

PENNSYLVANIA'S STATE SYSTEM OF HIGHER EDUCATION



Northwest Pennsylvania's
**WORKFORCE
CHARACTERISTICS
TECHNICAL REPORT**

A report for Pennsylvania's
State System of Higher Education

2016



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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 U.S., 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: U.S. Department of Education

USDOL: U.S. 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.¹ 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.”² Analysis and understanding of the economy and workforce the State System supports, as well as future demands for talent, advances the State System’s mission and philosophy—a key component of this report. Further, it enables effective and targeted strategies and decision-making, grounded in data-driven evidence.

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

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

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

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

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

1.1 Goal of Report of the Workforce Characteristics Report

The first phase of the State System’s Gap Analysis Project was creating the context for the supply/demand analysis. This was possible with a Georgetown University-State System collaboration, which resulted in the production of the report “Degrees of Value: College Majors and the Pennsylvania State System’s Contribution to the Workforce”.³ Georgetown University’s Center on Education and the Workforce is a premier world-class independent, nonprofit research and policy institute that studies the link between education, career qualifications, and workforce demands. In their report, Georgetown’s Center on Education and the Workforce (CEW) provides contextual data on Baccalaureate-level education output in order to support and inform efforts associated with the State System’s Gap Analysis Project. This report is similar to previous national level work from CEW that examines earnings, employment, and occupational outcomes by major for bachelor’s degree (BD) holders. In this report, customized to the State System and Pennsylvania, CEW delves into the increasing importance of BD holders in the Pennsylvania workforce, the critical role of the State System as part of the state’s BD sector, and how earnings and employment vary by field of study and occupational area.

The 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 used for the 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

³ Georgetown’s Center on Education and the Workforce analysis of degree production in the Pennsylvania Baccalaureate Sector.

Model), and Economic Modeling Specialists International (EMSI). Ultimately, the reports generated from this project will assist the State System universities with strategic engagement, program development and evaluation, student engagement, and marketing.

The intentions of this Workforce Characteristics Report are fourfold.

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

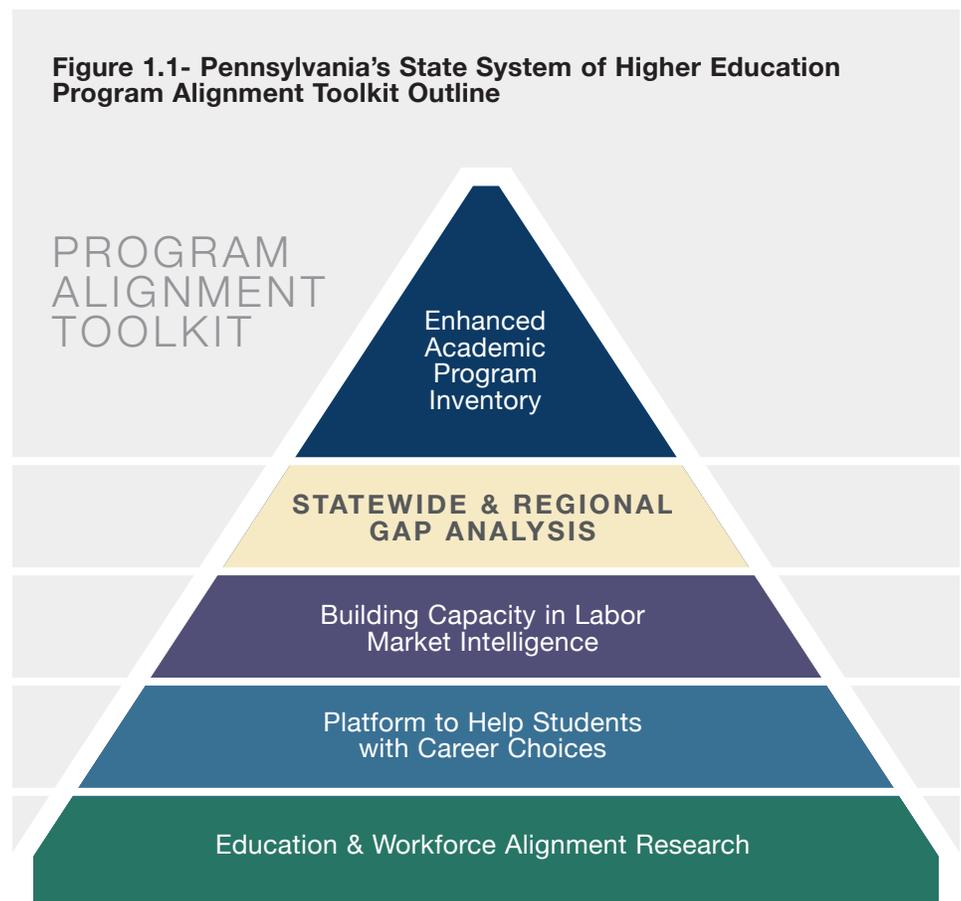
While the main body of this report provides a high-level summary, the Appendices provide an abundance of information for those seeking additional detail. Appendix A provides a map of the state sub-region boundaries along with PREP and WIA boundaries. Appendix B provides detail on the employment and enrollment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

1.2 Pennsylvania's State System of Higher Education Gap Analysis Project

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

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

information, developed in response to the State System’s Strategic Plan “Rising to the Challenge 2020.” The Program Alignment Toolkit helps provide multiple perspectives of how higher education can connect to the state’s economy and lead to career success for students. A key component of this toolkit is the development of a statewide and regional gap analysis. Other high impact strategies that are a part of the State System’s Program Alignment Toolkit are presented in the figure below. 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.



The next section provides a high-level overview of the State System and its fourteen universities in terms of location, enrollment, and bachelor’s degree output.

2. PENNSYLVANIA'S STATE SYSTEM OF HIGHER EDUCATION

During the fall of 2013, total enrollment in State System universities was 112,225—inclusive of resident and non-resident enrollment. Figure 2.1 depicts the geographic location of each university across Pennsylvania, while Table 2.1 shows the enrollment by university.

Figure 2.1 – Locations of Pennsylvania's State System of Higher Education Universities



Source: U.S. Department of the Interior – U.S. Geological Survey: Colleges and Universities (published 09-30-2010)

Table 2.1 – Pennsylvania's State System of Higher Education Enrollment by University

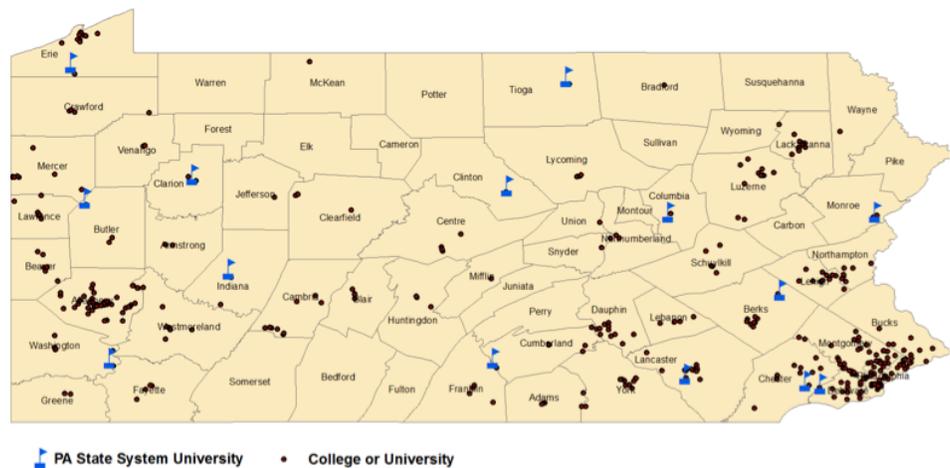
University	Fall 2013 Enrollment
Bloomsburg University of Pennsylvania	10,127
California University of Pennsylvania	8,243
Cheyney University of Pennsylvania	1,212
Clarion University of Pennsylvania	6,080
East Stroudsburg University of Pennsylvania	6,778
Edinboro University of Pennsylvania	7,098
Indiana University of Pennsylvania	14,925
Kutztown University of Pennsylvania	9,513
Lock Haven University	5,260
Mansfield University of Pennsylvania	2,970
Millersville University of Pennsylvania	8,279
Shippensburg University of Pennsylvania	7,548
Slippery Rock University of Pennsylvania	8,347
West Chester University of Pennsylvania	15,845

Source: National Center for Education Statistics' Integrated Postsecondary Education Data System (IPEDS)

2.1 Universe of Postsecondary Degree Granting Institutions in Pennsylvania

There are approximately 400 postsecondary institutions in Pennsylvania with 394 reporting their enrollment data in 2013. Figure 2.2 illustrates the locations of colleges and universities in 2010—latest latitude and longitude data available—for institutions that report to IPEDS. Latest data indicate these 394 institutions had 814,120 students enrolled. This means approximately one in eight postsecondary enrollees in Pennsylvania institutions are from the fourteen State System universities.⁴ Furthermore, enrollment in the 166 four-year institutions during this time period was 618,738 indicating that one in six four-year enrollees came from the State System universities.

Figure 2.2 – Locations of Pennsylvania’s Colleges and Universities



Source: U.S. Department of the Interior – U.S. Geological Survey: Colleges and Universities (published 09-30-2010)

2.2 The State System’s Bachelor’s Degree Output

In response to “Rising to the Challenge 2020” strategic plan, the State System formed a unique partnership with Georgetown’s Center on Education and the Workforce (CEW) to produce a report on the statewide bachelor’s degree output from the State System universities and contextualize the output within Pennsylvania’s baccalaureate sector. The forthcoming report provides key data and analysis on the State System’s contribution to Pennsylvania’s production of

⁴ Source: National Center for Education Statistics’ [NCES], Integrated Postsecondary Education Data System [IPEDS]

bachelor's degrees, the top fields of study among completers, recent trends in the bachelor's degree population and workforce in the state, and occupational areas of employment among incumbent Pennsylvania workers with these undergraduate majors. High-level key findings from the report indicate:⁵

- In recent years, bachelor's degree-holders constituted a growing share of Pennsylvania's population and workforce. About one-out-of-five bachelor's degrees awarded in Pennsylvania were from State System institutions, and the most common State System major groups were STEM-H, Business, Education, Humanities & Liberal Arts, and Social Sciences.
- Pennsylvania bachelor's degree-holders in STEM, health, and business majors had relatively high earnings, while education, social science, and humanities and liberal arts majors typically made less than college-educated workers in the state overall.
- Workers with a bachelor's degree or better had the highest median earnings in the southeast region and the lowest in the northwest region, but the magnitude of these geographic differences varied by field of study.
- Pennsylvania workers with a bachelor's degree in education or health had tighter relationships with a single related occupational area, while humanities and liberal arts and social sciences majors had more varied occupational destinations. Business majors fell somewhere in between.

With an understanding of where institutions are located and a high-level view of degree production, the next section evaluates where State System learners originate. This provides additional geographic perspective of enrollment and workforce size.

⁵ Key findings are extracted from a forthcoming report from Georgetown University's Center on Education and the Workforce's State System Report.

3. IDENTIFYING THE STATE SYSTEM'S SUB-REGIONS

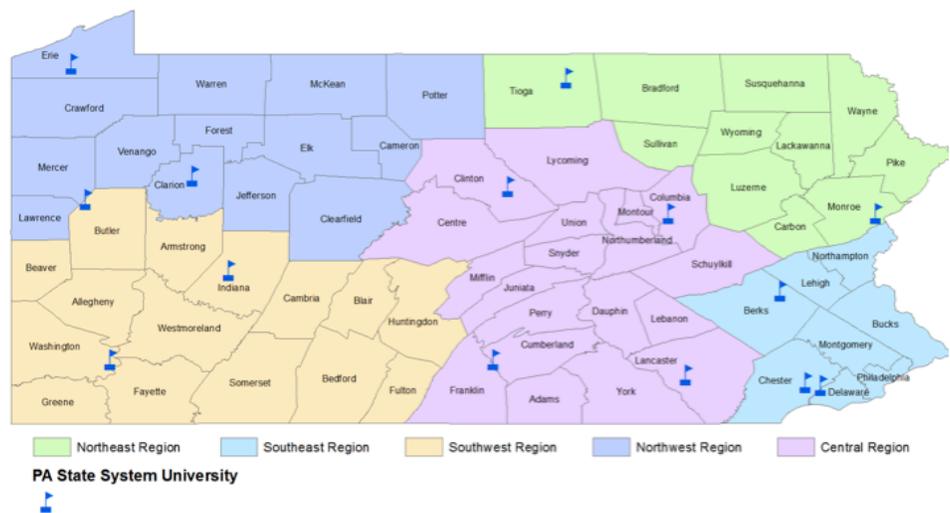
Pennsylvania's economically diverse geography supports the need for a more regionalized perspective of economic and workforce characteristics. The State System conducted original research to identify five broad sub-regions as well as fourteen university-specific workforce regions. It is important to note that these five regions align with Pennsylvania's Partnerships for Regional Economic Performance (PREP). The PREP regions are Pennsylvania's network of businesses as defined by the Department of Community and Economic Development (DCED). Aligning the State System's five regions to the PREP regions reflects a broader goal of the State System to connect higher education with economic development in the commonwealth.

The only exception to the PREP region boundary is Schuylkill County, which was allocated to the Central sub-region. This allocation balances enrollment between regions, although learners from Schuylkill were nearly evenly dispersed between the Central, Northeast and Southeast sub-regions.

Figure 3.1 illustrates the geographic areas for the sub-regions as well as the locations of the State System universities. Table 3.1 provides summary data of the population and learner enrollment for each respective sub-region.

For PREP geographic boundaries please see Appendix A.

Figure 3.1 – Pennsylvania State System Sub-regions



Source: Oxford Economics mapping

The counties in Northwest Pennsylvania's region are listed below:

Cameron	Erie	Mercer
Clarion	Forest	Potter
Clearfield	Jefferson	Venango
Crawford	Lawrence	Warren
Elk	McKean	

Table 3.1 – Pennsylvania Population and State System Learner Enrollment by Sub-region

Pennsylvania Region	Number of Counties	Regional Population	Regional Population Share	PA Resident State System Learners	Regional State System Learner Share
Northwest	14	941,584	7.4%	11,504	11.7%
Southwest	15	2,943,544	23.1%	21,741	22.1%
Central	19	2,690,436	21.1%	22,813	23.2%
Northeast	11	1,061,613	8.3%	8,202	8.4%
Southeast	8	5,094,204	40.0%	33,940	34.6%
Pennsylvania Total	67	12,731,381	100.0%	98,200	100.0%

Source: American Community Survey 2009-2013 five-year file; Pennsylvania's State System of Higher Education Research Office

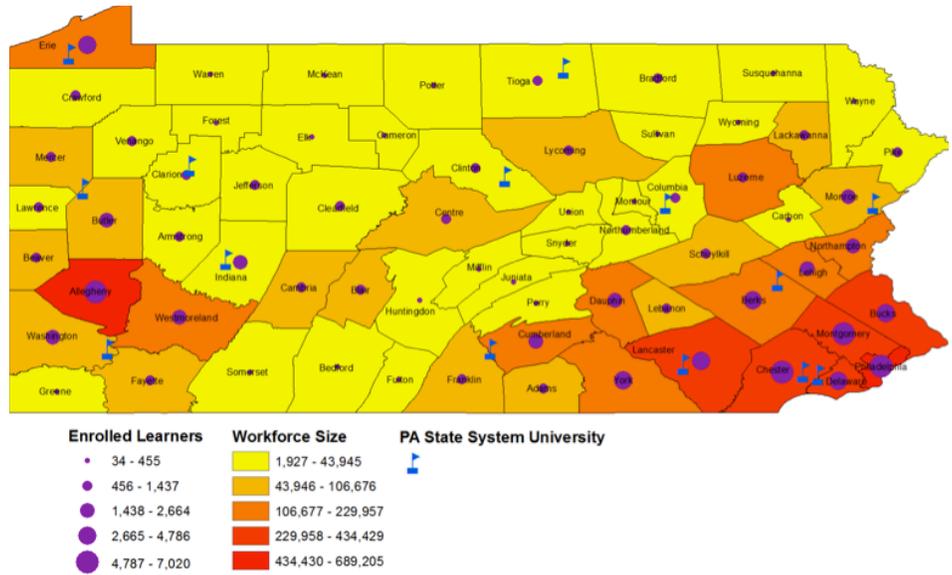
3.1 Pennsylvania's Sub-regions and State System Learner Origin

This section provides an overview of where State System learners come from within Pennsylvania and the region. 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% are Pennsylvania residents.⁶ The Commonwealth's urban and rural economic geography is very diverse, comprising of two distinct urban centers on the Western and Southeastern portions of the state, as well as key cities located throughout.

The map below (Figure 3.2) illustrates workforce size and the origin of Pennsylvania resident learners enrolled in Pennsylvania's State System of Higher Education.

⁶ Based on Fall 2013 enrollment.

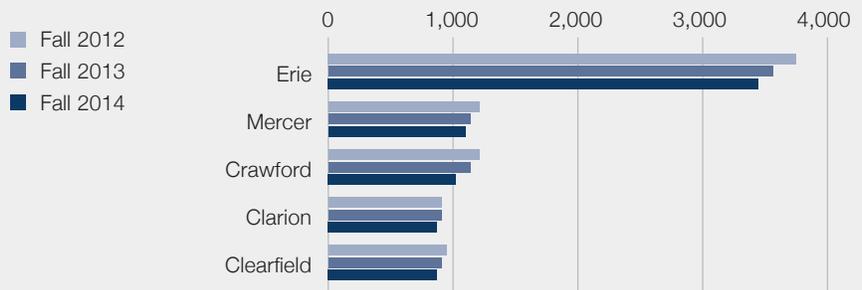
Figure 3.2 – State System Learner Origin and Workforce Size by County



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

State System learners, originally from Northwest Pennsylvania, come from every county in the region. State system learner enrollment from the region accounts for about 12% of total resident enrollment in the State System. The top counties in the region include Erie, Mercer, Crawford, Clarion, and Clearfield. Figure 3.3 highlights the Northwest Pennsylvania resident fall enrollment numbers between 2012 and 2014 for the top 5 counties. Table 3.2 provides enrollment detail for all counties in Northwest Pennsylvania.

Figure 3.3 – Northwest Pennsylvania State System Learner Enrollment by County



Source: Pennsylvania's State System of Higher Education

Table 3.2 Northwest Pennsylvania State System Learner Enrollment by County

County	Fall 2012	Fall 2013	Fall 2014
Cameron	77	81	65
Clarion	918	901	883
Clearfield	959	921	881
Crawford	1,230	1,127	1,024
Elk	516	459	398
Erie	3,758	3,587	3,469
Forest	62	57	57
Jefferson	701	629	587
Lawrence	830	841	810
McKean	299	271	277
Mercer	1,226	1,149	1,095
Potter	149	148	140
Venango	1,014	958	840
Warren	390	347	324
Total	12,129	11,476	10,850

Source: Pennsylvania's State System of Higher Education

The next section of this report describes key economic and workforce data and contextualizes Northwest Pennsylvania's economic environment.

4. OVERVIEW OF THE LABOR MARKET OF NORTHWEST PENNSYLVANIA

The following sections outline a brief analysis of economic, workforce, demographic and socio-economic information. The purpose of providing this analysis is to gain better insight into how Northwest Pennsylvania’s workforce 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 Northwest Pennsylvania and the state.

Table 4.1 – Summary of Northwest Pennsylvania and Pennsylvania Workforce Characteristics

Workforce Characteristic	Northwest Pennsylvania	Pennsylvania	Source
Population	950,000	12.7 million	2009-2013 American Community Survey 5-Year Estimates
Employed	372,000	5.6 million	2014 BLS Quarterly Census of Employment and Wages
Unemployed	26,800	370,000	2014 BLS Local Area Unemployment Statistics
Unemployment Rate	6.10%	5.80%	2014 BLS Local Area Unemployment Statistics
Poverty Rate	16.00%	13.70%	2013 Census Small Area Income and Poverty Estimates
Business Establishments	24,000	347,000	2014 BLS Quarterly Census of Employment and Wages
Educational Attainment (% of 25+ Population with Bachelor's or Higher)	19.30%	27.40%	2009-2013 American Community Survey 5-Year Estimates
Bachelor's or Higher Completions	8,600	137,000	Integrated Postsecondary Education Data System 3-Year Average AY2010-11 to AY2012-13
Projected Employment in 2024	401,000	6.2 million	Oxford Economics Projections 2014-2024

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

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

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

- Top Skilled Occupations: largest skilled employed occupations and new and replacement job demand.
- Key Skilled High Demand Occupations: five key skilled occupations and new and 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 profiles for five key skilled high demand occupations.

3. Demographics and Socio-economic Indicators – an evaluation of the demographic profile of Northwest Pennsylvania’s population. 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 About Employment Projections

Currently, the industry and occupation employment projections available from Pennsylvania’s Department of Labor and Industry reflect the time period from 2012–2022 and therefore do not incorporate 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 trends that further reflects the economic recovery. See Appendix C for 4-digit industry projections and Appendix D for 5-digit occupation projections.

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

The next section provides an analysis of industries in Northwest Pennsylvania with a focus on the post-recession recovery period 2009 to 2014, as well as top employers in the region.

5. INDUSTRIES IN NORTHWEST PENNSYLVANIA

Over the five years of 2009 to 2014, the Northwest Pennsylvania economy experienced significant growth in the manufacturing and natural resources and mining sectors, while information and government saw a reduction in jobs. Sectors such as manufacturing, construction, and natural resources and mining added a combined 5,800 new jobs between 2009 and 2014. Only two sectors experienced job losses in the region, with the largest job losses within government. Overall, the economy added about 6,400 jobs during this 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 percentage change.

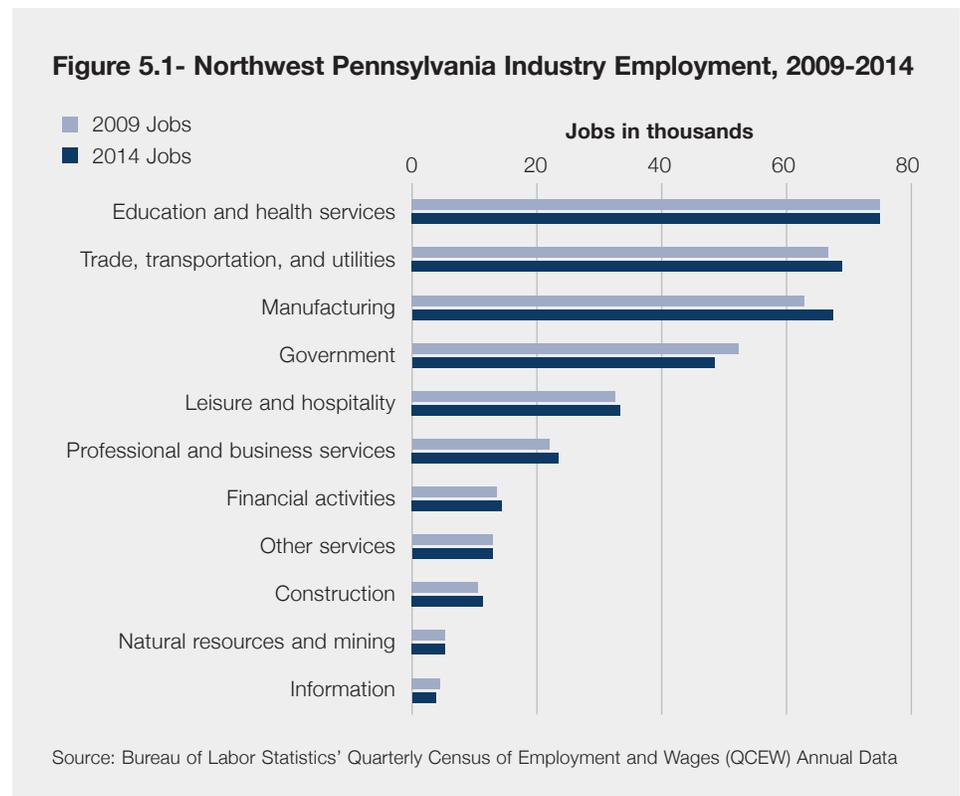


Table 5.1 – Northwest Pennsylvania Industry Employment, 2009-2014

Industry Employment	2009 Jobs	2014 Jobs	Absolute Change 09-14	% Change 09-14
Total, all industries	359,706	366,100	6,394	2%
Education and health services	75,214	75,544	330	0%
Trade, transportation, and utilities	67,114	68,884	1,770	3%
Manufacturing	63,271	67,750	4,479	7%
Government	52,096	48,433	-3,663	-7%
Leisure and hospitality	32,435	33,747	1,312	4%
Professional and business services	22,255	23,381	1,126	5%
Financial activities	13,993	14,156	163	1%
Other services	12,641	12,883	242	2%
Construction	10,793	11,441	648	6%
Natural resources and mining	4,984	5,665	681	14%
Information	4,472	3,478	-994	-22%

Source: Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW) Annual Data

Appendix C contains additional data on employment in detailed industry sectors as well as location quotients.

5.1 Top Employers in Northwest Pennsylvania

Amongst the top employers within Northwest Pennsylvania, education and health service establishments comprise a majority of the list. Other top employers in the region include federal, state, and local government as several manufacturing and mining establishments.

Major employers in the region are listed in Table 5.2 on the next page.

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

Table 5.2: Top Employers in Northwest Pennsylvania

Firm Name
Blair Payroll
Bradford Regional Medical Center
Charles Cole Memorial Hospital
Clarion Hospital
Cornell Abraxas Group
DuBois Regional Medical Center
Elk Regional Health Center
Erie Indemnity Company
General Electric
GKN Sinter Metals
ISS Facility Services
Jameson Memorial Hospital
Joy Global Underground Mining
Meadville Medical Center
Miller Welding & Machine Company
Northwest Bancshares
Owens-Brockway Glass Container
Pennsylvania State System of Higher Education
Punxsutawney Area School District
Sharon Pennsylvania Hospital
State Government
Training Toward Self Reliance Inc
UPMC Hamot
UPMC Northwest
Zippo Manufacturing Company

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

6. OCCUPATIONS IN NORTHWEST PENNSYLVANIA

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 Northwest Pennsylvania's workforce, 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.⁷

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.⁸

Most occupations in Job Zone Three require training in vocational schools, related on-the-job experience, or an associate's degree. Most occupations in Job Zone Four require a four-year bachelor's degree, but some do not. Most

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

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

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 Northwest Pennsylvania

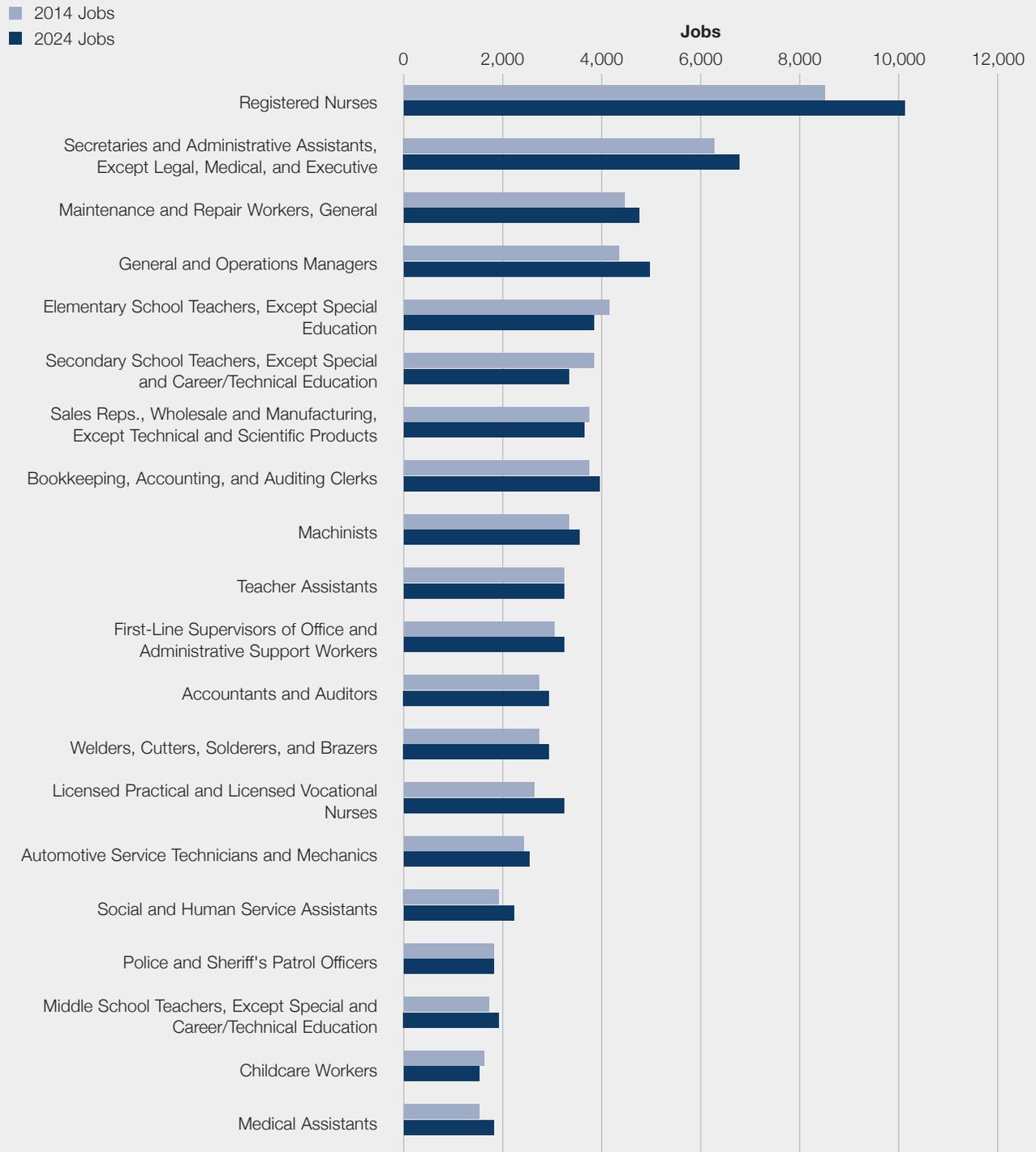
Top skilled occupations in the state are driven by industry composition. Medical centers employ a cadre of health professionals, while enterprise management companies employ a range of business professionals. Given the dominating presence of trade, transportation and utilities; healthcare and education services; and manufacturing establishments in Northwest Pennsylvania, top skilled occupations include: registered nurses, secretaries and administrative assistants, maintenance and repair workers, general and operations managers, and teachers. 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.⁹

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

⁹ 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 Northwest Pennsylvania and Projections, 2014-2024



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

Table 6.1 – Largest Skilled Occupations in Northwest Pennsylvania and Projections, 2014-2024

SOC Code	Occupation Title	2014 Jobs	2024 Jobs	10-Year New and Replacement Demand
29-1141	Registered Nurses	8,531	10,173	3,370
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	6,334	6,861	1,349
49-9071	Maintenance and Repair Workers, General	4,460	4,747	1,270
11-1021	General and Operations Managers	4,369	4,958	1,367
25-2021	Elementary School Teachers, Except Special Education	4,186	3,885	752
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	3,842	3,395	862
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3,734	3,654	788
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3,727	3,948	589
51-4041	Machinists	3,374	3,523	1,143
25-9041	Teacher Assistants	3,293	3,257	782
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3,091	3,215	864
13-2011	Accountants and Auditors	2,744	2,913	1,083
51-4121	Welders, Cutters, Solderers, and Brazers	2,713	2,917	1,087
29-2061	Licensed Practical and Licensed Vocational Nurses	2,627	3,231	1,298
49-3023	Automotive Service Technicians and Mechanics	2,433	2,568	843
21-1093	Social and Human Service Assistants	1,969	2,242	860
33-3051	Police and Sheriff's Patrol Officers	1,789	1,804	657
25-2022	Middle School Teachers, Except Special and Career/Technical Education	1,772	1,895	567
39-9011	Childcare Workers	1,627	1,545	404
31-9092	Medical Assistants	1,572	1,876	620

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 has 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.¹⁰

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 Northwest Pennsylvania.

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

¹⁰ 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.¹¹

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, general and operations managers, accountants and auditors, mechanical engineers, and medical and health services managers.¹²

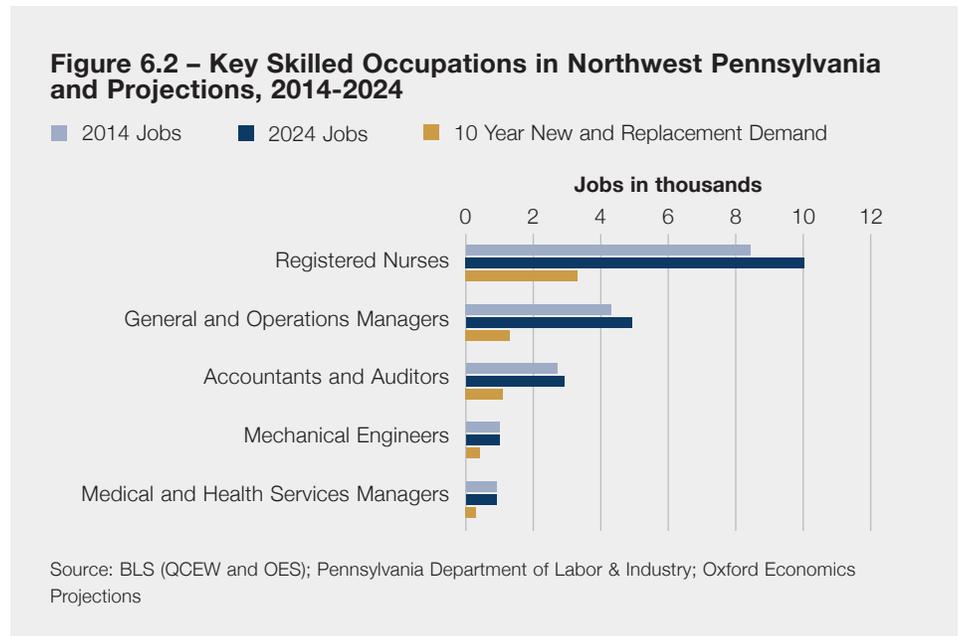


Table 6.2 – Key Skilled Occupations in Northwest Pennsylvania and Projections, 2014-2024

SOC Code	Occupation Title	2014 Jobs	2024 Jobs	10 Year New and Replacement Demand
29-1141	Registered Nurses	8,531	10,173	3,370
11-1021	General and Operations Managers	4,369	4,958	1,367
13-2011	Accountants and Auditors	2,744	2,913	1,083
17-2141	Mechanical Engineers	1,031	1,023	382
11-9111	Medical and Health Services Managers	878	934	270

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 700 unique (de-duplicated) job postings appeared in Northwest Pennsylvania for the top five key skilled high demand occupations (registered nurses, accountants and auditors, general and operations managers, mechanical engineers, and medical and health services managers). Sizable job postings include: registered nurses (332 unique postings per month) and accountants and auditors (113 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 high demand occupations.

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

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

Occupation	Average Monthly Postings (Jul 2014 - Jul 2015)	Average Monthly Hires (Jul 2014 - Jul 2015)	Ratio of Postings to Hires
Registered Nurses	332	293	1.1
Accountants and Auditors	113	140	0.8
General and Operations Managers	100	222	0.5
Medical and Health Services Managers	77	38	2.0
Mechanical Engineers	60	25	2.4

Source: Economic Modeling Specialists International (EMSI)

Registered Nurses

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

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

General and Operations Managers

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

Certifications: Six Sigma, Project Management Professional (PMP)

Accountants and Auditors

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

Certifications: Certified Public Accountant (CPA)

Mechanical Engineers

Unique skills: mechanical design, mechanical engineering, SolidWorks, CAD,
structural analysis

Certifications: Professional Engineer (PE), ABET accreditation, LEED AP

Medical and Health Services Managers

Unique skills: health administration, quality improvement

Certifications: clinical nursing, Certified Professional in Healthcare Quality
(CPHQ)

This list of skills and certifications does 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 Staffing Patterns for Key Skilled High Demand Occupations in Northwest Pennsylvania

Understanding which industries employ key skilled high demand 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 jobs in each respective industry in 2014 (e.g. general medical and surgical hospitals employ nearly 4,700 registered nurses);
- The percentage of the occupation's employment in the region that is employed in the industry (e.g. the 4,700 registered nurses employed in general medical and surgical hospitals represent almost 55% of the total registered nurse workforce in the region);
- The percentage of the industry sector's employment that is made up of the occupation (e.g. the 4,700 registered nurses make up about 27% of employment within general medical and surgical hospitals).

Staffing Patterns for Registered Nurses Employed in Northwest Pennsylvania

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
General Medical and Surgical Hospitals	4,686	27.2%	54.9%
Nursing Care Facilities (Skilled Nursing Facilities)	783	9.9%	9.2%
Offices of Physicians	646	9.4%	7.6%
Outpatient Care Centers	576	15.9%	6.8%
Home Health Care Services	553	21.0%	6.5%

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

Staffing Patterns for Accountants and Auditors Employed in Northwest Pennsylvania

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	557	38.6%	20.3%
Management of Companies and Enterprises	142	5.0%	5.2%
Insurance Carriers	97	2.4%	3.5%
Executive, Legislative, and Other General Government Support	73	0.8%	2.7%
Individual and Family Services	72	0.7%	2.6%

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

Staffing Patterns for General and Operations Managers Employed in Northwest Pennsylvania

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Individual and Family Services	137	1.2%	3.1%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	125	2.7%	2.9%
Restaurants and Other Eating Places	104	0.5%	2.4%
Metalworking Machinery Manufacturing	93	2.8%	2.1%
Other General Merchandise Stores	93	1.3%	2.1%

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

Staffing Patterns for Medical and Health Services Managers Employed in Northwest Pennsylvania

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
General Medical and Surgical Hospitals	211	1.2%	24.0%
Outpatient Care Centers	116	3.2%	13.2%
Nursing Care Facilities (Skilled Nursing Facilities)	97	1.2%	11.0%
Offices of Physicians	87	1.3%	9.9%
Home Health Care Services	77	2.9%	8.8%

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

Staffing Patterns for Mechanical Engineers Employed in Northwest Pennsylvania

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Railroad Rolling Stock Manufacturing	120	3.9%	11.6%
Architectural, Engineering, and Related Services	90	4.5%	8.8%
Forging and Stamping	78	1.2%	7.6%
Other General Purpose Machinery Manufacturing	64	4.0%	6.2%
Metalworking Machinery Manufacturing	55	1.7%	5.4%

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 give a perspective on 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

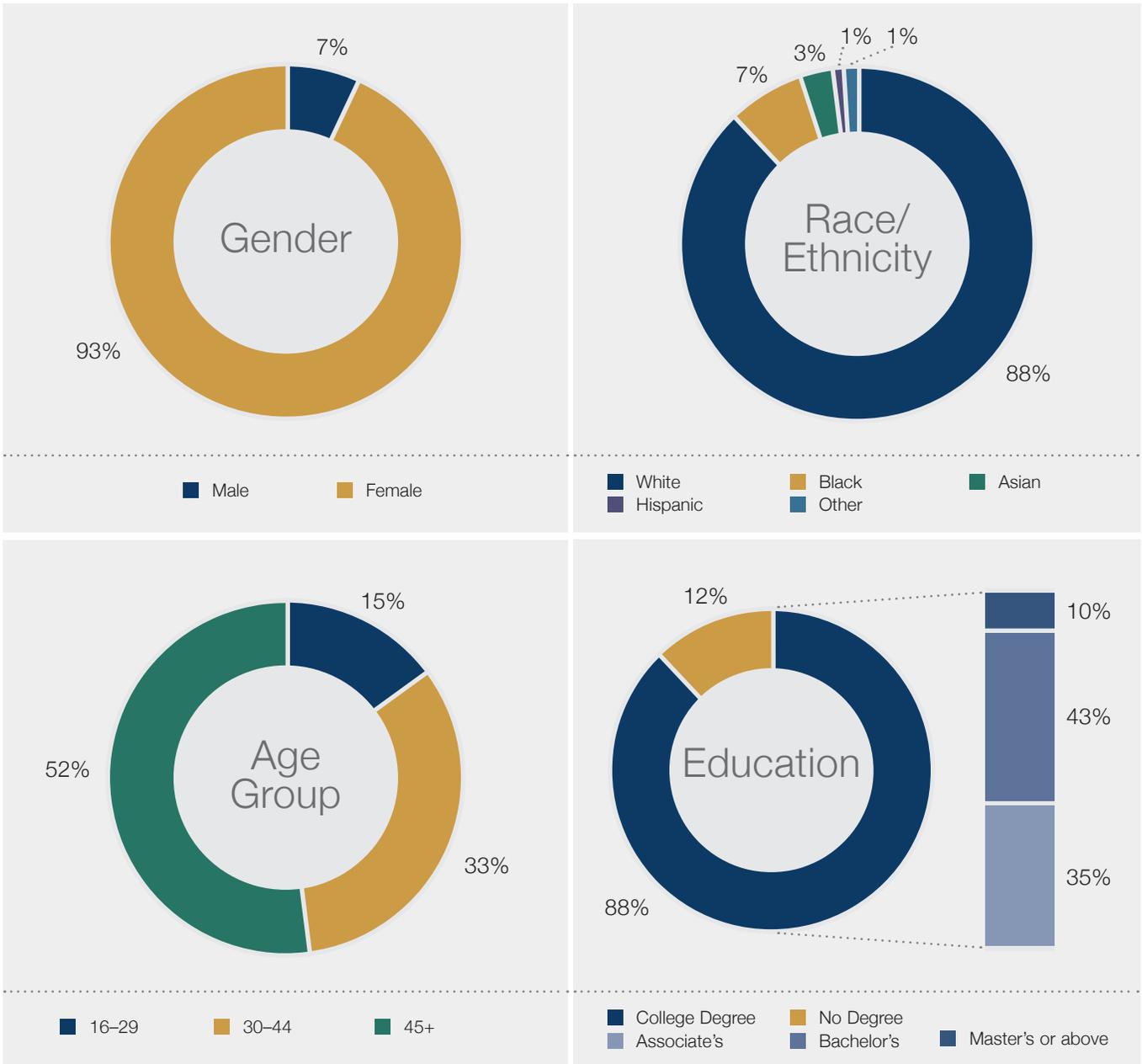
In addition to understanding the industries that employ key skilled high demand occupations, another lens focuses on the characteristics of those employed. The following section outlines the demographics for people from Pennsylvania who work in these key skilled occupations by showing each occupation's composition by gender, race/ethnicity, age, and education. This lends further insight into who generally works in the occupation 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 of Northwest Pennsylvania's entire population is further described in Section 7 of the report.

REGISTERED NURSES IN PENNSYLVANIA

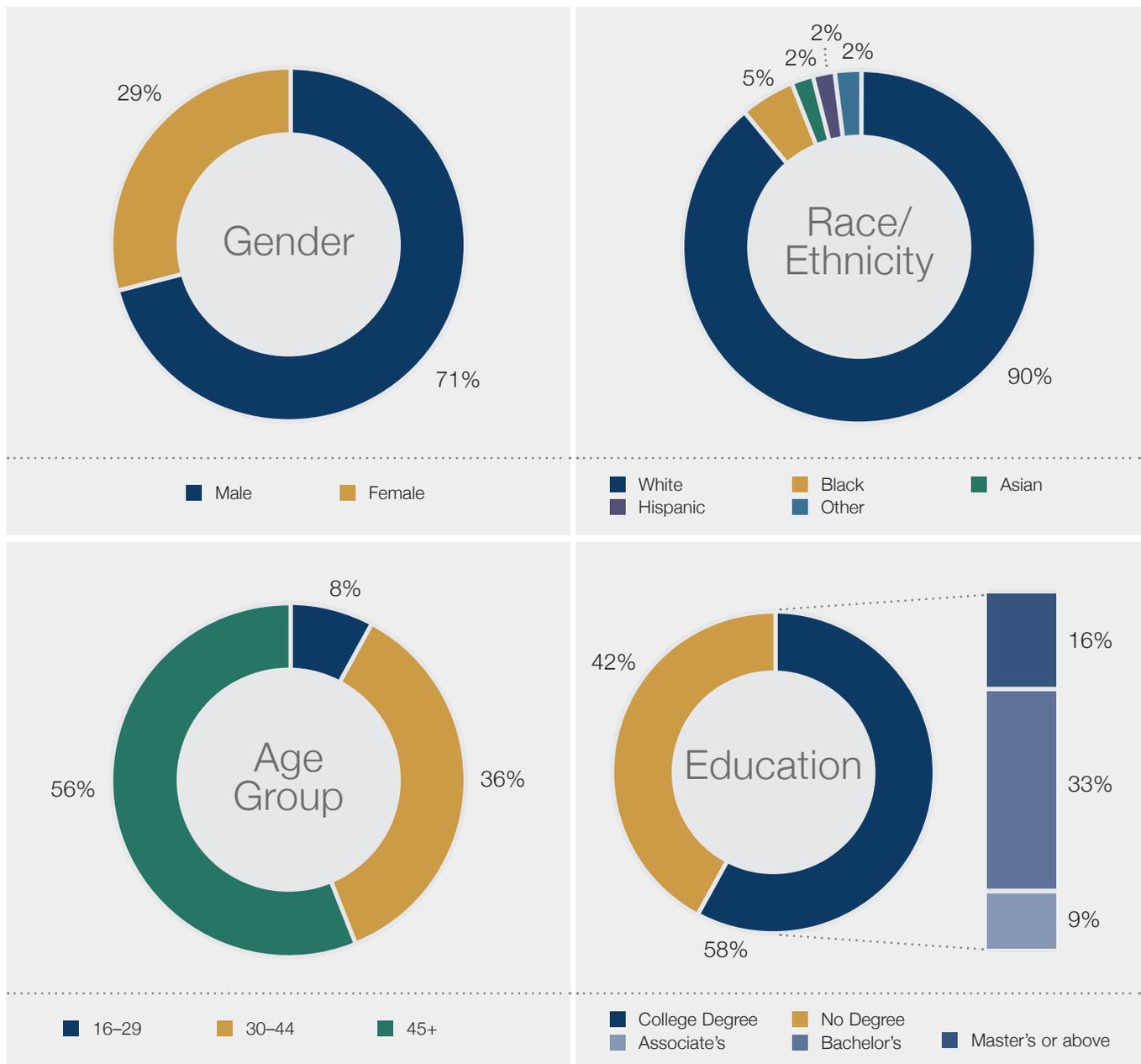
The demographic profile of registered nurses is dominated by white females. Age distribution indicates that registered nurses are a more mature cohort of workers (45 years and older), which can put increasing pressure on replacement jobs due to retirements over the next 10 years. Nearly 90% of registered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

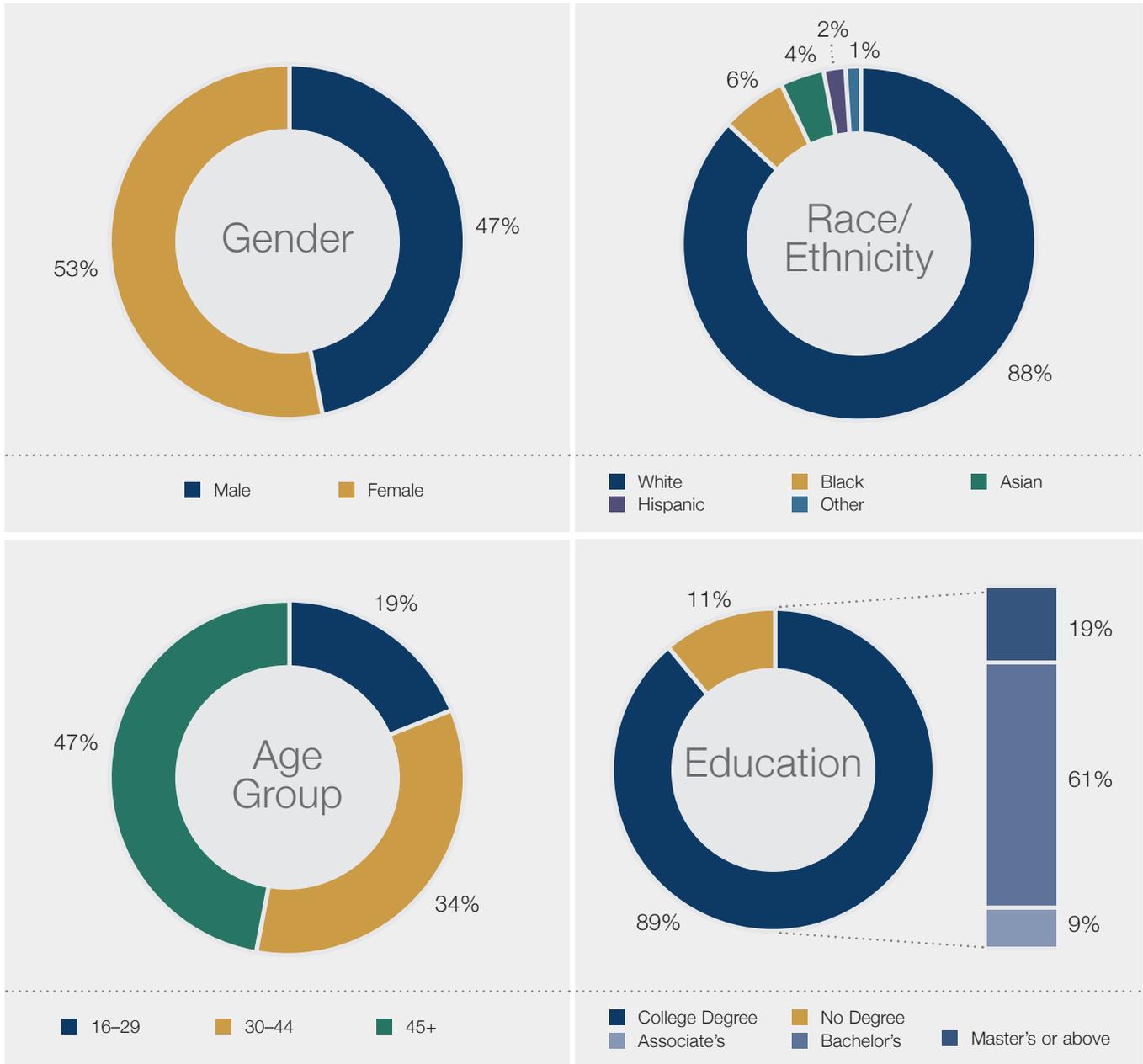
General and operations managers are typically male, though females occupy almost 30% of the employed population. The majority of those in this occupation are white. This occupation is represented by a more mature cohort of workers (45 years and older), though mid-career workers also occupy a significant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

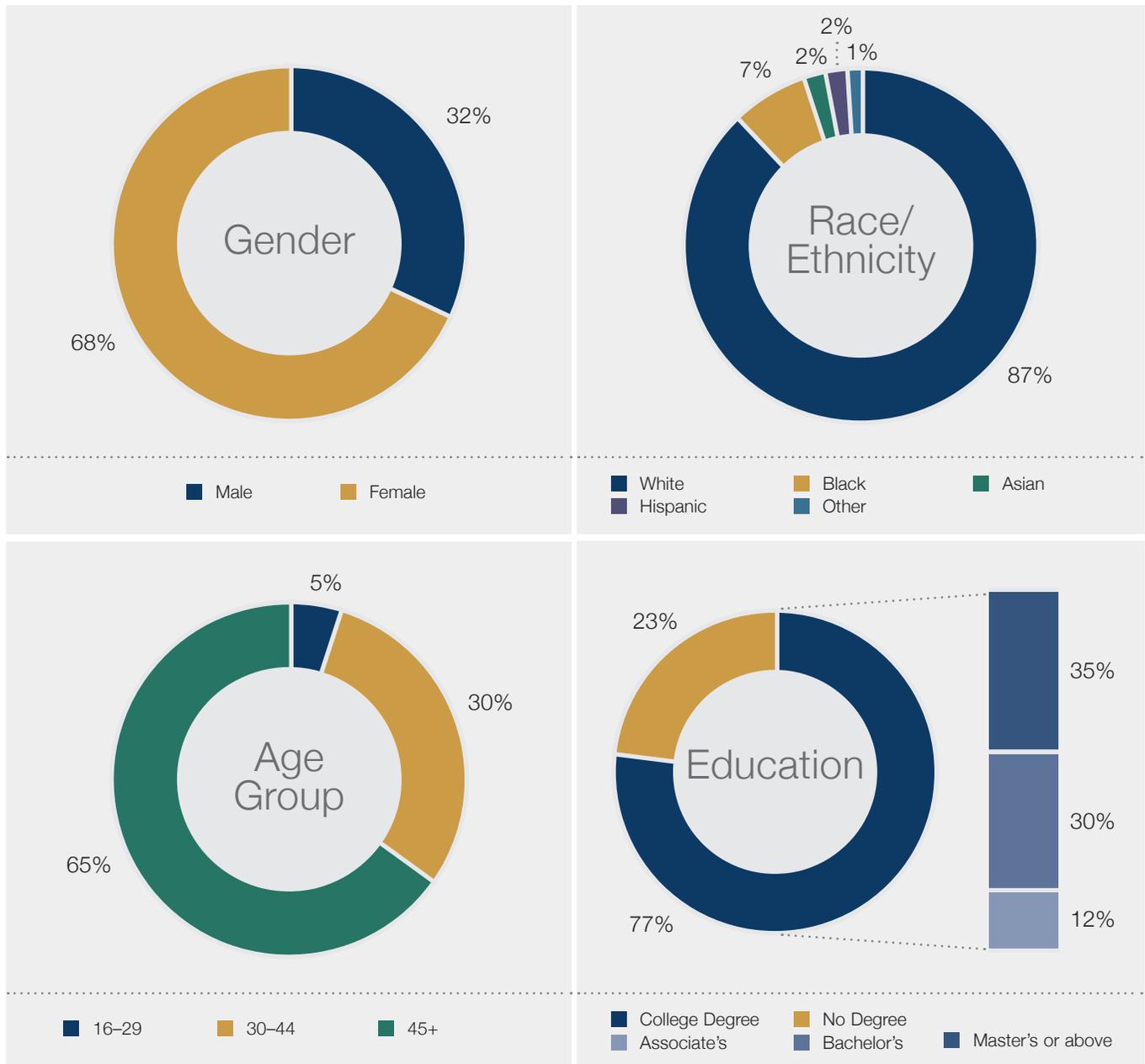
Accountants and auditors are fairly evenly split between male and female, though a slightly higher percent of employed accountants and auditors are female. A high proportion of white individuals are found in the occupation. Additionally, the age distribution is fairly even between entry-level and mature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

MEDICAL AND HEALTH SERVICES MANAGERS

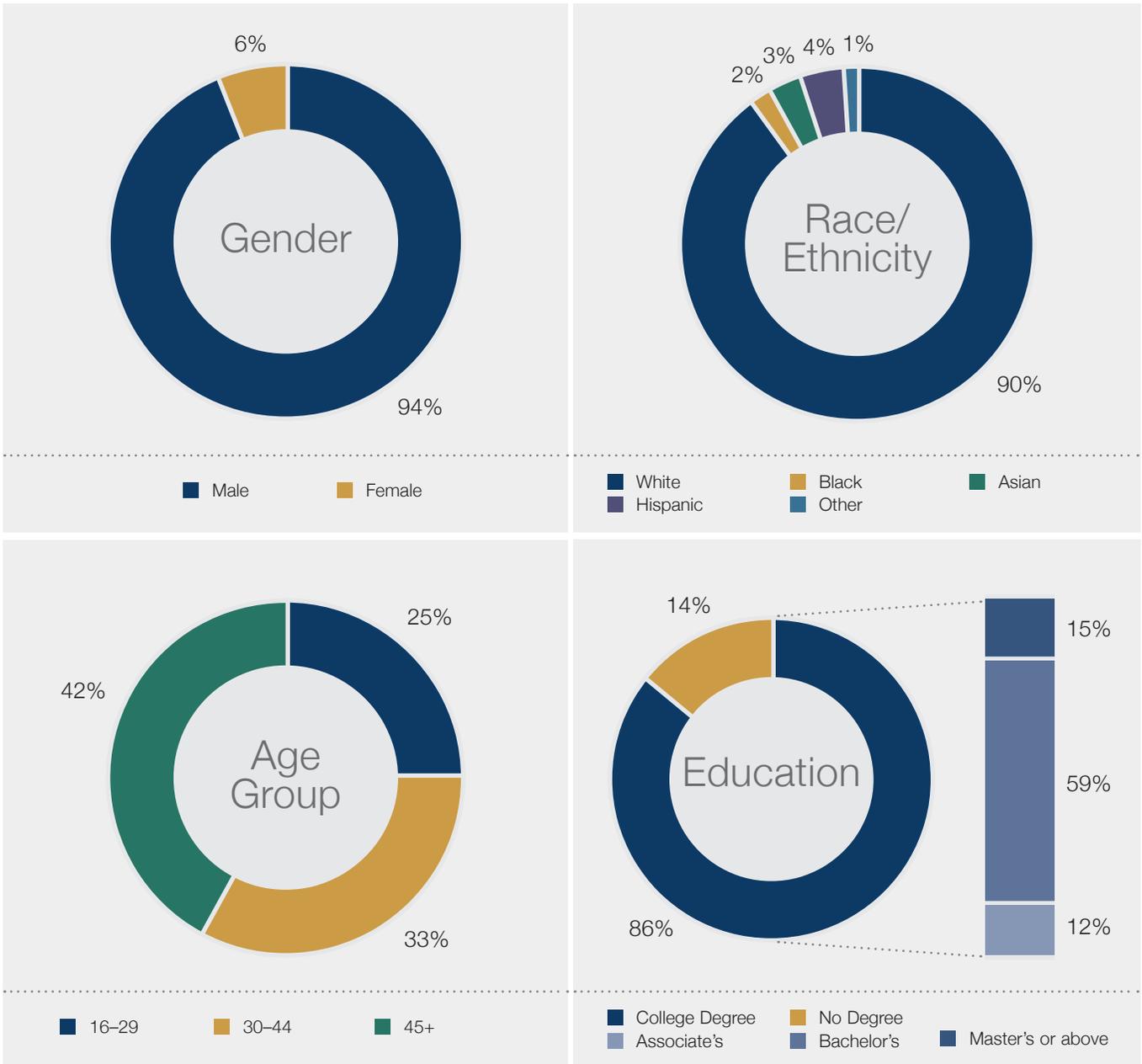
The demographic profile of medical and health services managers is dominated by white females. Age distribution indicates that medical and health services managers are a more mature demographic, which can put increasing pressure on replacement jobs due to retirements over the next 10 years. Nearly 80% of medical and health services managers 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

MECHANICAL ENGINEERS

Mechanical engineers indicate a larger proportion of males within the occupation. The race/ethnicity distribution within the occupation is predominately white. Additionally, the age distribution of the occupation, tends to favor a younger demographic. One quarter of the employed mechanical engineers is under 29 years old indicating that the occupation provides good opportunities for first destinations of recent college graduates. Over 85% of Mechanical 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

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

7. DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS IN NORTHWEST PENNSYLVANIA

This section provides further information about the regional demographic and socio-economic composition of Northwest Pennsylvania’s workforce 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 Northwest Pennsylvania’s Demographics

The Northwest Pennsylvania region has a population of about 940,000 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.

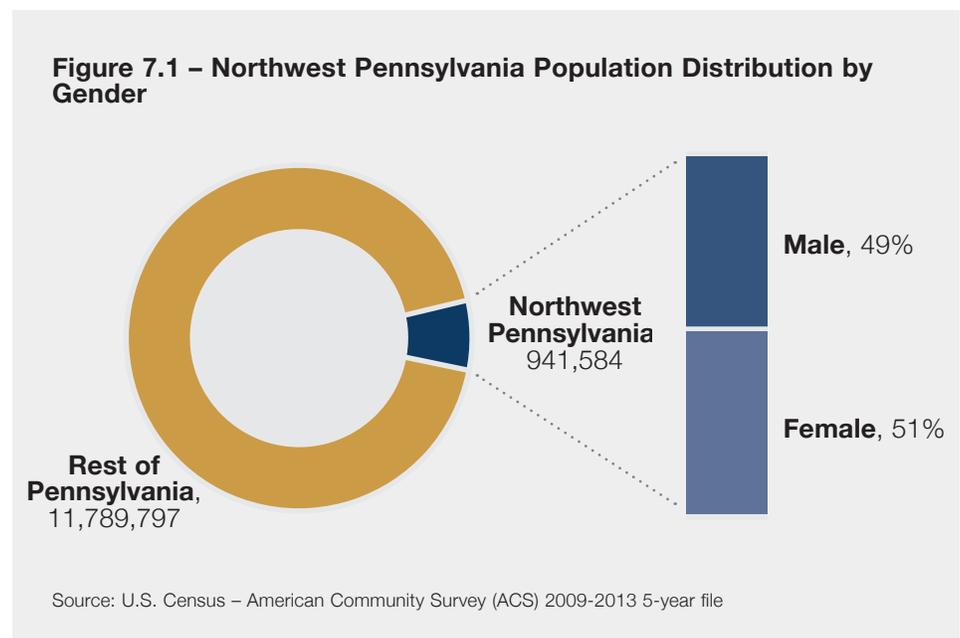
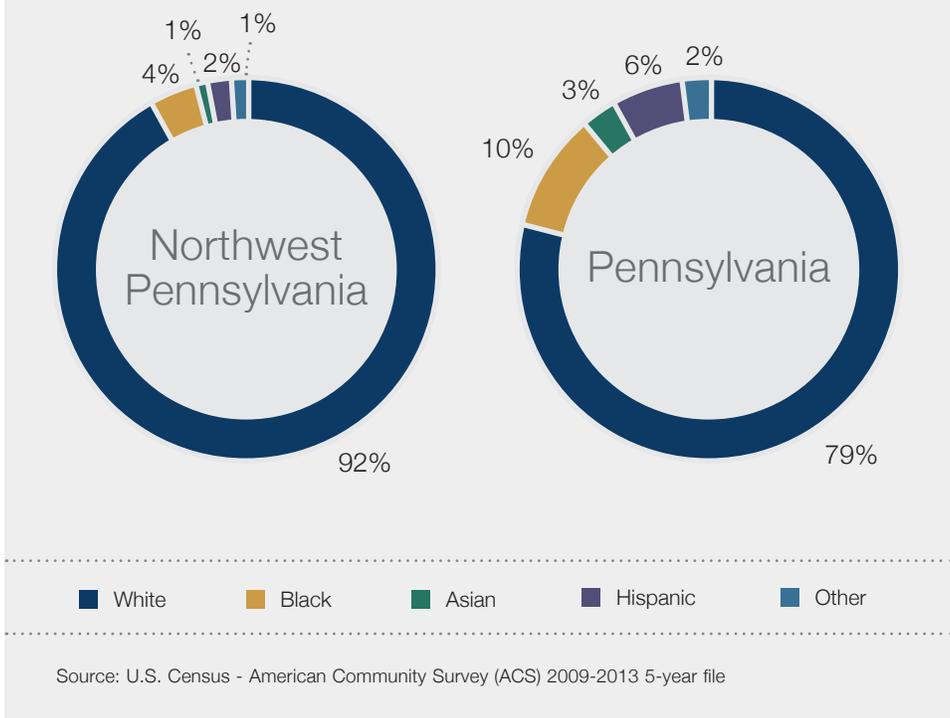


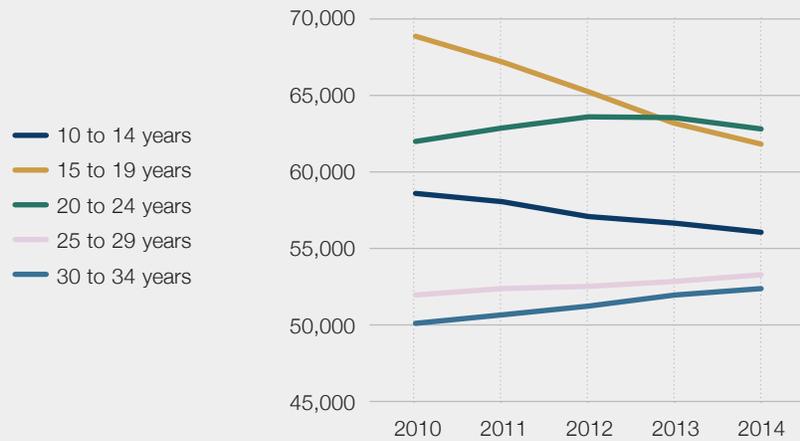
Figure 7.2 – Northwest Pennsylvania and Pennsylvania Race/Ethnicity Composition



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 indicates a diminishing number in the traditional age cohort and a growing number of adults aged 25 to 34 years old. As illustrated in figure 7.3, the 10 to 19 year old cohort population declined by over 9,500 people between 2010 and 2014—an 8% decline. Conversely, the 25-34 year old cohort increased by nearly 4%, or 3,500 people, over the same time period. This demographic shift presents an opportunity to incorporate a broader university recruitment strategy.

The next sub-section further explores the shifting socio-economic characteristics in Northwest Pennsylvania by identifying three inter-related variables.

Figure 7.3 – Northwest Pennsylvania Changes in Age Cohorts



Source: U.S. Census

7.2 Northwest Pennsylvania’s Socio-economic Indicators

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 Northwest Pennsylvania

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.^{13, 14}

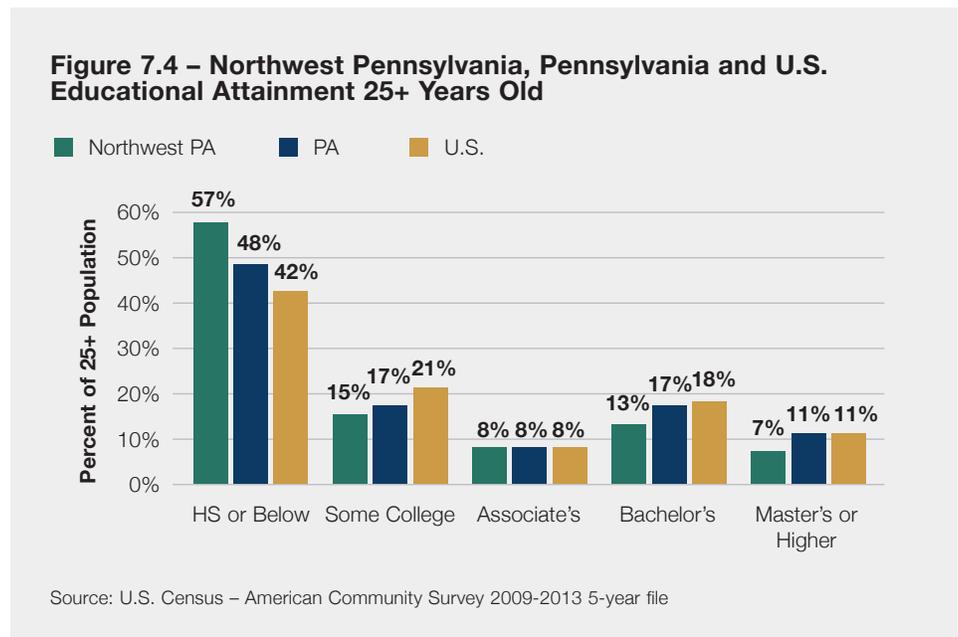
13 Feinstein et. al. (2006), “The effects of education on health: Concepts, evidence and policy implications: A review for the OECD Center for Educational Research and Innovation (CERI)”, unpublished manuscript, OECD, Paris.

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

A view of Northwest Pennsylvania's educational attainment indicates that just under half (47%) of those over 25 years old have had some postsecondary 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 lags behind the national average of 58% of the population having had at least some postsecondary education or higher.

When comparing degree completion, Northwest Pennsylvania 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 Northwest Pennsylvania.

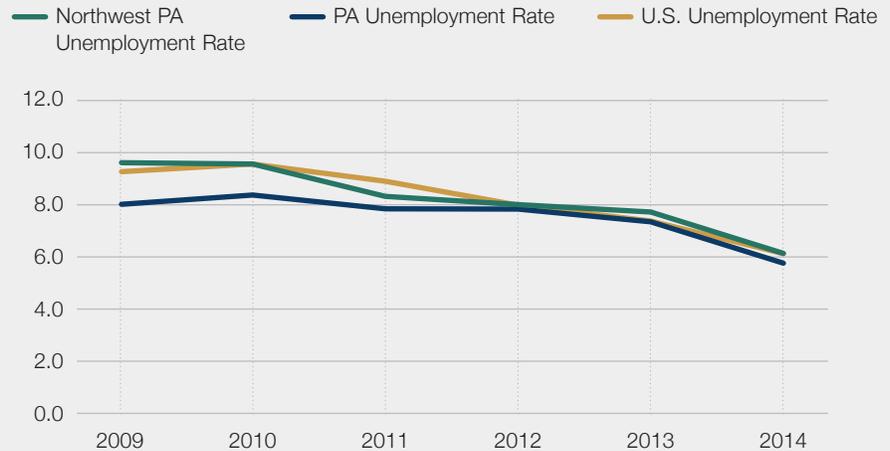


7.2.2 Unemployment and Poverty in Northwest Pennsylvania

Northwest Pennsylvania's unemployment rate—6.1% in 2014—trended closely with the state and national unemployment rate since 2012. This suggests that on average there are more opportunities for dislocated workers in the region compared to the rest of the nation.

Figure 7.5 shows the convergence of the unemployment rates of Northwest Pennsylvania, Pennsylvania, and the U.S. from 2009 to 2014.

Figure 7.5 – Northwest Pennsylvania, Pennsylvania and U.S. Unemployment Rates



Source: Bureau of Labor Statistics – Local Area Unemployment Statistics

In Northwest Pennsylvania, the poverty rate has trended upward from 2009 to 2013. The region's poverty rate is above the state poverty rate and is currently near the U.S. average.¹⁵ Given the similar poverty rate compared with the nation, there is an underlying assumption that the compensation associated with the jobs in Northwest Pennsylvania may be the same as the national average.

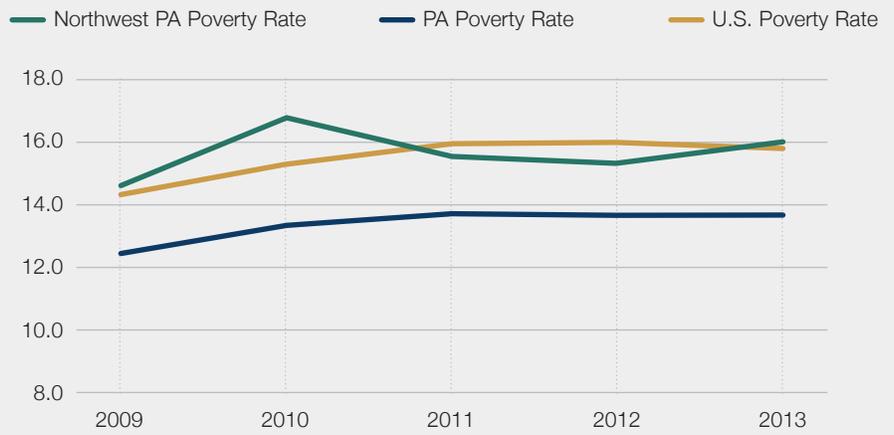
Figure 7.6 compares the poverty rates of Northwest Pennsylvania, Pennsylvania, and the U.S. from 2009 to 2013.

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.

¹⁵ 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 – Northwest Pennsylvania, Pennsylvania and U.S. Poverty Rates



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

8. NEXT STEPS

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

- Defining the state's sub-region workforce areas.
- Describing key economic, workforce and demographic attributes in the regional economy.
- Forecasting the initial 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 Pennsylvania.
- 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 state.

DATA SOURCES KEY

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

O*NET Resource Center (O*NET)

- Job Zones www.onetonline.org/help/online/zones

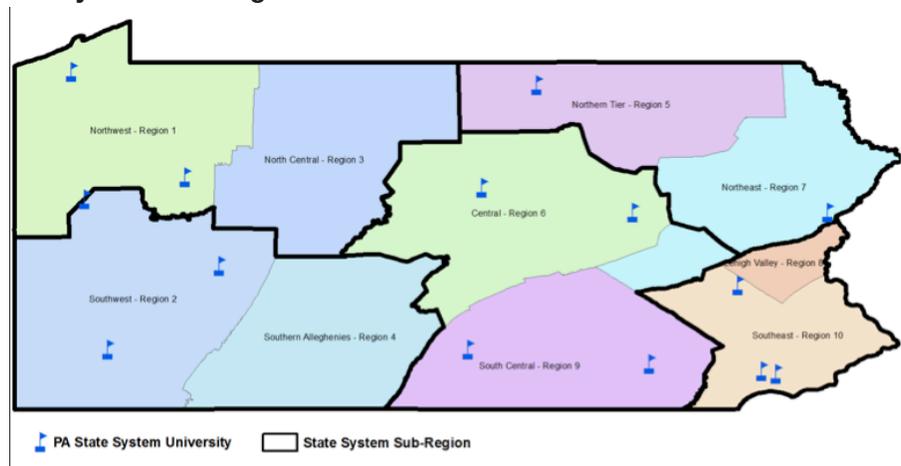
Economic Modeling Specialists International (EMSI)

APPENDIX A: STATE SYSTEM SUB-REGIONS WITH PREP REGIONS AND WIA REGIONS

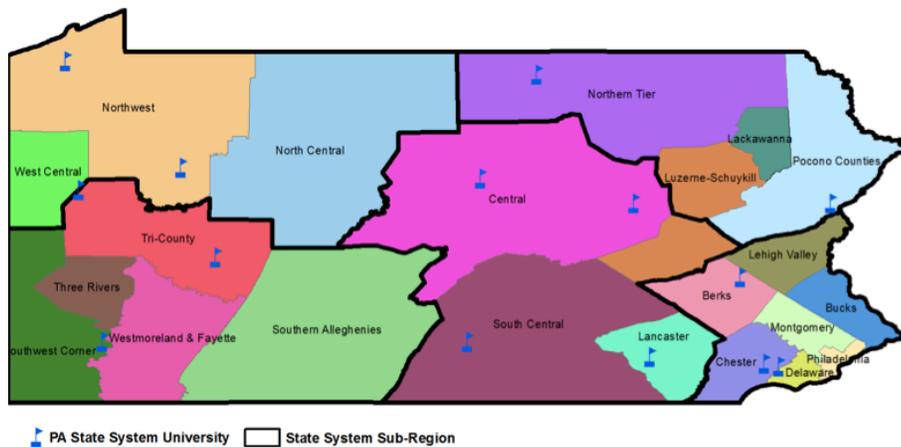
Partnerships for Regional Economic Performance (PREP) regions provide geographic context of how the Pennsylvania Department of Community & Economic Development divides resources and services to support business development, start-ups, investment and other economic development initiatives. To define sub-regions for this project, PREP regions served as the starting point. The following figures outline the sub-regions in relation to PREP regions.

An additional map of Pennsylvania's Workforce Investment Act (WIA) regional boundaries is also provided.

State System Sub-regions and PREP Boundaries



State System Sub-regions and WIA Boundaries



APPENDIX B: PENNSYLVANIA STATE AND COUNTY ENROLLMENT AND EMPLOYMENT

County	Fall 2014 Enrollment in PA's State System	2014 QCEW Employment
Allegheny	7,020	683,111
Chester	5,996	240,469
Montgomery	5,401	472,655
Philadelphia	5,263	640,987
Lancaster	4,786	225,673
Delaware	4,206	216,261
Bucks	4,145	250,889
Berks	3,759	166,792
Erie	3,469	124,095
York	3,104	172,145
Lehigh	2,664	180,757
Westmoreland	2,606	132,312
Cumberland	2,537	126,939
Monroe	2,532	52,933
Northampton	2,514	105,825
Butler	2,067	84,472
Dauphin	1,952	176,004
Washington	1,915	86,961
Indiana	1,645	32,653
Luzerne	1,437	140,329
Franklin	1,302	56,715
Fayette	1,137	39,979
Beaver	1,121	52,811
Mercer	1,095	48,028
Columbia	1,074	24,974
Schuylkill	1,068	50,049
Cambria	1,032	53,915
Crawford	1,024	31,113
Lycoming	1,013	53,197
Lackawanna	986	97,259

County	Fall 2014 Enrollment in PA's State System	2014 QCEW Employment
Northumberland	938	27,985
Clarion	883	13,586
Clearfield	881	29,938
Venango	840	19,251
Armstrong	814	17,582
Lawrence	810	29,500
Lebanon	803	48,869
Adams	705	34,139
Centre	699	67,147
Tioga	656	12,973
Bradford	641	24,568
Pike	633	10,748
Clinton	600	13,043
Jefferson	587	15,435
Blair	584	58,233
Carbon	455	16,974
Elk	398	14,994
Wayne	356	14,651
Montour	340	15,578
Warren	324	15,031
Somerset	323	24,398
Perry	319	7,661
Union	313	16,597
Mifflin	290	15,544
McKean	277	15,770
Snyder	269	15,522
Susquehanna	219	9,281
Bedford	202	15,397
Greene	201	14,844
Huntingdon	182	12,343
Wyoming	162	10,181
Potter	140	5,291
Juniata	123	6,146
Fulton	81	4,807
Cameron	65	2,015
Forest	57	2,053
Sullivan	34	1,772
Total Pennsylvania	96,074	5,643,676

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

APPENDIX C: INDUSTRY PROJECTIONS 2014-2024 FOR NORTHWEST PENNSYLVANIA

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 Pennsylvania. Also included in the table are the number of jobs in 2014 and the projected job growth/decline to 2024.

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
Total	All Industries	372,427	401,023	7.7%	1.0
1111	Oilseed and Grain Farming	63	73	15.9%	0.4
1112	Vegetable and Melon Farming	117	133	13.7%	0.4
1113	Fruit and Tree Nut Farming	84	96	14.3%	0.2
1114	Greenhouse, Nursery, and Floriculture Production	286	300	4.9%	0.7
1119	Other Crop Farming	25	26	4.0%	0.1
1121	Cattle Ranching and Farming	297	329	10.8%	0.7
1123	Poultry and Egg Production	39	41	5.1%	0.4
1125	Aquaculture	91	107	17.6%	5.2
1129	Other Animal Production	49	49	0.0%	0.9
1131	Timber Tract Operations	35	42	20.0%	1.8
1132	Forest Nurseries and Gathering of Forest Products	6	6	0.0%	1.0
1133	Logging	294	297	1.0%	2.1
1141	Fishing	7	8	14.3%	0.4
1142	Hunting and Trapping	3	3	0.0%	0.5
1151	Support Activities for Crop Production	58	53	-8.6%	0.1
1152	Support Activities for Animal Production	30	29	-3.3%	0.4
1153	Support Activities for Forestry	61	76	24.6%	1.3
2111	Oil and Gas Extraction	1,432	1,703	18.9%	2.7
2121	Coal Mining	590	497	-15.8%	3.0
2123	Nonmetallic Mineral Mining and Quarrying	231	245	6.1%	0.9
2131	Support Activities for Mining	2,497	2,557	2.4%	2.1
2211	Electric Power Generation, Transmission and Distribution	874	824	-5.7%	0.7
2212	Natural Gas Distribution	613	658	7.3%	1.9
2213	Water, Sewage and Other Systems	898	953	6.1%	1.6
2361	Residential Building Construction	1,246	1,417	13.7%	0.7
2362	Nonresidential Building Construction	1,355	1,347	-0.6%	0.7
2371	Utility System Construction	1,267	1,606	26.8%	1.0
2372	Land Subdivision	35	48	37.1%	0.3
2373	Highway, Street, and Bridge Construction	1,511	1,723	14.0%	1.4
2379	Other Heavy and Civil Engineering Construction	132	165	25.0%	0.5
2381	Foundation, Structure, and Building Exterior Contractors	1,271	1,250	-1.7%	0.6
2382	Building Equipment Contractors	3,428	3,650	6.5%	0.7
2383	Building Finishing Contractors	957	1,020	6.6%	0.5
2389	Other Specialty Trade Contractors	1,756	1,977	12.6%	1.1
3111	Animal Food Manufacturing	374	427	14.2%	2.5
3113	Sugar and Confectionery Product Manufacturing	360	406	12.8%	1.9

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	853	889	4.2%	1.8
3115	Dairy Product Manufacturing	523	544	4.0%	1.4
3116	Animal Slaughtering and Processing	500	475	-5.0%	0.4
3118	Bakeries and Tortilla Manufacturing	749	913	21.9%	0.9
3119	Other Food Manufacturing	385	468	21.6%	0.8
3121	Beverage Manufacturing	466	555	19.1%	0.9
3132	Fabric Mills	62	75	21.0%	0.4
3133	Textile and Fabric Finishing and Fabric Coating Mills	26	25	-3.8%	0.3
3141	Textile Furnishings Mills	5	6	20.0%	0.0
3149	Other Textile Product Mills	146	171	17.1%	0.9
3152	Cut and Sew Apparel Manufacturing	12	10	-16.7%	0.0
3159	Apparel Accessories and Other Apparel Manufacturing	24	15	-37.5%	0.8
3161	Leather and Hide Tanning and Finishing	12	13	8.3%	1.0
3169	Other Leather and Allied Product Manufacturing	33	40	21.2%	1.1
3211	Sawmills and Wood Preservation	1,406	1,804	28.3%	5.7
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	508	604	18.9%	2.6
3219	Other Wood Product Manufacturing	2,439	3,122	28.0%	4.3
3221	Pulp, Paper, and Paperboard Mills	266	251	-5.6%	0.9
3222	Converted Paper Product Manufacturing	1,214	1,133	-6.7%	1.7
3231	Printing and Related Support Activities	997	907	-9.0%	0.8
3241	Petroleum and Coal Products Manufacturing	823	960	16.6%	2.7
3251	Basic Chemical Manufacturing	316	291	-7.9%	0.8
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	222	233	5.0%	0.9
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	5	5	0.0%	0.0
3255	Paint, Coating, and Adhesive Manufacturing	360	323	-10.3%	2.2
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	20	20	0.0%	0.1
3259	Other Chemical Product and Preparation Manufacturing	414	400	-3.4%	1.8
3261	Plastics Product Manufacturing	5,237	5,469	4.4%	3.5
3262	Rubber Product Manufacturing	1,194	1,300	8.9%	3.3
3271	Clay Product and Refractory Manufacturing	360	348	-3.3%	3.4
3272	Glass and Glass Product Manufacturing	1,100	1,091	-0.8%	4.9
3273	Cement and Concrete Product Manufacturing	561	551	-1.8%	1.2
3274	Lime and Gypsum Product Manufacturing	19	22	15.8%	0.5
3279	Other Nonmetallic Mineral Product Manufacturing	144	144	0.0%	0.7
3311	Iron and Steel Mills and Ferroalloy Manufacturing	2,244	2,485	10.7%	9.0
3312	Steel Product Manufacturing from Purchased Steel	728	599	-17.7%	4.5

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3313	Alumina and Aluminum Production and Processing	100	120	20.0%	0.6
3314	Nonferrous Metal (except Aluminum) Production and Processing	232	252	8.6%	1.4
3315	Foundries	1,427	1,439	0.8%	4.1
3321	Forging and Stamping	6,325	6,799	7.5%	23.2
3322	Cutlery and Handtool Manufacturing	829	814	-1.8%	7.8
3323	Architectural and Structural Metals Manufacturing	2,179	2,314	6.2%	2.2
3324	Boiler, Tank, and Shipping Container Manufacturing	844	947	12.2%	3.2
3325	Hardware Manufacturing	25	31	24.0%	0.4
3326	Spring and Wire Product Manufacturing	300	290	-3.3%	2.6
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	4,593	4,659	1.4%	4.5
3328	Coating, Engraving, Heat Treating, and Allied Activities	1,409	1,510	7.2%	3.7
3329	Other Fabricated Metal Product Manufacturing	2,218	2,376	7.1%	2.9
3331	Agriculture, Construction, and Mining Machinery Manufacturing	1,845	1,627	-11.8%	2.7
3332	Industrial Machinery Manufacturing	538	565	5.0%	1.8
3333	Commercial and Service Industry Machinery Manufacturing	159	135	-15.1%	0.7
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	592	650	9.8%	1.7
3335	Metalworking Machinery Manufacturing	3,292	3,270	-0.7%	6.6
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	531	439	-17.3%	2.0
3339	Other General Purpose Machinery Manufacturing	1,603	1,663	3.7%	2.2
3341	Computer and Peripheral Equipment Manufacturing	20	15	-25.0%	0.0
3342	Communications Equipment Manufacturing	37	41	10.8%	0.1
3344	Semiconductor and Other Electronic Component Manufacturing	1,092	981	-10.2%	1.1
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	1,144	1,208	5.6%	1.1
3351	Electric Lighting Equipment Manufacturing	145	130	-10.3%	1.1
3353	Electrical Equipment Manufacturing	694	729	5.0%	1.8
3359	Other Electrical Equipment and Component Manufacturing	1,734	1,963	13.2%	5.0
3362	Motor Vehicle Body and Trailer Manufacturing	823	952	15.7%	2.1
3363	Motor Vehicle Parts Manufacturing	1,195	1,311	9.7%	0.8
3364	Aerospace Product and Parts Manufacturing	1,494	1,789	19.7%	1.1
3365	Railroad Rolling Stock Manufacturing	3,093	2,688	-13.1%	41.6
3366	Ship and Boat Building	340	381	12.1%	0.7
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	283	291	2.8%	0.4
3372	Office Furniture (including Fixtures) Manufacturing	382	474	24.1%	1.4
3379	Other Furniture Related Product Manufacturing	7	7	0.0%	0.1
3391	Medical Equipment and Supplies Manufacturing	287	305	6.3%	0.3

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3399	Other Miscellaneous Manufacturing	899	873	-2.9%	1.2
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	1,177	1,296	10.1%	1.3
4232	Furniture and Home Furnishing Merchant Wholesalers	140	175	25.0%	0.5
4233	Lumber and Other Construction Materials Merchant Wholesalers	773	955	23.5%	1.4
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	406	366	-9.9%	0.2
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	481	574	19.3%	1.4
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	513	590	15.0%	0.6
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	408	483	18.4%	0.6
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,695	1,737	2.5%	0.9
4239	Miscellaneous Durable Goods Merchant Wholesalers	587	615	4.8%	0.7
4241	Paper and Paper Product Merchant Wholesalers	221	237	7.2%	0.7
4242	Drugs and Druggists' Sundries Merchant Wholesalers	140	165	17.9%	0.3
4243	Apparel, Piece Goods, and Notions Merchant Wholesalers	18	18	0.0%	0.0
4244	Grocery and Related Product Merchant Wholesalers	957	1,012	5.7%	0.5
4245	Farm Product Raw Material Merchant Wholesalers	17	18	5.9%	0.1
4246	Chemical and Allied Products Merchant Wholesalers	245	225	-8.2%	0.7
4247	Petroleum and Petroleum Products Merchant Wholesalers	237	239	0.8%	0.9
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	288	301	4.5%	0.6
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	418	473	13.2%	0.5
4251	Wholesale Electronic Markets and Agents and Brokers	1,346	1,279	-5.0%	0.6
4411	Automobile Dealers	4,199	4,536	8.0%	1.3
4412	Other Motor Vehicle Dealers	397	455	14.6%	1.0
4413	Automotive Parts, Accessories, and Tire Stores	1,571	1,689	7.5%	1.1
4421	Furniture Stores	480	480	0.0%	0.8
4422	Home Furnishings Stores	380	378	-0.5%	0.6
4431	Electronics and Appliance Stores	865	807	-6.7%	0.6
4441	Building Material and Supplies Dealers	3,097	3,321	7.2%	1.1
4442	Lawn and Garden Equipment and Supplies Stores	735	735	0.0%	1.8
4451	Grocery Stores	6,685	6,221	-6.9%	0.9
4452	Specialty Food Stores	386	339	-12.2%	0.6
4453	Beer, Wine, and Liquor Stores	873	1,007	15.3%	2.0
4461	Health and Personal Care Stores	2,944	2,851	-3.2%	1.1
4471	Gasoline Stations	4,794	5,007	4.4%	2.0
4481	Clothing Stores	2,428	2,285	-5.9%	0.9
4482	Shoe Stores	566	602	6.4%	1.0

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4483	Jewelry, Luggage, and Leather Goods Stores	386	379	-1.8%	1.0
4511	Sporting Goods, Hobby, and Musical Instrument Stores	1,268	1,356	6.9%	0.9
4512	Book Stores and News Dealers	193	181	-6.2%	0.8
4521	Department Stores	2,720	2,362	-13.2%	0.7
4529	Other General Merchandise Stores	7,185	7,964	10.8%	1.5
4531	Florists	204	180	-11.8%	1.2
4532	Office Supplies, Stationery, and Gift Stores	638	554	-13.2%	0.8
4533	Used Merchandise Stores	395	418	5.8%	0.9
4539	Other Miscellaneous Store Retailers	811	839	3.5%	1.0
4541	Electronic Shopping and Mail-Order Houses	1,075	1,056	-1.8%	1.2
4542	Vending Machine Operators	45	44	-2.2%	0.4
4543	Direct Selling Establishments	437	448	2.5%	1.2
4811	Scheduled Air Transportation	40	51	27.5%	0.0
4812	Nonscheduled Air Transportation	44	56	27.3%	0.4
4832	Inland Water Transportation	13	17	30.8%	0.2
4841	General Freight Trucking	3,840	4,489	16.9%	1.5
4842	Specialized Freight Trucking	1,894	2,203	16.3%	1.6
4851	Urban Transit Systems	332	390	17.5%	0.5
4852	Interurban and Rural Bus Transportation	59	57	-3.4%	1.0
4853	Taxi and Limousine Service	43	46	7.0%	0.2
4854	School and Employee Bus Transportation	2,455	2,776	13.1%	3.6
4855	Charter Bus Industry	169	163	-3.6%	2.1
4859	Other Transit and Ground Passenger Transportation	120	140	16.7%	0.5
4862	Pipeline Transportation of Natural Gas	421	529	25.7%	5.3
4871	Scenic and Sightseeing Transportation, Land	9	8	-11.1%	0.3
4872	Scenic and Sightseeing Transportation, Water	40	36	-10.0%	1.0
4881	Support Activities for Air Transportation	156	159	1.9%	0.3
4882	Support Activities for Rail Transportation	275	404	46.9%	3.2
4883	Support Activities for Water Transportation	45	66	46.7%	0.2
4884	Support Activities for Road Transportation	274	414	51.1%	0.9
4885	Freight Transportation Arrangement	98	140	42.9%	0.2
4889	Other Support Activities for Transportation	24	28	16.7%	0.3
4911	Postal Service	1,700	1,334	-21.5%	1.0
4921	Couriers and Express Delivery Services	656	689	5.0%	0.5
4922	Local Messengers and Local Delivery	80	85	6.3%	0.5
4931	Warehousing and Storage	2,646	2,794	5.6%	1.3
5111	Newspaper, Periodical, Book, and Directory Publishers	1,177	1,135	-3.6%	1.1

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
5112	Software Publishers	90	69	-23.3%	0.1
5121	Motion Picture and Video Industries	254	222	-12.6%	0.3
5151	Radio and Television Broadcasting	391	445	13.8%	0.6
5152	Cable and Other Subscription Programming	17	15	-11.8%	0.1
5171	Wired Telecommunications Carriers	1,156	986	-14.7%	0.7
5172	Wireless Telecommunications Carriers (except Satellite)	98	108	10.2%	0.2
5179	Other Telecommunications	110	88	-20.0%	0.5
5182	Data Processing, Hosting, and Related Services	122	139	13.9%	0.2
5191	Other Information Services	467	584	25.1%	0.5
5221	Depository Credit Intermediation	4,892	4,733	-3.3%	1.1
5222	Nondepository Credit Intermediation	389	401	3.1%	0.2
5223	Activities Related to Credit Intermediation	118	120	1.7%	0.2
5231	Securities and Commodity Contracts Intermediation and Brokerage	334	371	11.1%	0.3
5239	Other Financial Investment Activities	253	310	22.5%	0.2
5241	Insurance Carriers	4,073	4,673	14.7%	1.3
5242	Agencies, Brokerages, and Other Insurance Related Activities	2,157	2,218	2.8%	0.8
5311	Lessors of Real Estate	829	975	17.6%	0.5
5312	Offices of Real Estate Agents and Brokers	210	247	17.6%	0.3
5313	Activities Related to Real Estate	599	674	12.5%	0.3
5321	Automotive Equipment Rental and Leasing	190	232	22.1%	0.4
5322	Consumer Goods Rental	620	711	14.7%	1.4
5323	General Rental Centers	78	87	11.5%	0.7
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	102	118	15.7%	0.3
5331	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	43	41	-4.7%	0.7
5411	Legal Services	1,426	1,462	2.5%	0.5
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	1,444	1,511	4.6%	0.5
5413	Architectural, Engineering, and Related Services	2,005	2,185	9.0%	0.5
5414	Specialized Design Services	148	166	12.2%	0.4
5415	Computer Systems Design and Related Services	786	1,106	40.7%	0.2
5416	Management, Scientific, and Technical Consulting Services	905	811	-10.4%	0.3
5417	Scientific Research and Development Services	99	111	12.1%	0.1
5418	Advertising, Public Relations, and Related Services	367	411	12.0%	0.3
5419	Other Professional, Scientific, and Technical Services	1,332	1,608	20.7%	0.8
5511	Management of Companies and Enterprises	2,832	3,079	8.7%	0.5
5611	Office Administrative Services	105	101	-3.8%	0.1
5612	Facilities Support Services	587	754	28.4%	1.6

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
5613	Employment Services	4,724	5,843	23.7%	0.5
5614	Business Support Services	1,283	1,292	0.7%	0.5
5615	Travel Arrangement and Reservation Services	244	229	-6.1%	0.5
5616	Investigation and Security Services	1,612	1,999	24.0%	0.7
5617	Services to Buildings and Dwellings	4,762	5,662	18.9%	0.9
5619	Other Support Services	455	618	35.8%	0.6
5621	Waste Collection	528	663	25.6%	1.2
5622	Waste Treatment and Disposal	236	290	22.9%	0.7
5629	Remediation and Other Waste Management Services	216	298	38.0%	0.6
6111	Elementary and Secondary Schools	22,545	21,087	-6.5%	1.1
6112	Junior Colleges	1,160	1,141	-1.6%	0.6
6113	Colleges, Universities, and Professional Schools	7,292	6,823	-6.4%	0.9
6114	Business Schools and Computer and Management Training	83	67	-19.3%	0.4
6115	Technical and Trade Schools	118	123	4.2%	0.3
6116	Other Schools and Instruction	379	467	23.2%	0.4
6117	Educational Support Services	143	176	23.1%	0.4
6211	Offices of Physicians	6,837	7,379	7.9%	1.0
6212	Offices of Dentists	1,911	2,174	13.8%	0.8
6213	Offices of Other Health Practitioners	3,405	4,339	27.4%	1.6
6214	Outpatient Care Centers	3,618	4,440	22.7%	1.7
6215	Medical and Diagnostic Laboratories	600	657	9.5%	0.9
6216	Home Health Care Services	2,639	3,988	51.1%	0.8
6219	Other Ambulatory Health Care Services	1,253	1,488	18.8%	1.6
6221	General Medical and Surgical Hospitals	17,231	19,152	11.1%	1.1
6222	Psychiatric and Substance Abuse Hospitals	689	639	-7.3%	1.1
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	294	362	23.1%	0.4
6231	Nursing Care Facilities (Skilled Nursing Facilities)	7,894	8,983	13.8%	1.7
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	6,028	7,184	19.2%	3.1
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	3,761	4,669	24.1%	1.6
6239	Other Residential Care Facilities	857	900	5.0%	1.8
6241	Individual and Family Services	11,071	14,664	32.5%	1.8
6242	Community Food and Housing, and Emergency and Other Relief Services	137	137	0.0%	0.3
6243	Vocational Rehabilitation Services	1,359	1,673	23.1%	1.4
6244	Child Day Care Services	2,350	2,733	16.3%	1.1
7111	Performing Arts Companies	126	149	18.3%	0.4

NAICS	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
7112	Spectator Sports	191	220	15.2%	0.5
7113	Promoters of Performing Arts, Sports, and Similar Events	469	568	21.1%	1.3
7114	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	3	3	0.0%	0.1
7115	Independent Artists, Writers, and Performers	8	9	12.5%	0.1
7121	Museums, Historical Sites, and Similar Institutions	216	239	10.6%	0.3
7131	Amusement Parks and Arcades	771	677	-12.2%	1.5
7132	Gambling Industries	639	783	22.5%	0.9
7139	Other Amusement and Recreation Industries	2,494	2,598	4.2%	0.7
7211	Traveler Accommodation	2,908	3,169	9.0%	0.6
7212	RV (Recreational Vehicle) Parks and Recreational Camps	322	355	10.2%	2.0
7213	Rooming and Boarding Houses	24	29	20.8%	0.6
7223	Special Food Services	1,910	2,274	19.1%	1.1
7224	Drinking Places (Alcoholic Beverages)	1,810	1,754	-3.1%	1.8
7225	Restaurants and Other Eating Places	22,729	24,537	8.0%	0.9
8111	Automotive Repair and Maintenance	2,235	2,287	2.3%	0.9
8112	Electronic and Precision Equipment Repair and Maintenance	165	167	1.2%	0.6
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	869	1,005	15.7%	1.6
8114	Personal and Household Goods Repair and Maintenance	70	75	7.1%	0.4
8121	Personal Care Services	1,871	2,056	9.9%	1.1
8122	Death Care Services	663	723	9.0%	1.8
8123	Drycleaning and Laundry Services	819	832	1.6%	1.0
8129	Other Personal Services	302	369	22.2%	0.4
8131	Religious Organizations	373	397	6.4%	0.7
8132	Grantmaking and Giving Services	259	243	-6.2%	0.7
8133	Social Advocacy Organizations	357	417	16.8%	0.6
8134	Civic and Social Organizations	4,204	4,527	7.7%	3.9
8139	Business, Professional, Labor, Political, and Similar Organizations	795	791	-0.5%	0.7
8141	Private Households	173	172	-0.6%	0.2
9211	Executive, Legislative, and Other General Government Support	9,179	9,292	1.2%	1.1
9221	Justice, Public Order, and Safety Activities	4,197	4,122	-1.8%	0.8
9231	Administration of Human Resource Programs	270	292	8.1%	0.1
9241	Administration of Environmental Quality Programs	1,080	1,109	2.7%	1.3
9251	Administration of Housing Programs, Urban Planning, and Community Development	295	284	-3.7%	1.3
9261	Administration of Economic Programs	242	223	-7.9%	0.1
9281	National Security and International Affairs	164	166	1.2%	0.1

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

APPENDIX D: OCCUPATION PROJECTIONS 2014-2024 FOR NORTHWEST PENNSYLVANIA

For this analysis a “skilled” occupation is defined as an occupation in O*NET Job Zones¹⁶ 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.¹⁷

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.

¹⁶ <https://www.onetonline.org/help/online/zones>

¹⁷ <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
Total	All Occupations	NA	372,427	401,023	7.7%	135,515
11-1011	Chief Executives	5	742	722	-2.7%	156
11-1021	General and Operations Managers	4	4,369	4,958	13.5%	1,367
11-1031	Legislators	4	135	108	-20.0%	8
11-2011	Advertising and Promotions Managers	4	24	21	-12.5%	5
11-2021	Marketing Managers	4	189	197	4.2%	49
11-2022	Sales Managers	4	543	537	-1.1%	111
11-2031	Public Relations and Fundraising Managers	4	71	67	-5.6%	11
11-3011	Administrative Services Managers	3	402	399	-0.7%	59
11-3021	Computer and Information Systems Managers	4	360	425	18.1%	117
11-3031	Financial Managers	4	705	693	-1.7%	118
11-3051	Industrial Production Managers	4	738	743	0.7%	176
11-3061	Purchasing Managers	4	94	91	-3.2%	18
11-3071	Transportation, Storage, and Distribution Managers	4	152	156	2.6%	41
11-3111	Compensation and Benefits Managers	4	24	21	-12.5%	5
11-3121	Human Resources Managers	4	147	175	19.0%	67
11-3131	Training and Development Managers	4	32	34	6.3%	11
11-9021	Construction Managers	4	348	409	17.5%	111
11-9031	Education Administrators, Preschool and Childcare Center/Program	4	131	137	4.6%	41
11-9032	Education Administrators, Elementary and Secondary School	5	592	531	-10.3%	135
11-9033	Education Administrators, Postsecondary	5	261	220	-15.7%	34
11-9039	Education Administrators, All Other	5	33	37	12.1%	13
11-9041	Architectural and Engineering Managers	5	331	351	6.0%	106
11-9051	Food Service Managers	3	354	377	6.5%	94
11-9061	Funeral Service Managers	3	49	47	-4.1%	13
11-9071	Gaming Managers	3	11	13	18.2%	5
11-9081	Lodging Managers	3	58	64	10.3%	31
11-9111	Medical and Health Services Managers	5	878	934	6.4%	270
11-9121	Natural Sciences Managers	5	25	25	0.0%	6
11-9131	Postmasters and Mail Superintendents	3	66	45	-31.8%	8
11-9141	Property, Real Estate, and Community Association Managers	4	131	170	29.8%	73
11-9151	Social and Community Service Managers	4	451	547	21.3%	199
11-9161	Emergency Management Directors	4	26	22	-15.4%	0
11-9199	Managers, All Other	4	340	356	4.7%	90

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	2	2	0.0%	0
13-1021	Buyers and Purchasing Agents, Farm Products	4	18	17	-5.6%	4
13-1022	Wholesale and Retail Buyers, Except Farm Products	3	220	207	-5.9%	47
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	4	1,203	1,205	0.2%	259
13-1031	Claims Adjusters, Examiners, and Investigators	4	747	823	10.2%	297
13-1032	Insurance Appraisers, Auto Damage	3	40	50	25.0%	24
13-1041	Compliance Officers	4	518	599	15.6%	189
13-1051	Cost Estimators	4	675	728	7.9%	283
13-1071	Human Resources Specialists	4	1,029	1,219	18.5%	410
13-1075	Labor Relations Specialists	4	230	188	-18.3%	27
13-1081	Logisticians	4	317	379	19.6%	104
13-1111	Management Analysts	4	673	732	8.8%	171
13-1121	Meeting, Convention, and Event Planners	4	144	182	26.4%	60
13-1131	Fundraisers	4	138	157	13.8%	50
13-1141	Compensation, Benefits, and Job Analysis Specialists	4	158	139	-12.0%	16
13-1151	Training and Development Specialists	4	491	522	6.3%	129
13-1161	Market Research Analysts and Marketing Specialists	4	888	1,101	24.0%	355
13-1199	Business Operations Specialists, All Other	4	921	904	-1.8%	97
13-2011	Accountants and Auditors	4	2,744	2,913	6.2%	1,083
13-2021	Appraisers and Assessors of Real Estate	4	71	70	-1.4%	10
13-2031	Budget Analysts	4	118	156	32.2%	88
13-2041	Credit Analysts	4	88	94	6.8%	32
13-2051	Financial Analysts	4	380	430	13.2%	150
13-2052	Personal Financial Advisors	4	205	251	22.4%	84
13-2053	Insurance Underwriters	4	280	336	20.0%	165
13-2061	Financial Examiners	4	55	56	1.8%	19
13-2071	Credit Counselors	4	85	100	17.6%	33
13-2072	Loan Officers	3	585	659	12.6%	236
13-2081	Tax Examiners and Collectors, and Revenue Agents	3	264	237	-10.2%	80
13-2082	Tax Preparers	3	87	76	-12.6%	15
13-2099	Financial Specialists, All Other	4	160	140	-12.5%	2
15-1111	Computer and Information Research Scientists	5	5	5	0.0%	1
15-1121	Computer Systems Analysts	4	651	794	22.0%	259
15-1122	Information Security Analysts	4	82	99	20.7%	30
15-1131	Computer Programmers	4	398	452	13.6%	184

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
15-1132	Software Developers, Applications	4	652	807	23.8%	248
15-1133	Software Developers, Systems Software	4	242	234	-3.3%	22
15-1134	Web Developers	3	128	142	10.9%	35
15-1141	Database Administrators	4	202	218	7.9%	62
15-1142	Network and Computer Systems Administrators	4	634	579	-8.7%	54
15-1143	Computer Network Architects	4	114	122	7.0%	26
15-1151	Computer User Support Specialists	3	938	1,136	21.1%	366
15-1152	Computer Network Support Specialists	4	185	188	1.6%	39
15-1199	Computer Occupations, All Other	4	308	361	17.2%	108
15-2011	Actuaries	4	68	82	20.6%	36
15-2031	Operations Research Analysts	5	106	115	8.5%	33
15-2041	Statisticians	5	61	76	24.6%	36
17-1011	Architects, Except Landscape and Naval	4	96	121	26.0%	59
17-1012	Landscape Architects	4	33	46	39.4%	23
17-1021	Cartographers and Photogrammetrists	4	10	12	20.0%	4
17-1022	Surveyors	4	60	71	18.3%	27
17-2011	Aerospace Engineers	4	19	24	26.3%	10
17-2021	Agricultural Engineers	4	2	2	0.0%	1
17-2031	Biomedical Engineers	4	28	25	-10.7%	5
17-2041	Chemical Engineers	4	96	95	-1.0%	27
17-2051	Civil Engineers	4	502	556	10.8%	191
17-2061	Computer Hardware Engineers	4	23	21	-8.7%	3
17-2071	Electrical Engineers	4	374	400	7.0%	119
17-2072	Electronics Engineers, Except Computer	4	160	144	-10.0%	24
17-2081	Environmental Engineers	5	109	116	6.4%	38
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	4	67	70	4.5%	24
17-2112	Industrial Engineers	4	1,081	1,060	-1.9%	345
17-2131	Materials Engineers	4	79	99	25.3%	50
17-2141	Mechanical Engineers	4	1,031	1,023	-0.8%	382
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	4	16	14	-12.5%	4
17-2161	Nuclear Engineers	4	89	101	13.5%	42
17-2171	Petroleum Engineers	4	166	232	39.8%	125
17-2199	Engineers, All Other	4	280	364	30.0%	140
17-3011	Architectural and Civil Drafters	4	185	203	9.7%	63
17-3012	Electrical and Electronics Drafters	3	77	69	-10.4%	5
17-3013	Mechanical Drafters	3	404	359	-11.1%	44

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
17-3019	Drafters, All Other	3	8	9	12.5%	2
17-3021	Aerospace Engineering and Operations Technicians	4	15	17	13.3%	5
17-3022	Civil Engineering Technicians	3	84	110	31.0%	48
17-3023	Electrical and Electronics Engineering Technicians	3	277	234	-15.5%	26
17-3024	Electro-Mechanical Technicians	3	31	29	-6.5%	8
17-3025	Environmental Engineering Technicians	4	41	43	4.9%	13
17-3026	Industrial Engineering Technicians	3	164	173	5.5%	50
17-3027	Mechanical Engineering Technicians	3	122	140	14.8%	47
17-3029	Engineering Technicians, Except Drafters, All Other	3	152	198	30.3%	84
17-3031	Surveying and Mapping Technicians	3	69	78	13.0%	25
19-1012	Food Scientists and Technologists	4	14	15	7.1%	6
19-1013	Soil and Plant Scientists	5	5	5	0.0%	3
19-1021	Biochemists and Biophysicists	5	7	9	28.6%	4
19-1022	Microbiologists	5	24	29	20.8%	13
19-1023	Zoologists and Wildlife Biologists	5	11	10	-9.1%	2
19-1029	Biological Scientists, All Other	5	20	20	0.0%	6
19-1031	Conservation Scientists	4	34	38	11.8%	14
19-1032	Foresters	4	75	83	10.7%	30
19-1041	Epidemiologists	5	8	7	-12.5%	1
19-1042	Medical Scientists, Except Epidemiologists	5	83	94	13.3%	31
19-1099	Life Scientists, All Other	5	10	12	20.0%	4
19-2012	Physicists	5	11	8	-27.3%	0
19-2021	Atmospheric and Space Scientists	4	5	4	-20.0%	0
19-2031	Chemists	4	169	186	10.1%	71
19-2032	Materials Scientists	5	18	17	-5.6%	4
19-2041	Environmental Scientists and Specialists, Including Health	4	136	154	13.2%	62
19-2042	Geoscientists, Except Hydrologists and Geographers	4	88	93	5.7%	37
19-2043	Hydrologists	4	6	5	-16.7%	1
19-2099	Physical Scientists, All Other	5	20	16	-20.0%	0
19-3011	Economists	5	19	21	10.5%	8
19-3022	Survey Researchers	5	123	131	6.5%	48
19-3031	Clinical, Counseling, and School Psychologists	5	420	425	1.2%	131
19-3039	Psychologists, All Other	5	26	30	15.4%	12
19-3041	Sociologists	5	5	4	-20.0%	2
19-3051	Urban and Regional Planners	5	92	101	9.8%	53

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
19-3093	Historians	5	6	5	-16.7%	0
19-3099	Social Scientists and Related Workers, All Other	4	30	32	6.7%	8
19-4011	Agricultural and Food Science Technicians	3	19	17	-10.5%	5
19-4021	Biological Technicians	4	77	78	1.3%	27
19-4031	Chemical Technicians	3	149	163	9.4%	61
19-4041	Geological and Petroleum Technicians	4	85	106	24.7%	63
19-4051	Nuclear Technicians	3	66	72	9.1%	35
19-4061	Social Science Research Assistants	4	28	32	14.3%	17
19-4091	Environmental Science and Protection Technicians, Including Health	4	58	67	15.5%	36
19-4092	Forensic Science Technicians	4	10	10	0.0%	4
19-4093	Forest and Conservation Technicians	3	24	25	4.2%	13
19-4099	Life, Physical, and Social Science Technicians, All Other	3	102	101	-1.0%	41
21-1011	Substance Abuse and Behavioral Disorder Counselors	5	711	712	0.1%	203
21-1012	Educational, Guidance, School, and Vocational Counselors	5	821	837	1.9%	209
21-1013	Marriage and Family Therapists	5	113	138	22.1%	50
21-1014	Mental Health Counselors	5	960	1,058	10.2%	361
21-1015	Rehabilitation Counselors	5	670	854	27.5%	372
21-1019	Counselors, All Other	5	78	85	9.0%	24
21-1021	Child, Family, and School Social Workers	4	1,373	1,526	11.1%	475
21-1022	Healthcare Social Workers	5	586	777	32.6%	327
21-1023	Mental Health and Substance Abuse Social Workers	5	915	1,112	21.5%	454
21-1029	Social Workers, All Other	5	80	85	6.3%	24
21-1091	Health Educators	4	184	208	13.0%	75
21-1092	Probation Officers and Correctional Treatment Specialists	4	267	278	4.1%	98
21-1093	Social and Human Service Assistants	4	1,969	2,242	13.9%	860
21-1094	Community Health Workers	4	82	90	9.8%	29
21-1099	Community and Social Service Specialists, All Other	4	91	106	16.5%	37
21-2011	Clergy	5	100	117	17.0%	42
21-2021	Directors, Religious Activities and Education	4	73	85	16.4%	45
21-2099	Religious Workers, All Other	4	18	15	-16.7%	3
23-1011	Lawyers	5	838	898	7.2%	203
23-1012	Judicial Law Clerks	5	77	95	23.4%	35
23-1021	Administrative Law Judges, Adjudicators, and Hearing Officers	5	47	43	-8.5%	5

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
23-1022	Arbitrators, Mediators, and Conciliators	5	15	17	13.3%	5
23-1023	Judges, Magistrate Judges, and Magistrates	5	18	15	-16.7%	1
23-2011	Paralegals and Legal Assistants	3	340	394	15.9%	111
23-2091	Court Reporters	3	50	50	0.0%	13
23-2093	Title Examiners, Abstractors, and Searchers	3	104	113	8.7%	33
23-2099	Legal Support Workers, All Other	3	46	48	4.3%	10
25-1011	Business Teachers, Postsecondary	5	248	262	5.6%	51
25-1021	Computer Science Teachers, Postsecondary	5	112	119	6.3%	24
25-1022	Mathematical Science Teachers, Postsecondary	5	157	155	-1.3%	22
25-1031	Architecture Teachers, Postsecondary	5	27	32	18.5%	9
25-1032	Engineering Teachers, Postsecondary	5	145	165	13.8%	42
25-1041	Agricultural Sciences Teachers, Postsecondary	5	19	16	-15.8%	0
25-1042	Biological Science Teachers, Postsecondary	5	196	191	-2.6%	25
25-1043	Forestry and Conservation Science Teachers, Postsecondary	5	7	6	-14.3%	0
25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	5	44	44	0.0%	7
25-1052	Chemistry Teachers, Postsecondary	5	82	86	4.9%	17
25-1053	Environmental Science Teachers, Postsecondary	5	16	14	-12.5%	1
25-1054	Physics Teachers, Postsecondary	5	56	68	21.4%	20
25-1061	Anthropology and Archeology Teachers, Postsecondary	5	17	14	-17.6%	1
25-1062	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	5	24	24	0.0%	4
25-1063	Economics Teachers, Postsecondary	5	60	59	-1.7%	9
25-1064	Geography Teachers, Postsecondary	5	18	18	0.0%	3
25-1065	Political Science Teachers, Postsecondary	5	60	54	-10.0%	5
25-1066	Psychology Teachers, Postsecondary	5	127	126	-0.8%	19
25-1067	Sociology Teachers, Postsecondary	5	84	88	4.8%	17
25-1069	Social Sciences Teachers, Postsecondary, All Other	5	25	30	20.0%	9
25-1071	Health Specialties Teachers, Postsecondary	5	358	331	-7.5%	28
25-1072	Nursing Instructors and Teachers, Postsecondary	5	172	168	-2.3%	22
25-1081	Education Teachers, Postsecondary	5	188	177	-5.9%	17
25-1082	Library Science Teachers, Postsecondary	5	18	19	5.6%	4
25-1111	Criminal Justice and Law Enforcement Teachers, Postsecondary	5	30	29	-3.3%	4
25-1112	Law Teachers, Postsecondary	5	29	29	0.0%	5
25-1113	Social Work Teachers, Postsecondary	5	33	29	-12.1%	1
25-1121	Art, Drama, and Music Teachers, Postsecondary	5	256	305	19.1%	88

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-1122	Communications Teachers, Postsecondary	5	83	85	2.4%	15
25-1123	English Language and Literature Teachers, Postsecondary	5	240	232	-3.3%	28
25-1124	Foreign Language and Literature Teachers, Postsecondary	5	97	95	-2.1%	14
25-1125	History Teachers, Postsecondary	5	79	76	-3.8%	10
25-1126	Philosophy and Religion Teachers, Postsecondary	5	79	75	-5.1%	9
25-1191	Graduate Teaching Assistants	5	78	82	5.1%	16
25-1192	Home Economics Teachers, Postsecondary	5	6	5	-16.7%	0
25-1193	Recreation and Fitness Studies Teachers, Postsecondary	5	53	49	-7.5%	4
25-1194	Vocational Education Teachers, Postsecondary	3	220	205	-6.8%	22
25-1199	Postsecondary Teachers, All Other	5	227	256	12.8%	63
25-2011	Preschool Teachers, Except Special Education	3	908	1,138	25.3%	491
25-2012	Kindergarten Teachers, Except Special Education	4	443	401	-9.5%	94
25-2021	Elementary School Teachers, Except Special Education	4	4,186	3,885	-7.2%	752
25-2022	Middle School Teachers, Except Special and Career/Technical Education	4	1,772	1,895	6.9%	567
25-2023	Career/Technical Education Teachers, Middle School	4	48	55	14.6%	21
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	4	3,842	3,395	-11.6%	862
25-2032	Career/Technical Education Teachers, Secondary School	4	344	295	-14.2%	63
25-2051	Special Education Teachers, Preschool	4	52	60	15.4%	17
25-2052	Special Education Teachers, Kindergarten and Elementary School	4	819	805	-1.7%	171
25-2053	Special Education Teachers, Middle School	4	286	279	-2.4%	59
25-2054	Special Education Teachers, Secondary School	4	619	626	1.1%	158
25-2059	Special Education Teachers, All Other	4	19	22	15.8%	5
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	4	115	103	-10.4%	12
25-3021	Self-Enrichment Education Teachers	3	405	387	-4.4%	68
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	3	256	296	15.6%	83
25-3098	Substitute Teachers	3	1,184	993	-16.1%	60
25-4011	Archivists	5	13	14	7.7%	4
25-4012	Curators	5	16	17	6.3%	5
25-4013	Museum Technicians and Conservators	4	16	19	18.8%	7
25-4021	Librarians	5	328	309	-5.8%	62

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-4031	Library Technicians	4	166	169	1.8%	97
25-9011	Audio-Visual and Multimedia Collections Specialists	4	14	15	7.1%	3
25-9021	Farm and Home Management Advisors	5	2	2	0.0%	0
25-9031	Instructional Coordinators	5	227	221	-2.6%	14
25-9041	Teacher Assistants	3	3,293	3,257	-1.1%	782
25-9099	Education, Training, and Library Workers, All Other	4	49	47	-4.1%	2
27-1011	Art Directors	4	41	45	9.8%	15
27-1012	Craft Artists	2	5	4	-20.0%	0
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	3	18	19	5.6%	6
27-1014	Multimedia Artists and Animators	4	14	15	7.1%	4
27-1019	Artists and Related Workers, All Other	4	7	6	-14.3%	0
27-1021	Commercial and Industrial Designers	4	52	41	-21.2%	5
27-1022	Fashion Designers	3	6	6	0.0%	2
27-1023	Floral Designers	2	134	95	-29.1%	33
27-1024	Graphic Designers	4	347	350	0.9%	113
27-1025	Interior Designers	4	56	61	8.9%	27
27-1026	Merchandise Displayers and Window Trimmers	3	129	150	16.3%	58
27-1027	Set and Exhibit Designers	5	10	12	20.0%	4
27-2011	Actors	2	44	48	9.1%	21
27-2012	Producers and Directors	4	115	139	20.9%	74
27-2021	Athletes and Sports Competitors	2	32	38	18.8%	18
27-2022	Coaches and Scouts	4	471	420	-10.8%	98
27-2023	Umpires, Referees, and Other Sports Officials	3	14	13	-7.1%	2
27-2031	Dancers	3	4	3	-25.0%	1
27-2032	Choreographers	4	6	8	33.3%	4
27-2041	Music Directors and Composers	3	62	48	-22.6%	8
27-2042	Musicians and Singers	3	38	36	-5.3%	13
27-2099	Entertainers and Performers, Sports and Related Workers, All Other	3	4	4	0.0%	0
27-3011	Radio and Television Announcers	3	67	73	9.0%	37
27-3012	Public Address System and Other Announcers	2	2	2	0.0%	1
27-3022	Reporters and Correspondents	4	80	71	-11.3%	33
27-3031	Public Relations Specialists	4	401	384	-4.2%	45
27-3041	Editors	4	170	174	2.4%	59
27-3042	Technical Writers	4	69	74	7.2%	27
27-3043	Writers and Authors	4	65	66	1.5%	17

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
27-3091	Interpreters and Translators	4	55	49	-10.9%	2
27-3099	Media and Communication Workers, All Other	4	14	12	-14.3%	0
27-4011	Audio and Video Equipment Technicians	3	73	79	8.2%	22
27-4012	Broadcast Technicians	3	33	35	6.1%	11
27-4014	Sound Engineering Technicians	3	15	15	0.0%	4
27-4021	Photographers	3	102	98	-3.9%	26
27-4031	Camera Operators, Television, Video, and Motion Picture	3	21	20	-4.8%	2
27-4032	Film and Video Editors	3	13	11	-15.4%	0
27-4099	Media and Communication Equipment Workers, All Other	3	12	9	-25.0%	0
29-1011	Chiropractors	5	107	143	33.6%	60
29-1021	Dentists, General	5	212	239	12.7%	80
29-1022	Oral and Maxillofacial Surgeons	5	8	9	12.5%	3
29-1023	Orthodontists	5	6	7	16.7%	3
29-1029	Dentists, All Other Specialists	5	6	6	0.0%	2
29-1031	Dietitians and Nutritionists	5	230	251	9.1%	52
29-1041	Optometrists	5	102	129	26.5%	62
29-1051	Pharmacists	5	760	758	-0.3%	198
29-1061	Anesthesiologists	5	97	95	-2.1%	25
29-1062	Family and General Practitioners	5	419	473	12.9%	170
29-1063	Internists, General	5	65	64	-1.5%	15
29-1064	Obstetricians and Gynecologists	5	22	28	27.3%	11
29-1065	Pediatricians, General	5	24	31	29.2%	11
29-1066	Psychiatrists	5	69	63	-8.7%	13
29-1067	Surgeons	5	137	172	25.5%	72
29-1069	Physicians and Surgeons, All Other	5	942	1,008	7.0%	313
29-1071	Physician Assistants	5	318	356	11.9%	100
29-1081	Podiatrists	5	40	53	32.5%	29
29-1122	Occupational Therapists	5	422	562	33.2%	206
29-1123	Physical Therapists	5	730	964	32.1%	441
29-1124	Radiation Therapists	3	56	63	12.5%	18
29-1125	Recreational Therapists	4	103	106	2.9%	27
29-1126	Respiratory Therapists	3	327	375	14.7%	95
29-1127	Speech-Language Pathologists	5	334	416	24.6%	131
29-1128	Exercise Physiologists	5	23	35	52.2%	15
29-1129	Therapists, All Other	4	31	43	38.7%	16
29-1131	Veterinarians	5	137	181	32.1%	94

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
29-1141	Registered Nurses	3	8,531	10,173	19.2%	3,370
29-1151	Nurse Anesthetists	5	132	146	10.6%	42
29-1161	Nurse Midwives	5	11	14	27.3%	5
29-1171	Nurse Practitioners	5	247	318	28.7%	116
29-1181	Audiologists	5	40	47	17.5%	16
29-1199	Health Diagnosing and Treating Practitioners, All Other	5	32	30	-6.3%	6
29-2011	Medical and Clinical Laboratory Technologists	4	530	565	6.6%	195
29-2012	Medical and Clinical Laboratory Technicians	3	611	682	11.6%	246
29-2021	Dental Hygienists	3	524	645	23.1%	263
29-2031	Cardiovascular Technologists and Technicians	3	196	245	25.0%	79
29-2032	Diagnostic Medical Sonographers	3	160	198	23.8%	61
29-2033	Nuclear Medicine Technologists	3	70	80	14.3%	21
29-2034	Radiologic Technologists	3	640	743	16.1%	203
29-2035	Magnetic Resonance Imaging Technologists	3	88	104	18.2%	30
29-2041	Emergency Medical Technicians and Paramedics	3	803	923	14.9%	385
29-2051	Dietetic Technicians	2	226	318	40.7%	119
29-2052	Pharmacy Technicians	3	897	943	5.1%	150
29-2053	Psychiatric Technicians	3	94	101	7.4%	27
29-2054	Respiratory Therapy Technicians	3	34	37	8.8%	6
29-2055	Surgical Technologists	3	244	325	33.2%	105
29-2056	Veterinary Technologists and Technicians	3	207	286	38.2%	101
29-2057	Ophthalmic Medical Technicians	3	75	99	32.0%	33
29-2061	Licensed Practical and Licensed Vocational Nurses	3	2,627	3,231	23.0%	1,298
29-2071	Medical Records and Health Information Technicians	3	507	611	20.5%	240
29-2081	Opticians, Dispensing	3	224	287	28.1%	140
29-2091	Orthotists and Prosthetists	5	9	12	33.3%	4
29-2092	Hearing Aid Specialists	3	9	10	11.1%	2
29-2099	Health Technologists and Technicians, All Other	3	169	224	32.5%	68
29-9011	Occupational Health and Safety Specialists	4	139	145	4.3%	47
29-9012	Occupational Health and Safety Technicians	3	49	50	2.0%	15
29-9091	Athletic Trainers	5	85	116	36.5%	56
29-9099	Healthcare Practitioners and Technical Workers, All Other	4	55	53	-3.6%	12
31-1011	Home Health Aides	2	4,416	5,838	32.2%	2,637
31-1013	Psychiatric Aides	2	124	121	-2.4%	28
31-1014	Nursing Assistants	2	5,601	6,486	15.8%	2,016

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
31-1015	Orderlies	2	155	180	16.1%	55
31-2011	Occupational Therapy Assistants	3	180	235	30.6%	111
31-2012	Occupational Therapy Aides	3	37	55	48.6%	28
31-2021	Physical Therapist Assistants	3	335	475	41.8%	230
31-2022	Physical Therapist Aides	2	158	219	38.6%	99
31-9011	Massage Therapists	3	140	189	35.0%	63
31-9091	Dental Assistants	3	718	818	13.9%	257
31-9092	Medical Assistants	3	1,572	1,876	19.3%	620
31-9093	Medical Equipment Preparers	2	127	149	17.3%	46
31-9094	Medical Transcriptionists	3	245	218	-11.0%	39
31-9095	Pharmacy Aides	2	91	75	-17.6%	5
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	3	124	129	4.0%	31
31-9097	Phlebotomists	3	335	414	23.6%	157
31-9099	Healthcare Support Workers, All Other	3	88	83	-5.7%	8
33-1011	First-Line Supervisors of Correctional Officers	3	86	94	9.3%	41
33-1012	First-Line Supervisors of Police and Detectives	3	189	211	11.6%	85
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	3	52	59	13.5%	31
33-1099	First-Line Supervisors of Protective Service Workers, All Other	3	111	149	34.2%	72
33-2011	Firefighters	3	320	339	5.9%	116
33-2021	Fire Inspectors and Investigators	3	16	14	-12.5%	4
33-3011	Bailiffs	2	14	11	-21.4%	2
33-3012	Correctional Officers and Jailers	3	1,060	1,026	-3.2%	295
33-3021	Detectives and Criminal Investigators	3	177	180	1.7%	49
33-3041	Parking Enforcement Workers	2	29	33	13.8%	15
33-3051	Police and Sheriff's Patrol Officers	3	1,789	1,804	0.8%	657
33-3052	Transit and Railroad Police	3	5	4	-20.0%	1
33-9011	Animal Control Workers	2	15	16	6.7%	5
33-9021	Private Detectives and Investigators	3	71	68	-4.2%	25
33-9031	Gaming Surveillance Officers and Gaming Investigators	2	34	44	29.4%	25
33-9032	Security Guards	2	2,232	2,604	16.7%	997
33-9091	Crossing Guards	1	246	190	-22.8%	9
33-9092	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	2	489	541	10.6%	406
33-9093	Transportation Security Screeners	2	83	83	0.0%	22
33-9099	Protective Service Workers, All Other	2	231	272	17.7%	206

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
35-1011	Chefs and Head Cooks	3	298	302	1.3%	64
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	2	2,039	2,253	10.5%	840
35-2011	Cooks, Fast Food	1	581	511	-12.0%	57
35-2012	Cooks, Institution and Cafeteria	2	1,275	1,285	0.8%	274
35-2014	Cooks, Restaurant	2	2,830	3,585	26.7%	1,413
35-2015	Cooks, Short Order	1	568	646	13.7%	218
35-2021	Food Preparation Workers	1	2,300	2,055	-10.7%	482
35-3011	Bartenders	2	2,750	2,901	5.5%	1,311
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	1	9,107	10,272	12.8%	5,077
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	1	657	640	-2.6%	407
35-3031	Waiters and Waitresses	1	6,613	7,277	10.0%	4,163
35-3041	Food Servers, Nonrestaurant	1	830	951	14.6%	389
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	1	988	998	1.0%	488
35-9021	Dishwashers	1	1,430	1,350	-5.6%	613
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	1	990	1,041	5.2%	851
35-9099	Food Preparation and Serving Related Workers, All Other	1	75	92	22.7%	60
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2	406	444	9.4%	151
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	3	170	190	11.8%	40
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2	5,926	6,283	6.0%	1,716
37-2012	Maids and Housekeeping Cleaners	2	2,311	2,557	10.6%	836
37-2019	Building Cleaning Workers, All Other	2	23	23	0.0%	4
37-2021	Pest Control Workers	2	106	137	29.2%	64
37-3011	Landscaping and Groundskeeping Workers	1	2,072	2,376	14.7%	908
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	2	32	32	0.0%	9
37-3013	Tree Trimmers and Pruners	2	183	243	32.8%	124
37-3019	Grounds Maintenance Workers, All Other	2	6	5	-16.7%	0
39-1011	Gaming Supervisors	2	74	97	31.1%	63
39-1012	Slot Supervisors	2	4	5	25.0%	2
39-1021	First-Line Supervisors of Personal Service Workers	3	590	739	25.3%	266
39-2011	Animal Trainers	2	8	7	-12.5%	3
39-2021	Nonfarm Animal Caretakers	1	204	242	18.6%	70

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
39-3011	Gaming Dealers	2	321	410	27.7%	251
39-3012	Gaming and Sports Book Writers and Runners	2	6	8	33.3%	4
39-3019	Gaming Service Workers, All Other	2	5	6	20.0%	2
39-3021	Motion Picture Projectionists	2	10	9	-10.0%	4
39-3031	Ushers, Lobby Attendants, and Ticket Takers	2	239	259	8.4%	169
39-3091	Amusement and Recreation Attendants	1	871	882	1.3%	506
39-3092	Costume Attendants	2	4	5	25.0%	3
39-3093	Locker Room, Coatroom, and Dressing Room Attendants	2	40	33	-17.5%	15
39-3099	Entertainment Attendants and Related Workers, All Other	2	33	29	-12.1%	16
39-4021	Funeral Attendants	2	180	216	20.0%	94
39-4031	Morticians, Undertakers, and Funeral Directors	3	109	137	25.7%	61
39-5011	Barbers	3	35	36	2.9%	11
39-5012	Hairdressers, Hairstylists, and Cosmetologists	3	1,244	1,364	9.6%	472
39-5092	Manicurists and Pedicurists	2	170	186	9.4%	34
39-5093	Shampooers	2	72	73	1.4%	14
39-5094	Skincare Specialists	3	59	54	-8.5%	0
39-6011	Baggage Porters and Bellhops	2	51	64	25.5%	32
39-6012	Concierges	3	36	51	41.7%	24
39-7011	Tour Guides and Escorts	3	44	43	-2.3%	23
39-7012	Travel Guides	3	3	3	0.0%	1
39-9011	Childcare Workers	3	1,627	1,545	-5.0%	404
39-9021	Personal Care Aides	2	5,576	8,704	56.1%	3,872
39-9031	Fitness Trainers and Aerobics Instructors	3	758	862	13.7%	236
39-9032	Recreation Workers	4	1,036	1,318	27.2%	406
39-9041	Residential Advisors	3	695	844	21.4%	498
39-9099	Personal Care and Service Workers, All Other	3	83	67	-19.3%	7
41-1011	First-Line Supervisors of Retail Sales Workers	2	3,148	3,259	3.5%	820
41-1012	First-Line Supervisors of Non-Retail Sales Workers	4	415	388	-6.5%	35
41-2011	Cashiers	1	11,360	10,742	-5.4%	4,724
41-2012	Gaming Change Persons and Booth Cashiers	2	19	24	26.3%	22
41-2021	Counter and Rental Clerks	1	913	956	4.7%	311
41-2022	Parts Salespersons	2	742	837	12.8%	317
41-2031	Retail Salespersons	2	13,396	14,261	6.5%	5,728
41-3011	Advertising Sales Agents	3	229	219	-4.4%	84
41-3021	Insurance Sales Agents	4	819	816	-0.4%	245

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
41-3031	Securities, Commodities, and Financial Services Sales Agents	4	397	393	-1.0%	107
41-3041	Travel Agents	3	84	74	-11.9%	34
41-3099	Sales Representatives, Services, All Other	4	1,218	1,486	22.0%	618
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	4	378	347	-8.2%	53
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	4	3,734	3,654	-2.1%	788
41-9011	Demonstrators and Product Promoters	2	61	58	-4.9%	15
41-9012	Models	1	6	7	16.7%	3
41-9021	Real Estate Brokers	4	34	31	-8.8%	2
41-9022	Real Estate Sales Agents	3	324	378	16.7%	108
41-9031	Sales Engineers	4	154	156	1.3%	35
41-9041	Telemarketers	2	317	274	-13.6%	108
41-9091	Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	2	6	6	0.0%	1
41-9099	Sales and Related Workers, All Other	3	85	78	-8.2%	9
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3	3,091	3,215	4.0%	864
43-2011	Switchboard Operators, Including Answering Service	2	305	249	-18.4%	52
43-2021	Telephone Operators	2	15	10	-33.3%	0
43-3011	Bill and Account Collectors	2	578	558	-3.5%	175
43-3021	Billing and Posting Clerks	2	1,492	1,641	10.0%	451
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3	3,727	3,948	5.9%	589
43-3041	Gaming Cage Workers	2	21	27	28.6%	17
43-3051	Payroll and Timekeeping Clerks	2	470	466	-0.9%	109
43-3061	Procurement Clerks	3	159	147	-7.5%	50
43-3071	Tellers	2	1,472	1,297	-11.9%	689
43-3099	Financial Clerks, All Other	2	40	44	10.0%	18
43-4011	Brokerage Clerks	3	79	87	10.1%	38
43-4021	Correspondence Clerks	2	30	30	0.0%	11
43-4031	Court, Municipal, and License Clerks	3	157	167	6.4%	37
43-4041	Credit Authorizers, Checkers, and Clerks	3	63	45	-28.6%	1
43-4051	Customer Service Representatives	2	5,664	6,120	8.1%	2,167
43-4061	Eligibility Interviewers, Government Programs	3	564	570	1.1%	129
43-4071	File Clerks	2	275	238	-13.5%	44
43-4081	Hotel, Motel, and Resort Desk Clerks	2	444	463	4.3%	289
43-4111	Interviewers, Except Eligibility and Loan	2	511	553	8.2%	154

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-4121	Library Assistants, Clerical	2	257	263	2.3%	124
43-4131	Loan Interviewers and Clerks	3	292	321	9.9%	72
43-4141	New Accounts Clerks	2	69	73	5.8%	31
43-4151	Order Clerks	2	524	472	-9.9%	135
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	3	373	332	-11.0%	71
43-4171	Receptionists and Information Clerks	2	2,455	2,423	-1.3%	647
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	2	19	19	0.0%	6
43-4199	Information and Record Clerks, All Other	2	172	125	-27.3%	6
43-5011	Cargo and Freight Agents	2	37	36	-2.7%	12
43-5021	Couriers and Messengers	2	134	121	-9.7%	18
43-5031	Police, Fire, and Ambulance Dispatchers	2	204	214	4.9%	75
43-5032	Dispatchers, Except Police, Fire, and Ambulance	2	398	460	15.6%	187
43-5041	Meter Readers, Utilities	2	113	97	-14.2%	31
43-5051	Postal Service Clerks	2	212	171	-19.3%	52
43-5052	Postal Service Mail Carriers	2	837	676	-19.2%	322
43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	2	389	263	-32.4%	20
43-5061	Production, Planning, and Expediting Clerks	3	1,062	1,108	4.3%	345
43-5071	Shipping, Receiving, and Traffic Clerks	2	1,983	1,930	-2.7%	539
43-5081	Stock Clerks and Order Fillers	2	5,098	5,048	-1.0%	1,731
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	2	109	109	0.0%	29
43-6011	Executive Secretaries and Executive Administrative Assistants	3	1,124	1,054	-6.2%	112
43-6012	Legal Secretaries	3	372	413	11.0%	115
43-6013	Medical Secretaries	3	1,440	1,880	30.6%	607
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	3	6,334	6,861	8.3%	1,349
43-9011	Computer Operators	3	125	126	0.8%	38
43-9021	Data Entry Keyers	2	427	325	-23.9%	47
43-9022	Word Processors and Typists	2	422	332	-21.3%	29
43-9031	Desktop Publishers	3	32	32	0.0%	9
43-9041	Insurance Claims and Policy Processing Clerks	3	613	641	4.6%	228
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	2	256	205	-19.9%	51
43-9061	Office Clerks, General	2	7,513	7,226	-3.8%	1,443
43-9071	Office Machine Operators, Except Computer	2	120	108	-10.0%	36
43-9081	Proofreaders and Copy Markers	4	21	19	-9.5%	4

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-9111	Statistical Assistants	4	28	28	0.0%	9
43-9199	Office and Administrative Support Workers, All Other	3	258	308	19.4%	125
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	3	28	27	-3.6%	7
45-2011	Agricultural Inspectors	2	24	22	-8.3%	8
45-2041	Graders and Sorters, Agricultural Products	1	13	14	7.7%	5
45-2091	Agricultural Equipment Operators	2	22	24	9.1%	11
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1	110	101	-8.2%	35
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	1	63	67	6.3%	29
45-4011	Forest and Conservation Workers	3	11	13	18.2%	3
45-4021	Fallers	1	7	6	-14.3%	0
45-4022	Logging Equipment Operators	1	66	73	10.6%	35
45-4023	Log Graders and Scalers	3	32	36	12.5%	10
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	3	1,204	1,336	11.0%	280
47-2011	Boilermakers	3	43	39	-9.3%	21
47-2021	Brickmasons and Blockmasons	2	152	157	3.3%	23
47-2022	Stonemasons	3	20	18	-10.0%	0
47-2031	Carpenters	2	1,765	1,834	3.9%	329
47-2041	Carpet Installers	2	83	94	13.3%	32
47-2042	Floor Layers, Except Carpet, Wood, and Hard Tiles	2	19	17	-10.5%	2
47-2044	Tile and Marble Setters	2	38	46	21.1%	14
47-2051	Cement Masons and Concrete Finishers	2	303	300	-1.0%	32
47-2053	Terrazzo Workers and Finishers	2	4	3	-25.0%	0
47-2061	Construction Laborers	2	1,978	2,321	17.3%	821
47-2071	Paving, Surfacing, and Tamping Equipment Operators	2	165	162	-1.8%	32
47-2072	Pile-Driver Operators	2	4	4	0.0%	1
47-2073	Operating Engineers and Other Construction Equipment Operators	2	1,313	1,348	2.7%	415
47-2081	Drywall and Ceiling Tile Installers	2	75	68	-9.3%	8
47-2082	Tapers	2	23	25	8.7%	6
47-2111	Electricians	3	1,388	1,537	10.7%	527
47-2121	Glaziers	2	80	83	3.8%	29
47-2131	Insulation Workers, Floor, Ceiling, and Wall	2	28	31	10.7%	8
47-2132	Insulation Workers, Mechanical	2	21	27	28.6%	9
47-2141	Painters, Construction and Maintenance	2	254	283	11.4%	83

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-2142	Paperhangers	2	6	5	-16.7%	0
47-2151	Pipelayers	2	81	78	-3.7%	18
47-2152	Plumbers, Pipefitters, and Steamfitters	3	906	878	-3.1%	136
47-2161	Plasterers and Stucco Masons	1	18	21	16.7%	3
47-2171	Reinforcing Iron and Rebar Workers	2	18	18	0.0%	3
47-2181	Roofers	2	207	183	-11.6%	56
47-2211	Sheet Metal Workers	2	301	294	-2.3%	57
47-2221	Structural Iron and Steel Workers	2	99	94	-5.1%	33
47-3011	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	2	49	43	-12.2%	1
47-3012	Helpers--Carpenters	2	46	51	10.9%	11
47-3013	Helpers--Electricians	2	77	98	27.3%	36
47-3014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	1	8	7	-12.5%	1
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	2	60	52	-13.3%	3
47-3016	Helpers--Roofers	2	19	24	26.3%	9
47-3019	Helpers, Construction Trades, All Other	2	15	14	-6.7%	1
47-4011	Construction and Building Inspectors	3	237	287	21.1%	116
47-4021	Elevator Installers and Repairers	3	20	17	-15.0%	4
47-4031	Fence Erectors	2	57	54	-5.3%	13
47-4041	Hazardous Materials Removal Workers	3	96	123	28.1%	61
47-4051	Highway Maintenance Workers	2	744	762	2.4%	162
47-4061	Rail-Track Laying and Maintenance Equipment Operators	2	29	32	10.3%	9
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	1	57	76	33.3%	37
47-4099	Construction and Related Workers, All Other	3	25	22	-12.0%	0
47-5011	Derrick Operators, Oil and Gas	1	89	77	-13.5%	37
47-5012	Rotary Drill Operators, Oil and Gas	2	358	375	4.7%	281
47-5013	Service Unit Operators, Oil, Gas, and Mining	2	182	194	6.6%	129
47-5021	Earth Drillers, Except Oil and Gas	2	87	96	10.3%	48
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	2	9	11	22.2%	4
47-5041	Continuous Mining Machine Operators	1	46	40	-13.0%	15
47-5042	Mine Cutting and Channeling Machine Operators	2	38	31	-18.4%	9
47-5049	Mining Machine Operators, All Other	2	12	14	16.7%	5
47-5051	Rock Splitters, Quarry	1	23	25	8.7%	11
47-5061	Roof Bolters, Mining	2	53	53	0.0%	27
47-5071	Roustabouts, Oil and Gas	1	262	304	16.0%	165
47-5081	Helpers--Extraction Workers	2	177	175	-1.1%	87

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-5099	Extraction Workers, All Other	2	29	24	-17.2%	3
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	3	1,074	1,198	11.5%	429
49-2011	Computer, Automated Teller, and Office Machine Repairers	3	165	167	1.2%	55
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	3	14	15	7.1%	3
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	3	240	239	-0.4%	60
49-2091	Avionics Technicians	3	38	44	15.8%	18
49-2092	Electric Motor, Power Tool, and Related Repairers	3	59	66	11.9%	24
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	3	11	10	-9.1%	2
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	3	244	223	-8.6%	47
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	3	65	83	27.7%	37
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	3	7	8	14.3%	2
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	3	26	24	-7.7%	10
49-2098	Security and Fire Alarm Systems Installers	3	142	167	17.6%	61
49-3011	Aircraft Mechanics and Service Technicians	3	48	54	12.5%	26
49-3021	Automotive Body and Related Repairers	2	456	498	9.2%	162
49-3022	Automotive Glass Installers and Repairers	2	58	62	6.9%	23
49-3023	Automotive Service Technicians and Mechanics	3	2,433	2,568	5.5%	843
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	3	838	1,011	20.6%	385
49-3041	Farm Equipment Mechanics and Service Technicians	3	55	48	-12.7%	14
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	3	260	273	5.0%	102
49-3043	Rail Car Repairers	2	109	153	40.4%	90
49-3051	Motorboat Mechanics and Service Technicians	3	17	16	-5.9%	3
49-3052	Motorcycle Mechanics	3	86	122	41.9%	67
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	2	127	141	11.0%	46
49-3091	Bicycle Repairers	2	25	20	-20.0%	7
49-3092	Recreational Vehicle Service Technicians	2	29	29	0.0%	11
49-3093	Tire Repairers and Changers	2	238	234	-1.7%	92
49-9011	Mechanical Door Repairers	2	24	25	4.2%	11
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	3	94	114	21.3%	54

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3	681	757	11.2%	284
49-9031	Home Appliance Repairers	3	66	53	-19.7%	18
49-9041	Industrial Machinery Mechanics	3	1,472	1,667	13.2%	675
49-9043	Maintenance Workers, Machinery	3	577	666	15.4%	192
49-9044	Millwrights	3	99	120	21.2%	45
49-9045	Refractory Materials Repairers, Except Brickmasons	2	25	26	4.0%	11
49-9051	Electrical Power-Line Installers and Repairers	3	222	258	16.2%	132
49-9052	Telecommunications Line Installers and Repairers	2	370	374	1.1%	152
49-9062	Medical Equipment Repairers	3	135	166	23.0%	78
49-9063	Musical Instrument Repairers and Tuners	3	25	24	-4.0%	9
49-9064	Watch Repairers	3	2	2	0.0%	1
49-9069	Precision Instrument and Equipment Repairers, All Other	3	10	9	-10.0%	2
49-9071	Maintenance and Repair Workers, General	3	4,460	4,747	6.4%	1,270
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	2	62	56	-9.7%	11
49-9092	Commercial Divers	3	23	22	-4.3%	8
49-9094	Locksmiths and Safe Repairers	2	18	17	-5.6%	4
49-9095	Manufactured Building and Mobile Home Installers	2	11	13	18.2%	7
49-9096	Riggers	2	17	22	29.4%	9
49-9098	Helpers--Installation, Maintenance, and Repair Workers	2	295	314	6.4%	112
49-9099	Installation, Maintenance, and Repair Workers, All Other	2	157	185	17.8%	53
51-1011	First-Line Supervisors of Production and Operating Workers	2	3,127	3,256	4.1%	757
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	185	214	15.7%	89
51-2021	Coil Winders, Tapers, and Finishers	2	56	49	-12.5%	7
51-2022	Electrical and Electronic Equipment Assemblers	2	773	741	-4.1%	153
51-2023	Electromechanical Equipment Assemblers	2	312	266	-14.7%	33
51-2031	Engine and Other Machine Assemblers	2	383	329	-14.1%	91
51-2041	Structural Metal Fabricators and Fitters	3	617	617	0.0%	305
51-2091	Fiberglass Laminators and Fabricators	2	69	73	5.8%	24
51-2092	Team Assemblers	2	4,073	4,033	-1.0%	905
51-2099	Assemblers and Fabricators, All Other	2	339	461	36.0%	183
51-3011	Bakers	2	522	560	7.3%	204
51-3021	Butchers and Meat Cutters	2	315	252	-20.0%	31
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	1	84	68	-19.0%	8

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-3023	Slaughterers and Meat Packers	1	92	86	-6.5%	29
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	2	18	22	22.2%	10
51-3092	Food Batchmakers	2	351	385	9.7%	182
51-3093	Food Cooking Machine Operators and Tenders	2	96	111	15.6%	46
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3	1,530	1,890	23.5%	893
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	3	217	235	8.3%	87
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	2	753	757	0.5%	276
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	2	635	667	5.0%	257
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	2	401	380	-5.2%	110
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	1,739	1,682	-3.3%	280
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	249	161	-35.3%	10
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	991	1,040	4.9%	434
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	604	557	-7.8%	173
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	3	269	266	-1.1%	92
51-4041	Machinists	3	3,374	3,523	4.4%	1,143
51-4051	Metal-Refining Furnace Operators and Tenders	2	160	160	0.0%	48
51-4052	Pourers and Casters, Metal	2	137	145	5.8%	61
51-4061	Model Makers, Metal and Plastic	3	126	107	-15.1%	14
51-4062	Patternmakers, Metal and Plastic	3	59	67	13.6%	32
51-4071	Foundry Mold and Coremakers	2	103	83	-19.4%	11
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2	1,078	1,069	-0.8%	265
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	1,384	1,522	10.0%	625
51-4111	Tool and Die Makers	3	1,041	1,140	9.5%	292
51-4121	Welders, Cutters, Solderers, and Brazers	3	2,713	2,917	7.5%	1,087
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	2	338	344	1.8%	138
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	2	343	293	-14.6%	55
51-4192	Layout Workers, Metal and Plastic	2	55	53	-3.6%	13
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	2	428	418	-2.3%	138

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-4194	Tool Grinders, Filers, and Sharpeners	2	149	130	-12.8%	25
51-4199	Metal Workers and Plastic Workers, All Other	2	110	127	15.5%	41
51-5111	Prepress Technicians and Workers	3	92	69	-25.0%	17
51-5112	Printing Press Operators	3	419	357	-14.8%	75
51-5113	Print Binding and Finishing Workers	2	125	111	-11.2%	30
51-6011	Laundry and Dry-Cleaning Workers	1	580	639	10.2%	266
51-6021	Pressers, Textile, Garment, and Related Materials	1	97	106	9.3%	30
51-6031	Sewing Machine Operators	1	158	164	3.8%	82
51-6041	Shoe and Leather Workers and Repairers	2	21	28	33.3%	25
51-6051	Sewers, Hand	2	149	183	22.8%	50
51-6052	Tailors, Dressmakers, and Custom Sewers	3	56	67	19.6%	26
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders	2	10	10	0.0%	8
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	2	33	40	21.2%	26
51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	2	18	21	16.7%	16
51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2	5	5	0.0%	3
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	2	65	55	-15.4%	14
51-6092	Fabric and Apparel Patternmakers	3	4	5	25.0%	2
51-6093	Upholsterers	2	30	36	20.0%	21
51-6099	Textile, Apparel, and Furnishings Workers, All Other	2	22	25	13.6%	6
51-7011	Cabinetmakers and Bench Carpenters	2	242	287	18.6%	146
51-7021	Furniture Finishers	1	74	95	28.4%	64
51-7031	Model Makers, Wood	3	17	17	0.0%	3
51-7032	Patternmakers, Wood	3	16	19	18.8%	6
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	2	623	887	42.4%	546
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	2	652	941	44.3%	438
51-7099	Woodworkers, All Other	2	8	7	-12.5%	1
51-8011	Nuclear Power Reactor Operators	3	20	22	10.0%	10
51-8012	Power Distributors and Dispatchers	3	38	43	13.2%	20
51-8013	Power Plant Operators	2	120	117	-2.5%	53
51-8021	Stationary Engineers and Boiler Operators	3	468	535	14.3%	269
51-8031	Water and Wastewater Treatment Plant and System Operators	3	435	472	8.5%	220
51-8091	Chemical Plant and System Operators	2	107	105	-1.9%	63
51-8092	Gas Plant Operators	3	202	250	23.8%	159

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	2	140	168	20.0%	103
51-8099	Plant and System Operators, All Other	2	34	37	8.8%	18
51-9011	Chemical Equipment Operators and Tenders	2	253	248	-2.0%	131
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	2	77	99	28.6%	57
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	2	107	104	-2.8%	41
51-9022	Grinding and Polishing Workers, Hand	1	188	198	5.3%	80
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2	462	504	9.1%	222
51-9031	Cutters and Trimmers, Hand	2	40	28	-30.0%	2
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	2	205	181	-11.7%	33
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	2	375	355	-5.3%	128
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	2	120	120	0.0%	51
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2	2,289	2,353	2.8%	659
51-9071	Jewelers and Precious Stone and Metal Workers	3	36	30	-16.7%	4
51-9081	Dental Laboratory Technicians	2	34	40	17.6%	25
51-9082	Medical Appliance Technicians	3	28	28	0.0%	14
51-9083	Ophthalmic Laboratory Technicians	2	61	61	0.0%	27
51-9111	Packaging and Filling Machine Operators and Tenders	2	939	946	0.7%	294
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	2	544	646	18.8%	245
51-9122	Painters, Transportation Equipment	2	365	331	-9.3%	72
51-9123	Painting, Coating, and Decorating Workers	2	67	65	-3.0%	17
51-9141	Semiconductor Processors	2	44	41	-6.8%	17
51-9151	Photographic Process Workers and Processing Machine Operators	2	60	45	-25.0%	10
51-9191	Adhesive Bonding Machine Operators and Tenders	2	35	37	5.7%	13
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	2	45	67	48.9%	35
51-9193	Cooling and Freezing Equipment Operators and Tenders	2	41	43	4.9%	17
51-9194	Etchers and Engravers	2	24	26	8.3%	10
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	2	244	233	-4.5%	100
51-9196	Paper Goods Machine Setters, Operators, and Tenders	2	486	448	-7.8%	91
51-9197	Tire Builders	2	113	132	16.8%	66

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-9198	Helpers--Production Workers	2	2,094	2,164	3.3%	604
51-9199	Production Workers, All Other	2	158	179	13.3%	61
53-1011	Aircraft Cargo Handling Supervisors	2	7	7	0.0%	2
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	2	338	368	8.9%	136
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	2	526	588	11.8%	219
53-2012	Commercial Pilots	3	41	50	22.0%	24
53-2021	Air Traffic Controllers	3	28	28	0.0%	14
53-2022	Airfield Operations Specialists	3	2	2	0.0%	1
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	2	109	143	31.2%	57
53-3021	Bus Drivers, Transit and Intercity	2	332	390	17.5%	150
53-3022	Bus Drivers, School or Special Client	2	2,529	2,901	14.7%	1,011
53-3031	Driver/Sales Workers	2	1,056	1,079	2.2%	225
53-3032	Heavy and Tractor-Trailer Truck Drivers	2	5,582	6,576	17.8%	2,169
53-3033	Light Truck or Delivery Services Drivers	2	1,836	1,810	-1.4%	322
53-3041	Taxi Drivers and Chauffeurs	1	395	424	7.3%	108
53-3099	Motor Vehicle Operators, All Other	2	56	67	19.6%	25
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	2	36	40	11.1%	15
53-5011	Sailors and Marine Oilers	2	13	17	30.8%	13
53-5021	Captains, Mates, and Pilots of Water Vessels	3	40	36	-10.0%	21
53-6011	Bridge and Lock Tenders	1	8	7	-12.5%	2
53-6021	Parking Lot Attendants	2	237	302	27.4%	203
53-6031	Automotive and Watercraft Service Attendants	1	198	212	7.1%	77
53-6041	Traffic Technicians	3	4	4	0.0%	2
53-6051	Transportation Inspectors	3	15	12	-20.0%	3
53-6061	Transportation Attendants, Except Flight Attendants	2	73	64	-12.3%	10
53-6099	Transportation Workers, All Other	2	18	19	5.6%	9
53-7011	Conveyor Operators and Tenders	2	123	116	-5.7%	38
53-7021	Crane and Tower Operators	3	155	165	6.5%	72
53-7032	Excavating and Loading Machine and Dragline Operators	2	123	136	10.6%	32
53-7033	Loading Machine Operators, Underground Mining	2	15	9	-40.0%	0
53-7051	Industrial Truck and Tractor Operators	2	1,792	2,039	13.8%	835
53-7061	Cleaners of Vehicles and Equipment	2	741	773	4.3%	273
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2	6,880	8,047	17.0%	3,646
53-7063	Machine Feeders and Offbearers	2	556	561	0.9%	147
53-7064	Packers and Packagers, Hand	2	2,042	2,203	7.9%	804

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
53-7071	Gas Compressor and Gas Pumping Station Operators	2	179	207	15.6%	135
53-7072	Pump Operators, Except Wellhead Pumpers	2	145	138	-4.8%	76
53-7073	Wellhead Pumpers	2	173	188	8.7%	143
53-7081	Refuse and Recyclable Material Collectors	2	317	356	12.3%	141
53-7111	Mine Shuttle Car Operators	2	24	20	-16.7%	8
53-7121	Tank Car, Truck, and Ship Loaders	2	56	61	8.9%	27
53-7199	Material Moving Workers, All Other	2	11	13	18.2%	6

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

ABOUT THE STATE SYSTEM'S GAP ANALYSIS PROJECT

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

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