

PENNSYLVANIA'S STATE SYSTEM OF HIGHER EDUCATION



CALU



CLARION  
UNIVERSITY



MANSFIELD  
UNIVERSITY

Millersville  
University



SlipperyRock  
University

WCU  
WEST CHESTER  
UNIVERSITY

Shippensburg University's  
**WORKFORCE  
CHARACTERISTICS  
TECHNICAL REPORT**

A report for Pennsylvania's  
State System of Higher Education

2016



Pennsylvania's  
**STATE SYSTEM**  
of Higher Education

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## 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

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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.

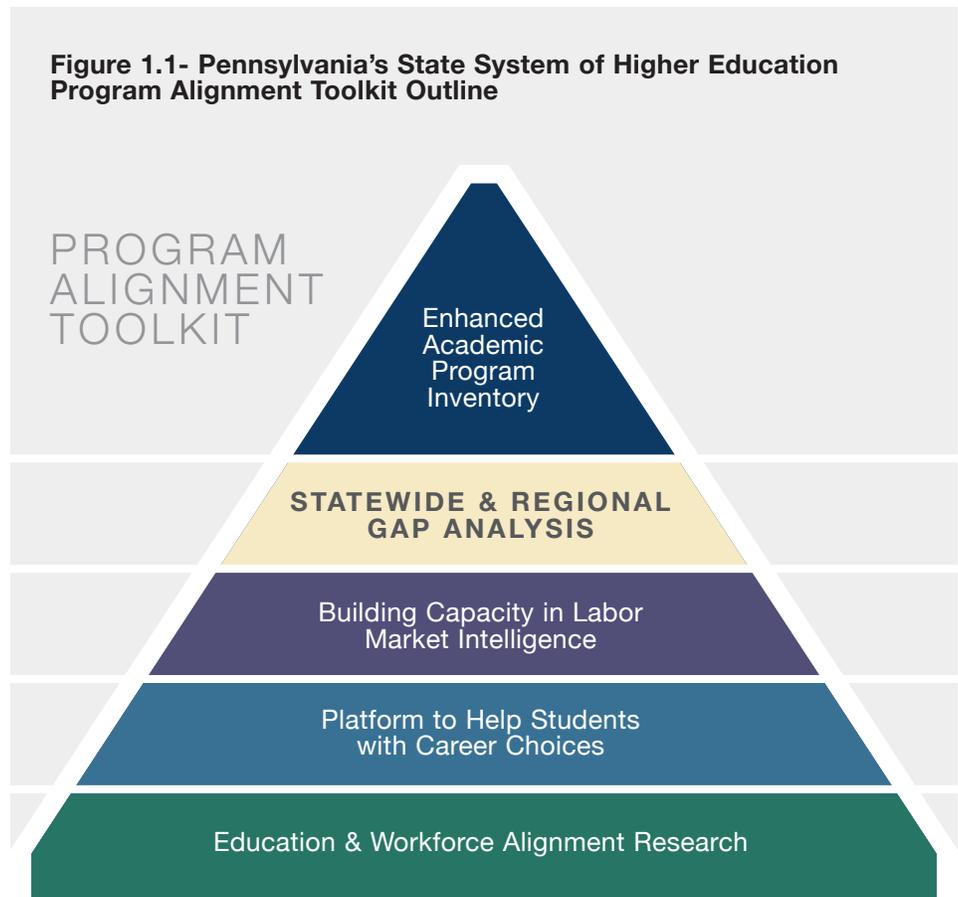
2 Source: The State System’s Economic and Employment Impact on the Commonwealth of Pennsylvania – released April 15, 2015.

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



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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.

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- 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

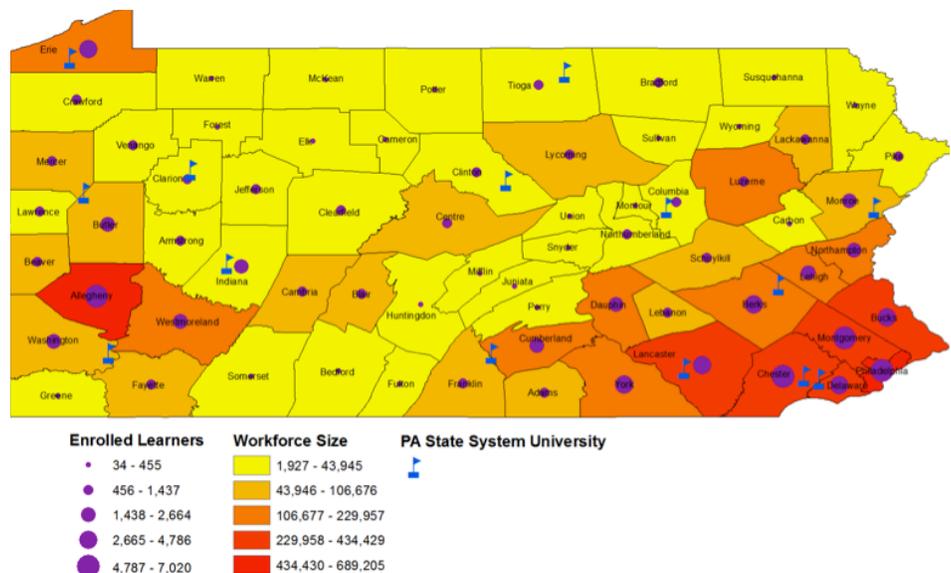
<sup>3</sup> Based on Fall 2013 enrollment.

**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**

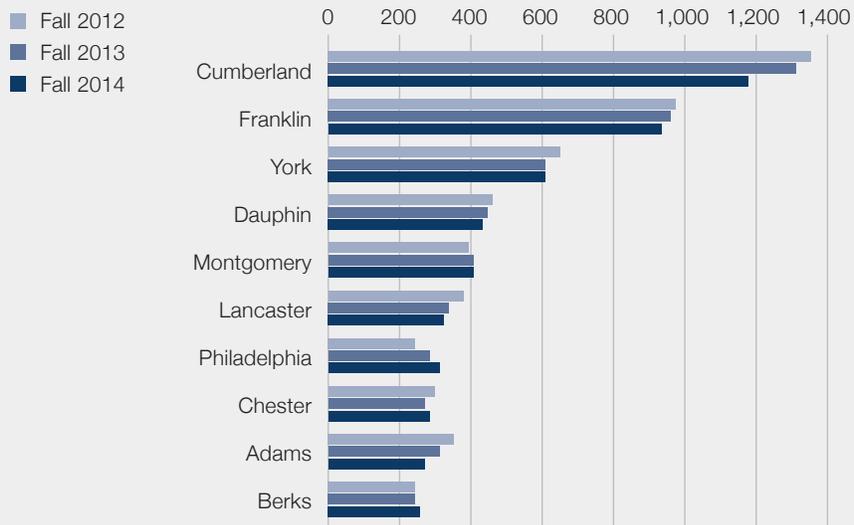


Source: Pennsylvania's State System of Higher Education, Oxford Economics mapping

## 2.1 Shippensburg University's Learner Origin

Shippensburg 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 central region. The top 10 learner enrollment counties account for about 75% of resident enrollment in Shippensburg 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 – Shippensburg University Learner Enrollment by County**



Source: Pennsylvania's State System of Higher Education

**Table 2.3 – Shippensburg University Learner Enrollment by County**

County	Fall 2012	Fall 2013	Fall 2014
Cumberland	1,347	1,303	1,174
Franklin	978	962	938
York	654	610	607
Dauphin	459	450	427
Montgomery	388	400	400
Lancaster	379	340	323
Philadelphia	246	279	305
Chester	292	274	284
Adams	349	304	264
Berks	248	245	258

Source: Pennsylvania's State System of Higher Education

### 3. SUMMARY OF SHIPPENSBURG UNIVERSITY WORKFORCE REGION

Located in Franklin County, Pennsylvania, Shippensburg University (SU) supports the central region of Pennsylvania’s State System of Higher Education. It provides a breadth of degree programs and serves a student population of about 7,500 learners, of which about 90% are Pennsylvania residents.<sup>4</sup>

The following sections outline the supporting data used to select SU’s Pennsylvania workforce region—defined as Cumberland, Franklin, Dauphin, York, Adams, Fulton, Huntingdon, and Perry 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.

<sup>4</sup> Based on Average Fall Enrollment 2012-2014.

### 3.1 Defining Shippensburg 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 57% 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, 85% 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- Shippensburg 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
Cumberland, Franklin, Dauphin	0.76	0.53	0.57	0.88	0.38
Cumberland, Franklin, Dauphin, York	0.82	0.63	0.57	0.86	0.47
Cumberland, Franklin, Dauphin, York, Adams, Fulton, Huntingdon, Perry	0.83	0.65	0.57	0.85	0.55

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

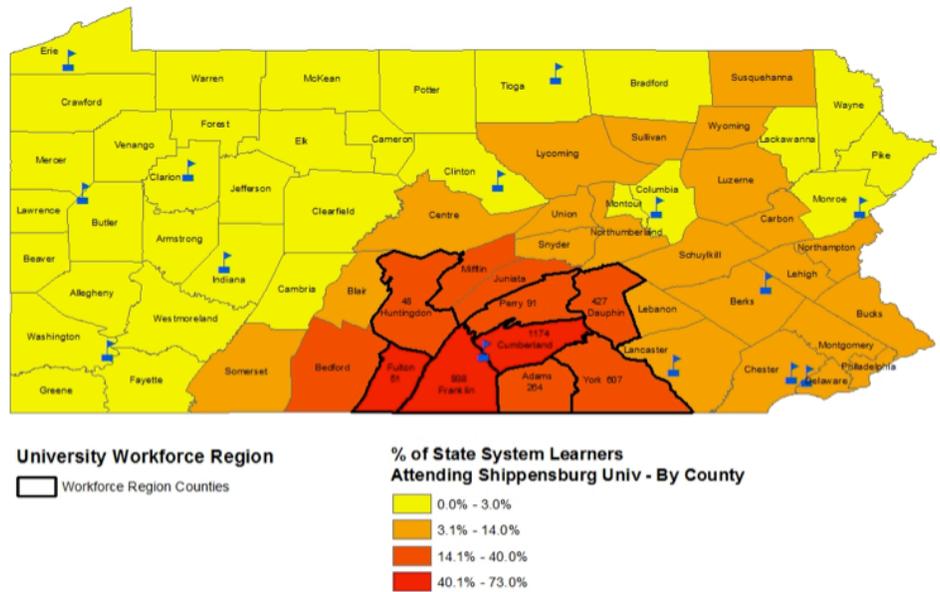
5 Bureau of Labor Statistics: Labor Market Area.

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 SU workforce region residents also work in the region (83%). This reflects a very strong centralized connection between workers and economic activity in a region that has 604,000 jobs. Additionally, learners at SU originate from nearby surrounding counties. When looking at the percentage of learners attending State System universities, 55% (the capture rate) of State System learners in SU’s workforce region attend SU.

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

**Figure 3.1 – Shippensburg 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 SHIPPENSBURG 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 Shippensburg 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 Shippensburg University's workforce region and Pennsylvania.

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

Workforce Characteristic	SU Workforce Region	Pennsylvania	Source
Population	1.3 million	12.7 million	2009-2013 American Community Survey 5-Year Estimates
Employed	604,000	5.6 million	2014 BLS Quarterly Census of Employment and Wages
Unemployed	35,000	370,000	2014 BLS Local Area Unemployment Statistics
Unemployment Rate	5.2%	5.8%	2014 BLS Local Area Unemployment Statistics
Poverty Rate	11.2%	13.7%	2013 Census Small Area Income and Poverty Estimates
Business Establishments	29,700	347,000	2014 BLS Quarterly Census of Employment and Wages
Educational Attainment (25+ Population with Bachelor's or Higher)	23.9%	27.4%	2009-2013 American Community Survey 5-Year Estimates
Bachelor's or Higher Completions	7,000	137,000	Integrated Postsecondary Education Data System 3-Year Average AY2010-11 to AY2012-13
Projected Jobs 2024	663,000	6.2 million	Oxford Economics Projections 2024

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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 Shippensburg 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 BLS and 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.

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

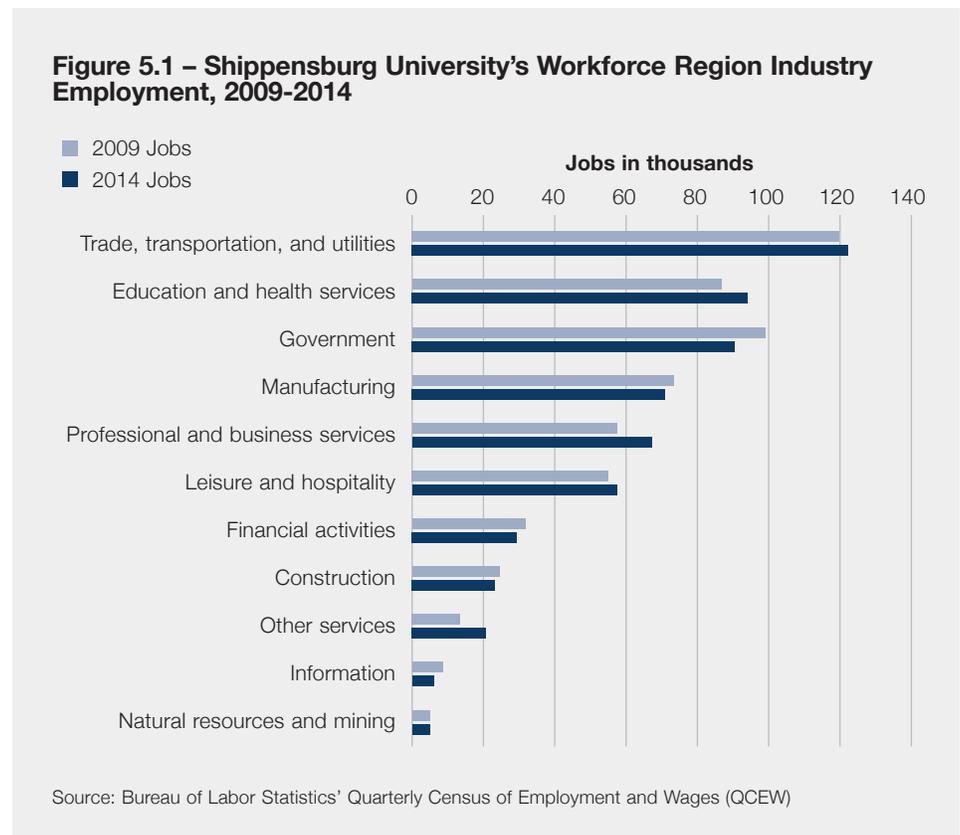
Oxford Economics, a premier economic modeling and consulting firm, produced the projections. By updating projections, Oxford Economics provided insight into new job growth which better measures occupational demand over the next 10 years.

The next section provides an analysis of industries in Shippensburg 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 SHIPPENSBURG UNIVERSITY'S WORKFORCE REGION

Over the five years of 2009 to 2014, Shippensburg University's (SU) 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 20,300 new jobs between 2009 and 2014. Government experienced the largest nominal employment loss, while other job losses occurred within information, financial activities, and construction. Overall, the economy added about 9,800 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 – Shippensburg University’s Workforce Region Industry Employment, 2009-2014**

<b>Industry Employment</b>	<b>2009 Jobs</b>	<b>2014 Jobs</b>	<b>Absolute Change 09-14</b>	<b>% Change 09-14</b>
<b>Total, all industries</b>	<b>580,959</b>	<b>590,753</b>	<b>9,794</b>	<b>1.7%</b>
Trade, transportation, and utilities	120,184	122,677	2,493	2.1%
Education and health services	87,073	94,357	7,284	8.4%
Government	98,881	91,108	-7,773	-7.9%
Manufacturing	73,011	71,381	-1,630	-2.2%
Professional and business services	57,420	67,123	9,703	16.9%
Leisure and hospitality	54,608	57,951	3,343	6.1%
Financial activities	31,569	29,702	-1,867	-5.9%
Construction	24,731	23,527	-1,204	-4.9%
Other services	13,647	20,848	7,201	52.8%
Information	8,941	6,610	-2,331	-26.1%
Natural resources and mining	4,960	5,472	512	10.3%

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

## **5.1 Top Employers in Shippensburg University’s Workforce Region**

Amongst the top employers within SU’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 as several manufacturing and retail establishments.

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

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

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

<b>Establishment Name</b>
Bonney Forge Company
Federal Government
Fulton County Medical Center
Gettysburg College
Giant Food Stores
Grove US
H E Rohrer
Hershey Entertainment & Resorts
Holy Spirit Hospital
J C Blair Memorial Hospital
JLG Equipment Services
JLG Industries
Juniata College
Knouse Foods Cooperative
Milton S. Hershey Medical Center
State Government
Susquenita School District
The Chambersburg Hospital
The Gettysburg Hospital
The Hershey Company
Wal-Mart
Wellspan Medical Group
West Perry School District
York County
York Hospital

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

## 6. OCCUPATIONS IN SHIPPENSBURG 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 SU'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

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<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 Shippensburg 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 manufacturing establishments in SU'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>

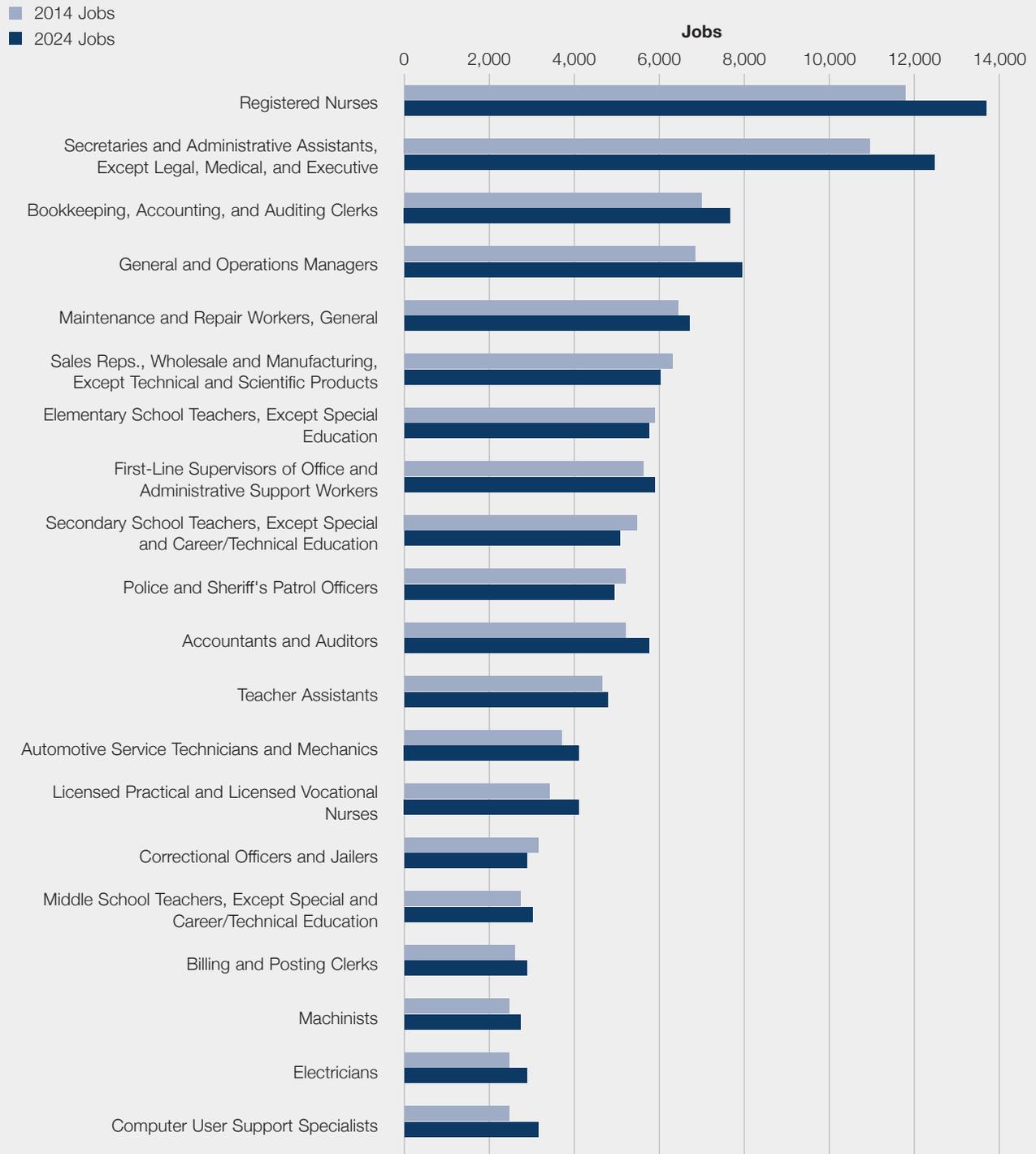
An important aspect to distinguish skilled occupations, in this sub-section, is that post-secondary education is not necessarily a pre-requisite for employment. However, a high percentage of those employed in the skilled occupation have a post-secondary education.

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.

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<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 SU’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 SU'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	11,800	13,658	4,248
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	10,965	12,480	2,940
43-3031	Bookkeeping, Accounting, and Auditing Clerks	6,930	7,656	1,411
11-1021	General and Operations Managers	6,869	7,989	2,343
49-9071	Maintenance and Repair Workers, General	6,415	6,750	1,748
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	6,286	5,962	1,137
25-2021	Elementary School Teachers, Except Special Education	5,957	5,739	1,280
43-1011	First-Line Supervisors of Office and Administrative Support Workers	5,555	5,853	1,628
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	5,519	5,102	1,463
33-3051	Police and Sheriff's Patrol Officers	5,181	4,945	1,623
13-2011	Accountants and Auditors	5,164	5,744	2,299
25-9041	Teacher Assistants	4,704	4,832	1,297
49-3023	Automotive Service Technicians and Mechanics	3,747	4,137	1,479
29-2061	Licensed Practical and Licensed Vocational Nurses	3,414	4,075	1,563
33-3012	Correctional Officers and Jailers	3,114	2,811	662
25-2022	Middle School Teachers, Except Special and Career/Technical Education	2,696	3,012	993
43-3021	Billing and Posting Clerks	2,596	2,931	860
51-4041	Machinists	2,476	2,763	1,016
47-2111	Electricians	2,437	2,882	1,109
15-1151	Computer User Support Specialists	2,426	3,212	1,221

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 SU's workforce region.

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

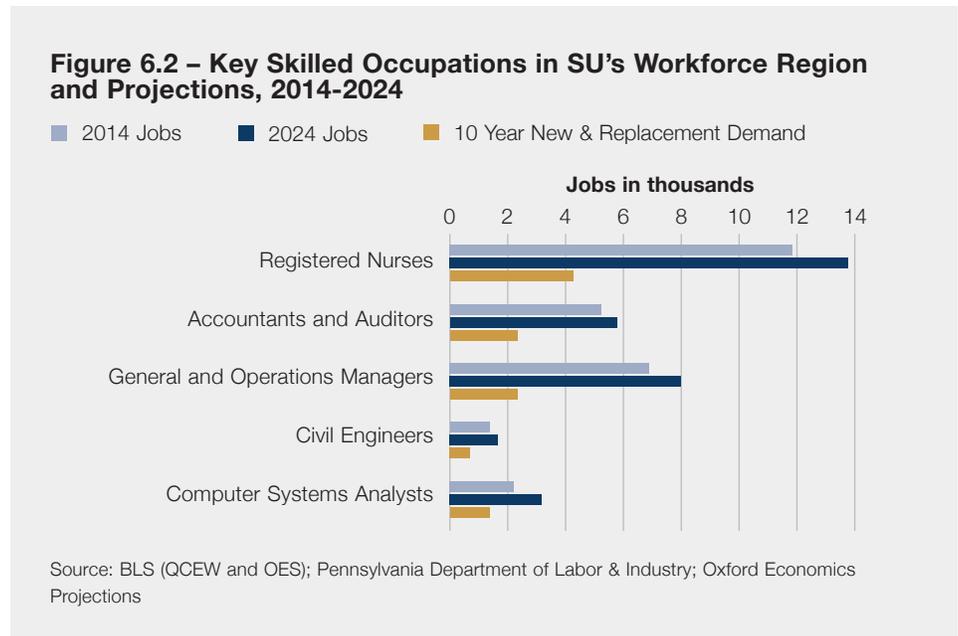
Many skilled occupations exist in Pennsylvania. Demand for new and replacement jobs for key skilled high demand occupations that tie more closely to university-level programs are typically determined by the sheer size of the employment within the occupation and the demographic characteristics of those 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

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<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 civil engineers.<sup>12</sup>



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

SOC Code	Occupation Title	2014 Jobs	2024 Jobs	10 Year New & Replacement Demand
29-1141	Registered Nurses	11,800	13,658	4,248
13-2011	Accountants and Auditors	5,164	5,744	2,299
11-1021	General and Operations Managers	6,869	7,989	2,343
17-2051	Civil Engineers	1,328	1,625	660
15-1121	Computer Systems Analysts	2,235	3,176	1,336

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 1,800 unique (de-duplicated) job postings appeared in SU'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 civil engineers). Sizable job postings include: registered nurses (852 unique postings per month), and general and operations managers (303 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	852	430	2.0
General and Operations Managers	303	363	0.8
Computer Systems Analysts	298	75	4.0
Accountants and Auditors	232	273	0.8
Civil Engineers	97	65	1.5

Source: Economic Modeling Specialists International (EMSI)

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### **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)

### **Civil Engineers**

*Unique skills:* structural engineering, design, construction management, structural analysis

*Certifications:* Professional Engineer (PE), Abet accredited, Chartered Engineer (C.Eng)

### **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 Shippensburg 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 6,300 registered nurses);
- The percent of the occupation's employment in the region that is employed in the industry (e.g. the 6,300 registered nurses employed in general medical and surgical hospitals represent nearly 54% 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 6,300 registered nurses make up about 27% of employment within general medical and surgical hospitals).

### Staffing Patterns for Registered Nurses Employed in SU'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	6,300	53.4%	27.2%
Offices of Physicians	1,012	8.6%	9.4%
Home Health Care Services	692	5.9%	21.0%
Nursing Care Facilities (Skilled Nursing Facilities)	672	5.7%	9.9%
Outpatient Care Centers	493	4.2%	15.9%

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

### Staffing Patterns for General and Operations Managers Employed in SU'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	352	5.1%	2.7%
Insurance Carriers	169	2.5%	1.5%
Restaurants and Other Eating Places	163	2.4%	0.5%
General Freight Trucking	144	2.1%	1.3%
Business, Professional, Labor, Political, and Similar Organizations	138	2.0%	4.5%

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

### Staffing Patterns for Accountants and Auditors Employed in SU'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	1,033	20.0%	38.6%
Management of Companies and Enterprises	661	12.8%	5.0%
Insurance Carriers	265	5.1%	2.4%
Executive, Legislative, and Other General Government Support	140	2.7%	0.8%
Management, Scientific, and Technical Consulting Services	105	2.0%	3.0%

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

### Staffing Patterns for Civil Engineers Employed in SU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Architectural, Engineering, and Related Services	805	60.6%	14.4%
Executive, Legislative, and Other General Government Support	107	8.1%	0.6%
Nonresidential Building Construction	90	6.8%	2.5%
Employment Services	55	4.2%	0.3%
National Security and International Affairs	53	4.0%	0.6%

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

## Staffing Patterns for Computer Systems Analysts Employed in SU'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	711	31.8%	12.8%
Management of Companies and Enterprises	313	14.0%	2.4%
Insurance Carriers	311	13.9%	2.8%
Employment Services	184	8.2%	1.0%
Data Processing, Hosting, and Related Services	103	4.6%	7.6%

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

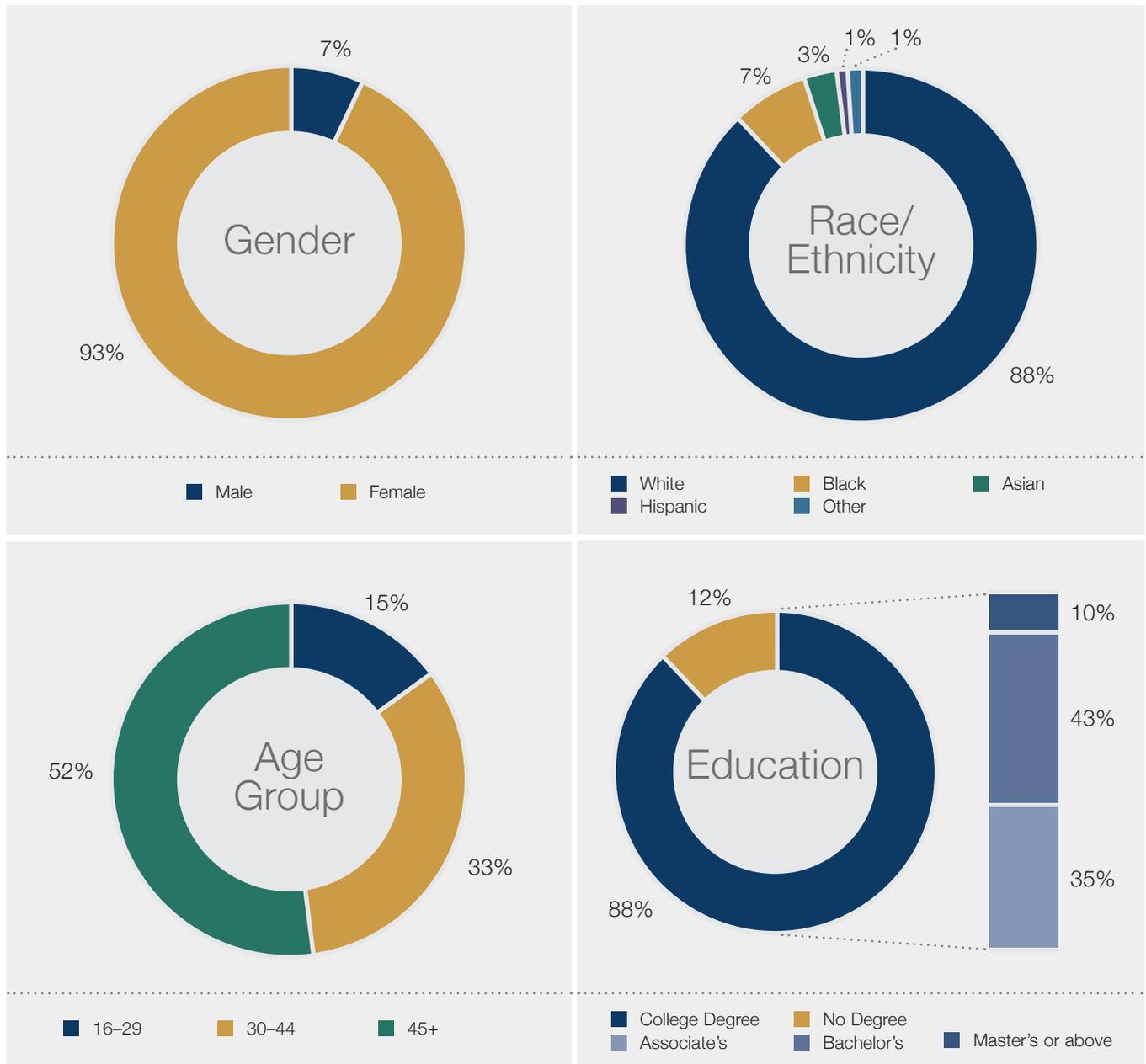
In addition to understanding the industries that employ key skilled high demand occupations, another lens to view key skilled high demand occupations focuses on the characteristics of those employed. The following section outlines the demographics for people from Pennsylvania who work in these key skilled 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 SU's workforce region is further described in Section 7 of the report.

## REGISTERED NURSES IN PENNSYLVANIA

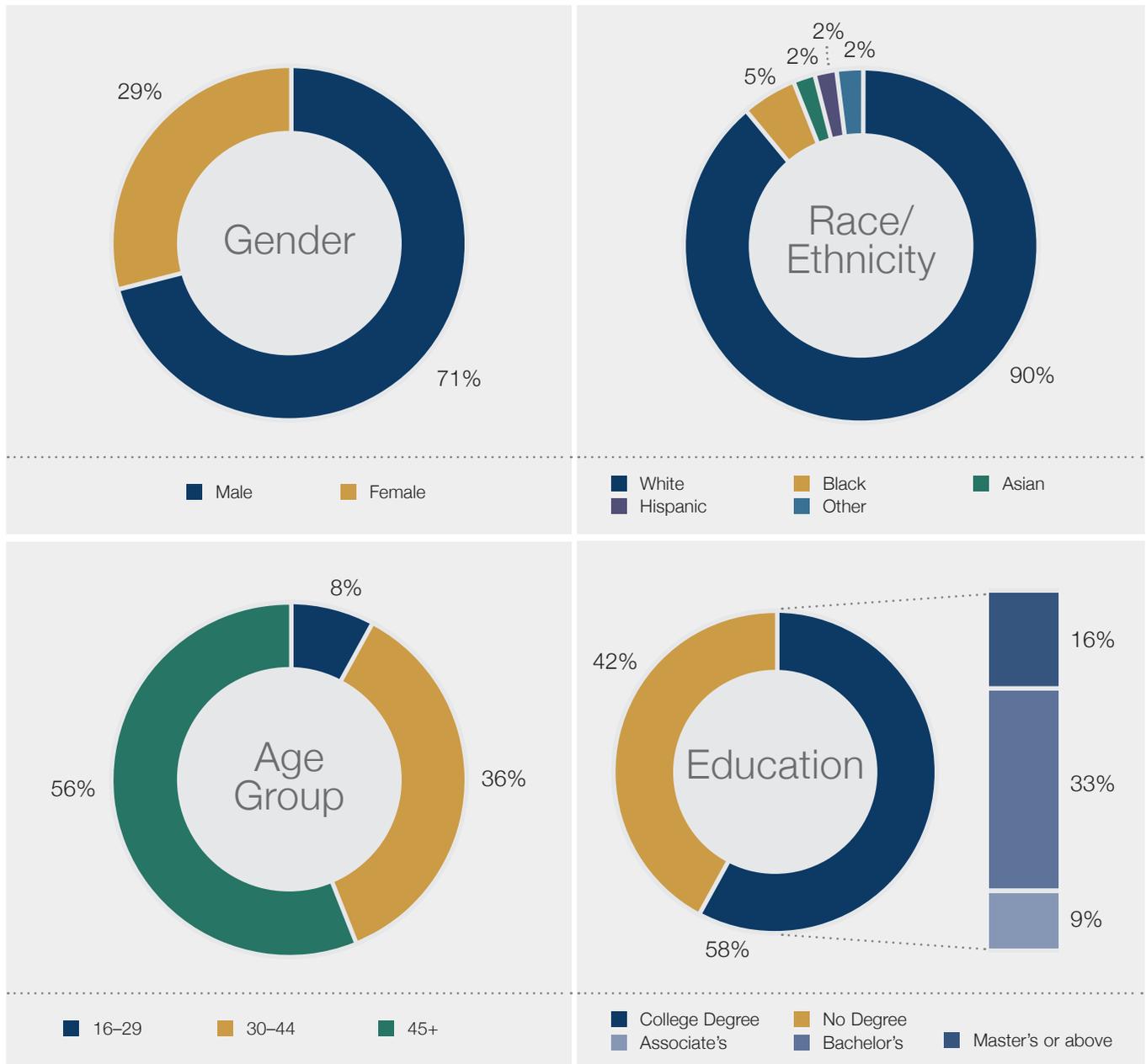
The demographic profile of registered nurses is largely dominated by white females. Age distribution indicates that registered nurses are a more mature cohort of workers (45 years and older), which can put increasing pressure on replacement jobs due to retirements over the next 10 years. Nearly 90% of 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

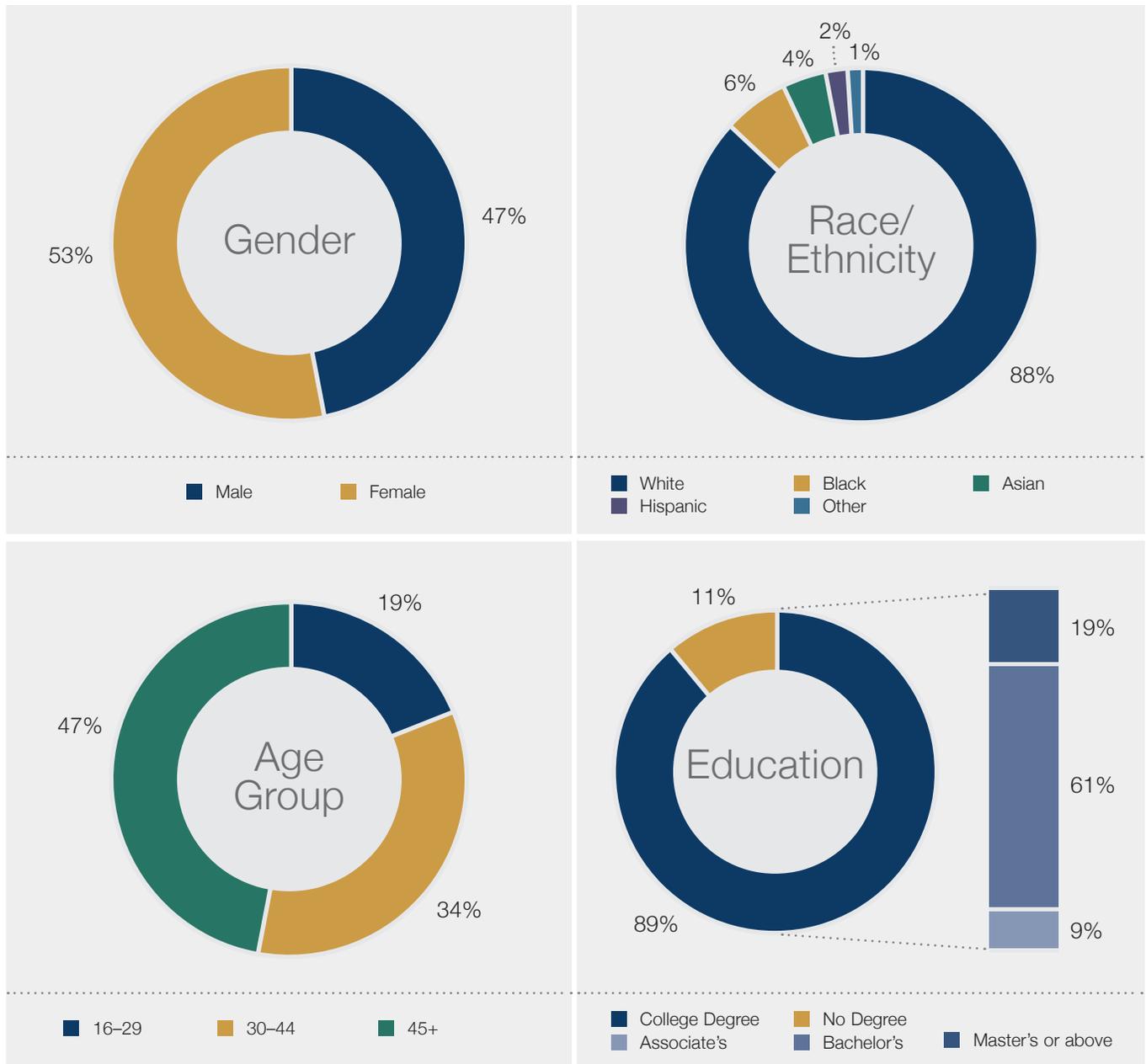
General and operations managers are typically male, though females occupy almost 30% of the employed population. The majority of those in this occupation are white. This occupation is represented by a more mature cohort of workers (45 years and older), though mid-career workers also occupy a significant 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

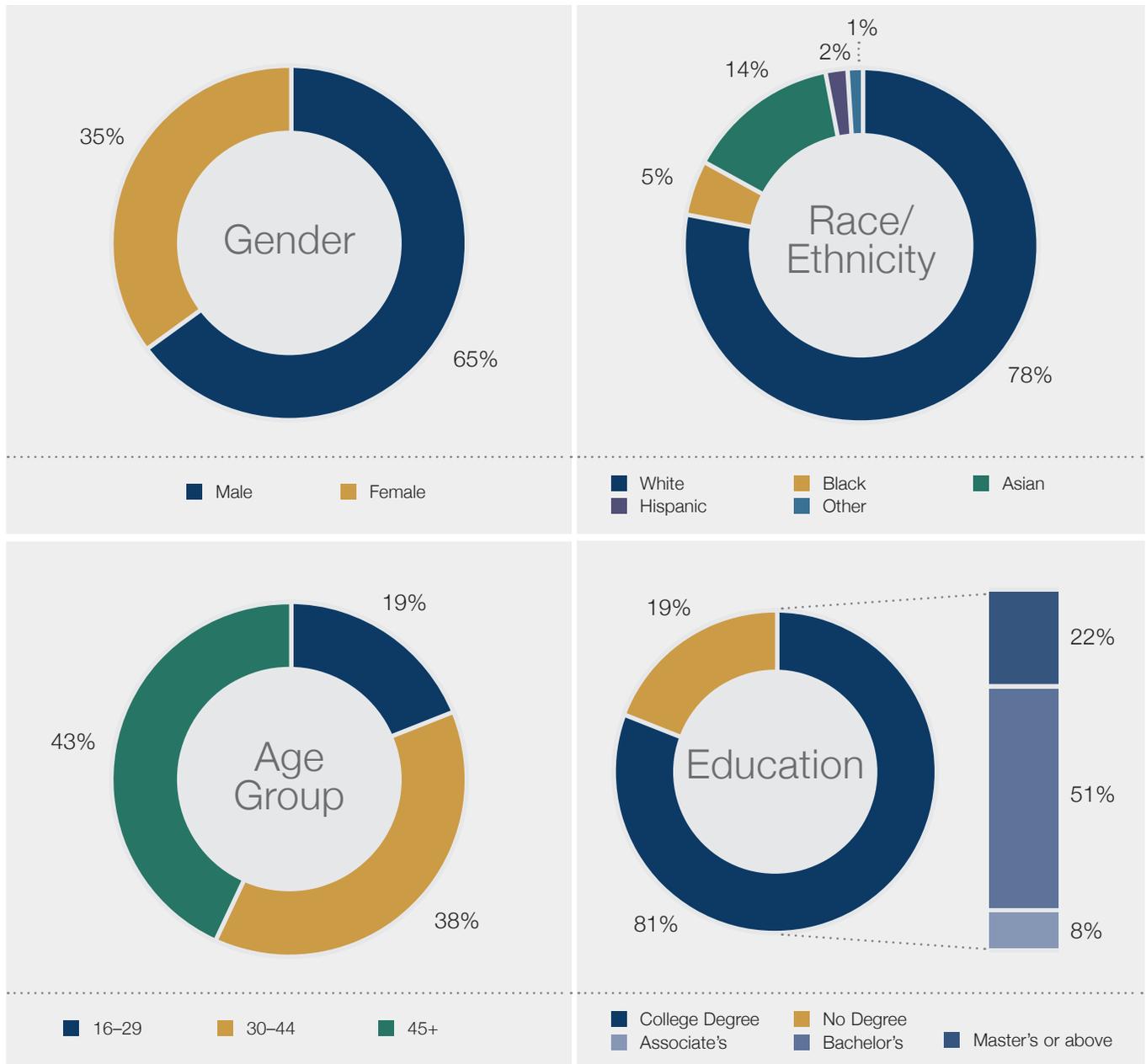
Accountants and auditors are fairly equally split between male and female, though a slightly higher percent of employed accountants and auditors are female. A high proportion of white individuals are found in the occupation. Additionally, the age distribution is fairly even between entry-level and mature 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

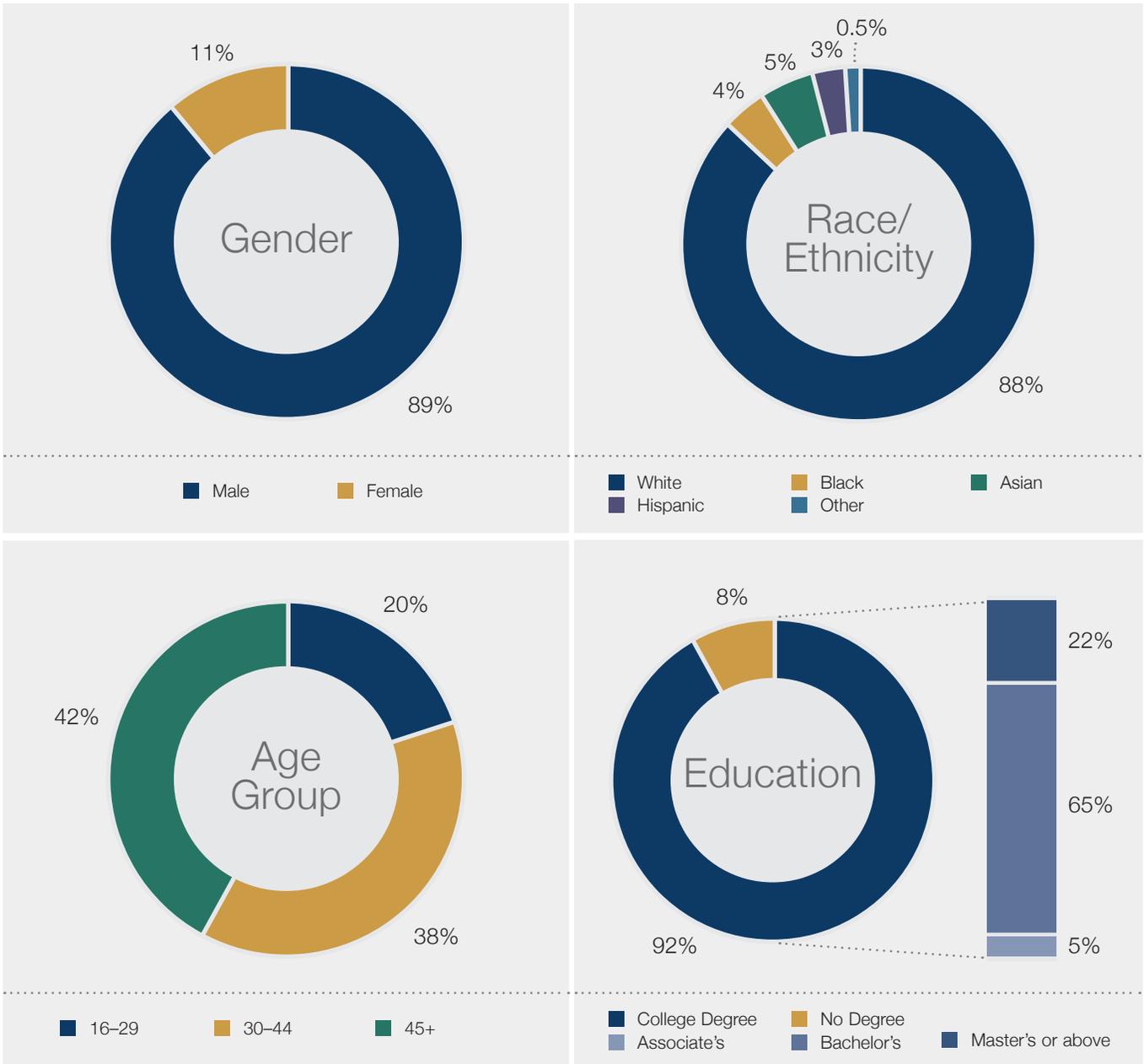
Computer systems analysts show a larger proportion of males in the occupation compared to females. While still represented by a larger share of white workers, a significant number of Asian workers are found in the occupation, making this occupation more diverse than the average Pennsylvania demographic 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

## CIVIL ENGINEERS IN PENNSYLVANIA

Civil engineers show a larger proportion of males in the occupation compared to females. 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. Over 90% of civil engineers 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

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The final section of this report explores SU'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.

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

This section provides further information about the demographic and socio-economic composition of SU'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.

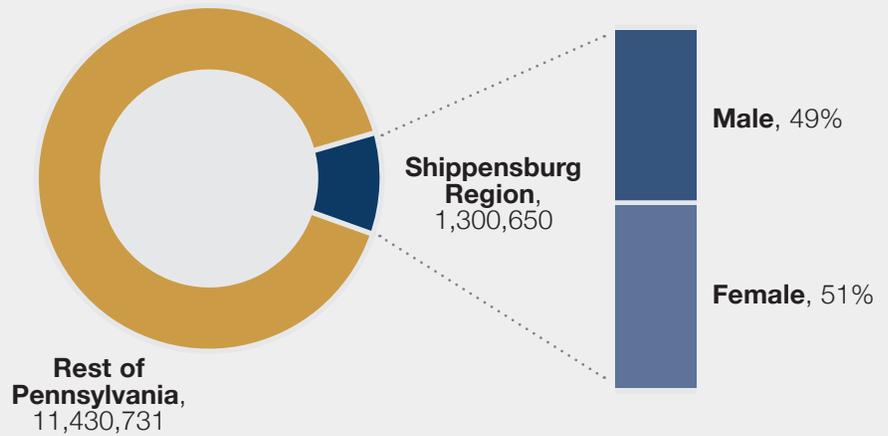
Analysis of three socio-economic indicators—education, unemployment, and poverty—also provides insight into the segment of the population that may be considered economically disadvantaged. Areas with high proportions of economically disadvantaged learners may require additional considerations in education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

### **7.1 Demographics of Shippensburg University's Workforce Region**

The SU workforce region has a population of about 1.3 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 Hispanics.

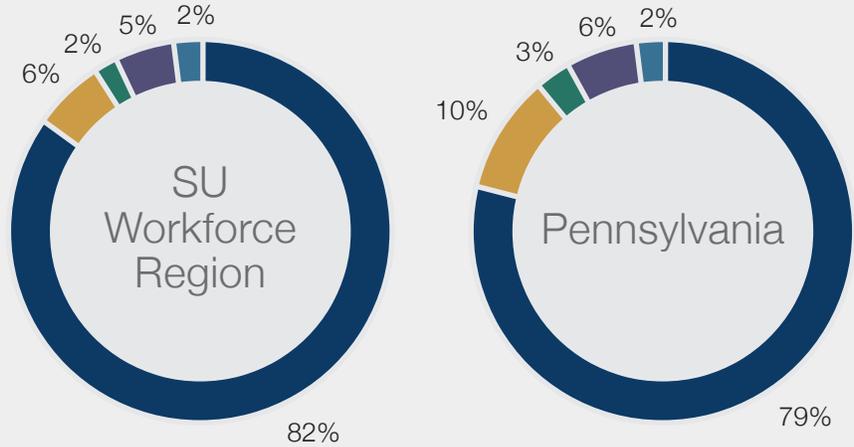
Fall 2014 data from the State System Research Office indicates that approximately 83% (90,966) of learners within the State System are traditional students—ages 18- to 22-year-old high school graduates—and 17% (18,640) are adult learners. A view of the change in population by age demographic indicates 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 4,400 people between 2010 and 2014—a 3% decline. Conversely, the 25-34 year old cohort increased nearly 6%, or 8,700 people, over the same time period. This demographic shift presents an opportunity to incorporate a broader university recruitment strategy.

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



Source: U.S. Census - ACS

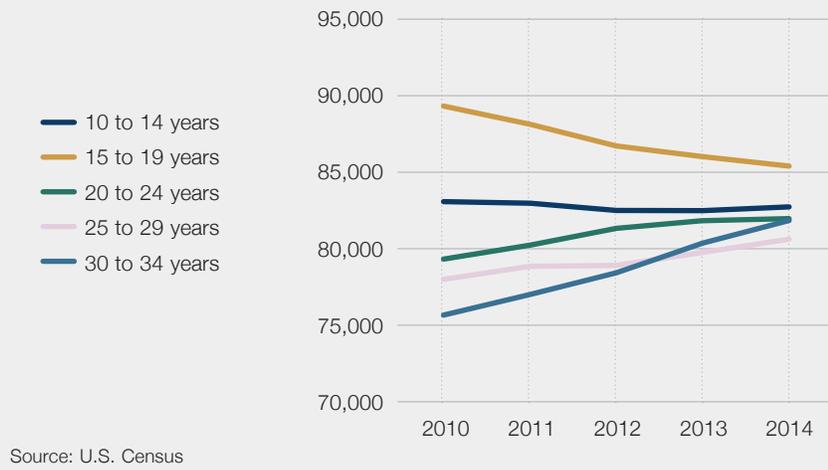
**Figure 7.2 – Shippensburg University’s Workforce Region Race/Ethnicity Composition**



■ White    
 ■ Black    
 ■ Asian    
 ■ Hispanic    
 ■ Other

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

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



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

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

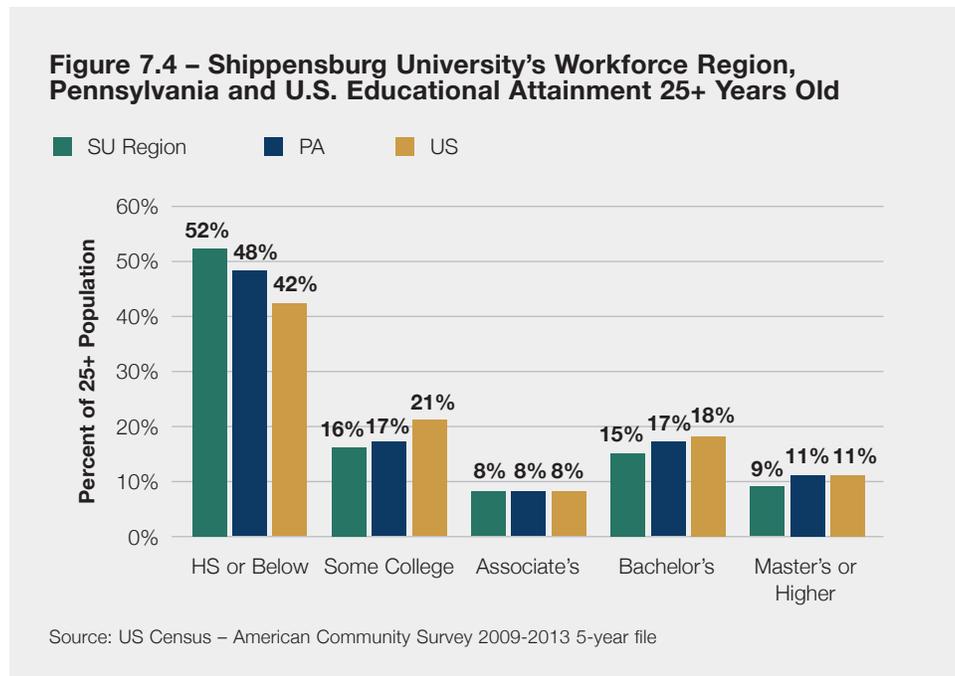
The levels of educational attainment of a population indicate several characteristics in an economy. Areas with better educated workers earn higher wages, are more productive and can typically adjust more quickly to changing economic conditions. Additionally, an educated workforce is less likely to be

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 SU’s workforce region indicates that less than half (48%) 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 the below as the national average of 58% of the population having had at least some post-secondary education or higher.

When comparing degree completion, SU’s workforce region is near the national average for the proportion of the population with an associate’s degree but below the national average for the proportion of the population with a 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 SU’s workforce region.



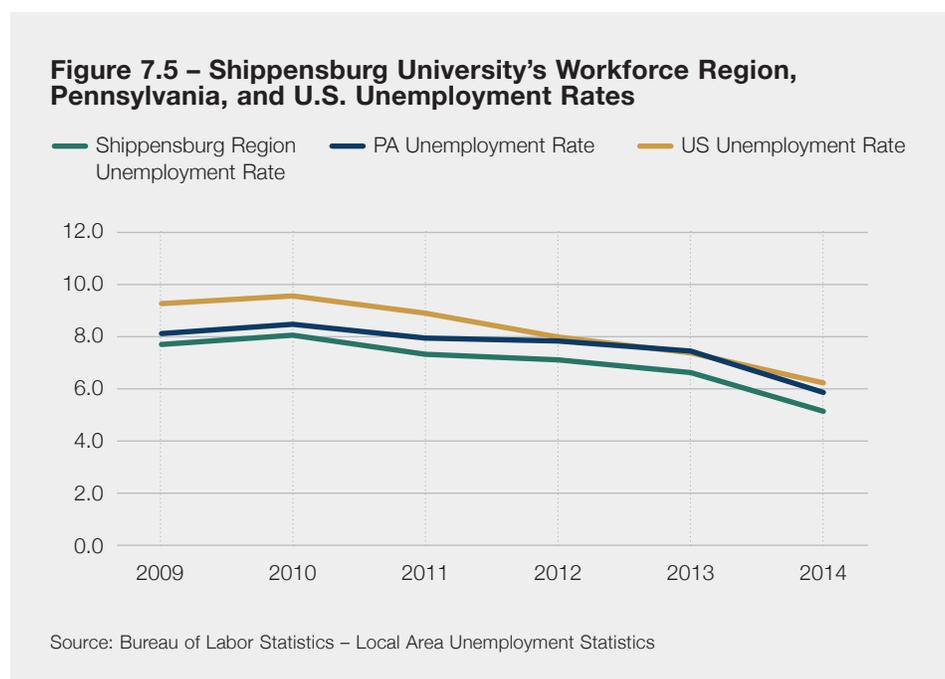
13 Feinstein et. al. (2006), “The effects of education on health: Concepts, evidence and policy implications: A review for the OECD Center for Educational Research and Innovation (CERI)”, unpublished manuscript, OECD, Paris.

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 Shippensburg University's Workforce Region

SU's workforce region unemployment rate—5.2% in 2014—has trended closely with the state and national unemployment rate since 2009 but has 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.

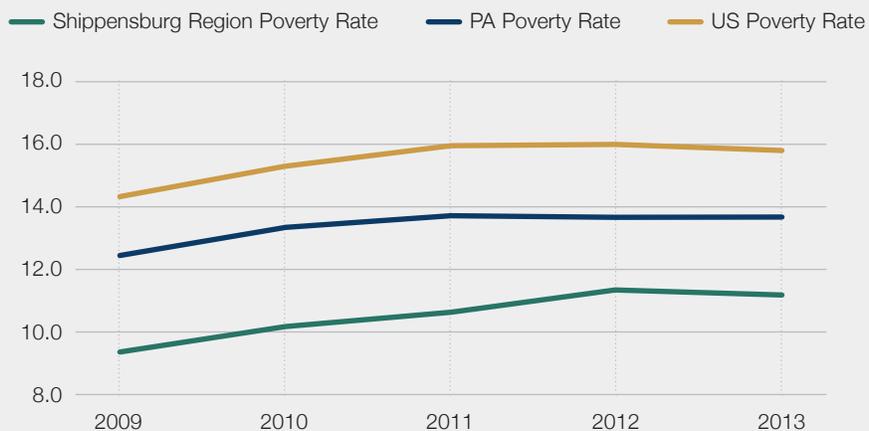
Figure 7.5 shows the convergence of the unemployment rates of SU's workforce region, Pennsylvania, and the U.S. from 2009 to 2014.



In SU's workforce region, the poverty rate trended upward since 2009 but declined slightly from 2012 to 2013. The region's poverty rate is below both 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 SU'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 – Shippensburg 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 SU'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.

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## 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.

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# 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

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<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

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<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”).

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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

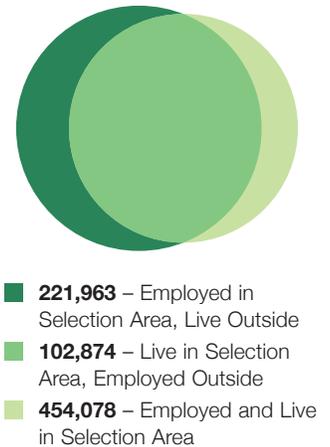
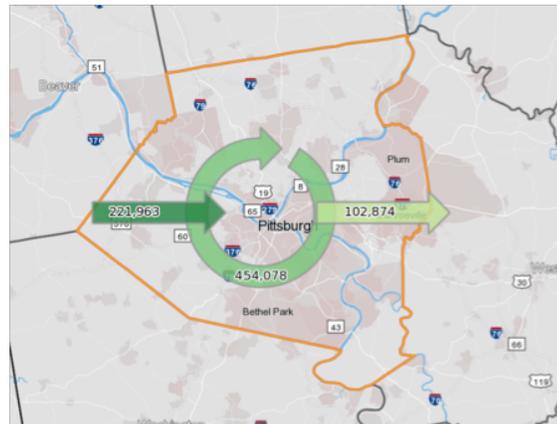
Given the workforce/commute, learner and economic variances that exist within the different geographies across Pennsylvania, an iterative process is used to define the workforce region. This multiple step, iterative process seeks to maximize the primary driver value (workforce flows), while adhering 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).

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### **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

<b>County</b>	<b>Fall 2014 Enrollment in Shippensburg University</b>	<b>2014 QCEW Employment</b>
Adams	264	34,139
Allegheny	28	683,111
Armstrong	1	17,582
Beaver	5	52,811
Bedford	45	15,397
Berks	258	166,792
Blair	49	58,233
Bradford	10	24,568
Bucks	221	250,889
Butler	6	84,472
Cambria	27	53,915
Cameron	0	2,015
Carbon	20	16,974
Centre	22	67,147
Chester	284	240,469
Clarion	2	13,586
Clearfield	10	29,938
Clinton	6	13,043
Columbia	24	24,974
Crawford	2	31,113
Cumberland	1,174	126,939
Dauphin	427	176,004
Delaware	176	216,261
Elk	3	14,994
Erie	5	124,095
Fayette	5	39,979
Forest	0	2,053
Franklin	938	56,715
Fulton	51	4,807
Greene	4	14,844
Huntingdon	48	12,343

<b>County</b>	<b>Fall 2014 Enrollment in Shippensburg University</b>	<b>2014 QCEW Employment</b>
Indiana	6	32,653
Jefferson	5	15,435
Juniata	27	6,146
Lackawanna	24	97,259
Lancaster	323	225,673
Lawrence	3	29,500
Lebanon	124	48,869
Lehigh	105	180,757
Luzerne	70	140,329
Lycoming	39	53,197
McKean	2	15,770
Mercer	4	48,028
Mifflin	60	15,544
Monroe	59	52,933
Montgomery	400	472,655
Montour	5	15,578
Northampton	108	105,825
Northumberland	51	27,985
Perry	91	7,661
Philadelphia	305	640,987
Pike	12	10,748
Potter	1	5,291
Schuylkill	93	50,049
Snyder	17	15,522
Somerset	18	24,398
Sullivan	2	1,772
Susquehanna	12	9,281
Tioga	0	12,973
Union	21	16,597
Venango	0	19,251
Warren	1	15,031
Washington	14	86,961
Wayne	9	14,651
Westmoreland	16	132,312
Wyoming	6	10,181
York	607	172,145
<b>Total Pennsylvania</b>	<b>6,755</b>	<b>5,643,676</b>

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

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# APPENDIX C: INDUSTRY PROJECTIONS 2014-2024 FOR SHIPPENSBURG 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 SU'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>603,701</b>	<b>662,613</b>	<b>9.8%</b>	<b>1.0</b>
1111	Oilseed and Grain Farming	122	132	8.2%	0.5
1112	Vegetable and Melon Farming	227	257	13.2%	0.5
1113	Fruit and Tree Nut Farming	1,077	1,115	3.5%	1.2
1114	Greenhouse, Nursery, and Floriculture Production	430	468	8.8%	0.7
1119	Other Crop Farming	56	63	12.5%	0.2
1121	Cattle Ranching and Farming	1,007	1,140	13.2%	1.5
1122	Hog and Pig Farming	165	188	13.9%	1.2
1123	Poultry and Egg Production	349	373	6.9%	2.0
1124	Sheep and Goat Farming	5	6	20.0%	0.8
1125	Aquaculture	47	53	12.8%	1.7
1129	Other Animal Production	200	215	7.5%	2.4
1131	Timber Tract Operations	8	11	37.5%	0.3
1133	Logging	40	47	17.5%	0.2
1142	Hunting and Trapping	13	3	-76.9%	1.6
1151	Support Activities for Crop Production	638	811	27.1%	0.4
1152	Support Activities for Animal Production	205	243	18.5%	1.7
1153	Support Activities for Forestry	26	34	30.8%	0.4
2111	Oil and Gas Extraction	3	2	-33.3%	0.0
2121	Coal Mining	33	29	-12.1%	0.1
2123	Nonmetallic Mineral Mining and Quarrying	763	865	13.4%	1.9
2131	Support Activities for Mining	111	141	27.0%	0.1
2211	Electric Power Generation, Transmission and Distribution	1,852	1,687	-8.9%	0.9
2212	Natural Gas Distribution	345	361	4.6%	0.7
2213	Water, Sewage and Other Systems	1,020	1,058	3.7%	1.1
2361	Residential Building Construction	2,809	3,452	22.9%	1.0
2362	Nonresidential Building Construction	3,591	4,033	12.3%	1.2
2371	Utility System Construction	2,836	3,806	34.2%	1.4
2372	Land Subdivision	39	50	28.2%	0.2
2373	Highway, Street, and Bridge Construction	1,235	1,481	19.9%	0.7
2379	Other Heavy and Civil Engineering Construction	146	203	39.0%	0.3
2381	Foundation, Structure, and Building Exterior Contractors	2,629	3,157	20.1%	0.8
2382	Building Equipment Contractors	7,435	8,336	12.1%	0.9
2383	Building Finishing Contractors	1,885	2,056	9.1%	0.6
2389	Other Specialty Trade Contractors	2,965	3,507	18.3%	1.2
3111	Animal Food Manufacturing	979	975	-0.4%	4.1
3112	Grain and Oilseed Milling	281	337	19.9%	1.1

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3113	Sugar and Confectionery Product Manufacturing	2,613	2,770	6.0%	8.5
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	1,864	1,796	-3.6%	2.5
3115	Dairy Product Manufacturing	1,510	1,431	-5.2%	2.5
3116	Animal Slaughtering and Processing	1,518	1,851	21.9%	0.7
3118	Bakeries and Tortilla Manufacturing	2,068	2,072	0.2%	1.6
3119	Other Food Manufacturing	4,301	4,591	6.7%	5.2
3121	Beverage Manufacturing	575	659	14.6%	0.7
3122	Tobacco Manufacturing	46	56	21.7%	0.8
3131	Fiber, Yarn, and Thread Mills	36	20	-44.4%	0.3
3132	Fabric Mills	61	44	-27.9%	0.3
3133	Textile and Fabric Finishing and Fabric Coating Mills	80	71	-11.3%	0.6
3141	Textile Furnishings Mills	36	31	-13.9%	0.2
3149	Other Textile Product Mills	96	63	-34.4%	0.3
3151	Apparel Knitting Mills	17	14	-17.6%	0.3
3152	Cut and Sew Apparel Manufacturing	240	110	-54.2%	0.5
3159	Apparel Accessories and Other Apparel Manufacturing	16	8	-50.0%	0.3
3161	Leather and Hide Tanning and Finishing	161	194	20.5%	8.2
3169	Other Leather and Allied Product Manufacturing	107	110	2.8%	2.1
3211	Sawmills and Wood Preservation	341	436	27.9%	0.9
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	156	193	23.7%	0.5
3219	Other Wood Product Manufacturing	1,519	1,872	23.2%	1.6
3221	Pulp, Paper, and Paperboard Mills	703	642	-8.7%	1.5
3222	Converted Paper Product Manufacturing	3,498	3,831	9.5%	3.0
3231	Printing and Related Support Activities	4,346	3,974	-8.6%	2.2
3241	Petroleum and Coal Products Manufacturing	505	530	5.0%	1.0
3251	Basic Chemical Manufacturing	86	79	-8.1%	0.1
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	54	43	-20.4%	0.1
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	248	248	0.0%	1.5
3254	Pharmaceutical and Medicine Manufacturing	268	276	3.0%	0.2
3255	Paint, Coating, and Adhesive Manufacturing	57	61	7.0%	0.2
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	344	294	-14.5%	0.7
3259	Other Chemical Product and Preparation Manufacturing	271	325	19.9%	0.7
3261	Plastics Product Manufacturing	2,604	2,688	3.2%	1.1
3262	Rubber Product Manufacturing	759	826	8.8%	1.3
3271	Clay Product and Refractory Manufacturing	538	657	22.1%	3.1
3272	Glass and Glass Product Manufacturing	656	704	7.3%	1.8

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3273	Cement and Concrete Product Manufacturing	1,314	1,482	12.8%	1.7
3279	Other Nonmetallic Mineral Product Manufacturing	193	233	20.7%	0.6
3311	Iron and Steel Mills and Ferroalloy Manufacturing	484	382	-21.1%	1.2
3312	Steel Product Manufacturing from Purchased Steel	657	674	2.6%	2.5
3313	Alumina and Aluminum Production and Processing	520	618	18.8%	2.0
3314	Nonferrous Metal (except Aluminum) Production and Processing	276	290	5.1%	1.0
3315	Foundries	648	650	0.3%	1.2
3321	Forging and Stamping	672	650	-3.3%	1.5
3322	Cutlery and Handtool Manufacturing	214	223	4.2%	1.3
3323	Architectural and Structural Metals Manufacturing	2,618	2,900	10.8%	1.7
3324	Boiler, Tank, and Shipping Container Manufacturing	655	765	16.8%	1.5
3325	Hardware Manufacturing	24	23	-4.2%	0.2
3326	Spring and Wire Product Manufacturing	240	209	-12.9%	1.3
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,623	1,702	4.9%	1.0
3328	Coating, Engraving, Heat Treating, and Allied Activities	604	615	1.8%	1.0
3329	Other Fabricated Metal Product Manufacturing	1,519	1,461	-3.8%	1.2
3331	Agriculture, Construction, and Mining Machinery Manufacturing	3,292	3,411	3.6%	3.0
3332	Industrial Machinery Manufacturing	608	543	-10.7%	1.3
3333	Commercial and Service Industry Machinery Manufacturing	150	138	-8.0%	0.4
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	1,835	1,823	-0.7%	3.2
3335	Metalworking Machinery Manufacturing	1,471	1,528	3.9%	1.8
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	1,461	1,241	-15.1%	3.3
3339	Other General Purpose Machinery Manufacturing	1,754	1,900	8.3%	1.5
3341	Computer and Peripheral Equipment Manufacturing	24	26	8.3%	0.0
3342	Communications Equipment Manufacturing	58	66	13.8%	0.1
3343	Audio and Video Equipment Manufacturing	9	10	11.1%	0.1
3344	Semiconductor and Other Electronic Component Manufacturing	2,091	1,822	-12.9%	1.3
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	233	161	-30.9%	0.1
3346	Manufacturing and Reproducing Magnetic and Optical Media	41	46	12.2%	0.5
3351	Electric Lighting Equipment Manufacturing	133	117	-12.0%	0.6
3352	Household Appliance Manufacturing	215	236	9.8%	0.8
3353	Electrical Equipment Manufacturing	563	565	0.4%	0.9
3359	Other Electrical Equipment and Component Manufacturing	2,314	2,198	-5.0%	4.1
3362	Motor Vehicle Body and Trailer Manufacturing	239	307	28.5%	0.4
3363	Motor Vehicle Parts Manufacturing	1,519	1,509	-0.7%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3364	Aerospace Product and Parts Manufacturing	1,699	2,152	26.7%	0.8
3365	Railroad Rolling Stock Manufacturing	92	117	27.2%	0.8
3369	Other Transportation Equipment Manufacturing	1,855	1,964	5.9%	13.0
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	1,059	1,092	3.1%	1.0
3372	Office Furniture (including Fixtures) Manufacturing	458	516	12.7%	1.0
3391	Medical Equipment and Supplies Manufacturing	1,508	1,430	-5.2%	1.1
3399	Other Miscellaneous Manufacturing	1,028	1,029	0.1%	0.8
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	2,418	2,464	1.9%	1.6
4232	Furniture and Home Furnishing Merchant Wholesalers	134	148	10.4%	0.3
4233	Lumber and Other Construction Materials Merchant Wholesalers	755	829	9.8%	0.8
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	2,121	2,076	-2.1%	0.8
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	430	429	-0.2%	0.8
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	939	950	1.2%	0.7
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	1,141	1,354	18.7%	1.1
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	3,053	3,409	11.7%	1.0
4239	Miscellaneous Durable Goods Merchant Wholesalers	872	1,105	26.7%	0.7
4241	Paper and Paper Product Merchant Wholesalers	532	509	-4.3%	1.0
4242	Drugs and Druggists' Sundries Merchant Wholesalers	444	464	4.5%	0.5
4243	Apparel, Piece Goods, and Notions Merchant Wholesalers	86	77	-10.5%	0.1
4244	Grocery and Related Product Merchant Wholesalers	3,210	3,350	4.4%	1.0
4245	Farm Product Raw Material Merchant Wholesalers	116	131	12.9%	0.4
4246	Chemical and Allied Products Merchant Wholesalers	321	365	13.7%	0.6
4247	Petroleum and Petroleum Products Merchant Wholesalers	237	205	-13.5%	0.5
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	288	310	7.6%	0.4
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	1,045	976	-6.6%	0.7
4251	Wholesale Electronic Markets and Agents and Brokers	2,805	2,723	-2.9%	0.7
4411	Automobile Dealers	6,059	7,151	18.0%	1.2
4412	Other Motor Vehicle Dealers	572	660	15.4%	0.9
4413	Automotive Parts, Accessories, and Tire Stores	1,992	2,218	11.3%	0.8
4421	Furniture Stores	635	565	-11.0%	0.7
4422	Home Furnishings Stores	762	755	-0.9%	0.7
4431	Electronics and Appliance Stores	1,473	1,455	-1.2%	0.7
4441	Building Material and Supplies Dealers	4,420	4,885	10.5%	0.9
4442	Lawn and Garden Equipment and Supplies Stores	836	919	9.9%	1.3

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4451	Grocery Stores	12,773	13,616	6.6%	1.1
4452	Specialty Food Stores	963	1,059	10.0%	1.0
4453	Beer, Wine, and Liquor Stores	868	970	11.8%	1.2
4461	Health and Personal Care Stores	3,774	3,735	-1.0%	0.8
4471	Gasoline Stations	5,051	4,886	-3.3%	1.3
4481	Clothing Stores	3,323	3,145	-5.4%	0.7
4482	Shoe Stores	654	657	0.5%	0.7
4483	Jewelry, Luggage, and Leather Goods Stores	514	548	6.6%	0.8
4511	Sporting Goods, Hobby, and Musical Instrument Stores	2,196	2,216	0.9%	0.9
4512	Book Stores and News Dealers	248	134	-46.0%	0.6
4521	Department Stores	4,600	3,867	-15.9%	0.8
4529	Other General Merchandise Stores	7,161	7,921	10.6%	0.9
4531	Florists	318	273	-14.2%	1.2
4532	Office Supplies, Stationery, and Gift Stores	1,285	1,045	-18.7%	1.0
4533	Used Merchandise Stores	676	851	25.9%	0.9
4539	Other Miscellaneous Store Retailers	1,489	1,637	9.9%	1.1
4541	Electronic Shopping and Mail-Order Houses	1,267	1,268	0.1%	0.9
4542	Vending Machine Operators	251	266	6.0%	1.5
4543	Direct Selling Establishments	1,062	1,144	7.7%	1.8
4811	Scheduled Air Transportation	304	267	-12.2%	0.2
4812	Nonscheduled Air Transportation	6	6	0.0%	0.0
4832	Inland Water Transportation	29	38	31.0%	0.2
4841	General Freight Trucking	11,121	13,057	17.4%	2.6
4842	Specialized Freight Trucking	2,040	2,588	26.9%	1.0
4851	Urban Transit Systems	238	239	0.4%	0.2
4852	Interurban and Rural Bus Transportation	3	4	33.3%	0.0
4853	Taxi and Limousine Service	57	58	1.8%	0.2
4854	School and Employee Bus Transportation	3,127	3,531	12.9%	2.9
4855	Charter Bus Industry	99	110	11.1%	0.7
4859	Other Transit and Ground Passenger Transportation	284	392	38.0%	0.7
4862	Pipeline Transportation of Natural Gas	92	106	15.2%	0.7
4869	Other Pipeline Transportation	9	8	-11.1%	0.2
4871	Scenic and Sightseeing Transportation, Land	61	55	-9.8%	1.0
4872	Scenic and Sightseeing Transportation, Water	28	36	28.6%	0.4
4881	Support Activities for Air Transportation	191	238	24.6%	0.2
4882	Support Activities for Rail Transportation	183	215	17.5%	1.3
4884	Support Activities for Road Transportation	803	1,138	41.7%	1.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4885	Freight Transportation Arrangement	821	1,024	24.7%	1.0
4889	Other Support Activities for Transportation	170	227	33.5%	1.2
4911	Postal Service	2,901	2,249	-22.5%	1.1
4921	Couriers and Express Delivery Services	3,484	3,445	-1.1%	1.5
4922	Local Messengers and Local Delivery	139	156	12.2%	0.6
4931	Warehousing and Storage	14,632	17,790	21.6%	4.4
5111	Newspaper, Periodical, Book, and Directory Publishers	1,322	1,019	-22.9%	0.7
5112	Software Publishers	110	99	-10.0%	0.1
5121	Motion Picture and Video Industries	736	761	3.4%	0.5
5122	Sound Recording Industries	16	15	-6.3%	0.2
5151	Radio and Television Broadcasting	833	848	1.8%	0.9
5171	Wired Telecommunications Carriers	1,925	1,644	-14.6%	0.7
5172	Wireless Telecommunications Carriers (except Satellite)	258	212	-17.8%	0.4
5174	Satellite Telecommunications	14	14	0.0%	0.3
5179	Other Telecommunications	42	30	-28.6%	0.1
5182	Data Processing, Hosting, and Related Services	1,368	1,422	3.9%	1.1
5191	Other Information Services	842	905	7.5%	0.5
5221	Depository Credit Intermediation	6,994	6,898	-1.4%	0.9
5222	Nondepository Credit Intermediation	1,049	1,016	-3.1%	0.4
5223	Activities Related to Credit Intermediation	205	194	-5.4%	0.2
5231	Securities and Commodity Contracts Intermediation and Brokerage	576	686	19.1%	0.3
5232	Securities and Commodity Exchanges	2	3	50.0%	0.1
5239	Other Financial Investment Activities	746	1,074	44.0%	0.4
5241	Insurance Carriers	11,128	10,239	-8.0%	2.1
5242	Agencies, Brokerages, and Other Insurance Related Activities	6,465	8,056	24.6%	1.5
5259	Other Investment Pools and Funds	338	410	21.3%	21.7
5311	Lessors of Real Estate	1,260	1,269	0.7%	0.5
5312	Offices of Real Estate Agents and Brokers	687	824	19.9%	0.5
5313	Activities Related to Real Estate	1,163	1,330	14.4%	0.4
5321	Automotive Equipment Rental and Leasing	905	1,089	20.3%	1.1
5322	Consumer Goods Rental	403	466	15.6%	0.6
5323	General Rental Centers	200	225	12.5%	1.2
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	469	619	32.0%	0.7
5331	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	18	24	33.3%	0.2
5411	Legal Services	3,436	3,543	3.1%	0.7
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	2,675	3,006	12.4%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
5413	Architectural, Engineering, and Related Services	5,591	6,777	21.2%	0.9
5414	Specialized Design Services	97	99	2.1%	0.2
5415	Computer Systems Design and Related Services	5,540	7,842	41.6%	0.7
5416	Management, Scientific, and Technical Consulting Services	3,508	3,978	13.4%	0.6
5417	Scientific Research and Development Services	301	395	31.2%	0.1
5418	Advertising, Public Relations, and Related Services	1,417	1,508	6.4%	0.7
5419	Other Professional, Scientific, and Technical Services	2,234	2,489	11.4%	0.8
5511	Management of Companies and Enterprises	13,179	16,189	22.8%	1.4
5611	Office Administrative Services	222	290	30.6%	0.1
5612	Facilities Support Services	390	553	41.8%	0.6
5613	Employment Services	19,105	25,567	33.8%	1.3
5614	Business Support Services	2,608	2,870	10.0%	0.7
5615	Travel Arrangement and Reservation Services	495	583	17.8%	0.6
5616	Investigation and Security Services	2,654	3,430	29.2%	0.7
5617	Services to Buildings and Dwellings	7,100	8,918	25.6%	0.8
5619	Other Support Services	1,889	2,509	32.8%	1.4
5621	Waste Collection	629	771	22.6%	0.9
5622	Waste Treatment and Disposal	732	820	12.0%	1.4
5629	Remediation and Other Waste Management Services	451	474	5.1%	0.8
6111	Elementary and Secondary Schools	30,861	29,160	-5.5%	0.9
6112	Junior Colleges	2,269	2,521	11.1%	0.7
6113	Colleges, Universities, and Professional Schools	9,835	9,723	-1.1%	0.8
6114	Business Schools and Computer and Management Training	197	193	-2.0%	0.6
6115	Technical and Trade Schools	383	439	14.6%	0.6
6116	Other Schools and Instruction	792	956	20.7%	0.5
6117	Educational Support Services	350	496	41.7%	0.5
6211	Offices of Physicians	10,710	12,763	19.2%	1.0
6212	Offices of Dentists	3,294	3,849	16.8%	0.8
6213	Offices of Other Health Practitioners	4,277	5,995	40.2%	1.2
6214	Outpatient Care Centers	3,099	3,845	24.1%	0.9
6215	Medical and Diagnostic Laboratories	888	1,063	19.7%	0.8
6216	Home Health Care Services	3,303	4,465	35.2%	0.6
6219	Other Ambulatory Health Care Services	1,317	1,729	31.3%	1.0
6221	General Medical and Surgical Hospitals	23,166	24,775	6.9%	0.9
6222	Psychiatric and Substance Abuse Hospitals	709	921	29.9%	0.7
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	1,778	2,219	24.8%	1.6
6231	Nursing Care Facilities (Skilled Nursing Facilities)	6,766	7,425	9.7%	0.9

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	3,406	3,609	6.0%	1.1
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	6,903	8,482	22.9%	1.8
6239	Other Residential Care Facilities	1,245	1,462	17.4%	1.6
6241	Individual and Family Services	9,700	13,630	40.5%	1.0
6242	Community Food and Housing, and Emergency and Other Relief Services	507	650	28.2%	0.7
6243	Vocational Rehabilitation Services	1,019	1,413	38.7%	0.7
6244	Child Day Care Services	3,934	4,862	23.6%	1.1
7111	Performing Arts Companies	117	133	13.7%	0.2
7112	Spectator Sports	416	416	0.0%	0.7
7113	Promoters of Performing Arts, Sports, and Similar Events	225	258	14.7%	0.4
7114	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	7	6	-14.3%	0.1
7115	Independent Artists, Writers, and Performers	115	133	15.7%	0.5
7121	Museums, Historical Sites, and Similar Institutions	718	901	25.5%	0.7
7131	Amusement Parks and Arcades	1,068	1,023	-4.2%	1.3
7132	Gambling Industries	3,057	3,899	27.5%	2.6
7139	Other Amusement and Recreation Industries	5,657	6,351	12.3%	1.0
7211	Traveler Accommodation	7,168	7,679	7.1%	0.9
7212	RV (Recreational Vehicle) Parks and Recreational Camps	358	382	6.7%	1.4
7213	Rooming and Boarding Houses	18	20	11.1%	0.3
7223	Special Food Services	3,063	3,497	14.2%	1.1
7224	Drinking Places (Alcoholic Beverages)	1,234	1,256	1.8%	0.8
7225	Restaurants and Other Eating Places	35,453	39,810	12.3%	0.8
8111	Automotive Repair and Maintenance	3,813	4,102	7.6%	1.0
8112	Electronic and Precision Equipment Repair and Maintenance	1,295	1,551	19.8%	2.9
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1,051	1,213	15.4%	1.2
8114	Personal and Household Goods Repair and Maintenance	199	197	-1.0%	0.6
8121	Personal Care Services	3,295	3,670	11.4%	1.1
8122	Death Care Services	710	822	15.8%	1.2
8123	Drycleaning and Laundry Services	848	904	6.6%	0.6
8129	Other Personal Services	694	901	29.8%	0.5
8131	Religious Organizations	597	603	1.0%	0.7
8132	Grantmaking and Giving Services	886	786	-11.3%	1.5
8133	Social Advocacy Organizations	757	800	5.7%	0.8
8134	Civic and Social Organizations	4,397	4,475	1.8%	2.5
8139	Business, Professional, Labor, Political, and Similar Organizations	3,051	3,163	3.7%	1.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
8141	Private Households	258	240	-7.0%	0.2
9211	Executive, Legislative, and Other General Government Support	17,467	16,314	-6.6%	1.3
9221	Justice, Public Order, and Safety Activities	7,353	7,312	-0.6%	0.9
9231	Administration of Human Resource Programs	4,478	4,206	-6.1%	1.3
9241	Administration of Environmental Quality Programs	2,249	2,315	2.9%	1.6
9251	Administration of Housing Programs, Urban Planning, and Community Development	515	534	3.7%	1.4
9261	Administration of Economic Programs	4,631	4,576	-1.2%	1.8
9281	National Security and International Affairs	8,621	7,731	-10.3%	3.4

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

# APPENDIX D: OCCUPATION PROJECTIONS 2014-2024 FOR SHIPPENSBURG 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.

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<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.

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- *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>603,701</b>	<b>662,613</b>	<b>9.8%</b>	<b>230,578</b>
11-1011	Chief Executives	5	1,161	1,122	-3.4%	237
11-1021	General and Operations Managers	4	6,869	7,989	16.3%	2,343
11-1031	Legislators	4	396	319	-19.4%	27
11-2011	Advertising and Promotions Managers	4	61	50	-18.0%	9
11-2021	Marketing Managers	4	506	566	11.9%	170
11-2022	Sales Managers	4	1,035	1,031	-0.4%	220
11-2031	Public Relations and Fundraising Managers	4	176	162	-8.0%	24
11-3011	Administrative Services Managers	3	782	790	1.0%	127
11-3021	Computer and Information Systems Managers	4	1,017	1,359	33.6%	491
11-3031	Financial Managers	4	1,444	1,444	0.0%	267
11-3051	Industrial Production Managers	4	764	743	-2.7%	155
11-3061	Purchasing Managers	4	229	225	-1.7%	48
11-3071	Transportation, Storage, and Distribution Managers	4	536	605	12.9%	202
11-3111	Compensation and Benefits Managers	4	73	62	-15.1%	11
11-3121	Human Resources Managers	4	369	451	22.2%	179
11-3131	Training and Development Managers	4	89	111	24.7%	45
11-9021	Construction Managers	4	619	805	30.0%	276
11-9031	Education Administrators, Preschool and Childcare Center/Program	4	200	236	18.0%	90
11-9032	Education Administrators, Elementary and Secondary School	5	813	743	-8.6%	199
11-9033	Education Administrators, Postsecondary	5	381	364	-4.5%	92
11-9039	Education Administrators, All Other	5	65	79	21.5%	32
11-9041	Architectural and Engineering Managers	5	554	590	6.5%	179
11-9051	Food Service Managers	3	593	681	14.8%	208
11-9061	Funeral Service Managers	3	52	56	7.7%	20
11-9071	Gaming Managers	3	51	62	21.6%	22
11-9081	Lodging Managers	3	135	158	17.0%	81
11-9111	Medical and Health Services Managers	5	1,202	1,287	7.1%	377
11-9121	Natural Sciences Managers	5	73	83	13.7%	28
11-9131	Postmasters and Mail Superintendents	3	112	62	-44.6%	0
11-9141	Property, Real Estate, and Community Association Managers	4	264	311	17.8%	115
11-9151	Social and Community Service Managers	4	569	678	19.2%	239
11-9161	Emergency Management Directors	4	60	50	-16.7%	0
11-9199	Managers, All Other	4	885	945	6.8%	253

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	5	4	-20.0%	0
13-1021	Buyers and Purchasing Agents, Farm Products	4	50	47	-6.0%	10
13-1022	Wholesale and Retail Buyers, Except Farm Products	3	433	422	-2.5%	107
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	4	1,724	1,753	1.7%	398
13-1031	Claims Adjusters, Examiners, and Investigators	4	2,134	2,096	-1.8%	594
13-1032	Insurance Appraisers, Auto Damage	3	111	132	18.9%	61
13-1041	Compliance Officers	4	1,298	1,470	13.3%	441
13-1051	Cost Estimators	4	1,113	1,267	13.8%	532
13-1071	Human Resources Specialists	4	2,296	2,881	25.5%	1,076
13-1075	Labor Relations Specialists	4	860	668	-22.3%	61
13-1081	Logisticians	4	807	1,006	24.7%	306
13-1111	Management Analysts	4	1,921	2,203	14.7%	602
13-1121	Meeting, Convention, and Event Planners	4	329	433	31.6%	155
13-1131	Fundraisers	4	299	358	19.7%	126
13-1141	Compensation, Benefits, and Job Analysis Specialists	4	374	359	-4.0%	68
13-1151	Training and Development Specialists	4	1,069	1,237	15.7%	380
13-1161	Market Research Analysts and Marketing Specialists	4	2,049	2,706	32.1%	985
13-1199	Business Operations Specialists, All Other	4	2,059	1,922	-6.7%	106
13-2011	Accountants and Auditors	4	5,164	5,744	11.2%	2,299
13-2021	Appraisers and Assessors of Real Estate	4	174	164	-5.7%	17
13-2031	Budget Analysts	4	245	274	11.8%	132
13-2041	Credit Analysts	4	192	228	18.8%	94
13-2051	Financial Analysts	4	1,016	1,198	17.9%	448
13-2052	Personal Financial Advisors	4	440	621	41.1%	263
13-2053	Insurance Underwriters	4	782	770	-1.5%	292
13-2061	Financial Examiners	4	185	186	0.5%	60
13-2071	Credit Counselors	4	149	196	31.5%	79
13-2072	Loan Officers	3	1,011	1,123	11.1%	392
13-2081	Tax Examiners and Collectors, and Revenue Agents	3	776	650	-16.2%	189
13-2082	Tax Preparers	3	162	149	-8.0%	36
13-2099	Financial Specialists, All Other	4	398	359	-9.8%	15
15-1111	Computer and Information Research Scientists	5	28	30	7.1%	6
15-1121	Computer Systems Analysts	4	2,235	3,176	42.1%	1,336
15-1122	Information Security Analysts	4	257	370	44.0%	153
15-1131	Computer Programmers	4	1,330	1,822	37.0%	927

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
15-1132	Software Developers, Applications	4	2,112	2,894	37.0%	1,083
15-1133	Software Developers, Systems Software	4	881	973	10.4%	199
15-1134	Web Developers	3	352	471	33.8%	177
15-1141	Database Administrators	4	500	615	23.0%	218
15-1142	Network and Computer Systems Administrators	4	1,468	1,451	-1.2%	235
15-1143	Computer Network Architects	4	346	424	22.5%	133
15-1151	Computer User Support Specialists	3	2,426	3,212	32.4%	1,221
15-1152	Computer Network Support Specialists	4	515	543	5.4%	127
15-1199	Computer Occupations, All Other	4	896	1,029	14.8%	291
15-2011	Actuaries	4	198	237	19.7%	103
15-2031	Operations Research Analysts	5	296	322	8.8%	95
15-2041	Statisticians	5	181	212	17.1%	93
17-1011	Architects, Except Landscape and Naval	4	270	349	29.3%	174
17-1012	Landscape Architects	4	78	117	50.0%	63
17-1021	Cartographers and Photogrammetrists	4	30	31	3.3%	8
17-1022	Surveyors	4	149	182	22.1%	72
17-2011	Aerospace Engineers	4	66	79	19.7%	30
17-2021	Agricultural Engineers	4	7	9	28.6%	5
17-2031	Biomedical Engineers	4	56	63	12.5%	22
17-2041	Chemical Engineers	4	86	87	1.2%	27
17-2051	Civil Engineers	4	1,328	1,625	22.4%	660
17-2061	Computer Hardware Engineers	4	116	111	-4.3%	19
17-2071	Electrical Engineers	4	712	844	18.5%	310
17-2072	Electronics Engineers, Except Computer	4	283	234	-17.3%	21
17-2081	Environmental Engineers	5	316	387	22.5%	163
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	4	116	120	3.4%	41
17-2112	Industrial Engineers	4	1,110	1,118	0.7%	384
17-2131	Materials Engineers	4	101	128	26.7%	65
17-2141	Mechanical Engineers	4	1,225	1,242	1.4%	480
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	4	31	31	0.0%	12
17-2161	Nuclear Engineers	4	198	236	19.2%	106
17-2171	Petroleum Engineers	4	5	5	0.0%	2
17-2199	Engineers, All Other	4	425	515	21.2%	176
17-3011	Architectural and Civil Drafters	4	446	532	19.3%	194
17-3012	Electrical and Electronics Drafters	3	121	103	-14.9%	2
17-3013	Mechanical Drafters	3	469	415	-11.5%	48

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
17-3019	Drafters, All Other	3	20	27	35.0%	10
17-3021	Aerospace Engineering and Operations Technicians	4	17	22	29.4%	8
17-3022	Civil Engineering Technicians	3	225	292	29.8%	123
17-3023	Electrical and Electronics Engineering Technicians	3	434	363	-16.4%	36
17-3024	Electro-Mechanical Technicians	3	35	33	-5.7%	8
17-3025	Environmental Engineering Technicians	4	119	143	20.2%	55
17-3026	Industrial Engineering Technicians	3	220	229	4.1%	64
17-3027	Mechanical Engineering Technicians	3	190	241	26.8%	97
17-3029	Engineering Technicians, Except Drafters, All Other	3	410	524	27.8%	217
17-3031	Surveying and Mapping Technicians	3	149	202	35.6%	85
19-1012	Food Scientists and Technologists	4	92	111	20.7%	52
19-1013	Soil and Plant Scientists	5	15	18	20.0%	9
19-1021	Biochemists and Biophysicists	5	21	29	38.1%	14
19-1022	Microbiologists	5	54	71	31.5%	35
19-1023	Zoologists and Wildlife Biologists	5	34	31	-8.8%	6
19-1029	Biological Scientists, All Other	5	58	46	-20.7%	7
19-1031	Conservation Scientists	4	95	103	8.4%	39
19-1032	Foresters	4	48	43	-10.4%	10
19-1041	Epidemiologists	5	17	13	-23.5%	0
19-1042	Medical Scientists, Except Epidemiologists	5	170	218	28.2%	89
19-1099	Life Scientists, All Other	5	31	34	9.7%	10
19-2012	Physicists	5	16	13	-18.8%	1
19-2021	Atmospheric and Space Scientists	4	11	9	-18.2%	1
19-2031	Chemists	4	242	287	18.6%	123
19-2032	Materials Scientists	5	19	21	10.5%	8
19-2041	Environmental Scientists and Specialists, Including Health	4	257	315	22.6%	141
19-2042	Geoscientists, Except Hydrologists and Geographers	4	89	96	7.9%	38
19-2043	Hydrologists	4	19	16	-15.8%	3
19-2099	Physical Scientists, All Other	5	60	47	-21.7%	1
19-3011	Economists	5	59	63	6.8%	23
19-3022	Survey Researchers	5	223	212	-4.9%	60
19-3031	Clinical, Counseling, and School Psychologists	5	516	523	1.4%	163
19-3039	Psychologists, All Other	5	64	81	26.6%	35
19-3041	Sociologists	5	7	6	-14.3%	3
19-3051	Urban and Regional Planners	5	273	279	2.2%	137

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
19-3091	Anthropologists and Archeologists	5	1	1	0.0%	0
19-3093	Historians	5	17	13	-23.5%	0
19-3099	Social Scientists and Related Workers, All Other	4	85	75	-11.8%	8
19-4011	Agricultural and Food Science Technicians	3	71	66	-7.0%	22
19-4021	Biological Technicians	4	150	164	9.3%	63
19-4031	Chemical Technicians	3	239	300	25.5%	137
19-4041	Geological and Petroleum Technicians	4	20	26	30.0%	16
19-4051	Nuclear Technicians	3	140	151	7.9%	73
19-4061	Social Science Research Assistants	4	45	54	20.0%	29
19-4091	Environmental Science and Protection Technicians, Including Health	4	175	225	28.6%	128
19-4092	Forensic Science Technicians	4	29	27	-6.9%	10
19-4093	Forest and Conservation Technicians	3	68	70	2.9%	35
19-4099	Life, Physical, and Social Science Technicians, All Other	3	203	219	7.9%	101
21-1011	Substance Abuse and Behavioral Disorder Counselors	5	614	613	-0.2%	174
21-1012	Educational, Guidance, School, and Vocational Counselors	5	1,024	1,041	1.7%	258
21-1013	Marriage and Family Therapists	5	106	148	39.6%	66
21-1014	Mental Health Counselors	5	916	990	8.1%	324
21-1015	Rehabilitation Counselors	5	651	833	28.0%	364
21-1019	Counselors, All Other	5	118	112	-5.1%	21
21-1021	Child, Family, and School Social Workers	4	1,705	1,956	14.7%	650
21-1022	Healthcare Social Workers	5	732	897	22.5%	335
21-1023	Mental Health and Substance Abuse Social Workers	5	848	1,017	19.9%	407
21-1029	Social Workers, All Other	5	131	130	-0.8%	29
21-1091	Health Educators	4	269	295	9.7%	100
21-1092	Probation Officers and Correctional Treatment Specialists	4	784	727	-7.3%	197
21-1093	Social and Human Service Assistants	4	1,960	2,174	10.9%	798
21-1094	Community Health Workers	4	112	104	-7.1%	21
21-1099	Community and Social Service Specialists, All Other	4	178	188	5.6%	52
21-2011	Clergy	5	157	181	15.3%	62
21-2021	Directors, Religious Activities and Education	4	113	133	17.7%	70
21-2099	Religious Workers, All Other	4	29	24	-17.2%	4
23-1011	Lawyers	5	2,162	2,322	7.4%	529
23-1012	Judicial Law Clerks	5	225	216	-4.0%	38

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	138	119	-13.8%	9
23-1022	Arbitrators, Mediators, and Conciliators	5	40	48	20.0%	15
23-1023	Judges, Magistrate Judges, and Magistrates	5	52	43	-17.3%	2
23-2011	Paralegals and Legal Assistants	3	865	1,044	20.7%	325
23-2091	Court Reporters	3	131	137	4.6%	41
23-2093	Title Examiners, Abstractors, and Searchers	3	255	265	3.9%	68
23-2099	Legal Support Workers, All Other	3	136	130	-4.4%	18
25-1011	Business Teachers, Postsecondary	5	362	404	11.6%	96
25-1021	Computer Science Teachers, Postsecondary	5	173	199	15.0%	53
25-1022	Mathematical Science Teachers, Postsecondary	5	239	255	6.7%	51
25-1031	Architecture Teachers, Postsecondary	5	40	46	15.0%	12
25-1032	Engineering Teachers, Postsecondary	5	198	240	21.2%	71
25-1041	Agricultural Sciences Teachers, Postsecondary	5	27	24	-11.1%	1
25-1042	Biological Science Teachers, Postsecondary	5	279	283	1.4%	46
25-1043	Forestry and Conservation Science Teachers, Postsecondary	5	9	8	-11.1%	0
25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	5	59	63	6.8%	13
25-1052	Chemistry Teachers, Postsecondary	5	117	127	8.5%	28
25-1053	Environmental Science Teachers, Postsecondary	5	21	19	-9.5%	1
25-1054	Physics Teachers, Postsecondary	5	78	84	7.7%	18
25-1061	Anthropology and Archeology Teachers, Postsecondary	5	23	37	60.9%	17
25-1062	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	5	33	32	-3.0%	5
25-1063	Economics Teachers, Postsecondary	5	84	96	14.3%	25
25-1064	Geography Teachers, Postsecondary	5	24	25	4.2%	5
25-1065	Political Science Teachers, Postsecondary	5	80	84	5.0%	16
25-1066	Psychology Teachers, Postsecondary	5	186	200	7.5%	42
25-1067	Sociology Teachers, Postsecondary	5	123	139	13.0%	34
25-1069	Social Sciences Teachers, Postsecondary, All Other	5	33	41	24.2%	12
25-1071	Health Specialties Teachers, Postsecondary	5	523	526	0.6%	82
25-1072	Nursing Instructors and Teachers, Postsecondary	5	261	269	3.1%	47
25-1081	Education Teachers, Postsecondary	5	266	261	-1.9%	36
25-1082	Library Science Teachers, Postsecondary	5	24	27	12.5%	6
25-1111	Criminal Justice and Law Enforcement Teachers, Postsecondary	5	46	53	15.2%	14
25-1112	Law Teachers, Postsecondary	5	42	44	4.8%	9

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-1113	Social Work Teachers, Postsecondary	5	46	40	-13.0%	2
25-1121	Art, Drama, and Music Teachers, Postsecondary	5	373	452	21.2%	135
25-1122	Communications Teachers, Postsecondary	5	116	124	6.9%	25
25-1123	English Language and Literature Teachers, Postsecondary	5	368	376	2.2%	63
25-1124	Foreign Language and Literature Teachers, Postsecondary	5	140	156	11.4%	37
25-1125	History Teachers, Postsecondary	5	115	121	5.2%	23
25-1126	Philosophy and Religion Teachers, Postsecondary	5	108	116	7.4%	24
25-1191	Graduate Teaching Assistants	5	105	111	5.7%	22
25-1192	Home Economics Teachers, Postsecondary	5	8	7	-12.5%	0
25-1193	Recreation and Fitness Studies Teachers, Postsecondary	5	76	71	-6.6%	7
25-1194	Vocational Education Teachers, Postsecondary	3	495	507	2.4%	87
25-1199	Postsecondary Teachers, All Other	5	322	366	13.7%	93
25-2011	Preschool Teachers, Except Special Education	3	1,409	1,897	34.6%	893
25-2012	Kindergarten Teachers, Except Special Education	4	613	576	-6.0%	152
25-2021	Elementary School Teachers, Except Special Education	4	5,957	5,739	-3.7%	1,280
25-2022	Middle School Teachers, Except Special and Career/Technical Education	4	2,696	3,012	11.7%	993
25-2023	Career/Technical Education Teachers, Middle School	4	65	75	15.4%	30
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	4	5,519	5,102	-7.6%	1,463
25-2032	Career/Technical Education Teachers, Secondary School	4	471	393	-16.6%	76
25-2051	Special Education Teachers, Preschool	4	68	81	19.1%	25
25-2052	Special Education Teachers, Kindergarten and Elementary School	4	1,118	1,113	-0.4%	248
25-2053	Special Education Teachers, Middle School	4	391	378	-3.3%	76
25-2054	Special Education Teachers, Secondary School	4	807	802	-0.6%	191
25-2059	Special Education Teachers, All Other	4	28	32	14.3%	8
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	4	143	131	-8.4%	18
25-3021	Self-Enrichment Education Teachers	3	660	656	-0.6%	136
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	3	446	537	20.4%	168
25-3098	Substitute Teachers	3	1,774	1,534	-13.5%	131
25-4011	Archivists	5	29	35	20.7%	13
25-4012	Curators	5	46	63	37.0%	29

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-4013	Museum Technicians and Conservators	4	53	78	47.2%	39
25-4021	Librarians	5	551	513	-6.9%	99
25-4031	Library Technicians	4	323	302	-6.5%	161
25-9011	Audio-Visual and Multimedia Collections Specialists	4	20	20	0.0%	4
25-9021	Farm and Home Management Advisors	5	3	3	0.0%	0
25-9031	Instructional Coordinators	5	406	440	8.4%	68
25-9041	Teacher Assistants	3	4,704	4,832	2.7%	1,297
25-9099	Education, Training, and Library Workers, All Other	4	83	83	0.0%	8
27-1011	Art Directors	4	93	103	10.8%	38
27-1012	Craft Artists	2	11	10	-9.1%	2
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	3	33	28	-15.2%	6
27-1014	Multimedia Artists and Animators	4	39	46	17.9%	17
27-1019	Artists and Related Workers, All Other	4	21	16	-23.8%	0
27-1021	Commercial and Industrial Designers	4	66	53	-19.7%	6
27-1022	Fashion Designers	3	19	17	-10.5%	3
27-1023	Floral Designers	2	210	158	-24.8%	57
27-1024	Graphic Designers	4	706	701	-0.7%	218
27-1025	Interior Designers	4	75	86	14.7%	41
27-1026	Merchandise Displayers and Window Trimmers	3	259	297	14.7%	114
27-1027	Set and Exhibit Designers	5	17	21	23.5%	9
27-2011	Actors	2	65	65	0.0%	25
27-2012	Producers and Directors	4	236	258	9.3%	125
27-2021	Athletes and Sports Competitors	2	71	73	2.8%	29
27-2022	Coaches and Scouts	4	696	643	-7.6%	168
27-2023	Umpires, Referees, and Other Sports Officials	3	32	28	-12.5%	5
27-2031	Dancers	3	6	5	-16.7%	1
27-2032	Choreographers	4	13	16	23.1%	7
27-2041	Music Directors and Composers	3	87	68	-21.8%	12
27-2042	Musicians and Singers	3	55	49	-10.9%	15
27-2099	Entertainers and Performers, Sports and Related Workers, All Other	3	6	6	0.0%	0
27-3011	Radio and Television Announcers	3	137	129	-5.8%	56
27-3012	Public Address System and Other Announcers	2	23	28	21.7%	11
27-3022	Reporters and Correspondents	4	107	76	-29.0%	25
27-3031	Public Relations Specialists	4	952	912	-4.2%	105
27-3041	Editors	4	264	238	-9.8%	59

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
27-3042	Technical Writers	4	137	155	13.1%	61
27-3043	Writers and Authors	4	126	118	-6.3%	24
27-3091	Interpreters and Translators	4	83	89	7.2%	16
27-3099	Media and Communication Workers, All Other	4	27	23	-14.8%	0
27-4011	Audio and Video Equipment Technicians	3	157	165	5.1%	42
27-4012	Broadcast Technicians	3	65	69	6.2%	22
27-4014	Sound Engineering Technicians	3	29	25	-13.8%	3
27-4021	Photographers	3	173	150	-13.3%	28
27-4031	Camera Operators, Television, Video, and Motion Picture	3	49	42	-14.3%	0
27-4032	Film and Video Editors	3	32	27	-15.6%	0
27-4099	Media and Communication Equipment Workers, All Other	3	25	15	-40.0%	0
29-1011	Chiropractors	5	134	199	48.5%	95
29-1021	Dentists, General	5	361	415	15.0%	145
29-1022	Oral and Maxillofacial Surgeons	5	13	14	7.7%	4
29-1023	Orthodontists	5	10	13	30.0%	5
29-1029	Dentists, All Other Specialists	5	13	11	-15.4%	1
29-1031	Dietitians and Nutritionists	5	283	284	0.4%	38
29-1041	Optometrists	5	136	199	46.3%	108
29-1051	Pharmacists	5	1,103	1,143	3.6%	331
29-1061	Anesthesiologists	5	147	168	14.3%	61
29-1062	Family and General Practitioners	5	617	699	13.3%	254
29-1063	Internists, General	5	94	91	-3.2%	20
29-1064	Obstetricians and Gynecologists	5	33	41	24.2%	15
29-1065	Pediatricians, General	5	35	46	31.4%	18
29-1066	Psychiatrists	5	77	70	-9.1%	15
29-1067	Surgeons	5	199	265	33.2%	119
29-1069	Physicians and Surgeons, All Other	5	1,445	1,640	13.5%	574
29-1071	Physician Assistants	5	470	560	19.1%	183
29-1081	Podiatrists	5	53	77	45.3%	45
29-1122	Occupational Therapists	5	569	752	32.2%	272
29-1123	Physical Therapists	5	986	1,350	36.9%	643
29-1124	Radiation Therapists	3	72	66	-8.3%	9
29-1125	Recreational Therapists	4	132	132	0.0%	32
29-1126	Respiratory Therapists	3	470	565	20.2%	163
29-1127	Speech-Language Pathologists	5	449	567	26.3%	185
29-1128	Exercise Physiologists	5	32	39	21.9%	11

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
29-1129	Therapists, All Other	4	36	51	41.7%	19
29-1131	Veterinarians	5	234	294	25.6%	144
29-1141	Registered Nurses	3	11,800	13,658	15.7%	4,248
29-1151	Nurse Anesthetists	5	198	231	16.7%	75
29-1161	Nurse Midwives	5	14	19	35.7%	7
29-1171	Nurse Practitioners	5	358	483	34.9%	190
29-1181	Audiologists	5	55	71	29.1%	29
29-1199	Health Diagnosing and Treating Practitioners, All Other	5	67	54	-19.4%	2
29-2011	Medical and Clinical Laboratory Technologists	4	767	837	9.1%	303
29-2012	Medical and Clinical Laboratory Technicians	3	827	928	12.2%	336
29-2021	Dental Hygienists	3	905	1,162	28.4%	502
29-2031	Cardiovascular Technologists and Technicians	3	272	345	26.8%	113
29-2032	Diagnostic Medical Sonographers	3	222	271	22.1%	80
29-2033	Nuclear Medicine Technologists	3	96	101	5.2%	19
29-2034	Radiologic Technologists	3	902	1,033	14.5%	270
29-2035	Magnetic Resonance Imaging Technologists	3	123	165	34.1%	62
29-2041	Emergency Medical Technicians and Paramedics	3	987	1,185	20.1%	523
29-2051	Dietetic Technicians	2	265	357	34.7%	124
29-2052	Pharmacy Technicians	3	1,272	1,363	7.2%	237
29-2053	Psychiatric Technicians	3	103	111	7.8%	29
29-2054	Respiratory Therapy Technicians	3	46	42	-8.7%	1
29-2055	Surgical Technologists	3	316	393	24.4%	107
29-2056	Veterinary Technologists and Technicians	3	351	445	26.8%	131
29-2057	Ophthalmic Medical Technicians	3	110	157	42.7%	61
29-2061	Licensed Practical and Licensed Vocational Nurses	3	3,414	4,075	19.4%	1,563
29-2071	Medical Records and Health Information Technicians	3	717	874	21.9%	351
29-2081	Opticians, Dispensing	3	293	406	38.6%	213
29-2091	Orthotists and Prosthetists	5	33	46	39.4%	16
29-2092	Hearing Aid Specialists	3	12	13	8.3%	2
29-2099	Health Technologists and Technicians, All Other	3	201	238	18.4%	52
29-9011	Occupational Health and Safety Specialists	4	282	304	7.8%	105
29-9012	Occupational Health and Safety Technicians	3	50	56	12.0%	20
29-9091	Athletic Trainers	5	120	163	35.8%	78
29-9099	Healthcare Practitioners and Technical Workers, All Other	4	87	75	-13.8%	10
31-1011	Home Health Aides	2	4,539	6,134	35.1%	2,843

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
31-1013	Psychiatric Aides	2	115	138	20.0%	52
31-1014	Nursing Assistants	2	6,916	7,850	13.5%	2,330
31-1015	Orderlies	2	245	268	9.4%	71
31-2011	Occupational Therapy Assistants	3	229	314	37.1%	155
31-2012	Occupational Therapy Aides	3	54	95	75.9%	56
31-2021	Physical Therapist Assistants	3	437	640	46.5%	322
31-2022	Physical Therapist Aides	2	216	311	44.0%	146
31-9011	Massage Therapists	3	220	309	40.5%	111
31-9091	Dental Assistants	3	1,249	1,492	19.5%	517
31-9092	Medical Assistants	3	2,254	2,936	30.3%	1,134
31-9093	Medical Equipment Preparers	2	170	195	14.7%	57
31-9094	Medical Transcriptionists	3	358	322	-10.1%	61
31-9095	Pharmacy Aides	2	133	112	-15.8%	11
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	3	205	189	-7.8%	27
31-9097	Phlebotomists	3	432	533	23.4%	201
31-9099	Healthcare Support Workers, All Other	3	164	142	-13.4%	3
33-1011	First-Line Supervisors of Correctional Officers	3	254	260	2.4%	104
33-1012	First-Line Supervisors of Police and Detectives	3	540	612	13.3%	252
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	3	152	172	13.2%	90
33-1099	First-Line Supervisors of Protective Service Workers, All Other	3	208	263	26.4%	119
33-2011	Firefighters	3	940	945	0.5%	290
33-2021	Fire Inspectors and Investigators	3	46	37	-19.6%	7
33-3011	Bailiffs	2	40	30	-25.0%	3
33-3012	Correctional Officers and Jailers	3	3,114	2,811	-9.7%	662
33-3021	Detectives and Criminal Investigators	3	519	518	-0.2%	132
33-3041	Parking Enforcement Workers	2	81	91	12.3%	41
33-3051	Police and Sheriff's Patrol Officers	3	5,181	4,945	-4.6%	1,623
33-3052	Transit and Railroad Police	3	15	12	-20.0%	1
33-9011	Animal Control Workers	2	38	36	-5.3%	8
33-9021	Private Detectives and Investigators	3	150	143	-4.7%	51
33-9031	Gaming Surveillance Officers and Gaming Investigators	2	164	217	32.3%	128
33-9032	Security Guards	2	3,803	4,750	24.9%	2,012
33-9091	Crossing Guards	1	688	639	-7.1%	118
33-9092	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	2	742	798	7.5%	593
33-9093	Transportation Security Screeners	2	244	215	-11.9%	38

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
33-9099	Protective Service Workers, All Other	2	462	548	18.6%	417
35-1011	Chefs and Head Cooks	3	519	553	6.6%	137
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	2	3,132	3,568	13.9%	1,399
35-2011	Cooks, Fast Food	1	938	861	-8.2%	128
35-2012	Cooks, Institution and Cafeteria	2	1,758	1,721	-2.1%	328
35-2014	Cooks, Restaurant	2	4,322	5,648	30.7%	2,330
35-2015	Cooks, Short Order	1	782	920	17.6%	331
35-2021	Food Preparation Workers	1	3,647	3,472	-4.8%	979
35-3011	Bartenders	2	3,329	3,570	7.2%	1,645
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	1	14,046	16,447	17.1%	8,435
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	1	1,237	1,188	-4.0%	749
35-3031	Waiters and Waitresses	1	10,386	11,925	14.8%	7,035
35-3041	Food Servers, Nonrestaurant	1	1,284	1,408	9.7%	538
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	1	1,633	1,727	5.8%	884
35-9021	Dishwashers	1	2,256	2,237	-0.8%	1,075
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	1	1,567	1,710	9.1%	1,409
35-9099	Food Preparation and Serving Related Workers, All Other	1	126	151	19.8%	99
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2	625	701	12.2%	249
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	3	286	322	12.6%	69
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2	8,928	9,660	8.2%	2,779
37-2012	Maids and Housekeeping Cleaners	2	3,797	4,205	10.7%	1,376
37-2019	Building Cleaning Workers, All Other	2	34	34	0.0%	6
37-2021	Pest Control Workers	2	161	221	37.3%	110
37-3011	Landscaping and Groundskeeping Workers	1	3,374	4,066	20.5%	1,675
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	2	52	50	-3.8%	12
37-3013	Tree Trimmers and Pruners	2	277	412	48.7%	230
37-3019	Grounds Maintenance Workers, All Other	2	13	11	-15.4%	1
39-1011	Gaming Supervisors	2	353	454	28.6%	291
39-1012	Slot Supervisors	2	19	25	31.6%	9
39-1021	First-Line Supervisors of Personal Service Workers	3	707	907	28.3%	341
39-2011	Animal Trainers	2	17	15	-11.8%	6
39-2021	Nonfarm Animal Caretakers	1	439	554	26.2%	184

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
39-3011	Gaming Dealers	2	1,531	1,949	27.3%	1,188
39-3012	Gaming and Sports Book Writers and Runners	2	26	33	26.9%	17
39-3019	Gaming Service Workers, All Other	2	22	29	31.8%	7
39-3021	Motion Picture Projectionists	2	29	18	-37.9%	6
39-3031	Ushers, Lobby Attendants, and Ticket Takers	2	319	344	7.8%	223
39-3091	Amusement and Recreation Attendants	1	1,609	1,714	6.5%	1,019
39-3092	Costume Attendants	2	4	4	0.0%	2
39-3093	Locker Room, Coatroom, and Dressing Room Attendants	2	99	96	-3.0%	50
39-3099	Entertainment Attendants and Related Workers, All Other	2	45	43	-4.4%	25
39-4021	Funeral Attendants	2	194	233	20.1%	101
39-4031	Morticians, Undertakers, and Funeral Directors	3	117	154	31.6%	72
39-5011	Barbers	3	62	62	0.0%	20
39-5012	Hairdressers, Hairstylists, and Cosmetologists	3	2,180	2,408	10.5%	844
39-5092	Manicurists and Pedicurists	2	298	326	9.4%	58
39-5093	Shampooers	2	127	129	1.6%	24
39-5094	Skincare Specialists	3	103	113	9.7%	16
39-6011	Baggage Porters and Bellhops	2	94	96	2.1%	38
39-6012	Concierges	3	71	104	46.5%	52
39-7011	Tour Guides and Escorts	3	122	120	-1.6%	63
39-7012	Travel Guides	3	6	6	0.0%	3
39-9011	Childcare Workers	3	2,321	2,263	-2.5%	635
39-9021	Personal Care Aides	2	5,056	7,801	54.3%	3,419
39-9031	Fitness Trainers and Aerobics Instructors	3	1,241	1,446	16.5%	422
39-9032	Recreation Workers	4	1,446	1,787	23.6%	514
39-9041	Residential Advisors	3	688	847	23.1%	504
39-9099	Personal Care and Service Workers, All Other	3	135	108	-20.0%	11
41-1011	First-Line Supervisors of Retail Sales Workers	2	4,449	4,694	5.5%	1,246
41-1012	First-Line Supervisors of Non-Retail Sales Workers	4	857	797	-7.0%	68
41-2011	Cashiers	1	15,819	15,193	-4.0%	6,813
41-2012	Gaming Change Persons and Booth Cashiers	2	93	116	24.7%	105
41-2021	Counter and Rental Clerks	1	1,486	1,633	9.9%	585
41-2022	Parts Salespersons	2	1,127	1,326	17.7%	536
41-2031	Retail Salespersons	2	19,444	20,952	7.8%	8,567
41-3011	Advertising Sales Agents	3	459	401	-12.6%	129
41-3021	Insurance Sales Agents	4	2,379	2,560	7.6%	902
41-3031	Securities, Commodities, and Financial Services Sales Agents	4	774	836	8.0%	278

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
41-3041	Travel Agents	3	170	189	11.2%	107
41-3099	Sales Representatives, Services, All Other	4	2,836	3,685	29.9%	1,663
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	4	843	785	-6.9%	130
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	4	6,286	5,962	-5.2%	1,137
41-9011	Demonstrators and Product Promoters	2	170	175	2.9%	57
41-9012	Models	1	8	10	25.0%	4
41-9021	Real Estate Brokers	4	83	75	-9.6%	4
41-9022	Real Estate Sales Agents	3	552	620	12.3%	160
41-9031	Sales Engineers	4	285	291	2.1%	68
41-9041	Telemarketers	2	660	617	-6.5%	273
41-9091	Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	2	7	5	-28.6%	0
41-9099	Sales and Related Workers, All Other	3	177	181	2.3%	36
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3	5,555	5,853	5.4%	1,628
43-2011	Switchboard Operators, Including Answering Service	2	546	466	-14.7%	113
43-2021	Telephone Operators	2	24	14	-41.7%	0
43-3011	Bill and Account Collectors	2	1,170	1,178	0.7%	401
43-3021	Billing and Posting Clerks	2	2,596	2,931	12.9%	860
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3	6,930	7,656	10.5%	1,411
43-3041	Gaming Cage Workers	2	86	109	26.7%	67
43-3051	Payroll and Timekeeping Clerks	2	820	854	4.1%	231
43-3061	Procurement Clerks	3	336	289	-14.0%	84
43-3071	Tellers	2	2,110	1,877	-11.0%	1,005
43-3099	Financial Clerks, All Other	2	117	141	20.5%	65
43-4011	Brokerage Clerks	3	193	207	7.3%	88
43-4021	Correspondence Clerks	2	84	93	10.7%	36
43-4031	Court, Municipal, and License Clerks	3	461	478	3.7%	95
43-4041	Credit Authorizers, Checkers, and Clerks	3	115	92	-20.0%	1
43-4051	Customer Service Representatives	2	11,397	12,985	13.9%	5,031
43-4061	Eligibility Interviewers, Government Programs	3	1,644	1,516	-7.8%	229
43-4071	File Clerks	2	549	489	-10.9%	100
43-4081	Hotel, Motel, and Resort Desk Clerks	2	1,070	1,110	3.7%	690
43-4111	Interviewers, Except Eligibility and Loan	2	781	867	11.0%	257
43-4121	Library Assistants, Clerical	2	485	449	-7.4%	187
43-4131	Loan Interviewers and Clerks	3	619	709	14.5%	181

<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>
43-4141	New Accounts Clerks	2	99	91	-8.1%	31
43-4151	Order Clerks	2	979	918	-6.2%	288
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	3	704	647	-8.1%	154
43-4171	Receptionists and Information Clerks	2	4,030	4,139	2.7%	1,224
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	2	69	50	-27.5%	1
43-4199	Information and Record Clerks, All Other	2	480	333	-30.6%	1
43-5011	Cargo and Freight Agents	2	139	132	-5.0%	42
43-5021	Couriers and Messengers	2	312	261	-16.3%	21
43-5031	Police, Fire, and Ambulance Dispatchers	2	534	488	-8.6%	124
43-5032	Dispatchers, Except Police, Fire, and Ambulance	2	945	1,120	18.5%	471
43-5041	Meter Readers, Utilities	2	157	140	-10.8%	48
43-5051	Postal Service Clerks	2	361	285	-21.1%	81
43-5052	Postal Service Mail Carriers	2	1,428	1,155	-19.1%	549
43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	2	664	432	-34.9%	19
43-5061	Production, Planning, and Expediting Clerks	3	1,543	1,670	8.2%	561
43-5071	Shipping, Receiving, and Traffic Clerks	2	3,315	3,281	-1.0%	955
43-5081	Stock Clerks and Order Fillers	2	9,108	9,424	3.5%	3,498
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	2	344	397	15.4%	141
43-6011	Executive Secretaries and Executive Administrative Assistants	3	2,348	2,257	-3.9%	288
43-6012	Legal Secretaries	3	929	1,009	8.6%	265
43-6013	Medical Secretaries	3	2,059	2,813	36.6%	994
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	3	10,965	12,480	13.8%	2,940
43-9011	Computer Operators	3	386	364	-5.7%	80
43-9021	Data Entry Keyers	2	1,031	865	-16.1%	194
43-9022	Word Processors and Typists	2	1,138	825	-27.5%	6
43-9031	Desktop Publishers	3	80	70	-12.5%	13
43-9041	Insurance Claims and Policy Processing Clerks	3	1,700	1,648	-3.1%	502
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	2	678	560	-17.4%	143
43-9061	Office Clerks, General	2	13,605	13,480	-0.9%	3,008
43-9071	Office Machine Operators, Except Computer	2	321	262	-18.4%	69
43-9081	Proofreaders and Copy Markers	4	46	40	-13.0%	7
43-9111	Statistical Assistants	4	73	78	6.8%	27
43-9199	Office and Administrative Support Workers, All Other	3	456	534	17.1%	210

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	3	83	87	4.8%	27
45-2011	Agricultural Inspectors	2	70	61	-12.9%	19
45-2041	Graders and Sorters, Agricultural Products	1	35	38	8.6%	11
45-2091	Agricultural Equipment Operators	2	83	103	24.1%	50
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1	380	327	-13.9%	102
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	1	245	265	8.2%	119
45-2099	Agricultural Workers, All Other	1	1	1	0.0%	0
45-4011	Forest and Conservation Workers	3	33	38	15.2%	11
45-4021	Fallers	1	10	4	-60.0%	0
45-4022	Logging Equipment Operators	1	84	109	29.8%	60
45-4023	Log Graders and Scalers	3	8	10	25.0%	3
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	3	1,904	2,255	18.4%	585
47-2011	Boilermakers	3	96	115	19.8%	69
47-2021	Brickmasons and Blockmasons	2	313	412	31.6%	132
47-2022	Stonemasons	3	42	41	-2.4%	1
47-2031	Carpenters	2	3,680	4,171	13.3%	1,032
47-2041	Carpet Installers	2	165	177	7.3%	53
47-2042	Floor Layers, Except Carpet, Wood, and Hard Tiles	2	37	33	-10.8%	5
47-2044	Tile and Marble Setters	2	72	85	18.1%	25
47-2051	Cement Masons and Concrete Finishers	2	576	684	18.8%	176
47-2053	Terrazzo Workers and Finishers	2	8	7	-12.5%	0
47-2061	Construction Laborers	2	3,524	4,423	25.5%	1,752
47-2071	Paving, Surfacing, and Tamping Equipment Operators	2	194	202	4.1%	49
47-2072	Pile-Driver Operators	2	3	3	0.0%	1
47-2073	Operating Engineers and Other Construction Equipment Operators	2	2,178	2,236	2.7%	689
47-2081	Drywall and Ceiling Tile Installers	2	149	136	-8.7%	17
47-2082	Tapers	2	44	47	6.8%	9
47-2111	Electricians	3	2,437	2,882	18.3%	1,109
47-2121	Glaziers	2	145	164	13.1%	68
47-2131	Insulation Workers, Floor, Ceiling, and Wall	2	57	68	19.3%	22
47-2132	Insulation Workers, Mechanical	2	47	57	21.3%	17
47-2141	Painters, Construction and Maintenance	2	512	575	12.3%	170
47-2142	Paperhangers	2	14	11	-21.4%	0
47-2151	Pipelayers	2	138	135	-2.2%	32

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-2152	Plumbers, Pipefitters, and Steamfitters	3	1,624	1,714	5.5%	386
47-2161	Plasterers and Stucco Masons	1	38	45	18.4%	8
47-2171	Reinforcing Iron and Rebar Workers	2	25	32	28.0%	12
47-2181	Roofers	2	431	470	9.0%	205
47-2211	Sheet Metal Workers	2	636	634	-0.3%	135
47-2221	Structural Iron and Steel Workers	2	201	224	11.4%	99
47-3011	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	2	100	119	19.0%	31
47-3012	Helpers--Carpenters	2	104	122	17.3%	32
47-3013	Helpers--Electricians	2	167	237	41.9%	102
47-3014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	1	17	17	0.0%	4
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	2	134	131	-2.2%	18
47-3016	Helpers--Roofers	2	40	51	27.5%	20
47-3019	Helpers, Construction Trades, All Other	2	37	40	8.1%	6
47-4011	Construction and Building Inspectors	3	659	864	31.1%	386
47-4021	Elevator Installers and Repairers	3	43	38	-11.6%	10
47-4031	Fence Erectors	2	96	90	-6.3%	21
47-4041	Hazardous Materials Removal Workers	3	252	267	6.0%	104
47-4051	Highway Maintenance Workers	2	1,963	1,866	-4.9%	282
47-4061	Rail-Track Laying and Maintenance Equipment Operators	2	20	28	40.0%	12
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	1	136	133	-2.2%	40
47-4099	Construction and Related Workers, All Other	3	46	41	-10.9%	1
47-5011	Derrick Operators, Oil and Gas	1	3	4	33.3%	3
47-5012	Rotary Drill Operators, Oil and Gas	2	12	17	41.7%	14
47-5013	Service Unit Operators, Oil, Gas, and Mining	2	17	22	29.4%	16
47-5021	Earth Drillers, Except Oil and Gas	2	109	152	39.4%	92
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	2	30	33	10.0%	11
47-5041	Continuous Mining Machine Operators	1	16	18	12.5%	10
47-5042	Mine Cutting and Channeling Machine Operators	2	23	23	0.0%	10
47-5049	Mining Machine Operators, All Other	2	1	1	0.0%	0
47-5051	Rock Splitters, Quarry	1	76	91	19.7%	44
47-5061	Roof Bolters, Mining	2	3	3	0.0%	1
47-5071	Roustabouts, Oil and Gas	1	45	69	53.3%	45
47-5081	Helpers--Extraction Workers	2	38	45	18.4%	26
47-5099	Extraction Workers, All Other	2	1	2	100.0%	1

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	3	1,804	2,042	13.2%	751
49-2011	Computer, Automated Teller, and Office Machine Repairers	3	610	669	9.7%	252
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	3	32	29	-9.4%	1
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	3	487	477	-2.1%	114
49-2091	Avionics Technicians	3	44	54	22.7%	24
49-2092	Electric Motor, Power Tool, and Related Repairers	3	85	82	-3.5%	22
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	3	31	29	-6.5%	4
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	3	589	523	-11.2%	99
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	3	102	100	-2.0%	27
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	3	19	22	15.8%	7
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	3	114	123	7.9%	65
49-2098	Security and Fire Alarm Systems Installers	3	242	307	26.9%	125
49-3011	Aircraft Mechanics and Service Technicians	3	109	105	-3.7%	42
49-3021	Automotive Body and Related Repairers	2	750	888	18.4%	334
49-3022	Automotive Glass Installers and Repairers	2	98	111	13.3%	45
49-3023	Automotive Service Technicians and Mechanics	3	3,747	4,137	10.4%	1,479
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	3	1,696	2,143	26.4%	878
49-3041	Farm Equipment Mechanics and Service Technicians	3	126	109	-13.5%	31
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	3	432	481	11.3%	198
49-3043	Rail Car Repairers	2	69	75	8.7%	35
49-3051	Motorboat Mechanics and Service Technicians	3	29	30	3.4%	8
49-3052	Motorcycle Mechanics	3	123	157	27.6%	77
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	2	165	205	24.2%	83
49-3091	Bicycle Repairers	2	43	36	-16.3%	13
49-3092	Recreational Vehicle Service Technicians	2	43	41	-4.7%	16
49-3093	Tire Repairers and Changers	2	299	283	-5.4%	104
49-9011	Mechanical Door Repairers	2	49	49	0.0%	19
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	3	89	100	12.4%	44
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3	1,468	1,670	13.8%	651
49-9031	Home Appliance Repairers	3	143	129	-9.8%	49

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
49-9041	Industrial Machinery Mechanics	3	1,886	2,235	18.5%	965
49-9043	Maintenance Workers, Machinery	3	512	579	13.1%	158
49-9044	Millwrights	3	158	201	27.2%	82
49-9045	Refractory Materials Repairers, Except Brickmasons	2	17	19	11.8%	9
49-9051	Electrical Power-Line Installers and Repairers	3	485	588	21.2%	312
49-9052	Telecommunications Line Installers and Repairers	2	707	762	7.8%	337
49-9062	Medical Equipment Repairers	3	361	498	38.0%	264
49-9063	Musical Instrument Repairers and Tuners	3	46	39	-15.2%	12
49-9064	Watch Repairers	3	7	7	0.0%	2
49-9069	Precision Instrument and Equipment Repairers, All Other	3	54	47	-13.0%	10
49-9071	Maintenance and Repair Workers, General	3	6,415	6,750	5.2%	1,748
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	2	215	205	-4.7%	49
49-9092	Commercial Divers	3	39	36	-7.7%	13
49-9094	Locksmiths and Safe Repairers	2	31	30	-3.2%	9
49-9095	Manufactured Building and Mobile Home Installers	2	20	24	20.0%	13
49-9096	Riggers	2	40	52	30.0%	22
49-9098	Helpers--Installation, Maintenance, and Repair Workers	2	568	609	7.2%	221
49-9099	Installation, Maintenance, and Repair Workers, All Other	2	372	465	25.0%	151
51-1011	First-Line Supervisors of Production and Operating Workers	2	3,209	3,295	2.7%	731
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	210	263	25.2%	121
51-2021	Coil Winders, Tapers, and Finishers	2	75	62	-17.3%	3
51-2022	Electrical and Electronic Equipment Assemblers	2	1,049	913	-13.0%	119
51-2023	Electromechanical Equipment Assemblers	2	320	251	-21.6%	12
51-2031	Engine and Other Machine Assemblers	2	574	507	-11.7%	149
51-2041	Structural Metal Fabricators and Fitters	3	727	782	7.6%	414
51-2091	Fiberglass Laminators and Fabricators	2	35	36	2.9%	12
51-2092	Team Assemblers	2	5,018	4,938	-1.6%	1,084
51-2099	Assemblers and Fabricators, All Other	2	767	1,105	44.1%	479
51-3011	Bakers	2	1,137	1,161	2.1%	386
51-3021	Butchers and Meat Cutters	2	675	685	1.5%	209
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	1	225	233	3.6%	73
51-3023	Slaughterers and Meat Packers	1	278	320	15.1%	145
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	2	132	144	9.1%	58

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-3092	Food Batchmakers	2	1,408	1,479	5.0%	665
51-3093	Food Cooking Machine Operators and Tenders	2	473	549	16.1%	232
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3	1,052	1,315	25.0%	629
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	3	112	113	0.9%	36
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	2	556	563	1.3%	208
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	2	105	100	-4.8%	33
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	2	198	182	-8.1%	48
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	1,047	1,057	1.0%	212
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	92	64	-30.4%	7
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	598	606	1.3%	240
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	292	247	-15.4%	62
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	3	165	179	8.5%	72
51-4041	Machinists	3	2,476	2,763	11.6%	1,016
51-4051	Metal-Refining Furnace Operators and Tenders	2	100	90	-10.0%	20
51-4052	Pourers and Casters, Metal	2	75	73	-2.7%	27
51-4061	Model Makers, Metal and Plastic	3	32	31	-3.1%	7
51-4062	Patternmakers, Metal and Plastic	3	31	33	6.5%	14
51-4071	Foundry Mold and Coremakers	2	47	42	-10.6%	10
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2	590	517	-12.4%	76
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	1,025	1,115	8.8%	451
51-4111	Tool and Die Makers	3	515	530	2.9%	111
51-4121	Welders, Cutters, Solderers, and Brazers	3	2,045	2,401	17.4%	1,021
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	2	416	419	0.7%	166
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	2	129	107	-17.1%	17
51-4192	Layout Workers, Metal and Plastic	2	23	25	8.7%	8
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	2	242	216	-10.7%	58
51-4194	Tool Grinders, Filers, and Sharpeners	2	55	44	-20.0%	6
51-4199	Metal Workers and Plastic Workers, All Other	2	171	222	29.8%	89

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-5111	Prepress Technicians and Workers	3	300	225	-25.0%	55
51-5112	Printing Press Operators	3	1,394	1,210	-13.2%	272
51-5113	Print Binding and Finishing Workers	2	527	481	-8.7%	138
51-6011	Laundry and Dry-Cleaning Workers	1	734	829	12.9%	357
51-6021	Pressers, Textile, Garment, and Related Materials	1	107	122	14.0%	39
51-6031	Sewing Machine Operators	1	316	235	-25.6%	69
51-6041	Shoe and Leather Workers and Repairers	2	67	78	16.4%	68
51-6051	Sewers, Hand	2	285	261	-8.4%	23
51-6052	Tailors, Dressmakers, and Custom Sewers	3	79	90	13.9%	31
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders	2	28	24	-14.3%	18
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	2	33	24	-27.3%	11
51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	2	30	24	-20.0%	15
51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2	42	24	-42.9%	7
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	2	34	26	-23.5%	5
51-6092	Fabric and Apparel Patternmakers	3	6	3	-50.0%	0
51-6093	Upholsterers	2	82	89	8.5%	49
51-6099	Textile, Apparel, and Furnishings Workers, All Other	2	67	65	-3.0%	10
51-7011	Cabinetmakers and Bench Carpenters	2	496	531	7.1%	241
51-7021	Furniture Finishers	1	112	138	23.2%	90
51-7031	Model Makers, Wood	3	10	10	0.0%	2
51-7032	Patternmakers, Wood	3	13	15	15.4%	4
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	2	294	396	34.7%	236
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	2	416	560	34.6%	239
51-7099	Woodworkers, All Other	2	8	7	-12.5%	0
51-8011	Nuclear Power Reactor Operators	3	43	45	4.7%	19
51-8012	Power Distributors and Dispatchers	3	85	92	8.2%	40
51-8013	Power Plant Operators	2	253	217	-14.2%	83
51-8021	Stationary Engineers and Boiler Operators	3	257	281	9.3%	135
51-8031	Water and Wastewater Treatment Plant and System Operators	3	719	706	-1.8%	289
51-8091	Chemical Plant and System Operators	2	72	70	-2.8%	42
51-8092	Gas Plant Operators	3	73	77	5.5%	44
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	2	69	72	4.3%	40

<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>
51-8099	Plant and System Operators, All Other	2	51	49	-3.9%	20
51-9011	Chemical Equipment Operators and Tenders	2	184	189	2.7%	104
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	2	165	165	0.0%	76
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	2	207	236	14.0%	113
51-9022	Grinding and Polishing Workers, Hand	1	100	106	6.0%	43
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2	736	826	12.2%	376
51-9031	Cutters and Trimmers, Hand	2	29	23	-20.7%	2
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	2	371	329	-11.3%	61
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	2	457	471	3.1%	195
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	2	90	85	-5.6%	34
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2	2,414	2,495	3.4%	708
51-9071	Jewelers and Precious Stone and Metal Workers	3	48	37	-22.9%	3
51-9081	Dental Laboratory Technicians	2	139	153	10.1%	89
51-9082	Medical Appliance Technicians	3	129	120	-7.0%	56
51-9083	Ophthalmic Laboratory Technicians	2	115	109	-5.2%	45
51-9111	Packaging and Filling Machine Operators and Tenders	2	2,422	2,226	-8.1%	545
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	2	507	596	17.6%	221
51-9122	Painters, Transportation Equipment	2	144	149	3.5%	47
51-9123	Painting, Coating, and Decorating Workers	2	69	66	-4.3%	17
51-9141	Semiconductor Processors	2	75	64	-14.7%	23
51-9151	Photographic Process Workers and Processing Machine Operators	2	105	74	-29.5%	12
51-9191	Adhesive Bonding Machine Operators and Tenders	2	74	80	8.1%	30
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	2	115	130	13.0%	48
51-9193	Cooling and Freezing Equipment Operators and Tenders	2	112	103	-8.0%	31
51-9194	Etchers and Engravers	2	40	37	-7.5%	10
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	2	278	291	4.7%	140
51-9196	Paper Goods Machine Setters, Operators, and Tenders	2	1,386	1,430	3.2%	367
51-9197	Tire Builders	2	72	84	16.7%	41
51-9198	Helpers--Production Workers	2	3,335	3,644	9.3%	1,159
51-9199	Production Workers, All Other	2	602	709	17.8%	258

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
53-1011	Aircraft Cargo Handling Supervisors	2	33	32	-3.0%	8
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	2	1,004	1,128	12.4%	440
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	2	1,127	1,308	16.1%	517
53-2012	Commercial Pilots	3	30	34	13.3%	16
53-2021	Air Traffic Controllers	3	83	77	-7.2%	36
53-2022	Airfield Operations Specialists	3	12	10	-16.7%	4
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	2	124	191	54.0%	93
53-3021	Bus Drivers, Transit and Intercity	2	238	239	0.4%	67
53-3022	Bus Drivers, School or Special Client	2	3,432	3,972	15.7%	1,407
53-3031	Driver/Sales Workers	2	2,059	2,177	5.7%	512
53-3032	Heavy and Tractor-Trailer Truck Drivers	2	12,251	14,570	18.9%	4,898
53-3033	Light Truck or Delivery Services Drivers	2	4,551	4,295	-5.6%	608
53-3041	Taxi Drivers and Chauffeurs	1	676	772	14.2%	232
53-3099	Motor Vehicle Operators, All Other	2	135	163	20.7%	63
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	2	18	19	5.6%	7
53-5011	Sailors and Marine Oilers	2	29	38	31.0%	27
53-5021	Captains, Mates, and Pilots of Water Vessels	3	28	36	28.6%	26
53-6011	Bridge and Lock Tenders	1	23	12	-47.8%	0
53-6021	Parking Lot Attendants	2	470	643	36.8%	447
53-6031	Automotive and Watercraft Service Attendants	1	256	272	6.3%	98
53-6041	Traffic Technicians	3	12	13	8.3%	6
53-6051	Transportation Inspectors	3	49	42	-14.3%	11
53-6061	Transportation Attendants, Except Flight Attendants	2	156	143	-8.3%	27
53-6099	Transportation Workers, All Other	2	52	58	11.5%	29
53-7011	Conveyor Operators and Tenders	2	207	194	-6.3%	64
53-7021	Crane and Tower Operators	3	172	204	18.6%	100
53-7032	Excavating and Loading Machine and Dragline Operators	2	155	192	23.9%	61
53-7033	Loading Machine Operators, Underground Mining	2	1	1	0.0%	0
53-7051	Industrial Truck and Tractor Operators	2	4,692	5,638	20.2%	2,485
53-7061	Cleaners of Vehicles and Equipment	2	1,261	1,428	13.2%	577
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2	16,168	20,317	25.7%	9,975
53-7063	Machine Feeders and Offbearers	2	718	722	0.6%	188
53-7064	Packers and Packagers, Hand	2	5,340	6,188	15.9%	2,531
53-7071	Gas Compressor and Gas Pumping Station Operators	2	30	34	13.3%	22

<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>
53-7072	Pump Operators, Except Wellhead Pumpers	2	10	11	10.0%	7
53-7073	Wellhead Pumpers	2	6	6	0.0%	4
53-7081	Refuse and Recyclable Material Collectors	2	590	652	10.5%	252
53-7111	Mine Shuttle Car Operators	2	1	1	0.0%	0
53-7121	Tank Car, Truck, and Ship Loaders	2	63	63	0.0%	25
53-7199	Material Moving Workers, All Other	2	49	68	38.8%	34

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

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# 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.

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