9%	216
25-2021	Elementary School Teachers, Except Special Education	4	8,960	8,414	-6.1%	1,708
25-2022	Middle School Teachers, Except Special and Career/Technical Education	4	3,890	4,169	7.2%	1,255
25-2023	Career/Technical Education Teachers, Middle School	4	101	116	14.9%	46
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	4	8,249	7,398	-10.3%	1,958
25-2032	Career/Technical Education Teachers, Secondary School	4	727	635	-12.7%	146
25-2051	Special Education Teachers, Preschool	4	106	124	17.0%	38
25-2052	Special Education Teachers, Kindergarten and Elementary School	4	1,726	1,718	-0.5%	383
25-2053	Special Education Teachers, Middle School	4	603	581	-3.6%	115
25-2054	Special Education Teachers, Secondary School	4	1,284	1,270	-1.1%	298
25-2059	Special Education Teachers, All Other	4	40	47	17.5%	12
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	4	257	224	-12.8%	21
25-3021	Self-Enrichment Education Teachers	3	1,388	1,312	-5.5%	221
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	3	905	1,029	13.7%	279
25-3098	Substitute Teachers	3	2,583	2,188	-15.3%	147
25-4011	Archivists	5	76	90	18.4%	32
25-4012	Curators	5	125	152	21.6%	57

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-4013	Museum Technicians and Conservators	4	131	166	26.7%	70
25-4021	Librarians	5	1,072	1,095	2.1%	288
25-4031	Library Technicians	4	624	662	6.1%	390
25-9011	Audio-Visual and Multimedia Collections Specialists	4	43	44	2.3%	10
25-9021	Farm and Home Management Advisors	5	10	8	-20.0%	0
25-9031	Instructional Coordinators	5	787	792	0.6%	72
25-9041	Teacher Assistants	3	7,327	7,342	0.2%	1,836
25-9099	Education, Training, and Library Workers, All Other	4	166	158	-4.8%	7
27-1011	Art Directors	4	249	294	18.1%	117
27-1012	Craft Artists	2	20	16	-20.0%	1
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	3	36	41	13.9%	16
27-1014	Multimedia Artists and Animators	4	108	131	21.3%	51
27-1019	Artists and Related Workers, All Other	4	16	12	-25.0%	0
27-1021	Commercial and Industrial Designers	4	150	128	-14.7%	24
27-1022	Fashion Designers	3	18	19	5.6%	6
27-1023	Floral Designers	2	414	248	-40.1%	50
27-1024	Graphic Designers	4	1,596	1,826	14.4%	735
27-1025	Interior Designers	4	337	429	27.3%	226
27-1026	Merchandise Displayers and Window Trimmers	3	544	663	21.9%	278
27-1027	Set and Exhibit Designers	5	58	70	20.7%	29
27-1029	Designers, All Other	4	1	1	0.0%	0
27-2011	Actors	2	321	274	-14.6%	77
27-2012	Producers and Directors	4	574	643	12.0%	320
27-2021	Athletes and Sports Competitors	2	214	251	17.3%	119
27-2022	Coaches and Scouts	4	1,403	1,236	-11.9%	278
27-2023	Umpires, Referees, and Other Sports Officials	3	70	63	-10.0%	13
27-2031	Dancers	3	29	22	-24.1%	4
27-2032	Choreographers	4	33	35	6.1%	14
27-2041	Music Directors and Composers	3	169	133	-21.3%	24
27-2042	Musicians and Singers	3	204	176	-13.7%	51
27-2099	Entertainers and Performers, Sports and Related Workers, All Other	3	19	18	-5.3%	0
27-3011	Radio and Television Announcers	3	271	297	9.6%	153
27-3012	Public Address System and Other Announcers	2	20	27	35.0%	13
27-3022	Reporters and Correspondents	4	229	186	-18.8%	77
27-3031	Public Relations Specialists	4	1,954	1,867	-4.5%	212

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
27-3041	Editors	4	555	523	-5.8%	147
27-3042	Technical Writers	4	242	241	-0.4%	74
27-3043	Writers and Authors	4	287	294	2.4%	79
27-3091	Interpreters and Translators	4	157	152	-3.2%	16
27-3099	Media and Communication Workers, All Other	4	68	56	-17.6%	0
27-4011	Audio and Video Equipment Technicians	3	425	433	1.9%	101
27-4012	Broadcast Technicians	3	131	149	13.7%	53
27-4014	Sound Engineering Technicians	3	70	66	-5.7%	15
27-4021	Photographers	3	327	274	-16.2%	43
27-4031	Camera Operators, Television, Video, and Motion Picture	3	110	100	-9.1%	4
27-4032	Film and Video Editors	3	71	60	-15.5%	0
27-4099	Media and Communication Equipment Workers, All Other	3	38	29	-23.7%	0
29-1011	Chiropractors	5	320	448	40.0%	200
29-1021	Dentists, General	5	667	747	12.0%	247
29-1022	Oral and Maxillofacial Surgeons	5	24	25	4.2%	7
29-1023	Orthodontists	5	18	22	22.2%	8
29-1029	Dentists, All Other Specialists	5	17	15	-11.8%	3
29-1031	Dietitians and Nutritionists	5	595	617	3.7%	99
29-1041	Optometrists	5	321	416	29.6%	203
29-1051	Pharmacists	5	2,461	2,628	6.8%	816
29-1061	Anesthesiologists	5	334	350	4.8%	108
29-1062	Family and General Practitioners	5	1,392	1,501	7.8%	498
29-1063	Internists, General	5	213	204	-4.2%	43
29-1064	Obstetricians and Gynecologists	5	74	95	28.4%	37
29-1065	Pediatricians, General	5	79	101	27.8%	38
29-1066	Psychiatrists	5	186	177	-4.8%	43
29-1067	Surgeons	5	449	574	27.8%	244
29-1069	Physicians and Surgeons, All Other	5	3,167	3,408	7.6%	1,072
29-1071	Physician Assistants	5	1,047	1,156	10.4%	314
29-1081	Podiatrists	5	121	172	42.1%	100
29-1122	Occupational Therapists	5	1,285	1,752	36.3%	669
29-1123	Physical Therapists	5	2,279	3,047	33.7%	1,412
29-1124	Radiation Therapists	3	160	149	-6.9%	22
29-1125	Recreational Therapists	4	249	260	4.4%	72
29-1126	Respiratory Therapists	3	1,050	1,182	12.6%	284
29-1127	Speech-Language Pathologists	5	915	1,282	40.1%	503

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
29-1128	Exercise Physiologists	5	72	99	37.5%	36
29-1129	Therapists, All Other	4	83	122	47.0%	49
29-1131	Veterinarians	5	431	558	29.5%	281
29-1141	Registered Nurses	3	25,458	29,434	15.6%	9,132
29-1151	Nurse Anesthetists	5	442	482	9.0%	133
29-1161	Nurse Midwives	5	31	40	29.0%	15
29-1171	Nurse Practitioners	5	819	1,019	24.4%	350
29-1181	Audiologists	5	124	156	25.8%	61
29-1199	Health Diagnosing and Treating Practitioners, All Other	5	93	77	-17.2%	5
29-2011	Medical and Clinical Laboratory Technologists	4	1,742	1,834	5.3%	619
29-2012	Medical and Clinical Laboratory Technicians	3	1,943	2,124	9.3%	735
29-2021	Dental Hygienists	3	1,653	1,982	19.9%	776
29-2031	Cardiovascular Technologists and Technicians	3	612	753	23.0%	233
29-2032	Diagnostic Medical Sonographers	3	506	609	20.4%	174
29-2033	Nuclear Medicine Technologists	3	214	220	2.8%	38
29-2034	Radiologic Technologists	3	2,028	2,256	11.2%	542
29-2035	Magnetic Resonance Imaging Technologists	3	281	351	24.9%	115
29-2041	Emergency Medical Technicians and Paramedics	3	2,784	2,829	1.6%	963
29-2051	Dietetic Technicians	2	523	763	45.9%	302
29-2052	Pharmacy Technicians	3	2,871	3,106	8.2%	567
29-2053	Psychiatric Technicians	3	267	266	-0.4%	53
29-2054	Respiratory Therapy Technicians	3	102	95	-6.9%	2
29-2055	Surgical Technologists	3	700	884	26.3%	251
29-2056	Veterinary Technologists and Technicians	3	677	833	23.0%	227
29-2057	Ophthalmic Medical Technicians	3	254	344	35.4%	121
29-2061	Licensed Practical and Licensed Vocational Nurses	3	6,857	8,575	25.1%	3,529
29-2071	Medical Records and Health Information Technicians	3	1,628	1,936	18.9%	747
29-2081	Opticians, Dispensing	3	695	971	39.7%	513
29-2091	Orthotists and Prosthetists	5	61	72	18.0%	17
29-2092	Hearing Aid Specialists	3	29	32	10.3%	6
29-2099	Health Technologists and Technicians, All Other	3	432	516	19.4%	118
29-9011	Occupational Health and Safety Specialists	4	449	474	5.6%	157
29-9012	Occupational Health and Safety Technicians	3	92	95	3.3%	29
29-9091	Athletic Trainers	5	278	370	33.1%	174
29-9099	Healthcare Practitioners and Technical Workers, All Other	4	179	150	-16.2%	16

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
31-1011	Home Health Aides	2	9,445	12,217	29.3%	5,369
31-1013	Psychiatric Aides	2	312	305	-2.2%	73
31-1014	Nursing Assistants	2	14,021	15,986	14.0%	4,797
31-1015	Orderlies	2	470	493	4.9%	114
31-2011	Occupational Therapy Assistants	3	531	739	39.2%	372
31-2012	Occupational Therapy Aides	3	121	187	54.5%	100
31-2021	Physical Therapist Assistants	3	1,025	1,489	45.3%	741
31-2022	Physical Therapist Aides	2	494	710	43.7%	333
31-9011	Massage Therapists	3	479	665	38.8%	233
31-9091	Dental Assistants	3	2,279	2,500	9.7%	721
31-9092	Medical Assistants	3	5,113	6,159	20.5%	2,073
31-9093	Medical Equipment Preparers	2	384	444	15.6%	133
31-9094	Medical Transcriptionists	3	818	669	-18.2%	73
31-9095	Pharmacy Aides	2	285	239	-16.1%	22
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	3	407	387	-4.9%	65
31-9097	Phlebotomists	3	1,109	1,290	16.3%	438
31-9099	Healthcare Support Workers, All Other	3	269	232	-13.8%	10
33-1011	First-Line Supervisors of Correctional Officers	3	186	192	3.2%	77
33-1012	First-Line Supervisors of Police and Detectives	3	426	479	12.4%	195
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	3	112	125	11.6%	64
33-1099	First-Line Supervisors of Protective Service Workers, All Other	3	526	664	26.2%	300
33-2011	Firefighters	3	690	686	-0.6%	204
33-2021	Fire Inspectors and Investigators	3	34	28	-17.6%	6
33-3011	Bailiffs	2	30	22	-26.7%	2
33-3012	Correctional Officers and Jailers	3	2,288	2,048	-10.5%	469
33-3021	Detectives and Criminal Investigators	3	381	367	-3.7%	84
33-3041	Parking Enforcement Workers	2	67	75	11.9%	34
33-3051	Police and Sheriff's Patrol Officers	3	3,956	3,728	-5.8%	1,191
33-3052	Transit and Railroad Police	3	11	9	-18.2%	1
33-9011	Animal Control Workers	2	45	45	0.0%	11
33-9021	Private Detectives and Investigators	3	399	349	-12.5%	103
33-9031	Gaming Surveillance Officers and Gaming Investigators	2	46	40	-13.0%	15
33-9032	Security Guards	2	10,720	11,580	8.0%	3,862
33-9091	Crossing Guards	1	601	438	-27.1%	6
33-9092	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	2	997	1,118	12.1%	843

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
33-9093	Transportation Security Screeners	2	179	152	-15.1%	22
33-9099	Protective Service Workers, All Other	2	541	633	17.0%	480
35-1011	Chefs and Head Cooks	3	905	967	6.9%	242
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	2	5,921	6,554	10.7%	2,451
35-2011	Cooks, Fast Food	1	1,776	1,542	-13.2%	154
35-2012	Cooks, Institution and Cafeteria	2	3,283	3,354	2.2%	753
35-2014	Cooks, Restaurant	2	8,223	10,479	27.4%	4,168
35-2015	Cooks, Short Order	1	1,494	1,808	21.0%	683
35-2021	Food Preparation Workers	1	6,474	5,790	-10.6%	1,363
35-3011	Bartenders	2	6,252	6,621	5.9%	3,005
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	1	26,907	30,385	12.9%	15,036
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	1	2,393	2,239	-6.4%	1,389
35-3031	Waiters and Waitresses	1	19,498	21,374	9.6%	12,195
35-3041	Food Servers, Nonrestaurant	1	2,260	2,465	9.1%	934
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	1	2,799	2,863	2.3%	1,418
35-9021	Dishwashers	1	4,236	3,944	-6.9%	1,763
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	1	2,989	3,115	4.2%	2,539
35-9099	Food Preparation and Serving Related Workers, All Other	1	226	291	28.8%	196
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2	1,074	1,112	3.5%	336
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	3	513	510	-0.6%	57
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2	15,702	15,761	0.4%	3,659
37-2012	Maids and Housekeeping Cleaners	2	5,810	6,247	7.5%	1,919
37-2019	Building Cleaning Workers, All Other	2	66	59	-10.6%	6
37-2021	Pest Control Workers	2	308	361	17.2%	150
37-3011	Landscaping and Groundskeeping Workers	1	6,132	6,545	6.7%	2,200
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	2	90	80	-11.1%	14
37-3013	Tree Trimmers and Pruners	2	528	666	26.1%	319
37-3019	Grounds Maintenance Workers, All Other	2	17	14	-17.6%	1
39-1011	Gaming Supervisors	2	98	86	-12.2%	40
39-1012	Slot Supervisors	2	5	5	0.0%	0
39-1021	First-Line Supervisors of Personal Service Workers	3	1,370	1,704	24.4%	606
39-2011	Animal Trainers	2	56	53	-5.4%	24

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
39-2021	Nonfarm Animal Caretakers	1	1,135	1,310	15.4%	352
39-3011	Gaming Dealers	2	443	390	-12.0%	170
39-3012	Gaming and Sports Book Writers and Runners	2	16	17	6.3%	7
39-3019	Gaming Service Workers, All Other	2	6	5	-16.7%	0
39-3021	Motion Picture Projectionists	2	71	65	-8.5%	36
39-3031	Ushers, Lobby Attendants, and Ticket Takers	2	1,154	1,282	11.1%	843
39-3091	Amusement and Recreation Attendants	1	2,832	3,308	16.8%	2,085
39-3092	Costume Attendants	2	28	25	-10.7%	12
39-3093	Locker Room, Coatroom, and Dressing Room Attendants	2	137	116	-15.3%	53
39-3099	Entertainment Attendants and Related Workers, All Other	2	140	139	-0.7%	83
39-4021	Funeral Attendants	2	452	483	6.9%	176
39-4031	Morticians, Undertakers, and Funeral Directors	3	274	331	20.8%	139
39-5011	Barbers	3	137	139	1.5%	45
39-5012	Hairdressers, Hairstylists, and Cosmetologists	3	4,832	5,349	10.7%	1,884
39-5092	Manicurists and Pedicurists	2	661	701	6.1%	108
39-5093	Shampooers	2	282	272	-3.5%	38
39-5094	Skincare Specialists	3	223	203	-9.0%	3
39-6011	Baggage Porters and Bellhops	2	245	251	2.4%	99
39-6012	Concierges	3	121	148	22.3%	59
39-7011	Tour Guides and Escorts	3	375	397	5.9%	222
39-7012	Travel Guides	3	12	10	-16.7%	5
39-9011	Childcare Workers	3	3,637	3,314	-8.9%	763
39-9021	Personal Care Aides	2	10,315	15,568	50.9%	6,630
39-9031	Fitness Trainers and Aerobics Instructors	3	1,973	2,260	14.5%	633
39-9032	Recreation Workers	4	2,079	2,614	25.7%	783
39-9041	Residential Advisors	3	1,415	1,782	25.9%	1,077
39-9099	Personal Care and Service Workers, All Other	3	222	197	-11.3%	37
41-1011	First-Line Supervisors of Retail Sales Workers	2	8,051	8,108	0.7%	1,870
41-1012	First-Line Supervisors of Non-Retail Sales Workers	4	1,743	1,597	-8.4%	113
41-2011	Cashiers	1	26,302	23,842	-9.4%	9,909
41-2012	Gaming Change Persons and Booth Cashiers	2	26	21	-19.2%	18
41-2021	Counter and Rental Clerks	1	2,785	2,930	5.2%	966
41-2022	Parts Salespersons	2	1,825	2,086	14.3%	807
41-2031	Retail Salespersons	2	38,632	40,848	5.7%	16,241
41-3011	Advertising Sales Agents	3	1,094	1,077	-1.6%	430
41-3021	Insurance Sales Agents	4	3,034	3,155	4.0%	1,041

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
41-3031	Securities, Commodities, and Financial Services Sales Agents	4	2,374	2,420	1.9%	709
41-3041	Travel Agents	3	345	281	-18.6%	116
41-3099	Sales Representatives, Services, All Other	4	6,179	7,667	24.1%	3,261
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	4	1,985	1,766	-11.0%	221
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	4	11,730	10,844	-7.6%	1,839
41-9011	Demonstrators and Product Promoters	2	335	320	-4.5%	87
41-9012	Models	1	25	29	16.0%	12
41-9021	Real Estate Brokers	4	205	169	-17.6%	6
41-9022	Real Estate Sales Agents	3	1,456	1,545	6.1%	332
41-9031	Sales Engineers	4	648	679	4.8%	170
41-9041	Telemarketers	2	1,496	1,059	-29.2%	278
41-9091	Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	2	16	14	-12.5%	1
41-9099	Sales and Related Workers, All Other	3	382	323	-15.4%	10
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3	11,224	11,312	0.8%	2,777
43-2011	Switchboard Operators, Including Answering Service	2	1,055	800	-24.2%	119
43-2021	Telephone Operators	2	65	37	-43.1%	0
43-3011	Bill and Account Collectors	2	2,628	2,273	-13.5%	531
43-3021	Billing and Posting Clerks	2	5,464	5,831	6.7%	1,472
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3	12,814	13,626	6.3%	2,080
43-3041	Gaming Cage Workers	2	65	72	10.8%	41
43-3051	Payroll and Timekeeping Clerks	2	1,524	1,468	-3.7%	311
43-3061	Procurement Clerks	3	490	428	-12.7%	129
43-3071	Tellers	2	7,328	6,076	-17.1%	3,046
43-3099	Financial Clerks, All Other	2	346	383	10.7%	157
43-4011	Brokerage Clerks	3	492	458	-6.9%	153
43-4021	Correspondence Clerks	2	134	135	0.7%	47
43-4031	Court, Municipal, and License Clerks	3	339	338	-0.3%	57
43-4041	Credit Authorizers, Checkers, and Clerks	3	308	211	-31.5%	0
43-4051	Customer Service Representatives	2	21,514	23,128	7.5%	8,114
43-4061	Eligibility Interviewers, Government Programs	3	1,214	1,110	-8.6%	160
43-4071	File Clerks	2	1,120	908	-18.9%	116
43-4081	Hotel, Motel, and Resort Desk Clerks	2	1,045	1,019	-2.5%	608
43-4111	Interviewers, Except Eligibility and Loan	2	1,764	1,906	8.0%	528

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-4121	Library Assistants, Clerical	2	969	1,029	6.2%	507
43-4131	Loan Interviewers and Clerks	3	1,804	1,983	9.9%	443
43-4141	New Accounts Clerks	2	342	342	0.0%	134
43-4151	Order Clerks	2	2,077	2,013	-3.1%	677
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	3	1,299	1,128	-13.2%	218
43-4171	Receptionists and Information Clerks	2	8,126	7,790	-4.1%	1,913
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	2	473	424	-10.4%	91
43-4199	Information and Record Clerks, All Other	2	636	483	-24.1%	36
43-5011	Cargo and Freight Agents	2	287	249	-13.2%	63
43-5021	Couriers and Messengers	2	612	524	-14.4%	52
43-5031	Police, Fire, and Ambulance Dispatchers	2	495	490	-1.0%	153
43-5032	Dispatchers, Except Police, Fire, and Ambulance	2	1,259	1,441	14.5%	577
43-5041	Meter Readers, Utilities	2	361	315	-12.7%	102
43-5051	Postal Service Clerks	2	742	501	-32.5%	82
43-5052	Postal Service Mail Carriers	2	2,934	2,060	-29.8%	816
43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	2	1,364	793	-41.9%	69
43-5061	Production, Planning, and Expediting Clerks	3	2,516	2,589	2.9%	781
43-5071	Shipping, Receiving, and Traffic Clerks	2	4,314	4,092	-5.1%	1,065
43-5081	Stock Clerks and Order Fillers	2	13,548	12,718	-6.1%	3,903
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	2	378	426	12.7%	145
43-6011	Executive Secretaries and Executive Administrative Assistants	3	4,561	4,181	-8.3%	357
43-6012	Legal Secretaries	3	2,624	3,036	15.7%	936
43-6013	Medical Secretaries	3	4,548	5,840	28.4%	1,823
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	3	20,538	22,737	10.7%	4,867
43-9011	Computer Operators	3	605	564	-6.8%	120
43-9021	Data Entry Keyers	2	2,012	1,629	-19.0%	320
43-9022	Word Processors and Typists	2	1,078	762	-29.3%	18
43-9031	Desktop Publishers	3	152	152	0.0%	43
43-9041	Insurance Claims and Policy Processing Clerks	3	2,348	2,411	2.7%	827
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	2	1,146	940	-18.0%	235
43-9061	Office Clerks, General	2	24,344	22,913	-5.9%	4,175
43-9071	Office Machine Operators, Except Computer	2	549	388	-29.3%	58
43-9081	Proofreaders and Copy Markers	4	91	81	-11.0%	16

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-9111	Statistical Assistants	4	114	125	9.6%	45
43-9199	Office and Administrative Support Workers, All Other	3	1,018	1,217	19.5%	494
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	3	19	19	0.0%	5
45-2011	Agricultural Inspectors	2	50	43	-14.0%	13
45-2041	Graders and Sorters, Agricultural Products	1	37	43	16.2%	15
45-2091	Agricultural Equipment Operators	2	16	18	12.5%	8
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1	108	91	-15.7%	27
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	1	63	58	-7.9%	20
45-2099	Agricultural Workers, All Other	1	2	2	0.0%	0
45-4011	Forest and Conservation Workers	3	24	26	8.3%	6
45-4021	Fallers	1	2	2	0.0%	0
45-4022	Logging Equipment Operators	1	18	20	11.1%	9
45-4023	Log Graders and Scalers	3	6	7	16.7%	2
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	3	3,534	4,151	17.5%	1,051
47-2011	Boilermakers	3	139	159	14.4%	96
47-2021	Brickmasons and Blockmasons	2	546	619	13.4%	131
47-2022	Stonemasons	3	75	66	-12.0%	0
47-2031	Carpenters	2	6,506	7,339	12.8%	1,790
47-2041	Carpet Installers	2	387	460	18.9%	170
47-2042	Floor Layers, Except Carpet, Wood, and Hard Tiles	2	94	81	-13.8%	8
47-2044	Tile and Marble Setters	2	176	218	23.9%	72
47-2051	Cement Masons and Concrete Finishers	2	1,018	1,101	8.2%	204
47-2053	Terrazzo Workers and Finishers	2	20	17	-15.0%	0
47-2061	Construction Laborers	2	6,530	8,257	26.4%	3,307
47-2071	Paving, Surfacing, and Tamping Equipment Operators	2	483	535	10.8%	153
47-2072	Pile-Driver Operators	2	11	10	-9.1%	2
47-2073	Operating Engineers and Other Construction Equipment Operators	2	3,503	3,877	10.7%	1,388
47-2081	Drywall and Ceiling Tile Installers	2	366	319	-12.8%	29
47-2082	Tapers	2	111	121	9.0%	28
47-2111	Electricians	3	4,190	4,916	17.3%	1,867
47-2121	Glaziers	2	271	286	5.5%	104
47-2131	Insulation Workers, Floor, Ceiling, and Wall	2	135	155	14.8%	47
47-2132	Insulation Workers, Mechanical	2	81	123	51.9%	54

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-2141	Painters, Construction and Maintenance	2	1,162	1,230	5.9%	312
47-2142	Paperhangers	2	34	30	-11.8%	1
47-2151	Pipelayers	2	257	254	-1.2%	63
47-2152	Plumbers, Pipefitters, and Steamfitters	3	3,024	3,137	3.7%	664
47-2161	Plasterers and Stucco Masons	1	85	96	12.9%	12
47-2171	Reinforcing Iron and Rebar Workers	2	58	57	-1.7%	9
47-2181	Roofers	2	758	700	-7.7%	234
47-2211	Sheet Metal Workers	2	846	841	-0.6%	177
47-2221	Structural Iron and Steel Workers	2	338	344	1.8%	134
47-3011	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	2	185	162	-12.4%	1
47-3012	Helpers--Carpenters	2	190	234	23.2%	70
47-3013	Helpers--Electricians	2	286	374	30.8%	144
47-3014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	1	41	37	-9.8%	5
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	2	224	209	-6.7%	20
47-3016	Helpers--Roofers	2	71	90	26.8%	36
47-3019	Helpers, Construction Trades, All Other	2	59	60	1.7%	7
47-4011	Construction and Building Inspectors	3	1,386	1,730	24.8%	726
47-4021	Elevator Installers and Repairers	3	75	66	-12.0%	16
47-4031	Fence Erectors	2	169	177	4.7%	55
47-4041	Hazardous Materials Removal Workers	3	383	423	10.4%	175
47-4051	Highway Maintenance Workers	2	1,685	1,656	-1.7%	297
47-4061	Rail-Track Laying and Maintenance Equipment Operators	2	108	138	27.8%	51
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	1	252	254	0.8%	82
47-4099	Construction and Related Workers, All Other	3	84	73	-13.1%	1
47-5011	Derrick Operators, Oil and Gas	1	83	78	-6.0%	41
47-5012	Rotary Drill Operators, Oil and Gas	2	356	414	16.3%	321
47-5013	Service Unit Operators, Oil, Gas, and Mining	2	192	222	15.6%	153
47-5021	Earth Drillers, Except Oil and Gas	2	196	222	13.3%	114
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	2	23	24	4.3%	7
47-5041	Continuous Mining Machine Operators	1	41	45	9.8%	22
47-5042	Mine Cutting and Channeling Machine Operators	2	40	38	-5.0%	15
47-5049	Mining Machine Operators, All Other	2	9	11	22.2%	5
47-5051	Rock Splitters, Quarry	1	60	58	-3.3%	21
47-5061	Roof Bolters, Mining	2	39	43	10.3%	24
47-5071	Roustabouts, Oil and Gas	1	320	387	20.9%	217

<b>SOC Code</b>	<b>Occupation Title</b>	<b>Job Zone</b>	<b>2014</b>	<b>2024</b>	<b>% Change 2014-2024</b>	<b>New and Replacement Jobs</b>
47-5081	Helpers--Extraction Workers	2	188	211	12.2%	117
47-5099	Extraction Workers, All Other	2	25	23	-8.0%	5
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	3	2,915	3,210	10.1%	1,124
49-2011	Computer, Automated Teller, and Office Machine Repairers	3	910	982	7.9%	360
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	3	48	40	-16.7%	2
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	3	1,074	1,042	-3.0%	243
49-2091	Avionics Technicians	3	60	68	13.3%	28
49-2092	Electric Motor, Power Tool, and Related Repairers	3	131	133	1.5%	40
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	3	23	21	-8.7%	3
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	3	609	518	-14.9%	80
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	3	189	196	3.7%	60
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	3	28	31	10.7%	9
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	3	120	99	-17.5%	37
49-2098	Security and Fire Alarm Systems Installers	3	795	773	-2.8%	175
49-3011	Aircraft Mechanics and Service Technicians	3	555	477	-14.1%	157
49-3021	Automotive Body and Related Repairers	2	1,268	1,455	14.7%	519
49-3022	Automotive Glass Installers and Repairers	2	170	190	11.8%	74
49-3023	Automotive Service Technicians and Mechanics	3	6,287	6,863	9.2%	2,404
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	3	2,020	2,485	23.0%	978
49-3041	Farm Equipment Mechanics and Service Technicians	3	103	87	-15.5%	24
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	3	684	742	8.5%	294
49-3043	Rail Car Repairers	2	142	153	7.7%	71
49-3051	Motorboat Mechanics and Service Technicians	3	38	22	-42.1%	4
49-3052	Motorcycle Mechanics	3	136	169	24.3%	82
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	2	243	269	10.7%	89
49-3091	Bicycle Repairers	2	86	71	-17.4%	24
49-3092	Recreational Vehicle Service Technicians	2	47	49	4.3%	21
49-3093	Tire Repairers and Changers	2	492	439	-10.8%	143
49-9011	Mechanical Door Repairers	2	110	104	-5.5%	36
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	3	242	284	17.4%	130

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3	2,120	2,439	15.0%	967
49-9031	Home Appliance Repairers	3	318	315	-0.9%	136
49-9041	Industrial Machinery Mechanics	3	2,462	2,662	8.1%	1,004
49-9043	Maintenance Workers, Machinery	3	834	913	9.5%	228
49-9044	Millwrights	3	266	344	29.3%	143
49-9045	Refractory Materials Repairers, Except Brickmasons	2	79	68	-13.9%	21
49-9051	Electrical Power-Line Installers and Repairers	3	740	857	15.8%	436
49-9052	Telecommunications Line Installers and Repairers	2	1,495	1,496	0.1%	597
49-9062	Medical Equipment Repairers	3	542	687	26.8%	334
49-9063	Musical Instrument Repairers and Tuners	3	97	94	-3.1%	37
49-9064	Watch Repairers	3	16	15	-6.3%	4
49-9069	Precision Instrument and Equipment Repairers, All Other	3	50	41	-18.0%	6
49-9071	Maintenance and Repair Workers, General	3	11,563	11,725	1.4%	2,710
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	2	272	240	-11.8%	42
49-9092	Commercial Divers	3	69	67	-2.9%	27
49-9094	Locksmiths and Safe Repairers	2	95	92	-3.2%	25
49-9095	Manufactured Building and Mobile Home Installers	2	31	37	19.4%	20
49-9096	Riggers	2	61	78	27.9%	32
49-9098	Helpers--Installation, Maintenance, and Repair Workers	2	782	818	4.6%	284
49-9099	Installation, Maintenance, and Repair Workers, All Other	2	524	647	23.5%	205
51-1011	First-Line Supervisors of Production and Operating Workers	2	4,568	4,605	0.8%	956
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	16	13	-18.8%	2
51-2021	Coil Winders, Tapers, and Finishers	2	147	140	-4.8%	25
51-2022	Electrical and Electronic Equipment Assemblers	2	1,976	1,787	-9.6%	283
51-2023	Electromechanical Equipment Assemblers	2	657	524	-20.2%	34
51-2031	Engine and Other Machine Assemblers	2	246	211	-14.2%	58
51-2041	Structural Metal Fabricators and Fitters	3	867	889	2.5%	451
51-2091	Fiberglass Laminators and Fabricators	2	45	45	0.0%	14
51-2092	Team Assemblers	2	4,698	4,477	-4.7%	869
51-2099	Assemblers and Fabricators, All Other	2	745	926	24.3%	317
51-3011	Bakers	2	1,519	1,449	-4.6%	413
51-3021	Butchers and Meat Cutters	2	840	672	-20.0%	80
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	1	199	162	-18.6%	21

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-3023	Slaughterers and Meat Packers	1	84	79	-6.0%	26
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	2	35	38	8.6%	16
51-3092	Food Batchmakers	2	623	637	2.2%	276
51-3093	Food Cooking Machine Operators and Tenders	2	155	169	9.0%	65
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3	1,575	1,909	21.2%	883
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	3	184	188	2.2%	62
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	2	961	927	-3.5%	313
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	2	339	318	-6.2%	99
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	2	959	792	-17.4%	146
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	1,666	1,538	-7.7%	194
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	291	188	-35.4%	12
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	1,124	1,157	2.9%	470
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	548	499	-8.9%	151
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	3	285	272	-4.6%	88
51-4041	Machinists	3	3,864	4,044	4.7%	1,318
51-4051	Metal-Refining Furnace Operators and Tenders	2	473	409	-13.5%	79
51-4052	Pourers and Casters, Metal	2	372	370	-0.5%	142
51-4061	Model Makers, Metal and Plastic	3	80	62	-22.5%	3
51-4062	Patternmakers, Metal and Plastic	3	75	85	13.3%	40
51-4071	Foundry Mold and Coremakers	2	157	145	-7.6%	37
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2	892	843	-5.5%	178
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	1,210	1,279	5.7%	496
51-4111	Tool and Die Makers	3	895	907	1.3%	179
51-4121	Welders, Cutters, Solderers, and Brazers	3	3,263	3,768	15.5%	1,566
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	2	270	263	-2.6%	99
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	2	379	315	-16.9%	53
51-4192	Layout Workers, Metal and Plastic	2	40	39	-2.5%	9
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	2	460	432	-6.1%	131

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-4194	Tool Grinders, Filers, and Sharpeners	2	110	84	-23.6%	7
51-4199	Metal Workers and Plastic Workers, All Other	2	207	222	7.2%	61
51-5111	Prepress Technicians and Workers	3	249	148	-40.6%	11
51-5112	Printing Press Operators	3	1,256	1,000	-20.4%	154
51-5113	Print Binding and Finishing Workers	2	405	337	-16.8%	73
51-6011	Laundry and Dry-Cleaning Workers	1	1,430	1,488	4.1%	569
51-6021	Pressers, Textile, Garment, and Related Materials	1	260	252	-3.1%	48
51-6031	Sewing Machine Operators	1	448	460	2.7%	226
51-6041	Shoe and Leather Workers and Repairers	2	3	4	33.3%	4
51-6042	Shoe Machine Operators and Tenders	2	11	9	-18.2%	10
51-6051	Sewers, Hand	2	427	497	16.4%	116
51-6052	Tailors, Dressmakers, and Custom Sewers	3	192	226	17.7%	83
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders	2	12	12	0.0%	9
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	2	112	121	8.0%	76
51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	2	62	58	-6.5%	40
51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2	23	14	-39.1%	5
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	2	50	36	-28.0%	5
51-6092	Fabric and Apparel Patternmakers	3	12	14	16.7%	4
51-6093	Upholsterers	2	127	142	11.8%	79
51-6099	Textile, Apparel, and Furnishings Workers, All Other	2	35	38	8.6%	9
51-7011	Cabinetmakers and Bench Carpenters	2	291	307	5.5%	137
51-7021	Furniture Finishers	1	71	87	22.5%	56
51-7031	Model Makers, Wood	3	7	7	0.0%	1
51-7032	Patternmakers, Wood	3	17	21	23.5%	7
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	2	216	350	62.0%	232
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	2	315	446	41.6%	202
51-7099	Woodworkers, All Other	2	6	5	-16.7%	0
51-8011	Nuclear Power Reactor Operators	3	72	80	11.1%	37
51-8012	Power Distributors and Dispatchers	3	152	171	12.5%	77
51-8013	Power Plant Operators	2	430	411	-4.4%	182
51-8021	Stationary Engineers and Boiler Operators	3	1,408	1,573	11.7%	774
51-8031	Water and Wastewater Treatment Plant and System Operators	3	1,362	1,457	7.0%	669
51-8091	Chemical Plant and System Operators	2	309	269	-12.9%	148

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-8092	Gas Plant Operators	3	302	331	9.6%	196
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	2	352	397	12.8%	232
51-8099	Plant and System Operators, All Other	2	95	90	-5.3%	37
51-9011	Chemical Equipment Operators and Tenders	2	661	652	-1.4%	348
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	2	194	210	8.2%	105
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	2	217	230	6.0%	102
51-9022	Grinding and Polishing Workers, Hand	1	183	198	8.2%	82
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2	936	996	6.4%	423
51-9031	Cutters and Trimmers, Hand	2	34	30	-11.8%	5
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	2	270	217	-19.6%	26
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	2	568	552	-2.8%	208
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	2	206	161	-21.8%	43
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2	3,185	3,177	-0.3%	819
51-9071	Jewelers and Precious Stone and Metal Workers	3	93	72	-22.6%	5
51-9081	Dental Laboratory Technicians	2	248	274	10.5%	160
51-9082	Medical Appliance Technicians	3	232	200	-13.8%	85
51-9083	Ophthalmic Laboratory Technicians	2	250	234	-6.4%	96
51-9111	Packaging and Filling Machine Operators and Tenders	2	1,918	1,843	-3.9%	512
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	2	616	746	21.1%	291
51-9122	Painters, Transportation Equipment	2	372	366	-1.6%	103
51-9123	Painting, Coating, and Decorating Workers	2	112	113	0.9%	33
51-9141	Semiconductor Processors	2	71	62	-12.7%	24
51-9151	Photographic Process Workers and Processing Machine Operators	2	221	159	-28.1%	27
51-9191	Adhesive Bonding Machine Operators and Tenders	2	32	32	0.0%	11
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	2	70	88	25.7%	38
51-9193	Cooling and Freezing Equipment Operators and Tenders	2	60	60	0.0%	22
51-9194	Etchers and Engravers	2	56	58	3.6%	21
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	2	449	457	1.8%	213
51-9196	Paper Goods Machine Setters, Operators, and Tenders	2	277	262	-5.4%	52

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-9197	Tire Builders	2	54	54	0.0%	22
51-9198	Helpers--Production Workers	2	3,379	3,366	-0.4%	850
51-9199	Production Workers, All Other	2	417	435	4.3%	124
53-1011	Aircraft Cargo Handling Supervisors	2	50	53	6.0%	17
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	2	1,062	1,193	12.3%	465
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	2	1,336	1,508	12.9%	571
53-2012	Commercial Pilots	3	372	432	16.1%	204
53-2021	Air Traffic Controllers	3	61	55	-9.8%	25
53-2022	Airfield Operations Specialists	3	62	57	-8.1%	30
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	2	399	515	29.1%	200
53-3021	Bus Drivers, Transit and Intercity	2	2,404	2,642	9.9%	907
53-3022	Bus Drivers, School or Special Client	2	5,856	6,663	13.8%	2,287
53-3031	Driver/Sales Workers	2	3,101	3,235	4.3%	727
53-3032	Heavy and Tractor-Trailer Truck Drivers	2	10,789	12,835	19.0%	4,317
53-3033	Light Truck or Delivery Services Drivers	2	6,552	6,429	-1.9%	1,120
53-3041	Taxi Drivers and Chauffeurs	1	1,406	1,492	6.1%	370
53-3099	Motor Vehicle Operators, All Other	2	168	205	22.0%	80
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	2	54	47	-13.0%	9
53-5011	Sailors and Marine Oilers	2	256	243	-5.1%	151
53-5021	Captains, Mates, and Pilots of Water Vessels	3	82	71	-13.4%	40
53-6011	Bridge and Lock Tenders	1	17	14	-17.6%	5
53-6021	Parking Lot Attendants	2	1,131	1,448	28.0%	976
53-6031	Automotive and Watercraft Service Attendants	1	432	484	12.0%	190
53-6041	Traffic Technicians	3	8	10	25.0%	4
53-6051	Transportation Inspectors	3	79	72	-8.9%	22
53-6061	Transportation Attendants, Except Flight Attendants	2	176	159	-9.7%	28
53-6099	Transportation Workers, All Other	2	38	42	10.5%	20
53-7011	Conveyor Operators and Tenders	2	115	111	-3.5%	39
53-7021	Crane and Tower Operators	3	455	497	9.2%	221
53-7032	Excavating and Loading Machine and Dragline Operators	2	202	224	10.9%	54
53-7033	Loading Machine Operators, Underground Mining	2	11	12	9.1%	3
53-7051	Industrial Truck and Tractor Operators	2	3,161	3,599	13.9%	1,475
53-7061	Cleaners of Vehicles and Equipment	2	2,125	2,315	8.9%	880
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2	16,551	19,431	17.4%	8,844
53-7063	Machine Feeders and Offbearers	2	608	558	-8.2%	106

<b>SOC Code</b>	<b>Occupation Title</b>	<b>Job Zone</b>	<b>2014</b>	<b>2024</b>	<b>% Change 2014-2024</b>	<b>New and Replacement Jobs</b>
53-7064	Packers and Packagers, Hand	2	3,935	4,286	8.9%	1,591
53-7071	Gas Compressor and Gas Pumping Station Operators	2	126	133	5.6%	82
53-7072	Pump Operators, Except Wellhead Pumpers	2	144	155	7.6%	93
53-7073	Wellhead Pumpers	2	191	226	18.3%	177
53-7081	Refuse and Recyclable Material Collectors	2	849	994	17.1%	418
53-7111	Mine Shuttle Car Operators	2	18	21	16.7%	12
53-7121	Tank Car, Truck, and Ship Loaders	2	129	121	-6.2%	41
53-7199	Material Moving Workers, All Other	2	32	40	25.0%	18

Source: Bureau of Labor Statistics, Occupational Employment Statistics (OES), O\*NET OnLine, Pennsylvania Department of Labor & Industry, Oxford Economics Projections

---

# ABOUT THE STATE SYSTEM'S GAP ANALYSIS PROJECT

The Workforce Characteristics Report was produced through a multi-organization collaboration that consisted of Pennsylvania's State System of Higher Education Office of the Chancellor, Oxford Economics USA Inc., and Georgetown University's Center on Education and the Workforce. Oxford Economics completed the analysis and research work for this report, under the guidance of The State System's Office of the Chancellor, the team sought feedback and insight from senior administration and representatives from each of the 14 State System Universities. The team also drew on insight and feedback from subject matter experts involved in labor market intelligence and education program alignment.

The modeling and results presented here are based on information provided by third parties, upon which Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

Oxford Economics is a key adviser to corporate, financial, government and education decision-makers and thought leaders. Oxford Economics' worldwide client base now comprises over 1000 international organizations, including leading multinational companies and financial institutions; key government bodies and trade associations; and top universities, consultancies, and think tanks.

This report is confidential to clients of Pennsylvania's State System of Higher Education and may not be published or distributed without their prior written permission. Contact information for such request is provided below:

**Dr. Sue Mukherjee**

*Executive Director for Program Alignment and Policy Development*

Phone: (717) 720-4201

Email: SMukherjee@passhe.edu