

PENNSYLVANIA'S STATE SYSTEM OF HIGHER EDUCATION



West Chester University'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 US, giving rise to the conclusion that Silicon Valley has a comparative advantage in the computer programming workforce.

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

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

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

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

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

ACRONYMS USED

ACS: American Community Survey

BLS: Bureau of Labor Statistics

EMSI: Economic Modeling Specialists International

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

IPEDS: Integrated Postsecondary Education Data System

LAUS: Local Area Unemployment Statistics

LEHD: Longitudinal Employment and Housing Dynamics

NCES: National Center for Education Statistics

OES: Occupational Employment Statistics

O*NET: Occupational Network

PUMS: Public Use Microdata Sample

QCEW: Quarterly Census of Employment and Wages

SAIPE: Small Area Income and Poverty Estimates

USDOE: US Department of Education

USDOL: US Department of Labor

1. INTRODUCTION

Pennsylvania’s State System of Higher Education (State System) comprises 14 universities, four branch campuses, multiple regional centers and the McKeever Environmental Learning Center.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 talents advances the State System’s mission and philosophy—a key component of this report. Further, it enables effective and targeted strategies and decision-making, grounded in data-driven evidence.

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

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

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

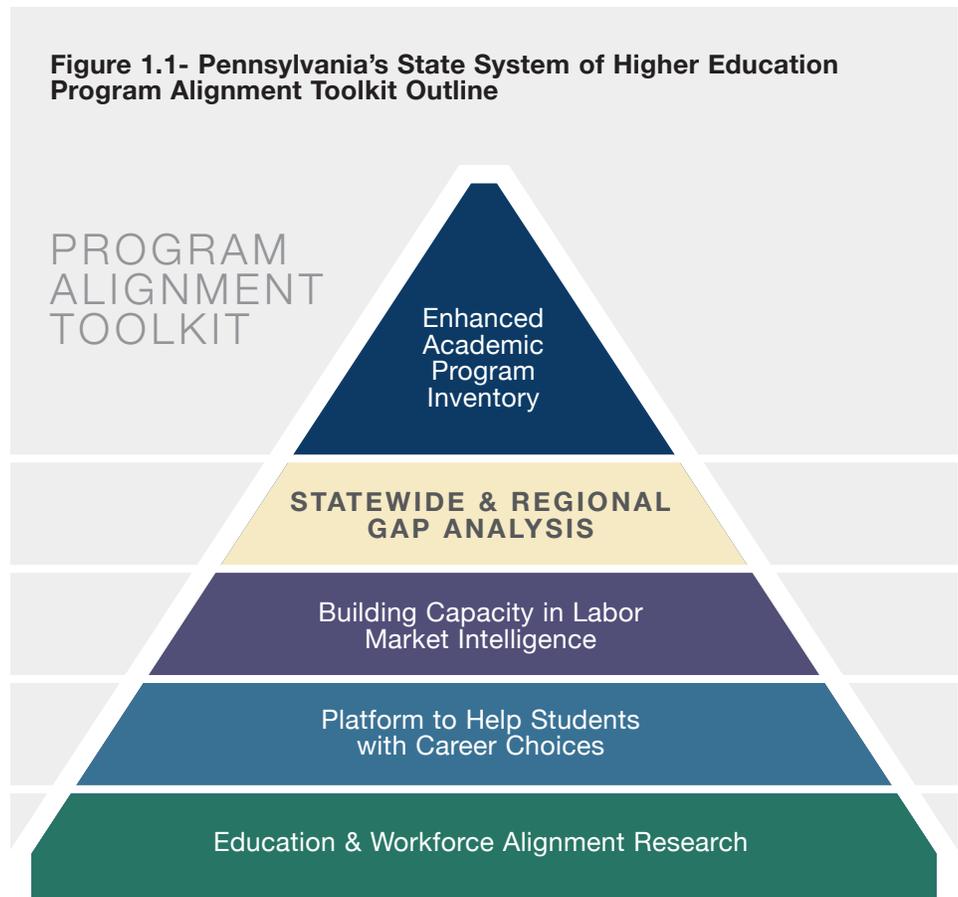
2 Source: The State System’s Economic and Employment Impact on the Commonwealth of Pennsylvania – released April 15, 2015.

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

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

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

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



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

1.2 Goal of the Workforce Characteristics Report

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

The intentions of this Workforce Characteristics Report are fourfold.

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

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

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

2. PENNSYLVANIA'S STATE SYSTEM LEARNER ORIGIN

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

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

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

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

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

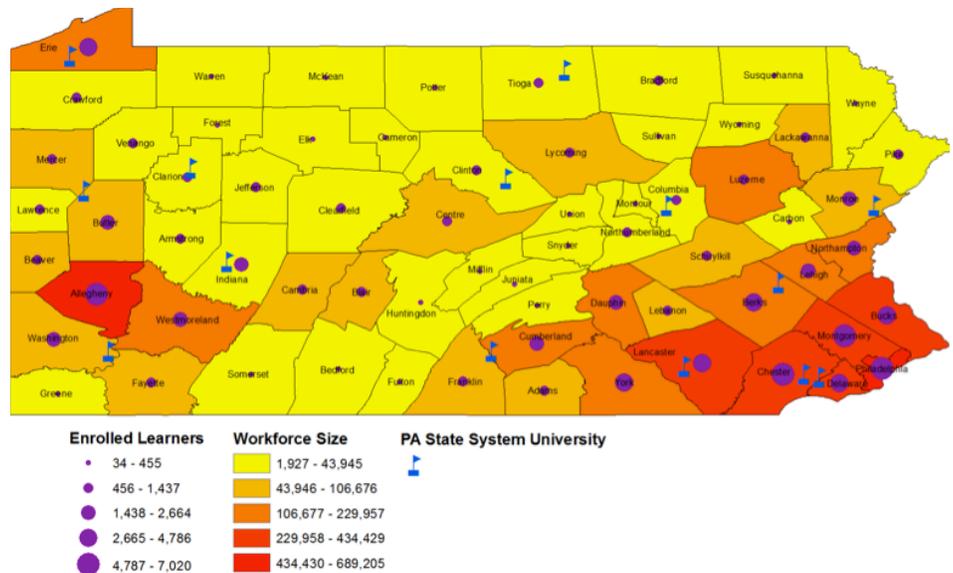
³ Based on Fall 2013 enrollment.

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

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

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

Figure 2.1 – State System Learner Origin and Workforce Size County

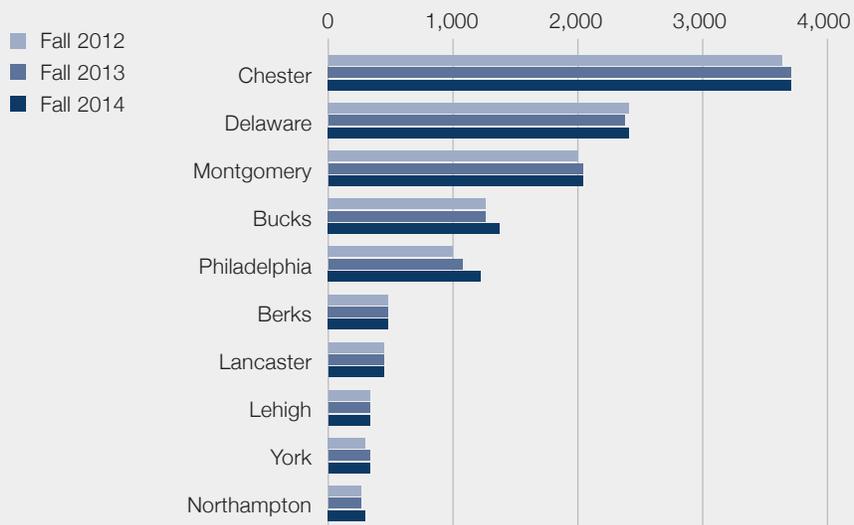


Source: Pennsylvania's State System of Higher Education, Oxford Economics mapping

2.1 West Chester University's Learner Origin

West Chester University learners, originally from Pennsylvania, come from nearly every county in the state. The vast majority of learners, however, come from counties that are in the southeast region. The top 10 learner enrollment counties account for about 90% of resident enrollment in West Chester University. Figure 2.2 shows the Pennsylvania resident fall enrollment numbers between 2012 and 2014 for the top 10 counties. Table 2.3 provides enrollment detail for the top 10 counties.

Figure 2.2 – West Chester University Learner Enrollment by County



Source: Pennsylvania's State System of Higher Education

Table 2.3 West Chester University Learner Enrollment by County

County	Fall 2012	Fall 2013	Fall 2014
Chester	3,692	3,733	3,745
Delaware	2,437	2,418	2,443
Montgomery	2,018	2,069	2,049
Bucks	1,261	1,282	1,378
Philadelphia	994	1,077	1,247
Berks	493	477	494
Lancaster	458	441	463
Lehigh	325	326	345
York	295	329	331
Northampton	258	278	286

Source: Pennsylvania's State System of Higher Education

3. SUMMARY OF WEST CHESTER UNIVERSITY WORKFORCE REGION

Located in rural West Chester, Chester County, Pennsylvania, West Chester University (WCU) anchors the Southeastern region of Pennsylvania's State System of Higher Education. It provides a breadth of degree programs and serves a student population of about 15,800 learners, of which about 90% are Pennsylvania residents.⁴

The following sections outline the supporting data used to select WCU's Pennsylvania workforce region—defined as Chester, Bucks, Delaware, Montgomery, and Philadelphia counties. Subsequent sections provide a brief analysis of economic, workforce, demographic and socio-economic information. The purpose of providing this analysis is to gain better insight into how the workforce region has changed over the past several years, as well as projections of how the area will continue to change over the next several years.

A BRIEF NOTE ON DEVELOPING THE WORKFORCE REGION

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

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

⁴ Based on Average Fall Enrollment 2012-2014.

3.1 Defining West Chester University’s Workforce Region

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

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

When taken in the context of regional economic activity, about 70% of regional demand for goods and services are produced by businesses located within the region. This indicates that regional business activity is locally contained. Similarly, 89% of household demand is satisfied by local production, meaning that households are not traveling outside the region to purchase goods or services to consume.

Table 3.1 - West Chester Workforce Region Commuting Patterns, Learner Capture Rate, and Economic Activity

County Combination	Job Share of People Living in the Region	Job Share of People Employed in the Region	Business Demand	Household Demand	Learner Capture Rate
Chester, Delaware, Philadelphia, Montgomery	0.78	0.73	0.70	0.89	0.67
Chester, Delaware, Philadelphia, Montgomery, Bucks	0.79	0.76	0.70	0.89	0.76

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

The majority of WCU workforce region residents also work in the region (almost 80%). This reflects a very strong centralized connection between workers and

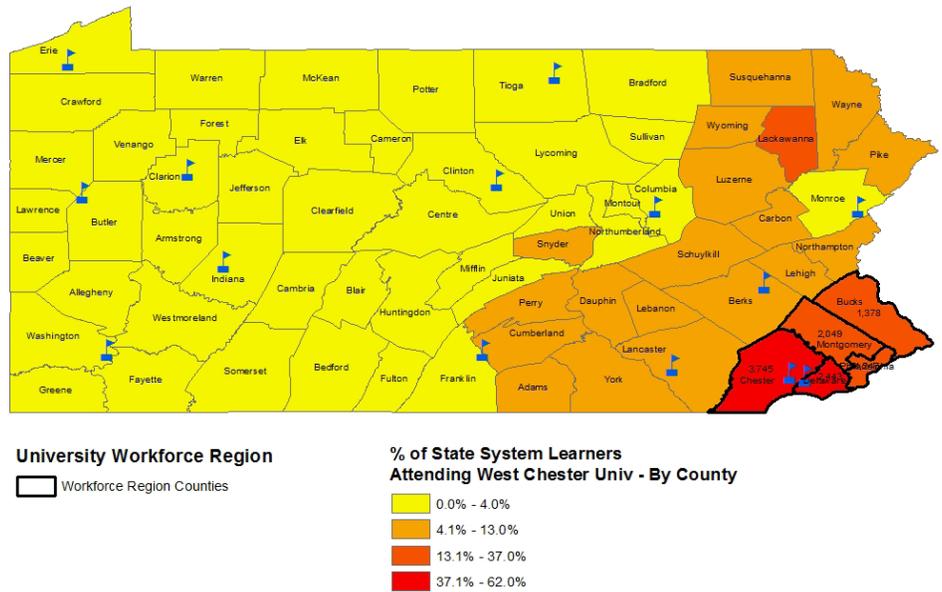
5 Bureau of Labor Statistics: Labor Market Area.

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

economic activity in a region that boasts more than 1.8 million jobs. Additionally, learners at WCU originate from nearby surrounding counties. When looking at the percentage of learners attending State System universities, 76% (the capture rate) of State System learners in WCU's workforce region attend WCU.

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

Figure 3.1 – West Chester Workforce Region: Learner Origin by Percent of Total State System Student Population



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

4. LABOR MARKET OF WEST CHESTER UNIVERSITY'S WORKFORCE REGION

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

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

Workforce Characteristic	WCU Workforce Region	Pennsylvania	Source
Population	4.0 million	12.7 million	2009-2013 American Community Survey 5-Year Estimates
Employed	1.8 million	5.6 million	2014 BLS Quarterly Census of Employment and Wages
Unemployed	119,870	370,000	2014 BLS Local Area Unemployment Statistics
Unemployment Rate	5.9%	5.8%	2014 BLS Local Area Unemployment Statistics
Poverty Rate	14.6%	13.7%	2013 Census Small Area Income and Poverty Estimates
Business Establishments	109,686	347,000	2014 BLS Quarterly Census of Employment and Wages
Educational Attainment (25+ Population with Bachelor's or Higher)	34.0%	27.4%	2009-2013 American Community Survey 5-Year Estimates
Bachelor's or Higher Completions	51,000	137,000	Integrated Postsecondary Education Data System 3-Year Average AY2010-11 to AY2012-13
Projected Job Growth 2014-2024	194,500	536,200	Oxford Economics Projections 2024*

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

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

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

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

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

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

4.1 Employment Projections

Currently, the industry and occupation employment projections available from Pennsylvania’s Department of Labor and Industry reflect the time period from 2012–2022 and therefore do not incorporate 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 West Chester University's workforce region with a focus on the post-recession recovery period 2009 to 2014, as well as top employers in the region.

5. INDUSTRIES IN WEST CHESTER UNIVERSITY'S WORKFORCE REGION

Over the five years of 2009 to 2014, West Chester University's (WCU) workforce region experienced job growth in many service-based sectors. Sectors such as education and health care, professional and business services, leisure and hospitality added a combined 58,800 new jobs between 2009 and 2014. Manufacturing experienced the largest nominal employment loss, while large relative job losses occurred within information, financial activities and government. Overall, the economy added about 42,300 jobs during the recovery period, 2009 to 2014. This growth reflects the recovery period for Pennsylvania from one of the worst recessions since the Great Depression—the Great Recession which lasted from 2007 to 2009.

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

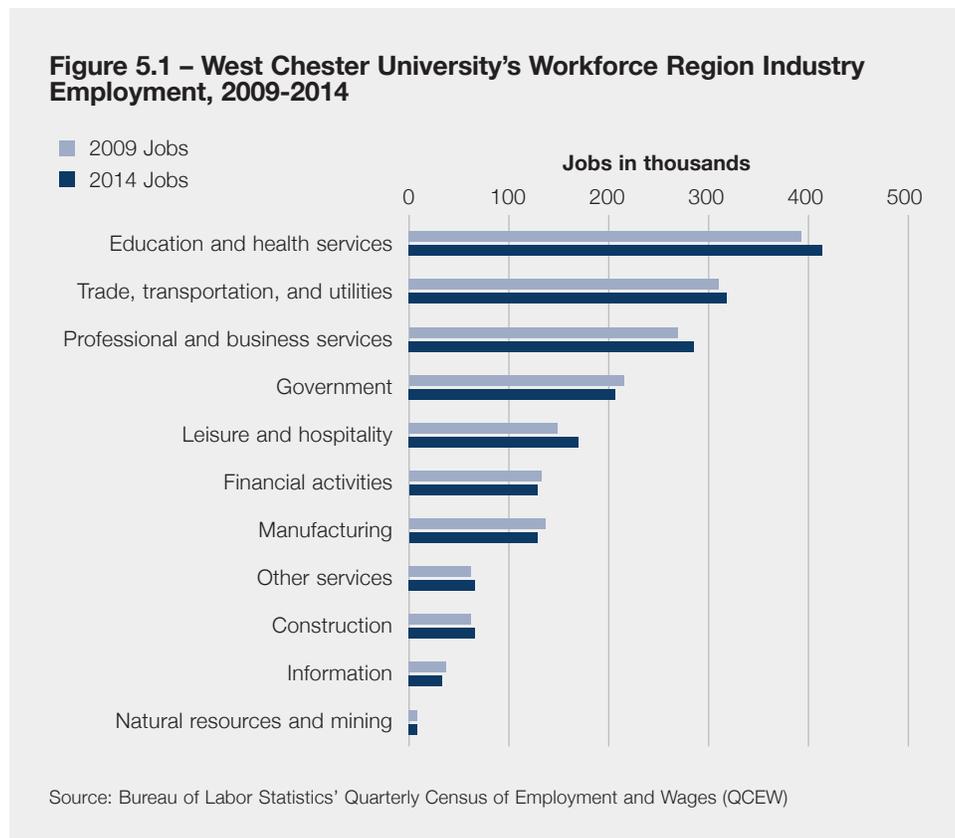


Table 5.1 – West Chester University’s Workforce Region Industry Employment, 2009-2014

Industry Employment	2009 Jobs	2014 Jobs	Absolute Change 09-14	% Change 09-14
Total, all industries	1,778,983	1,821,261	42,278	2%
Education and health services	392,341	414,204	21,863	6%
Trade, transportation, and utilities	310,898	318,627	7,729	2%
Professional and business services	271,560	287,850	16,290	6%
Government	214,078	206,134	-7,944	-4%
Leisure and hospitality	148,839	169,554	20,715	14%
Financial activities	133,525	127,623	-5,902	-4%
Manufacturing	136,428	126,993	-9,435	-7%
Other services	60,984	65,635	4,651	8%
Construction	63,634	64,685	1,051	2%
Information	39,059	32,659	-6,400	-16%
Natural resources and mining	7,628	7,299	-329	-4%

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

5.1 Top Employers in West Chester University’s Workforce Region

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

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

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

Table 5.2: Top Employers in West Chester University’s Workforce Region

Establishment Name
Abington Memorial Hospital
Central Bucks School District
City of Philadelphia
County of Chester
Crozer-Chester Medical Center
Delaware County
Doylestown Hospital
Federal Government
Giant Food Stores
Main Line Hospitals
Merck Sharp & Dohme Corporation
Northtec
QVS Network
School District of Philadelphia
Siemens Medical Solutions
Smithkline Beecham Corporation
St Mary Medical Center
State Government
The Boeing Company
The Chester County Hospital
The Children's Hospital of Philadelphia
Trustees of the University of Pennsylvania
United Parcel Service
Vanguard Group
Villanova University

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

6. OCCUPATIONS IN WEST CHESTER UNIVERSITY'S WORKFORCE REGION

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

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

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

6.1 Skilled Occupations

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

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

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

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 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 West Chester University's Workforce Region

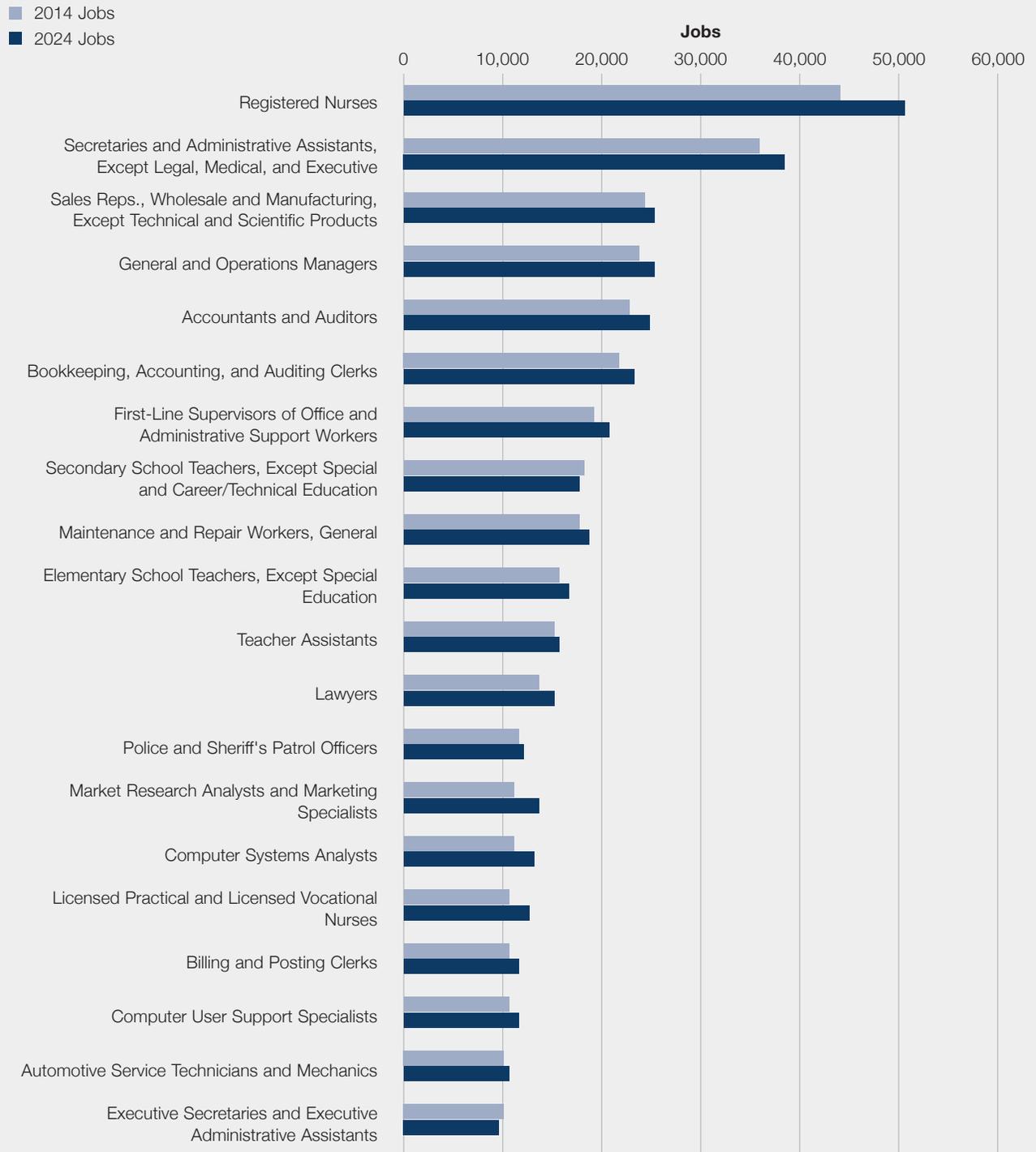
Top skilled occupations in the region are driven by industry composition. Medical centers employ a cadre of health professionals, while enterprise management companies employ a range of business professionals. Given the dominating presence of trade, transportation and utilities; healthcare and education services; and professional and business services establishments in WCU's workforce region, top skilled occupations include: lawyers, market research analysts, secretaries and administrative assistants, registered nurses, and elementary school 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 WCU’s Workforce Region and Projections, 2014-2024



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

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

SOC Code	Occupation Title	2014 Jobs	2024 Jobs	10-year New and Replacement Demand
29-1141	Registered Nurses	44,186	51,079	15,840
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	36,248	38,617	7,079
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	24,443	25,266	6,501
11-1021	General and Operations Managers	23,820	25,363	5,784
13-2011	Accountants and Auditors	23,139	24,885	9,449
43-3031	Bookkeeping, Accounting, and Auditing Clerks	21,804	23,360	3,712
43-1011	First-Line Supervisors of Office and Administrative Support Workers	19,381	20,670	5,930
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	18,171	17,959	5,977
49-9071	Maintenance and Repair Workers, General	17,745	18,938	5,102
25-2021	Elementary School Teachers, Except Special Education	15,944	16,649	4,716
25-9041	Teacher Assistants	15,307	15,939	4,436
23-1011	Lawyers	13,799	15,115	3,672
33-3051	Police and Sheriff’s Patrol Officers	11,971	12,076	4,399
13-1161	Market Research Analysts and Marketing Specialists	11,464	13,728	4,100
15-1121	Computer Systems Analysts	11,416	13,118	3,721
29-2061	Licensed Practical and Licensed Vocational Nurses	10,956	12,555	4,492
43-3021	Billing and Posting Clerks	10,767	11,736	3,147
15-1151	Computer User Support Specialists	10,486	11,903	3,295
49-3023	Automotive Service Technicians and Mechanics	10,348	10,835	3,496
43-6011	Executive Secretaries and Executive Administrative Assistants	10,047	9,881	1,458

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

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

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

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

6.3.1 New and Replacement Demand for Key Skilled High Demand Occupations

Many skilled occupations exist in Pennsylvania. Demand for new and replacement jobs for key skilled high demand occupations that tie more closely to university-level programs are typically determined by the sheer size of the employment within the occupation and the demographic characteristics of those who are currently employed—specifically age. For example, Pennsylvania businesses employ approximately 56,200 accountants and auditors. Projections indicate that new employment for accountants of auditors will increase to about 60,200 by 2024—4,000 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 56,200 employed workers will likely retire over the next 10

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).

years. This retirement will drive up the need to replace outgoing accountants and auditors with new workers—hence the reason we see nearly 22,700 new and replacement jobs (4,000 new and 18,700 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, accountants and auditors, general and operations managers, computer system analysts, and market research analysts and marketing specialists.¹²

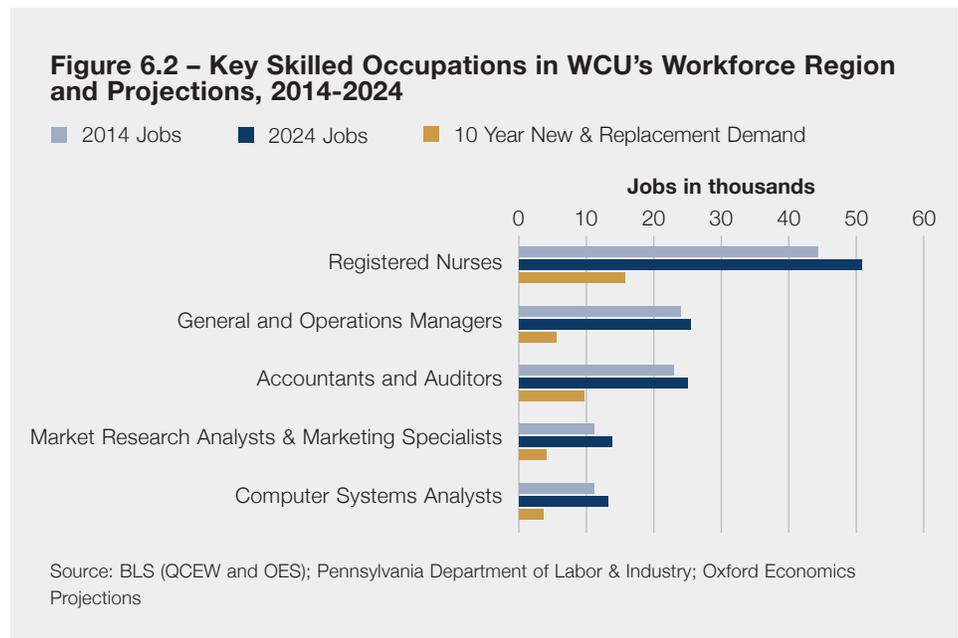


Table 6.2 – Key Skilled Occupations in WCU’s Workforce Region and Projections, 2014-2024

Code	Occupation Title	2014 Jobs	2024 Jobs	10 Year New & Replacement Demand
29-1141	Registered Nurses	44,186	51,079	15,840
11-1021	General and Operations Managers	23,820	25,363	5,784
13-2011	Accountants and Auditors	23,139	24,885	9,449
13-1161	Market Research Analysts and Marketing Specialists	11,464	13,728	4,100
15-1121	Computer Systems Analysts	11,416	13,118	3,721

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 7,600 unique (de-duplicated) job postings appeared in WCU's Workforce Region for the top five key skilled high demand occupations (registered nurses, accountants and auditors, general and operations managers, computer system analysts, and market research analysts and marketing specialists). Sizable job postings include: registered nurses (3,178 unique postings per month), and accountants and auditors (1,605 unique postings per month).

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

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

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

Occupation	Average Monthly Postings (Jul 2014 - Jul 2015)	Average Monthly Hires (Jul 2014 - Jul 2015)	Ratio of Postings to Hires
Registered Nurses	3,178	1,767	1.8
Accountants and Auditors	1,605	973	1.6
Computer Systems Analysts	1,194	427	2.8
General and Operations Managers	1,010	1,244	0.8
Market Research Analysts and Marketing Specialists	592	480	1.2

Source: Economic Modeling Specialists International (EMSI)

Registered Nurses

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

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

Accountants and Auditors

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

Certifications: Certified Public Accountant (CPA)

Computer Systems Analysts

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

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

Market Research Analysts and Marketing Specialists

Unique skills: product marketing, product management, marketing concepts, market analysis, social media, product development, presentations

Certifications: Six Sigma, Project Management Professional (PMP)

General and Operations Managers

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

Certifications: Six Sigma, Project Management Professional (PMP)

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

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

6.4 Industry Staffing Patterns for Key Skilled High Demand Occupations in West Chester University's Workforce Region

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

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

- The number of the occupation jobs in each respective industry in 2014 (e.g. general medical and surgical hospitals employ over 22,000 registered nurses);
- The percent of the occupation's employment in the region that is employed in the industry (e.g. the 22,000 registered nurses employed in general medical and surgical hospitals represent over 50% of the total registered nurse workforce in the region);
- The percent of the industry sector's employment that is made up of the occupation (e.g. the 22,000 registered nurses make up about 30% of employment within general medical and surgical hospitals).

Staffing Patterns for Registered Nurses Employed in WCU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
General Medical and Surgical Hospitals	22,247	50%	30%
Specialty (except Psychiatric and Substance Abuse) Hospitals	4,333	10%	32%
Home Health Care Services	3,248	7%	22%
Offices of Physicians	3,182	7%	10%
Nursing Care Facilities (Skilled Nursing Facilities)	2,112	5%	11%

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

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

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Management of Companies and Enterprises	1,377	6%	3%
Federal, State, and Local Government (excluding state and local schools and hospitals)	833	3%	1%
Other Financial Investment Activities	698	3%	3%
Computer Systems Design and Related Services	579	2%	2%
Management, Scientific, and Technical Consulting Services	559	2%	2%

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

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

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	5,901	26%	37%
Management of Companies and Enterprises	2,494	11%	5%
Other Financial Investment Activities	2,135	9%	9%
Federal, State, and Local Government (excluding state and local schools and hospitals)	818	4%	1%
Insurance Carriers	800	3%	3%

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

Staffing Patterns for Market Research Analysts Employed in WCU's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Management, Scientific, and Technical Consulting Services	1,665	15%	5%
Management of Companies and Enterprises	1,090	10%	2%
Computer Systems Design and Related Services	737	6%	2%
Other Professional, Scientific, and Technical Services	597	5%	4%
Other Financial Investment Activities	588	5%	2%

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

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

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Computer Systems Design and Related Services	4,714	41%	10%
Management of Companies and Enterprises	1,279	11%	2%
Insurance Carriers	999	9%	2%
Pharmaceutical and Medicine Manufacturing	504	4%	2%
Management, Scientific, and Technical Consulting Services	421	4%	1%

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

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

6.5 Key Skilled High Demand Occupational Profiles

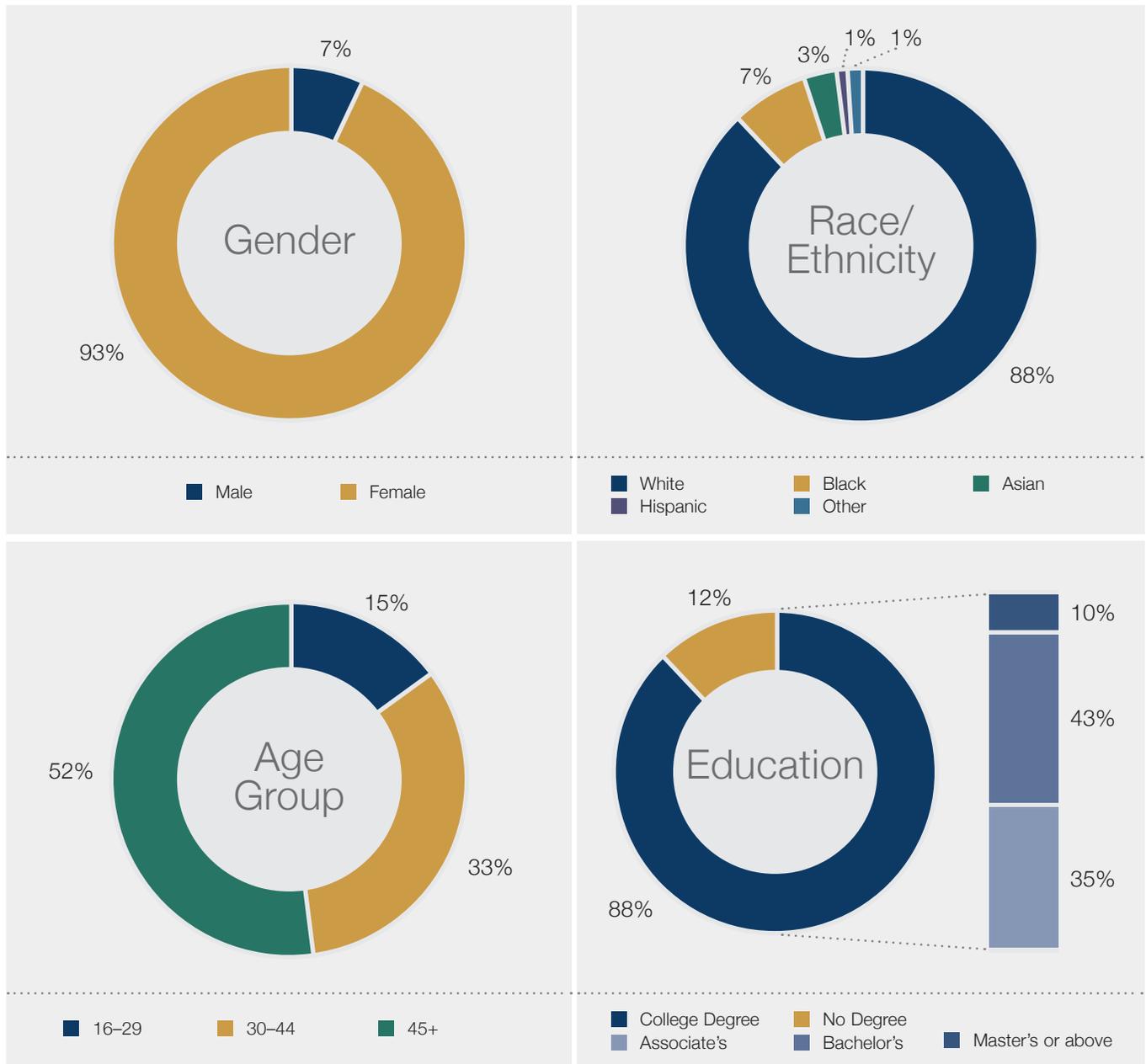
In addition to understanding the industries that employ key skilled high demand occupations, another lens to view key skilled high demand occupations focuses on the characteristics of those employed. The following section outlines the demographics for people from Pennsylvania who work in these key skilled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

REGISTERED NURSES IN PENNSYLVANIA

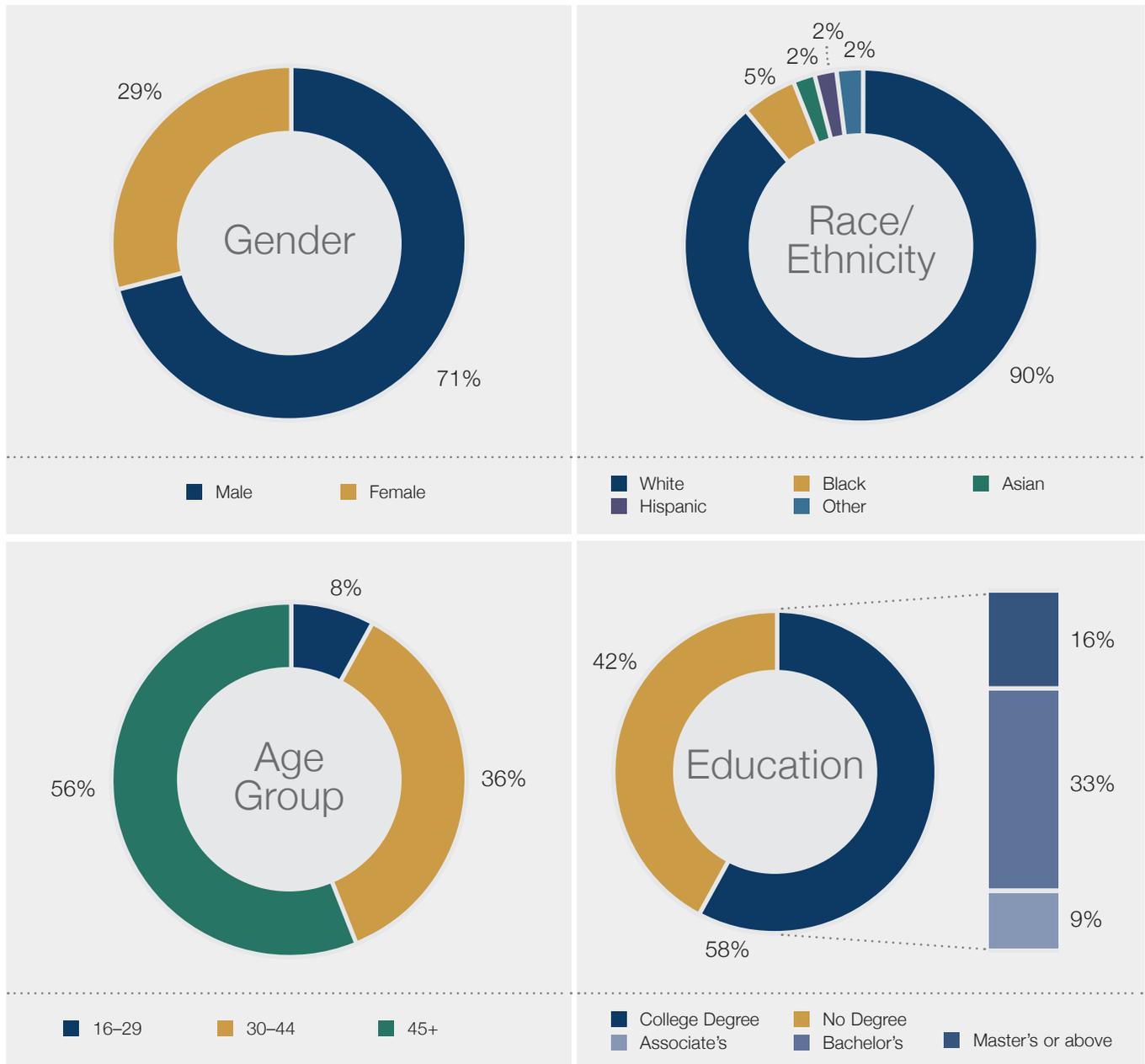
The demographic profile of registered nurses is largely dominated by white females. Age distribution indicates that registered nurses are a more mature cohort of workers (45 years and older), which can put increasing pressure on replacement jobs due to retirements over the next 10 years. Nearly 90% of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



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

GENERAL AND OPERATIONS MANAGERS IN PENNSYLVANIA

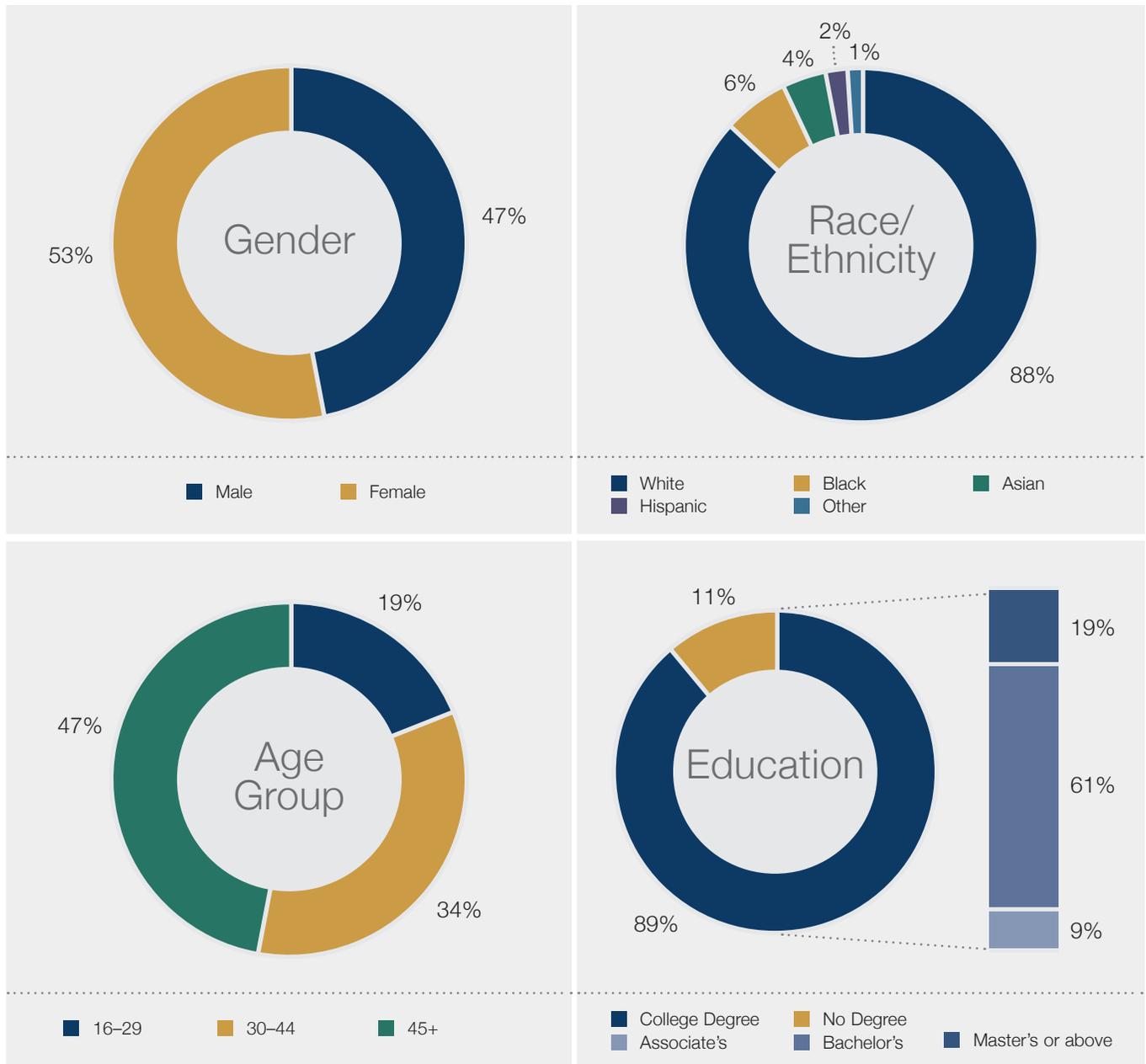
General and operations managers are typically male, though females occupy almost 30% of the employed population. The majority of those in this occupation are white. This occupation is represented by a more mature cohort of workers (45 years and older), though mid-career workers also occupy a significant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



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

ACCOUNTANTS AND AUDITORS IN PENNSYLVANIA

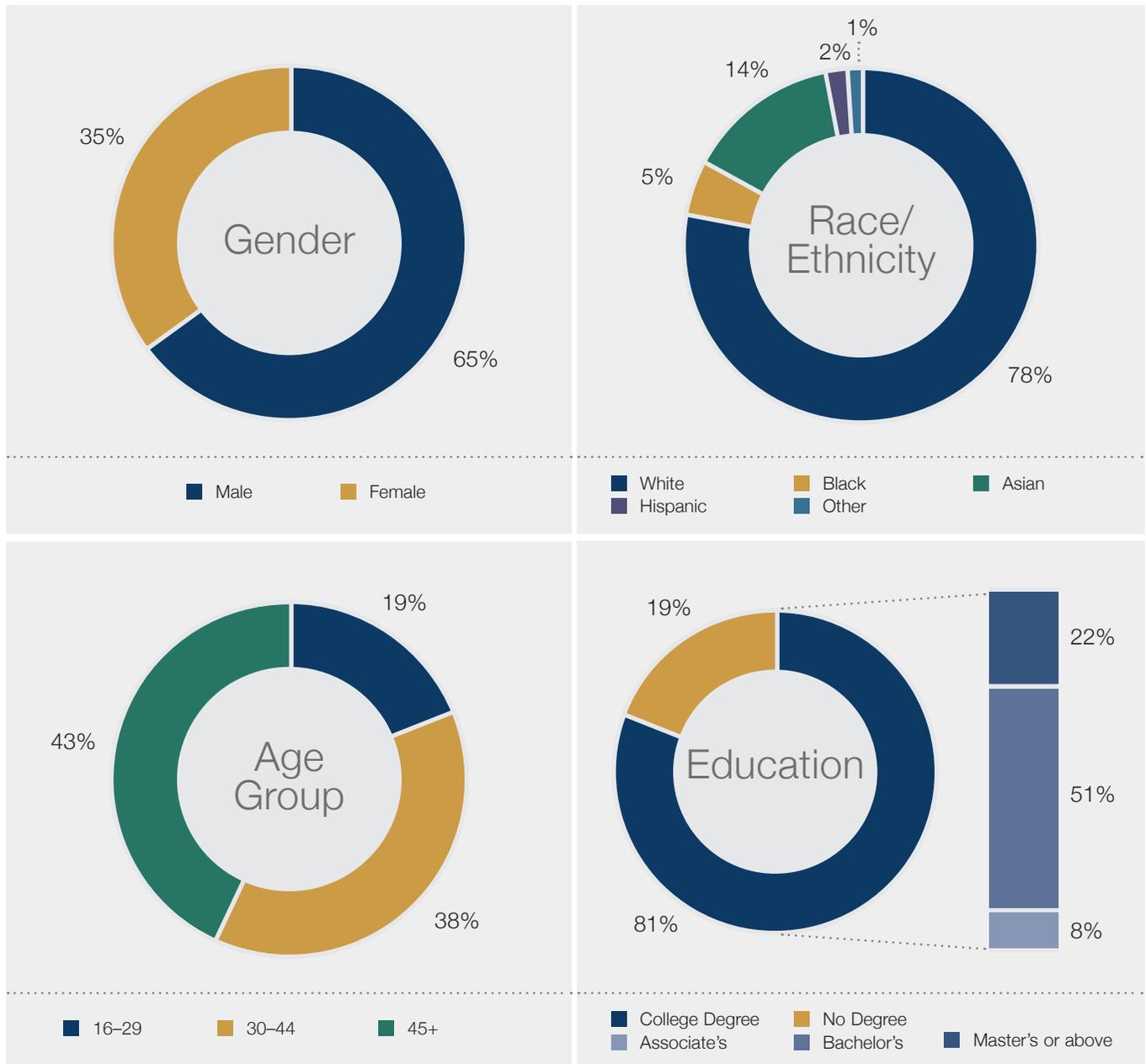
Accountants and auditors are fairly equally split between male and female, though a slightly higher percent of employed accountants and auditors are female. A high proportion of white individuals are found in the occupation. Additionally, the age distribution is fairly even between entry-level and mature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



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

COMPUTER SYSTEMS ANALYSTS IN PENNSYLVANIA

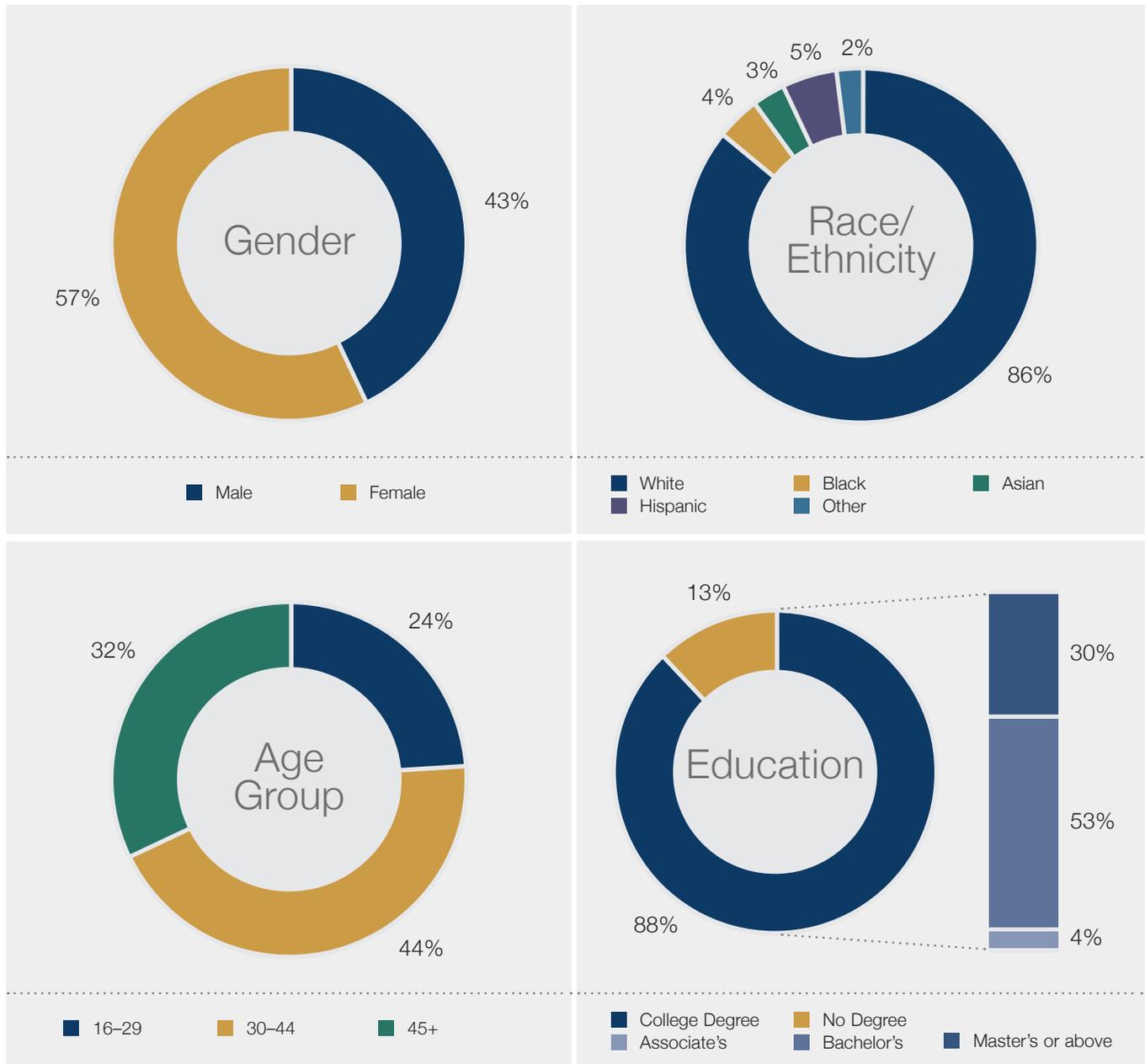
Computer systems analysts show a larger proportion of males in the occupation compared to females. While still represented by a larger share of white workers, a significant number of Asian workers are found in the occupation, making this occupation more diverse than the average Pennsylvania demographic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



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

MARKET RESEARCH ANALYSTS AND MARKETING SPECIALISTS IN PENNSYLVANIA

Market research analysts and marketing specialists indicate a larger proportion of females within the occupation compared to males. The race/ethnicity distribution within the occupation is predominately white. Additionally, the age distribution of the occupation, tends to favor a younger demographic. More than two thirds of the employed market research analysts and marketing specialists are under 45 years old. Nearly 90% of market research analysts and marketing specialists 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 WCU's workforce region demographic and socio-economic characteristics. While not tied to a specific occupation, the analysis further contextualizes the region's population and workforce.

7. DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS OF WEST CHESTER UNIVERSITY'S WORKFORCE REGION

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

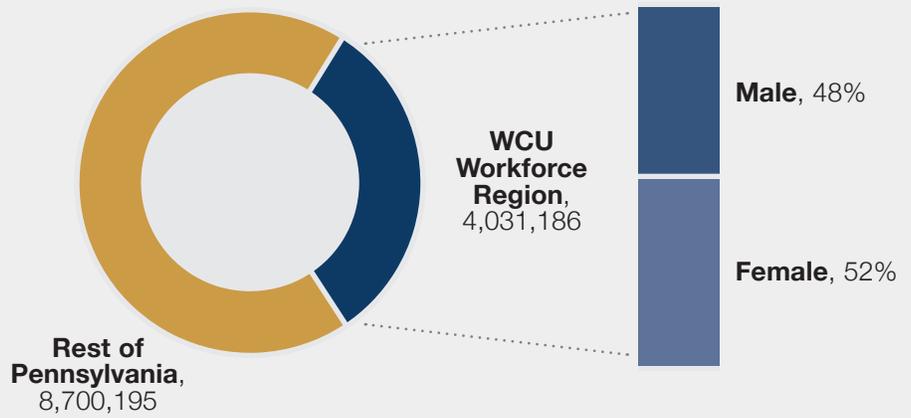
Analysis of three socio-economic indicators—education, unemployment, and poverty—also provides insight into the segment of the population that may be considered economically disadvantaged. Areas with high proportions of economically disadvantaged learners may require additional considerations in education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

7.1 Demographics of West Chester University's Workforce Region

The WCU workforce region has a population of about 4.0 million people. As shown in Figure 7.1, females make up a slightly larger share of the population compared to males. Figure 7.2 illustrates that the majority of the region is represented by a White demographic, with Blacks representing the next largest group, followed by Hispanics.

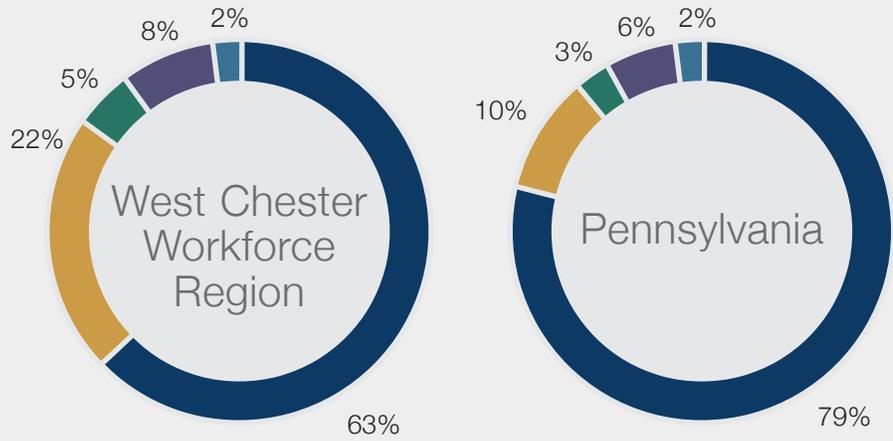
Fall 2014 data from the State System Research Office indicates that approximately 83% (90,966) of learners within the State System are traditional students—ages 18- to 22-year-old high school graduates—and 17% (18,640) are adult learners. A view of the change in population by age demographic indicates a diminishing number in the traditional age cohort and a growing rate of adults aged 25 to 34 years old. As illustrated in figure 7.3, the 10 to 19 year old cohort population declined by nearly 23,000 people between 2010 and 2014—a 4% decline. Conversely, the 25-34 year old cohort increased over 9%, or 48,000 people, over the same time period. This demographic shift presents an opportunity to incorporate a broader university recruitment strategy.

Figure 7.1 – West Chester University’s Workforce Region Population and Gender Distribution



Source: U.S. Census - ACS

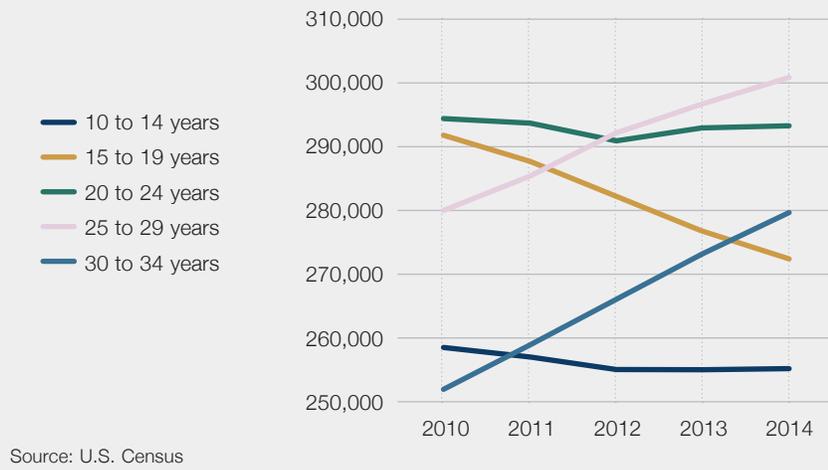
Figure 7.2 – West Chester University’s Workforce Region Race/Ethnicity Composition



■ White
 ■ Black
 ■ Asian
 ■ Hispanic
 ■ Other

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

Figure 7.3 – West Chester University’s Workforce Region: changes in population of age cohorts



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

7.2 Socio-economic Indicators of West Chester University’s Workforce Region

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

7.2.1 Educational Attainment in West Chester University’s Workforce Region

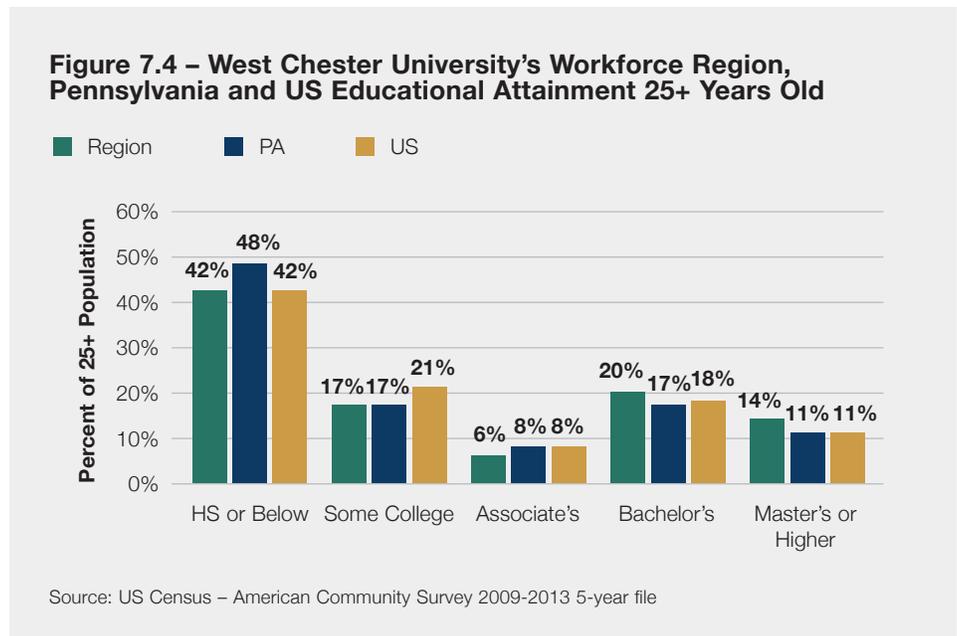
The levels of educational attainment of a population indicate several characteristics in an economy. Areas with better educated workers earn higher wages, are more productive and can typically adjust more quickly to changing economic conditions. Additionally, an educated workforce is less likely to be

unemployed, require social assistance, and more likely to lead a healthier lifestyle—aspects that bolster value in an economy.^{13, 14}

A view of educational attainment in WCU’s workforce region indicates that more than half (58%) 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 is the same as the national average of 58% of the population having had at least some postsecondary education or higher.

When comparing degree completion, WCU’s workforce region is near the national average for the proportion of the population with an associate’s degree and above 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 US, Pennsylvania, and WCU’s workforce region.



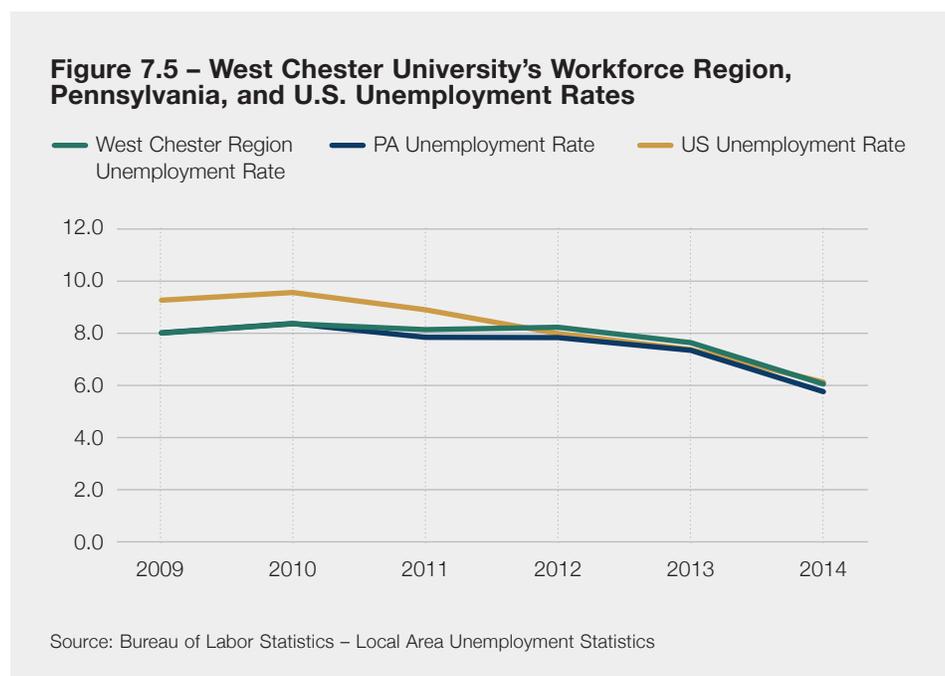
13 Feinstein et. al. (2006), “The effects of education on health: Concepts, evidence and policy implications: A review for the OECD Center for Educational Research and Innovation (CERI)”, unpublished manuscript, OECD, Paris.

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

7.2.2 Unemployment and Poverty in West Chester University's Workforce Region

WCU's workforce region unemployment rate—5.9% in 2014—has trended closely with the state and national unemployment rate since 2012. This suggests that opportunities for dislocated workers on average are roughly the same compared to the rest of the nation.

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

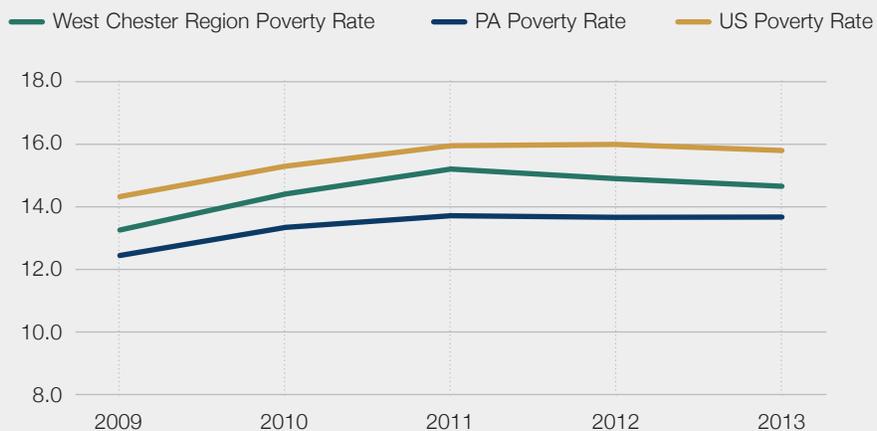


In WCU's workforce region, the poverty rate trended upward since 2009 but declined slightly from 2011 to 2013. The region's poverty rate is above the state poverty rate; however, it has trended below the U.S. average.¹⁵ Given the lower poverty rate compared with the nation, there is an underlying assumption that the compensation associated with the jobs in WCU's workforce region may be higher than the national average.

Figure 7.6 compares the poverty rates of WCU's workforce region, Pennsylvania, and the US from 2009 to 2013.

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 – West Chester University’s Workforce Region, Pennsylvania, and U.S. Poverty Rates



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

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

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

8. NEXT STEPS

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

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

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

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

DATA SOURCES

Bureau of Labor Statistics (BLS):

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

U.S. Census Bureau (Census):

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

National Center for Education Statistics (NCES):

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

Pennsylvania Department of Labor and Industry (PADLI):

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

O*NET Resource Center (O*NET)

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

Economic Modeling Specialists International (EMSI)

APPENDIX A: METHODOLOGY FOR IDENTIFYING STATE SYSTEM UNIVERSITY WORKFORCE REGIONS

Introduction

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

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

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

¹⁶ Bureau of Labor Statistics: Labor Market Area.

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

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

Further information on each of the measurements is detailed later.

Geographic Consideration

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

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

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

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

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

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

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

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

Process

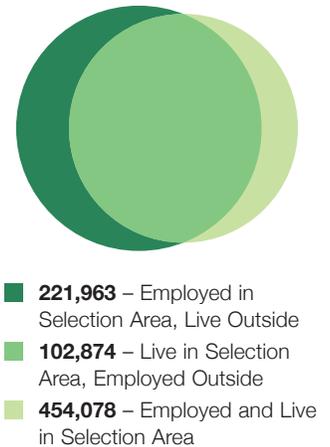
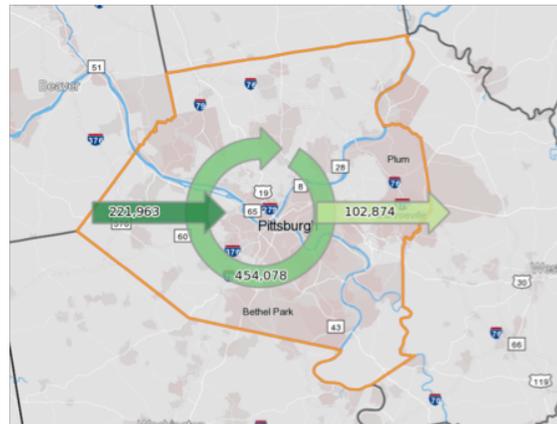
Given the workforce/commute, learner and economic variances that exist within the different geographies across Pennsylvania, an iterative process is used to define the workforce region. This multiple step, iterative process seeks to maximize the primary driver value (workforce flows), while adhering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

Workforce Flows:

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

When these numbers are converted into percentages, we find that

Inflow/Outflow Job Counts in 2013



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

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

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

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

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

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

Learner Capture Rates and Inclusiveness:

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

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

Economic Activity and Concentration:

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

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

Table A.1 – State System Workforce region by University

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

Source: Oxford Economics modeling and tabulations

APPENDIX B: PENNSYLVANIA STATE AND COUNTY ENROLLMENT AND EMPLOYMENT

County	Fall 2014 Enrollment in West Chester University	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
Northumberland	938	27,985

County	Fall 2014 Enrollment in West Chester University	2014 QCEW Employment
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 WEST CHESTER UNIVERSITY'S WORKFORCE REGION

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

To interpret results, LQs equal to 1 indicate that the area's industry concentration is equal the national concentration of the same industry. Industries with a higher location quotient (usually greater than 1.2) indicate that an area has a relatively higher concentration of jobs in the sector and therefore concludes that the area has a comparative advantage or specialization in the production of that good or service, compared to the national average. Note: High employment industries do not necessarily result in large location quotients, as this is a comparative statistic.

The following table provides the industry LQs at the 4-digit NAICS level in Pennsylvania. Also included in the table are the number of jobs in 2014 and the projected job growth/decline to 2024.

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
Total	All Industries	1,879,500	2,074,019	10.3%	1.0
1111	Oilseed and Grain Farming	66	71	7.6%	0.1
1112	Vegetable and Melon Farming	133	132	-0.8%	0.1
1113	Fruit and Tree Nut Farming	115	128	11.3%	0.0
1114	Greenhouse, Nursery, and Floriculture Production	4,946	4,716	-4.7%	2.5
1119	Other Crop Farming	63	71	12.7%	0.1
1121	Cattle Ranching and Farming	156	177	13.5%	0.1
1122	Hog and Pig Farming	6	7	16.7%	0.0
1123	Poultry and Egg Production	71	84	18.3%	0.1
1124	Sheep and Goat Farming	9	10	11.1%	0.4
1125	Aquaculture	16	15	-6.3%	0.2
1129	Other Animal Production	156	171	9.6%	0.6
1132	Forest Nurseries and Gathering of Forest Products	6	6	0.0%	0.2
1142	Hunting and Trapping	6	6	0.0%	0.2
1151	Support Activities for Crop Production	811	1,012	24.8%	0.2
1152	Support Activities for Animal Production	185	182	-1.6%	0.5
2111	Oil and Gas Extraction	78	91	16.7%	0.0
2123	Nonmetallic Mineral Mining and Quarrying	471	467	-0.8%	0.4
2131	Support Activities for Mining	56	71	26.8%	0.0
2211	Electric Power Generation, Transmission and Distribution	4,148	4,049	-2.4%	0.6
2212	Natural Gas Distribution	1,227	1,248	1.7%	0.8
2213	Water, Sewage and Other Systems	2,390	2,396	0.3%	0.8
2361	Residential Building Construction	7,933	10,241	29.1%	0.9
2362	Nonresidential Building Construction	6,706	8,131	21.2%	0.7
2371	Utility System Construction	5,583	7,326	31.2%	0.9
2372	Land Subdivision	288	317	10.1%	0.5
2373	Highway, Street, and Bridge Construction	5,733	6,869	19.8%	1.1
2379	Other Heavy and Civil Engineering Construction	508	619	21.9%	0.3
2381	Foundation, Structure, and Building Exterior Contractors	7,200	8,536	18.6%	0.7
2382	Building Equipment Contractors	22,582	27,857	23.4%	0.9
2383	Building Finishing Contractors	7,973	9,214	15.6%	0.8
2389	Other Specialty Trade Contractors	6,883	8,497	23.4%	0.9
3111	Animal Food Manufacturing	188	198	5.3%	0.3
3112	Grain and Oilseed Milling	56	49	-12.5%	0.1
3113	Sugar and Confectionery Product Manufacturing	1,080	1,121	3.8%	1.1
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	611	541	-11.5%	0.3
3115	Dairy Product Manufacturing	911	939	3.1%	0.5

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3116	Animal Slaughtering and Processing	5,120	5,594	9.3%	0.8
3117	Seafood Product Preparation and Packaging	86	98	14.0%	0.2
3118	Bakeries and Tortilla Manufacturing	4,291	3,875	-9.7%	1.1
3119	Other Food Manufacturing	1,400	1,472	5.1%	0.5
3121	Beverage Manufacturing	1,446	1,551	7.3%	0.5
3122	Tobacco Manufacturing	372	340	-8.6%	2.0
3131	Fiber, Yarn, and Thread Mills	112	86	-23.2%	0.3
3132	Fabric Mills	679	481	-29.2%	0.9
3133	Textile and Fabric Finishing and Fabric Coating Mills	357	235	-34.2%	0.8
3141	Textile Furnishings Mills	264	227	-14.0%	0.4
3149	Other Textile Product Mills	732	684	-6.6%	0.8
3151	Apparel Knitting Mills	59	59	0.0%	0.3
3152	Cut and Sew Apparel Manufacturing	1,125	1,017	-9.6%	0.7
3159	Apparel Accessories and Other Apparel Manufacturing	79	84	6.3%	0.5
3161	Leather and Hide Tanning and Finishing	199	233	17.1%	3.2
3162	Footwear Manufacturing	15	18	20.0%	0.1
3169	Other Leather and Allied Product Manufacturing	17	19	11.8%	0.1
3211	Sawmills and Wood Preservation	44	54	22.7%	0.0
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	183	203	10.9%	0.2
3219	Other Wood Product Manufacturing	1,018	1,129	10.9%	0.4
3221	Pulp, Paper, and Paperboard Mills	1,016	1,021	0.5%	0.7
3222	Converted Paper Product Manufacturing	4,683	4,532	-3.2%	1.3
3231	Printing and Related Support Activities	7,565	7,099	-6.2%	1.2
3241	Petroleum and Coal Products Manufacturing	1,639	1,506	-8.1%	1.1
3251	Basic Chemical Manufacturing	2,037	1,935	-5.0%	1.0
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	1,172	1,201	2.5%	0.9
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	213	200	-6.1%	0.4
3254	Pharmaceutical and Medicine Manufacturing	13,228	12,021	-9.1%	3.4
3255	Paint, Coating, and Adhesive Manufacturing	692	781	12.9%	0.8
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	3,179	3,052	-4.0%	2.2
3259	Other Chemical Product and Preparation Manufacturing	1,382	1,394	0.9%	1.2
3261	Plastics Product Manufacturing	4,071	4,535	11.4%	0.5
3262	Rubber Product Manufacturing	571	627	9.8%	0.3
3271	Clay Product and Refractory Manufacturing	80	78	-2.5%	0.1
3272	Glass and Glass Product Manufacturing	546	583	6.8%	0.5
3273	Cement and Concrete Product Manufacturing	1,395	1,523	9.2%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3274	Lime and Gypsum Product Manufacturing	36	44	22.2%	0.2
3279	Other Nonmetallic Mineral Product Manufacturing	526	567	7.8%	0.5
3311	Iron and Steel Mills and Ferroalloy Manufacturing	660	732	10.9%	0.5
3312	Steel Product Manufacturing from Purchased Steel	1,656	1,641	-0.9%	2.0
3313	Alumina and Aluminum Production and Processing	283	354	25.1%	0.4
3314	Nonferrous Metal (except Aluminum) Production and Processing	418	453	8.4%	0.5
3315	Foundries	245	260	6.1%	0.1
3321	Forging and Stamping	383	419	9.4%	0.3
3322	Cutlery and Handtool Manufacturing	312	319	2.2%	0.6
3323	Architectural and Structural Metals Manufacturing	3,838	4,510	17.5%	0.8
3324	Boiler, Tank, and Shipping Container Manufacturing	502	444	-11.6%	0.4
3325	Hardware Manufacturing	102	104	2.0%	0.3
3326	Spring and Wire Product Manufacturing	458	530	15.7%	0.8
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	5,502	5,621	2.2%	1.1
3328	Coating, Engraving, Heat Treating, and Allied Activities	1,054	1,138	8.0%	0.6
3329	Other Fabricated Metal Product Manufacturing	2,624	2,852	8.7%	0.7
3331	Agriculture, Construction, and Mining Machinery Manufacturing	422	394	-6.6%	0.1
3332	Industrial Machinery Manufacturing	1,176	1,232	4.8%	0.8
3333	Commercial and Service Industry Machinery Manufacturing	1,091	942	-13.7%	0.9
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	854	868	1.6%	0.5
3335	Metalworking Machinery Manufacturing	979	890	-9.1%	0.4
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	229	208	-9.2%	0.2
3339	Other General Purpose Machinery Manufacturing	2,880	2,749	-4.5%	0.8
3341	Computer and Peripheral Equipment Manufacturing	655	574	-12.4%	0.3
3342	Communications Equipment Manufacturing	1,252	1,164	-7.0%	1.0
3343	Audio and Video Equipment Manufacturing	147	110	-25.2%	0.5
3344	Semiconductor and Other Electronic Component Manufacturing	2,483	2,458	-1.0%	0.5
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	4,611	4,387	-4.9%	0.9
3346	Manufacturing and Reproducing Magnetic and Optical Media	677	686	1.3%	2.9
3351	Electric Lighting Equipment Manufacturing	759	675	-11.1%	1.2
3352	Household Appliance Manufacturing	393	419	6.6%	0.5
3353	Electrical Equipment Manufacturing	806	920	14.1%	0.4
3359	Other Electrical Equipment and Component Manufacturing	965	983	1.9%	0.6
3361	Motor Vehicle Manufacturing	122	149	22.1%	0.0
3362	Motor Vehicle Body and Trailer Manufacturing	414	510	23.2%	0.2

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3363	Motor Vehicle Parts Manufacturing	3,332	3,115	-6.5%	0.4
3364	Aerospace Product and Parts Manufacturing	6,255	5,247	-16.1%	0.9
3365	Railroad Rolling Stock Manufacturing	2,025	2,452	21.1%	5.4
3366	Ship and Boat Building	699	771	10.3%	0.3
3369	Other Transportation Equipment Manufacturing	770	928	20.5%	1.7
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	1,268	1,459	15.1%	0.4
3372	Office Furniture (including Fixtures) Manufacturing	2,136	2,321	8.7%	1.5
3379	Other Furniture Related Product Manufacturing	147	133	-9.5%	0.3
3391	Medical Equipment and Supplies Manufacturing	3,611	3,617	0.2%	0.9
3399	Other Miscellaneous Manufacturing	3,773	3,361	-10.9%	1.0
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	5,063	5,271	4.1%	1.1
4232	Furniture and Home Furnishing Merchant Wholesalers	1,252	1,260	0.6%	0.9
4233	Lumber and Other Construction Materials Merchant Wholesalers	2,235	2,313	3.5%	0.8
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	10,028	9,736	-2.9%	1.2
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	1,595	1,704	6.8%	0.9
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	3,923	3,659	-6.7%	0.9
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	3,346	3,744	11.9%	1.0
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	6,293	6,974	10.8%	0.7
4239	Miscellaneous Durable Goods Merchant Wholesalers	3,079	3,948	28.2%	0.7
4241	Paper and Paper Product Merchant Wholesalers	2,209	2,276	3.0%	1.3
4242	Drugs and Druggists' Sundries Merchant Wholesalers	5,349	5,048	-5.6%	2.0
4243	Apparel, Piece Goods, and Notions Merchant Wholesalers	2,126	2,176	2.4%	1.1
4244	Grocery and Related Product Merchant Wholesalers	7,327	7,728	5.5%	0.7
4245	Farm Product Raw Material Merchant Wholesalers	114	116	1.8%	0.1
4246	Chemical and Allied Products Merchant Wholesalers	1,608	1,757	9.3%	0.9
4247	Petroleum and Petroleum Products Merchant Wholesalers	482	505	4.8%	0.4
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	1,372	1,485	8.2%	0.5
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	2,537	2,405	-5.2%	0.6
4251	Wholesale Electronic Markets and Agents and Brokers	23,062	23,482	1.8%	1.9
4411	Automobile Dealers	14,860	17,044	14.7%	0.9
4412	Other Motor Vehicle Dealers	802	859	7.1%	0.4
4413	Automotive Parts, Accessories, and Tire Stores	4,090	4,559	11.5%	0.6
4421	Furniture Stores	2,742	2,802	2.2%	0.9
4422	Home Furnishings Stores	2,757	2,837	2.9%	0.8

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4431	Electronics and Appliance Stores	5,976	5,824	-2.5%	0.9
4441	Building Material and Supplies Dealers	10,581	11,139	5.3%	0.7
4442	Lawn and Garden Equipment and Supplies Stores	1,475	1,468	-0.5%	0.7
4451	Grocery Stores	43,983	47,241	7.4%	1.2
4452	Specialty Food Stores	4,219	4,306	2.1%	1.3
4453	Beer, Wine, and Liquor Stores	1,648	1,895	15.0%	0.8
4461	Health and Personal Care Stores	16,195	17,017	5.1%	1.2
4471	Gasoline Stations	6,628	7,400	11.6%	0.5
4481	Clothing Stores	16,251	15,445	-5.0%	1.1
4482	Shoe Stores	3,404	3,405	0.0%	1.2
4483	Jewelry, Luggage, and Leather Goods Stores	1,968	1,890	-4.0%	1.0
4511	Sporting Goods, Hobby, and Musical Instrument Stores	6,271	6,523	4.0%	0.9
4512	Book Stores and News Dealers	1,320	1,230	-6.8%	1.1
4521	Department Stores	17,871	15,462	-13.5%	0.9
4529	Other General Merchandise Stores	11,210	13,585	21.2%	0.5
4531	Florists	1,100	843	-23.4%	1.3
4532	Office Supplies, Stationery, and Gift Stores	3,810	3,423	-10.2%	0.9
4533	Used Merchandise Stores	1,674	1,815	8.4%	0.7
4539	Other Miscellaneous Store Retailers	4,366	4,896	12.1%	1.0
4541	Electronic Shopping and Mail-Order Houses	7,078	8,409	18.8%	1.6
4542	Vending Machine Operators	506	405	-20.0%	1.0
4543	Direct Selling Establishments	2,755	2,810	2.0%	1.5
4811	Scheduled Air Transportation	8,867	9,503	7.2%	1.6
4812	Nonscheduled Air Transportation	67	82	22.4%	0.1
4831	Deep Sea, Coastal, and Great Lakes Water Transportation	220	199	-9.5%	0.4
4832	Inland Water Transportation	28	35	25.0%	0.1
4841	General Freight Trucking	5,384	6,730	25.0%	0.4
4842	Specialized Freight Trucking	3,151	3,946	25.2%	0.5
4851	Urban Transit Systems	1,131	1,169	3.4%	0.4
4852	Interurban and Rural Bus Transportation	230	240	4.3%	0.7
4853	Taxi and Limousine Service	1,199	1,239	3.3%	1.1
4854	School and Employee Bus Transportation	7,713	8,846	14.7%	2.3
4855	Charter Bus Industry	438	493	12.6%	1.1
4859	Other Transit and Ground Passenger Transportation	2,098	2,239	6.7%	1.6
4862	Pipeline Transportation of Natural Gas	113	137	21.2%	0.3
4869	Other Pipeline Transportation	220	246	11.8%	2.0
4871	Scenic and Sightseeing Transportation, Land	231	192	-16.9%	1.2

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4872	Scenic and Sightseeing Transportation, Water	139	168	20.9%	0.7
4881	Support Activities for Air Transportation	2,193	2,733	24.6%	0.7
4882	Support Activities for Rail Transportation	340	381	12.1%	0.8
4883	Support Activities for Water Transportation	7,777	7,720	-0.7%	5.6
4884	Support Activities for Road Transportation	1,317	1,765	34.0%	0.9
4885	Freight Transportation Arrangement	1,910	2,067	8.2%	0.7
4889	Other Support Activities for Transportation	226	234	3.5%	0.5
4911	Postal Service	9,216	6,654	-27.8%	1.1
4921	Couriers and Express Delivery Services	9,271	10,720	15.6%	1.3
4922	Local Messengers and Local Delivery	535	603	12.7%	0.7
4931	Warehousing and Storage	7,601	8,548	12.5%	0.7
5111	Newspaper, Periodical, Book, and Directory Publishers	7,404	5,771	-22.1%	1.3
5112	Software Publishers	2,126	2,297	8.0%	0.5
5121	Motion Picture and Video Industries	2,601	2,621	0.8%	0.5
5122	Sound Recording Industries	160	151	-5.6%	0.7
5151	Radio and Television Broadcasting	3,010	3,090	2.7%	1.0
5152	Cable and Other Subscription Programming	88	86	-2.3%	0.1
5171	Wired Telecommunications Carriers	10,202	8,853	-13.2%	1.2
5172	Wireless Telecommunications Carriers (except Satellite)	1,002	809	-19.3%	0.5
5174	Satellite Telecommunications	77	68	-11.7%	0.6
5179	Other Telecommunications	790	733	-7.2%	0.7
5182	Data Processing, Hosting, and Related Services	4,363	3,821	-12.4%	1.1
5191	Other Information Services	4,273	4,822	12.8%	0.9
5211	Monetary Authorities-Central Bank	96	77	-19.8%	0.4
5221	Depository Credit Intermediation	20,105	17,877	-11.1%	0.9
5222	Nondepository Credit Intermediation	6,115	5,905	-3.4%	0.8
5223	Activities Related to Credit Intermediation	2,243	2,502	11.5%	0.6
5231	Securities and Commodity Contracts Intermediation and Brokerage	5,429	6,544	20.5%	0.9
5232	Securities and Commodity Exchanges	142	179	26.1%	1.5
5239	Other Financial Investment Activities	22,048	29,789	35.1%	3.7
5241	Insurance Carriers	32,176	34,464	7.1%	2.0
5242	Agencies, Brokerages, and Other Insurance Related Activities	19,879	23,606	18.7%	1.4
5251	Insurance and Employee Benefit Funds	86	69	-19.8%	2.8
5259	Other Investment Pools and Funds	857	1,090	27.2%	17.7
5311	Lessors of Real Estate	8,214	8,822	7.4%	1.0
5312	Offices of Real Estate Agents and Brokers	3,398	3,618	6.5%	0.9
5313	Activities Related to Real Estate	6,935	8,071	16.4%	0.8

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
5321	Automotive Equipment Rental and Leasing	2,670	2,851	6.8%	1.0
5322	Consumer Goods Rental	1,306	1,526	16.8%	0.6
5323	General Rental Centers	360	412	14.4%	0.7
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	2,277	2,980	30.9%	1.2
5331	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	319	346	8.5%	1.0
5411	Legal Services	25,937	27,481	6.0%	1.7
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	15,126	16,307	7.8%	1.1
5413	Architectural, Engineering, and Related Services	20,008	22,024	10.1%	1.0
5414	Specialized Design Services	2,461	3,251	32.1%	1.4
5415	Computer Systems Design and Related Services	36,459	47,933	31.5%	1.5
5416	Management, Scientific, and Technical Consulting Services	26,125	31,247	19.6%	1.5
5417	Scientific Research and Development Services	17,502	19,761	12.9%	1.9
5418	Advertising, Public Relations, and Related Services	7,854	8,932	13.7%	1.2
5419	Other Professional, Scientific, and Technical Services	11,241	13,838	23.1%	1.3
5511	Management of Companies and Enterprises	46,464	53,879	16.0%	1.6
5611	Office Administrative Services	1,327	1,333	0.5%	0.2
5612	Facilities Support Services	2,728	3,622	32.8%	1.4
5613	Employment Services	31,401	41,597	32.5%	0.7
5614	Business Support Services	8,565	7,917	-7.6%	0.7
5615	Travel Arrangement and Reservation Services	3,073	3,205	4.3%	1.1
5616	Investigation and Security Services	15,388	17,973	16.8%	1.3
5617	Services to Buildings and Dwellings	31,791	35,237	10.8%	1.2
5619	Other Support Services	6,974	8,492	21.8%	1.7
5621	Waste Collection	2,653	3,175	19.7%	1.2
5622	Waste Treatment and Disposal	829	961	15.9%	0.5
5629	Remediation and Other Waste Management Services	1,722	2,204	28.0%	0.9
6111	Elementary and Secondary Schools	95,030	93,081	-2.1%	0.9
6112	Junior Colleges	5,456	5,302	-2.8%	0.6
6113	Colleges, Universities, and Professional Schools	59,440	61,522	3.5%	1.5
6114	Business Schools and Computer and Management Training	777	811	4.4%	0.8
6115	Technical and Trade Schools	1,791	2,048	14.3%	0.9
6116	Other Schools and Instruction	6,064	6,946	14.5%	1.2
6117	Educational Support Services	3,375	3,789	12.3%	1.7
6211	Offices of Physicians	34,934	37,785	8.2%	1.0
6212	Offices of Dentists	11,862	12,916	8.9%	1.0
6213	Offices of Other Health Practitioners	11,083	14,114	27.3%	1.0

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
6214	Outpatient Care Centers	12,822	15,506	20.9%	1.2
6215	Medical and Diagnostic Laboratories	4,912	5,987	21.9%	1.4
6216	Home Health Care Services	17,132	27,129	58.4%	1.0
6219	Other Ambulatory Health Care Services	6,943	9,065	30.6%	1.7
6221	General Medical and Surgical Hospitals	81,076	87,344	7.7%	1.1
6222	Psychiatric and Substance Abuse Hospitals	4,932	5,771	17.0%	1.5
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	17,014	23,939	40.7%	5.0
6231	Nursing Care Facilities (Skilled Nursing Facilities)	26,577	30,447	14.6%	1.1
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	19,531	23,131	18.4%	2.0
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	23,750	28,815	21.3%	2.0
6239	Other Residential Care Facilities	1,889	1,997	5.7%	0.8
6241	Individual and Family Services	44,038	60,060	36.4%	1.5
6242	Community Food and Housing, and Emergency and Other Relief Services	3,086	3,608	16.9%	1.5
6243	Vocational Rehabilitation Services	3,147	3,518	11.8%	0.7
6244	Child Day Care Services	17,134	20,380	18.9%	1.5
7111	Performing Arts Companies	1,722	1,831	6.3%	1.1
7112	Spectator Sports	2,512	2,886	14.9%	1.3
7113	Promoters of Performing Arts, Sports, and Similar Events	2,297	2,720	18.4%	1.3
7114	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	79	86	8.9%	0.3
7115	Independent Artists, Writers, and Performers	558	609	9.1%	0.8
7121	Museums, Historical Sites, and Similar Institutions	3,651	3,946	8.1%	1.1
7131	Amusement Parks and Arcades	2,024	2,094	3.5%	0.8
7132	Gambling Industries	3,161	3,413	8.0%	0.9
7139	Other Amusement and Recreation Industries	17,677	19,850	12.3%	1.0
7211	Traveler Accommodation	14,023	15,464	10.3%	0.5
7212	RV (Recreational Vehicle) Parks and Recreational Camps	306	299	-2.3%	0.4
7213	Rooming and Boarding Houses	86	108	25.6%	0.5
7223	Special Food Services	14,784	15,789	6.8%	1.7
7224	Drinking Places (Alcoholic Beverages)	5,330	5,589	4.9%	1.1
7225	Restaurants and Other Eating Places	103,342	115,434	11.7%	0.8
8111	Automotive Repair and Maintenance	11,451	12,501	9.2%	1.0
8112	Electronic and Precision Equipment Repair and Maintenance	1,411	1,526	8.2%	1.0
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1,514	1,690	11.6%	0.5
8114	Personal and Household Goods Repair and Maintenance	584	551	-5.7%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
8121	Personal Care Services	14,783	18,090	22.4%	1.7
8122	Death Care Services	1,704	1,833	7.6%	0.9
8123	Drycleaning and Laundry Services	3,179	3,405	7.1%	0.8
8129	Other Personal Services	6,477	7,401	14.3%	1.6
8131	Religious Organizations	2,974	3,385	13.8%	1.2
8132	Grantmaking and Giving Services	2,755	3,084	11.9%	1.5
8133	Social Advocacy Organizations	3,416	3,901	14.2%	1.2
8134	Civic and Social Organizations	8,557	9,401	9.9%	1.6
8139	Business, Professional, Labor, Political, and Similar Organizations	6,539	7,277	11.3%	1.1
8141	Private Households	2,285	2,267	-0.8%	0.6
9211	Executive, Legislative, and Other General Government Support	28,577	27,966	-2.1%	0.7
9221	Justice, Public Order, and Safety Activities	24,231	22,715	-6.3%	0.9
9231	Administration of Human Resource Programs	7,553	7,181	-4.9%	0.7
9241	Administration of Environmental Quality Programs	2,303	2,216	-3.8%	0.5
9251	Administration of Housing Programs, Urban Planning, and Community Development	2,301	2,246	-2.4%	2.0
9261	Administration of Economic Programs	4,007	3,689	-7.9%	0.5
9281	National Security and International Affairs	7,079	6,519	-7.9%	0.9

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

APPENDIX D: OCCUPATION PROJECTIONS 2014-2024 FOR WEST CHESTER UNIVERSITY'S WORKFORCE REGION

For this analysis a “skilled” occupation is defined as an occupation in O*NET Job Zones¹⁹ 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.²⁰

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.

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

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

JOB ZONE TWO: Some Preparation Needed

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

JOB ZONE THREE: Medium Preparation Needed

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

JOB ZONE FOUR: Considerable Preparation Needed

- *Education* – Most of these occupations require a four-year bachelor's degree, but some do not.
- *Related Experience* – A considerable amount of work-related skill, knowledge, or experience is needed for these occupations. For example,

an accountant must complete four years of college and work for several years in accounting to be considered qualified.

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

JOB ZONE FIVE: Extensive Preparation Needed

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

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
Total	All Occupations	NA	1,879,500	2,074,019	10.3%	713,303
11-1011	Chief Executives	5	3,842	3,817	-0.7%	887
11-1021	General and Operations Managers	4	22,219	26,140	17.6%	7,877
11-1031	Legislators	4	664	523	-21.2%	32
11-2011	Advertising and Promotions Managers	4	252	216	-14.3%	47
11-2021	Marketing Managers	4	2,319	2,516	8.5%	699
11-2022	Sales Managers	4	3,748	3,803	1.5%	864
11-2031	Public Relations and Fundraising Managers	4	691	694	0.4%	150
11-3011	Administrative Services Managers	3	3,046	3,107	2.0%	527
11-3021	Computer and Information Systems Managers	4	4,709	6,203	31.7%	2,182
11-3031	Financial Managers	4	5,661	5,765	1.8%	1,151
11-3051	Industrial Production Managers	4	1,462	1,338	-8.5%	212
11-3061	Purchasing Managers	4	699	627	-10.3%	87
11-3071	Transportation, Storage, and Distribution Managers	4	1,099	1,233	12.2%	405
11-3111	Compensation and Benefits Managers	4	292	256	-12.3%	54
11-3121	Human Resources Managers	4	1,213	1,542	27.1%	645
11-3131	Training and Development Managers	4	364	458	25.8%	191
11-9021	Construction Managers	4	1,731	2,267	31.0%	788
11-9031	Education Administrators, Preschool and Childcare Center/Program	4	808	903	11.8%	312
11-9032	Education Administrators, Elementary and Secondary School	5	2,498	2,328	-6.8%	655
11-9033	Education Administrators, Postsecondary	5	2,033	1,978	-2.7%	523
11-9039	Education Administrators, All Other	5	286	349	22.0%	143
11-9041	Architectural and Engineering Managers	5	1,821	1,867	2.5%	517
11-9051	Food Service Managers	3	1,835	2,050	11.7%	586
11-9061	Funeral Service Managers	3	130	125	-3.8%	35
11-9071	Gaming Managers	3	53	58	9.4%	16
11-9081	Lodging Managers	3	259	322	24.3%	176
11-9111	Medical and Health Services Managers	5	4,613	5,057	9.6%	1,565
11-9121	Natural Sciences Managers	5	875	928	6.1%	270
11-9131	Postmasters and Mail Superintendents	3	357	241	-32.5%	44
11-9141	Property, Real Estate, and Community Association Managers	4	1,347	1,620	20.3%	620
11-9151	Social and Community Service Managers	4	2,169	2,602	20.0%	931
11-9161	Emergency Management Directors	4	126	103	-18.3%	0
11-9199	Managers, All Other	4	3,149	3,427	8.8%	964

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	56	52	-7.1%	15
13-1021	Buyers and Purchasing Agents, Farm Products	4	120	124	3.3%	35
13-1022	Wholesale and Retail Buyers, Except Farm Products	3	1,431	1,327	-7.3%	286
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	4	4,539	4,527	-0.3%	959
13-1031	Claims Adjusters, Examiners, and Investigators	4	5,997	6,489	8.2%	2,268
13-1032	Insurance Appraisers, Auto Damage	3	323	389	20.4%	182
13-1041	Compliance Officers	4	4,323	5,004	15.8%	1,577
13-1051	Cost Estimators	4	2,968	3,337	12.4%	1,377
13-1071	Human Resources Specialists	4	6,999	8,736	24.8%	3,231
13-1075	Labor Relations Specialists	4	1,922	1,636	-14.9%	280
13-1081	Logisticians	4	2,478	2,783	12.3%	635
13-1111	Management Analysts	4	10,385	12,939	24.6%	4,282
13-1121	Meeting, Convention, and Event Planners	4	1,202	1,629	35.5%	611
13-1131	Fundraisers	4	1,169	1,536	31.4%	631
13-1141	Compensation, Benefits, and Job Analysis Specialists	4	1,415	1,363	-3.7%	263
13-1151	Training and Development Specialists	4	4,147	4,828	16.4%	1,503
13-1161	Market Research Analysts and Marketing Specialists	4	10,132	13,552	33.8%	5,043
13-1199	Business Operations Specialists, All Other	4	6,203	6,217	0.2%	748
13-2011	Accountants and Auditors	4	21,470	23,947	11.5%	9,624
13-2021	Appraisers and Assessors of Real Estate	4	612	639	4.4%	121
13-2031	Budget Analysts	4	869	907	4.4%	404
13-2041	Credit Analysts	4	795	911	14.6%	353
13-2051	Financial Analysts	4	5,401	6,781	25.6%	2,794
13-2052	Personal Financial Advisors	4	4,833	7,038	45.6%	3,105
13-2053	Insurance Underwriters	4	2,317	2,480	7.0%	1,066
13-2061	Financial Examiners	4	605	706	16.7%	295
13-2071	Credit Counselors	4	672	864	28.6%	336
13-2072	Loan Officers	3	4,006	4,414	10.2%	1,517
13-2081	Tax Examiners and Collectors, and Revenue Agents	3	1,303	1,133	-13.0%	359
13-2082	Tax Preparers	3	937	813	-13.2%	161
13-2099	Financial Specialists, All Other	4	1,550	1,547	-0.2%	202
15-1111	Computer and Information Research Scientists	5	149	151	1.3%	21
15-1121	Computer Systems Analysts	4	10,756	14,513	34.9%	5,659
15-1122	Information Security Analysts	4	1,094	1,579	44.3%	653
15-1131	Computer Programmers	4	6,962	8,948	28.5%	4,266

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
15-1132	Software Developers, Applications	4	9,730	13,232	36.0%	4,888
15-1133	Software Developers, Systems Software	4	4,932	4,871	-1.2%	545
15-1134	Web Developers	3	1,733	2,242	29.4%	793
15-1141	Database Administrators	4	2,406	3,055	27.0%	1,145
15-1142	Network and Computer Systems Administrators	4	5,836	5,587	-4.3%	753
15-1143	Computer Network Architects	4	1,627	1,982	21.8%	614
15-1151	Computer User Support Specialists	3	10,833	14,378	32.7%	5,484
15-1152	Computer Network Support Specialists	4	2,333	2,430	4.2%	543
15-1199	Computer Occupations, All Other	4	2,732	3,229	18.2%	979
15-2011	Actuaries	4	715	924	29.2%	440
15-2031	Operations Research Analysts	5	1,241	1,585	27.7%	637
15-2041	Statisticians	5	984	1,361	38.3%	717
17-1011	Architects, Except Landscape and Naval	4	945	1,096	16.0%	487
17-1012	Landscape Architects	4	287	365	27.2%	168
17-1021	Cartographers and Photogrammetrists	4	77	83	7.8%	22
17-1022	Surveyors	4	500	566	13.2%	197
17-2011	Aerospace Engineers	4	670	827	23.4%	332
17-2021	Agricultural Engineers	4	55	59	7.3%	26
17-2031	Biomedical Engineers	4	444	487	9.7%	165
17-2041	Chemical Engineers	4	727	672	-7.6%	158
17-2051	Civil Engineers	4	4,027	4,519	12.2%	1,590
17-2061	Computer Hardware Engineers	4	554	483	-12.8%	45
17-2071	Electrical Engineers	4	1,987	2,291	15.3%	798
17-2072	Electronics Engineers, Except Computer	4	1,364	1,126	-17.4%	106
17-2081	Environmental Engineers	5	1,196	1,427	19.3%	576
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	4	459	450	-2.0%	139
17-2112	Industrial Engineers	4	2,674	2,558	-4.3%	790
17-2131	Materials Engineers	4	383	493	28.7%	255
17-2141	Mechanical Engineers	4	2,999	2,953	-1.5%	1,086
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	4	69	66	-4.3%	23
17-2161	Nuclear Engineers	4	494	600	21.5%	275
17-2171	Petroleum Engineers	4	11	14	27.3%	7
17-2199	Engineers, All Other	4	1,247	1,499	20.2%	503
17-3011	Architectural and Civil Drafters	4	1,480	1,571	6.1%	448
17-3012	Electrical and Electronics Drafters	3	363	305	-16.0%	4
17-3013	Mechanical Drafters	3	937	828	-11.6%	96

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
17-3019	Drafters, All Other	3	100	118	18.0%	33
17-3021	Aerospace Engineering and Operations Technicians	4	64	71	10.9%	20
17-3022	Civil Engineering Technicians	3	769	885	15.1%	309
17-3023	Electrical and Electronics Engineering Technicians	3	1,198	1,030	-14.0%	128
17-3024	Electro-Mechanical Technicians	3	190	166	-12.6%	33
17-3025	Environmental Engineering Technicians	4	441	518	17.5%	192
17-3026	Industrial Engineering Technicians	3	523	510	-2.5%	117
17-3027	Mechanical Engineering Technicians	3	556	637	14.6%	216
17-3029	Engineering Technicians, Except Drafters, All Other	3	818	1,050	28.4%	436
17-3031	Surveying and Mapping Technicians	3	477	564	18.2%	192
19-1012	Food Scientists and Technologists	4	69	82	18.8%	37
19-1013	Soil and Plant Scientists	5	62	79	27.4%	43
19-1021	Biochemists and Biophysicists	5	1,094	1,448	32.4%	687
19-1022	Microbiologists	5	562	746	32.7%	372
19-1023	Zoologists and Wildlife Biologists	5	98	83	-15.3%	13
19-1029	Biological Scientists, All Other	5	181	174	-3.9%	51
19-1031	Conservation Scientists	4	203	220	8.4%	82
19-1032	Foresters	4	56	50	-10.7%	11
19-1041	Epidemiologists	5	39	29	-25.6%	1
19-1042	Medical Scientists, Except Epidemiologists	5	3,448	4,280	24.1%	1,659
19-1099	Life Scientists, All Other	5	52	59	13.5%	17
19-2012	Physicists	5	72	58	-19.4%	2
19-2021	Atmospheric and Space Scientists	4	34	28	-17.6%	2
19-2031	Chemists	4	3,009	3,340	11.0%	1,303
19-2032	Materials Scientists	5	138	142	2.9%	46
19-2041	Environmental Scientists and Specialists, Including Health	4	1,134	1,479	30.4%	709
19-2042	Geoscientists, Except Hydrologists and Geographers	4	354	396	11.9%	168
19-2043	Hydrologists	4	71	72	1.4%	24
19-2099	Physical Scientists, All Other	5	100	80	-20.0%	2
19-3011	Economists	5	273	297	8.8%	116
19-3022	Survey Researchers	5	1,171	1,241	6.0%	445
19-3031	Clinical, Counseling, and School Psychologists	5	1,815	1,887	4.0%	621
19-3039	Psychologists, All Other	5	136	163	19.9%	67
19-3041	Sociologists	5	60	53	-11.7%	26
19-3051	Urban and Regional Planners	5	584	578	-1.0%	274

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
19-3091	Anthropologists and Archeologists	5	32	35	9.4%	9
19-3093	Historians	5	29	23	-20.7%	0
19-3099	Social Scientists and Related Workers, All Other	4	156	147	-5.8%	23
19-4011	Agricultural and Food Science Technicians	3	95	83	-12.6%	25
19-4021	Biological Technicians	4	2,393	2,767	15.6%	1,164
19-4031	Chemical Technicians	3	1,793	2,095	16.8%	872
19-4041	Geological and Petroleum Technicians	4	64	85	32.8%	53
19-4051	Nuclear Technicians	3	313	383	22.4%	208
19-4061	Social Science Research Assistants	4	340	430	26.5%	246
19-4091	Environmental Science and Protection Technicians, Including Health	4	685	876	27.9%	498
19-4092	Forensic Science Technicians	4	48	51	6.3%	23
19-4093	Forest and Conservation Technicians	3	124	136	9.7%	72
19-4099	Life, Physical, and Social Science Technicians, All Other	3	748	820	9.6%	384
21-1011	Substance Abuse and Behavioral Disorder Counselors	5	2,731	2,729	-0.1%	774
21-1012	Educational, Guidance, School, and Vocational Counselors	5	3,803	3,974	4.5%	1,065
21-1013	Marriage and Family Therapists	5	425	520	22.4%	190
21-1014	Mental Health Counselors	5	3,865	4,023	4.1%	1,214
21-1015	Rehabilitation Counselors	5	2,355	2,988	26.9%	1,295
21-1019	Counselors, All Other	5	331	340	2.7%	82
21-1021	Child, Family, and School Social Workers	4	5,891	6,763	14.8%	2,250
21-1022	Healthcare Social Workers	5	2,867	3,713	29.5%	1,513
21-1023	Mental Health and Substance Abuse Social Workers	5	3,408	4,165	22.2%	1,714
21-1029	Social Workers, All Other	5	345	367	6.4%	100
21-1091	Health Educators	4	977	1,095	12.1%	384
21-1092	Probation Officers and Correctional Treatment Specialists	4	1,315	1,368	4.0%	479
21-1093	Social and Human Service Assistants	4	8,099	9,353	15.5%	3,671
21-1094	Community Health Workers	4	432	475	10.0%	153
21-1099	Community and Social Service Specialists, All Other	4	558	611	9.5%	188
21-2011	Clergy	5	661	820	24.1%	319
21-2021	Directors, Religious Activities and Education	4	552	686	24.3%	381
21-2099	Religious Workers, All Other	4	146	124	-15.1%	27
23-1011	Lawyers	5	12,017	13,118	9.2%	3,153
23-1012	Judicial Law Clerks	5	377	396	5.0%	96

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
23-1021	Administrative Law Judges, Adjudicators, and Hearing Officers	5	232	204	-12.1%	19
23-1022	Arbitrators, Mediators, and Conciliators	5	138	170	23.2%	55
23-1023	Judges, Magistrate Judges, and Magistrates	5	87	72	-17.2%	4
23-2011	Paralegals and Legal Assistants	3	4,956	6,107	23.2%	1,990
23-2091	Court Reporters	3	275	282	2.5%	80
23-2093	Title Examiners, Abstractors, and Searchers	3	1,323	1,521	15.0%	497
23-2099	Legal Support Workers, All Other	3	229	217	-5.2%	29
25-1011	Business Teachers, Postsecondary	5	1,891	2,281	20.6%	674
25-1021	Computer Science Teachers, Postsecondary	5	814	968	18.9%	276
25-1022	Mathematical Science Teachers, Postsecondary	5	1,126	1,212	7.6%	255
25-1031	Architecture Teachers, Postsecondary	5	198	246	24.2%	77
25-1032	Engineering Teachers, Postsecondary	5	1,163	1,406	20.9%	418
25-1041	Agricultural Sciences Teachers, Postsecondary	5	149	119	-20.1%	0
25-1042	Biological Science Teachers, Postsecondary	5	1,535	1,639	6.8%	334
25-1043	Forestry and Conservation Science Teachers, Postsecondary	5	57	49	-14.0%	1
25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	5	356	406	14.0%	104
25-1052	Chemistry Teachers, Postsecondary	5	627	721	15.0%	187
25-1053	Environmental Science Teachers, Postsecondary	5	129	130	0.8%	20
25-1054	Physics Teachers, Postsecondary	5	440	518	17.7%	144
25-1061	Anthropology and Archeology Teachers, Postsecondary	5	142	138	-2.8%	18
25-1062	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	5	198	216	9.1%	47
25-1063	Economics Teachers, Postsecondary	5	464	558	20.3%	164
25-1064	Geography Teachers, Postsecondary	5	146	166	13.7%	43
25-1065	Political Science Teachers, Postsecondary	5	485	536	10.5%	124
25-1066	Psychology Teachers, Postsecondary	5	946	1,046	10.6%	241
25-1067	Sociology Teachers, Postsecondary	5	628	747	18.9%	214
25-1069	Social Sciences Teachers, Postsecondary, All Other	5	202	250	23.8%	78
25-1071	Health Specialties Teachers, Postsecondary	5	2,824	2,980	5.5%	584
25-1072	Nursing Instructors and Teachers, Postsecondary	5	1,180	1,222	3.6%	220
25-1081	Education Teachers, Postsecondary	5	1,467	1,507	2.7%	260
25-1082	Library Science Teachers, Postsecondary	5	146	176	20.5%	52
25-1111	Criminal Justice and Law Enforcement Teachers, Postsecondary	5	211	230	9.0%	50
25-1112	Law Teachers, Postsecondary	5	222	263	18.5%	74

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-1113	Social Work Teachers, Postsecondary	5	257	233	-9.3%	15
25-1121	Art, Drama, and Music Teachers, Postsecondary	5	2,096	2,596	23.9%	814
25-1122	Communications Teachers, Postsecondary	5	647	750	15.9%	200
25-1123	English Language and Literature Teachers, Postsecondary	5	1,718	1,753	2.0%	292
25-1124	Foreign Language and Literature Teachers, Postsecondary	5	728	831	14.1%	212
25-1125	History Teachers, Postsecondary	5	592	672	13.5%	169
25-1126	Philosophy and Religion Teachers, Postsecondary	5	634	698	10.1%	161
25-1191	Graduate Teaching Assistants	5	635	744	17.2%	204
25-1192	Home Economics Teachers, Postsecondary	5	49	41	-16.3%	0
25-1193	Recreation and Fitness Studies Teachers, Postsecondary	5	398	398	0.0%	61
25-1194	Vocational Education Teachers, Postsecondary	3	1,674	1,579	-5.7%	157
25-1199	Postsecondary Teachers, All Other	5	1,761	2,135	21.2%	638
25-2011	Preschool Teachers, Except Special Education	3	5,821	7,878	35.3%	3,728
25-2012	Kindergarten Teachers, Except Special Education	4	1,932	1,886	-2.4%	548
25-2021	Elementary School Teachers, Except Special Education	4	17,851	17,443	-2.3%	4,083
25-2022	Middle School Teachers, Except Special and Career/Technical Education	4	7,716	8,619	11.7%	2,840
25-2023	Career/Technical Education Teachers, Middle School	4	201	235	16.9%	95
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	4	16,427	15,366	-6.5%	4,534
25-2032	Career/Technical Education Teachers, Secondary School	4	1,452	1,294	-10.9%	317
25-2051	Special Education Teachers, Preschool	4	209	246	17.7%	75
25-2052	Special Education Teachers, Kindergarten and Elementary School	4	3,451	3,556	3.0%	888
25-2053	Special Education Teachers, Middle School	4	1,205	1,195	-0.8%	266
25-2054	Special Education Teachers, Secondary School	4	2,540	2,622	3.2%	700
25-2059	Special Education Teachers, All Other	4	81	95	17.3%	24
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	4	494	465	-5.9%	74
25-3021	Self-Enrichment Education Teachers	3	3,448	3,380	-2.0%	668
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	3	2,289	2,820	23.2%	923
25-3098	Substitute Teachers	3	5,129	4,741	-7.6%	681
25-4011	Archivists	5	137	156	13.9%	51
25-4012	Curators	5	217	267	23.0%	103

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25-4013	Museum Technicians and Conservators	4	243	307	26.3%	128
25-4021	Librarians	5	2,032	2,001	-1.5%	471
25-4031	Library Technicians	4	1,191	1,181	-0.8%	661
25-9011	Audio-Visual and Multimedia Collections Specialists	4	84	91	8.3%	24
25-9021	Farm and Home Management Advisors	5	20	17	-15.0%	0
25-9031	Instructional Coordinators	5	1,857	1,935	4.2%	238
25-9041	Teacher Assistants	3	15,864	17,041	7.4%	5,120
25-9099	Education, Training, and Library Workers, All Other	4	364	368	1.1%	38
27-1011	Art Directors	4	566	653	15.4%	251
27-1012	Craft Artists	2	19	16	-15.8%	1
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	3	142	137	-3.5%	41
27-1014	Multimedia Artists and Animators	4	242	266	9.9%	87
27-1019	Artists and Related Workers, All Other	4	35	25	-28.6%	0
27-1021	Commercial and Industrial Designers	4	305	279	-8.5%	67
27-1022	Fashion Designers	3	58	56	-3.4%	14
27-1023	Floral Designers	2	695	475	-31.7%	140
27-1024	Graphic Designers	4	3,661	3,969	8.4%	1,467
27-1025	Interior Designers	4	678	872	28.6%	463
27-1026	Merchandise Displayers and Window Trimmers	3	970	1,178	21.4%	491
27-1027	Set and Exhibit Designers	5	117	141	20.5%	57
27-1029	Designers, All Other	4	3	2	-33.3%	0
27-2011	Actors	2	653	611	-6.4%	209
27-2012	Producers and Directors	4	1,060	1,121	5.8%	524
27-2021	Athletes and Sports Competitors	2	374	443	18.4%	214
27-2022	Coaches and Scouts	4	2,813	2,688	-4.4%	766
27-2023	Umpires, Referees, and Other Sports Officials	3	130	119	-8.5%	28
27-2031	Dancers	3	53	46	-13.2%	11
27-2032	Choreographers	4	101	116	14.9%	50
27-2041	Music Directors and Composers	3	325	256	-21.2%	46
27-2042	Musicians and Singers	3	397	359	-9.6%	117
27-2099	Entertainers and Performers, Sports and Related Workers, All Other	3	36	36	0.0%	0
27-3011	Radio and Television Announcers	3	515	519	0.8%	246
27-3012	Public Address System and Other Announcers	2	113	125	10.6%	43
27-3022	Reporters and Correspondents	4	524	385	-26.5%	136
27-3031	Public Relations Specialists	4	3,933	3,895	-1.0%	564

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
27-3041	Editors	4	1,282	1,116	-12.9%	248
27-3042	Technical Writers	4	637	577	-9.4%	139
27-3043	Writers and Authors	4	682	673	-1.3%	162
27-3091	Interpreters and Translators	4	385	367	-4.7%	35
27-3099	Media and Communication Workers, All Other	4	117	99	-15.4%	2
27-4011	Audio and Video Equipment Technicians	3	812	842	3.7%	207
27-4012	Broadcast Technicians	3	250	251	0.4%	69
27-4014	Sound Engineering Technicians	3	115	102	-11.3%	17
27-4021	Photographers	3	835	732	-12.3%	142
27-4031	Camera Operators, Television, Video, and Motion Picture	3	182	165	-9.3%	12
27-4032	Film and Video Editors	3	114	97	-14.9%	1
27-4099	Media and Communication Equipment Workers, All Other	3	78	60	-23.1%	0
29-1011	Chiropractors	5	348	472	35.6%	202
29-1021	Dentists, General	5	1,281	1,433	11.9%	473
29-1022	Oral and Maxillofacial Surgeons	5	47	49	4.3%	14
29-1023	Orthodontists	5	35	43	22.9%	17
29-1029	Dentists, All Other Specialists	5	34	31	-8.8%	7
29-1031	Dietitians and Nutritionists	5	1,124	1,200	6.8%	223
29-1041	Optometrists	5	397	512	29.0%	248
29-1051	Pharmacists	5	4,523	5,015	10.9%	1,686
29-1061	Anesthesiologists	5	487	516	6.0%	163
29-1062	Family and General Practitioners	5	2,118	2,257	6.6%	730
29-1063	Internists, General	5	318	277	-12.9%	38
29-1064	Obstetricians and Gynecologists	5	108	136	25.9%	51
29-1065	Pediatricians, General	5	119	142	19.3%	46
29-1066	Psychiatrists	5	352	370	5.1%	118
29-1067	Surgeons	5	670	849	26.7%	358
29-1069	Physicians and Surgeons, All Other	5	5,019	5,354	6.7%	1,652
29-1071	Physician Assistants	5	1,627	1,835	12.8%	528
29-1081	Podiatrists	5	138	190	37.7%	108
29-1122	Occupational Therapists	5	2,226	3,065	37.7%	1,188
29-1123	Physical Therapists	5	3,600	4,979	38.3%	2,398
29-1124	Radiation Therapists	3	255	233	-8.6%	30
29-1125	Recreational Therapists	4	488	549	12.5%	179
29-1126	Respiratory Therapists	3	1,962	2,416	23.1%	737
29-1127	Speech-Language Pathologists	5	1,690	2,390	41.4%	950

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29-1128	Exercise Physiologists	5	103	137	33.0%	47
29-1129	Therapists, All Other	4	117	165	41.0%	62
29-1131	Veterinarians	5	1,142	1,532	34.2%	798
29-1141	Registered Nurses	3	45,264	55,303	22.2%	19,205
29-1151	Nurse Anesthetists	5	655	721	10.1%	204
29-1161	Nurse Midwives	5	48	76	58.3%	37
29-1171	Nurse Practitioners	5	1,345	1,822	35.5%	722
29-1181	Audiologists	5	169	206	21.9%	76
29-1199	Health Diagnosing and Treating Practitioners, All Other	5	173	142	-17.9%	10
29-2011	Medical and Clinical Laboratory Technologists	4	3,188	3,565	11.8%	1,342
29-2012	Medical and Clinical Laboratory Technicians	3	3,471	3,979	14.6%	1,498
29-2021	Dental Hygienists	3	3,228	3,902	20.9%	1,548
29-2031	Cardiovascular Technologists and Technicians	3	989	1,264	27.8%	423
29-2032	Diagnostic Medical Sonographers	3	823	980	19.1%	273
29-2033	Nuclear Medicine Technologists	3	333	344	3.3%	60
29-2034	Radiologic Technologists	3	3,346	3,867	15.6%	1,039
29-2035	Magnetic Resonance Imaging Technologists	3	484	658	36.0%	251
29-2041	Emergency Medical Technicians and Paramedics	3	4,378	5,530	26.3%	2,595
29-2051	Dietetic Technicians	2	977	1,319	35.0%	458
29-2052	Pharmacy Technicians	3	5,362	6,088	13.5%	1,345
29-2053	Psychiatric Technicians	3	569	646	13.5%	192
29-2054	Respiratory Therapy Technicians	3	160	146	-8.8%	3
29-2055	Surgical Technologists	3	1,157	1,466	26.7%	420
29-2056	Veterinary Technologists and Technicians	3	1,792	2,424	35.3%	822
29-2057	Ophthalmic Medical Technicians	3	338	436	29.0%	140
29-2061	Licensed Practical and Licensed Vocational Nurses	3	12,325	15,574	26.4%	6,504
29-2071	Medical Records and Health Information Technicians	3	2,787	3,558	27.7%	1,522
29-2081	Opticians, Dispensing	3	967	1,287	33.1%	650
29-2091	Orthotists and Prosthetists	5	79	95	20.3%	23
29-2092	Hearing Aid Specialists	3	52	60	15.4%	13
29-2099	Health Technologists and Technicians, All Other	3	729	836	14.7%	166
29-9011	Occupational Health and Safety Specialists	4	794	872	9.8%	311
29-9012	Occupational Health and Safety Technicians	3	130	147	13.1%	53
29-9091	Athletic Trainers	5	423	559	32.2%	261
29-9099	Healthcare Practitioners and Technical Workers, All Other	4	332	303	-8.7%	55

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
31-1011	Home Health Aides	2	20,076	28,304	41.0%	13,748
31-1013	Psychiatric Aides	2	704	675	-4.1%	149
31-1014	Nursing Assistants	2	25,186	30,072	19.4%	9,972
31-1015	Orderlies	2	829	949	14.5%	280
31-2011	Occupational Therapy Assistants	3	813	1,120	37.8%	558
31-2012	Occupational Therapy Aides	3	230	349	51.7%	184
31-2021	Physical Therapist Assistants	3	1,493	2,131	42.7%	1,041
31-2022	Physical Therapist Aides	2	721	949	31.6%	397
31-9011	Massage Therapists	3	801	1,100	37.3%	380
31-9091	Dental Assistants	3	4,376	4,774	9.1%	1,357
31-9092	Medical Assistants	3	7,703	9,150	18.8%	2,993
31-9093	Medical Equipment Preparers	2	658	797	21.1%	264
31-9094	Medical Transcriptionists	3	1,259	1,019	-19.1%	101
31-9095	Pharmacy Aides	2	531	473	-10.9%	68
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	3	1,047	1,144	9.3%	317
31-9097	Phlebotomists	3	1,867	2,338	25.2%	904
31-9099	Healthcare Support Workers, All Other	3	559	544	-2.7%	70
33-1011	First-Line Supervisors of Correctional Officers	3	426	440	3.3%	178
33-1012	First-Line Supervisors of Police and Detectives	3	960	1,071	11.6%	431
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	3	255	286	12.2%	147
33-1099	First-Line Supervisors of Protective Service Workers, All Other	3	873	1,106	26.7%	503
33-2011	Firefighters	3	1,577	1,577	0.0%	477
33-2021	Fire Inspectors and Investigators	3	77	64	-16.9%	13
33-3011	Bailiffs	2	68	51	-25.0%	5
33-3012	Correctional Officers and Jailers	3	5,227	4,707	-9.9%	1,100
33-3021	Detectives and Criminal Investigators	3	871	862	-1.0%	215
33-3041	Parking Enforcement Workers	2	149	168	12.8%	76
33-3051	Police and Sheriff's Patrol Officers	3	8,963	8,489	-5.3%	2,742
33-3052	Transit and Railroad Police	3	26	19	-26.9%	2
33-9011	Animal Control Workers	2	104	110	5.8%	33
33-9021	Private Detectives and Investigators	3	620	545	-12.1%	163
33-9031	Gaming Surveillance Officers and Gaming Investigators	2	169	180	6.5%	88
33-9032	Security Guards	2	17,362	20,803	19.8%	8,303
33-9091	Crossing Guards	1	1,459	1,210	-17.1%	112

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
33-9092	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	2	1,653	1,896	14.7%	1,440
33-9093	Transportation Security Screeners	2	410	369	-10.0%	71
33-9099	Protective Service Workers, All Other	2	1,023	1,225	19.7%	935
35-1011	Chefs and Head Cooks	3	1,516	1,628	7.4%	413
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	2	9,386	10,737	14.4%	4,234
35-2011	Cooks, Fast Food	1	2,698	2,531	-6.2%	423
35-2012	Cooks, Institution and Cafeteria	2	6,604	6,703	1.5%	1,469
35-2014	Cooks, Restaurant	2	12,513	16,188	29.4%	6,584
35-2015	Cooks, Short Order	1	2,292	2,756	20.2%	1,029
35-2021	Food Preparation Workers	1	11,549	10,916	-5.5%	3,019
35-3011	Bartenders	2	9,513	10,431	9.6%	4,930
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	1	42,198	48,975	16.1%	24,904
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	1	3,991	3,766	-5.6%	2,348
35-3031	Waiters and Waitresses	1	30,238	34,598	14.4%	20,362
35-3041	Food Servers, Nonrestaurant	1	4,516	5,024	11.2%	1,966
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	1	4,632	4,829	4.3%	2,438
35-9021	Dishwashers	1	6,984	6,800	-2.6%	3,205
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	1	4,517	4,920	8.9%	4,051
35-9099	Food Preparation and Serving Related Workers, All Other	1	369	473	28.2%	318
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2	2,279	2,469	8.3%	822
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	3	1,086	1,113	2.5%	154
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2	31,819	33,706	5.9%	9,184
37-2012	Maids and Housekeeping Cleaners	2	11,675	13,173	12.8%	4,476
37-2019	Building Cleaning Workers, All Other	2	153	139	-9.2%	18
37-2021	Pest Control Workers	2	707	884	25.0%	399
37-3011	Landscaping and Groundskeeping Workers	1	12,822	14,404	12.3%	5,318
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	2	206	187	-9.2%	37
37-3013	Tree Trimmers and Pruners	2	1,212	1,610	32.8%	814
37-3019	Grounds Maintenance Workers, All Other	2	29	25	-13.8%	1
39-1011	Gaming Supervisors	2	365	412	12.9%	243
39-1012	Slot Supervisors	2	20	22	10.0%	7

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
39-1021	First-Line Supervisors of Personal Service Workers	3	2,779	3,588	29.1%	1,361
39-2011	Animal Trainers	2	143	134	-6.3%	58
39-2021	Nonfarm Animal Caretakers	1	2,849	3,328	16.8%	922
39-3011	Gaming Dealers	2	1,609	1,792	11.4%	992
39-3012	Gaming and Sports Book Writers and Runners	2	40	46	15.0%	22
39-3019	Gaming Service Workers, All Other	2	23	26	13.0%	4
39-3021	Motion Picture Projectionists	2	104	99	-4.8%	56
39-3031	Ushers, Lobby Attendants, and Ticket Takers	2	1,823	2,045	12.2%	1,352
39-3091	Amusement and Recreation Attendants	1	4,455	4,972	11.6%	3,049
39-3092	Costume Attendants	2	56	57	1.8%	32
39-3093	Locker Room, Coatroom, and Dressing Room Attendants	2	271	237	-12.5%	113
39-3099	Entertainment Attendants and Related Workers, All Other	2	271	281	3.7%	171
39-4021	Funeral Attendants	2	481	572	18.9%	246
39-4031	Morticians, Undertakers, and Funeral Directors	3	291	372	27.8%	167
39-5011	Barbers	3	280	319	13.9%	126
39-5012	Hairdressers, Hairstylists, and Cosmetologists	3	9,844	12,143	23.4%	5,083
39-5092	Manicurists and Pedicurists	2	1,354	1,587	17.2%	373
39-5093	Shampooers	2	577	622	7.8%	144
39-5094	Skincare Specialists	3	437	440	0.7%	31
39-6011	Baggage Porters and Bellhops	2	485	594	22.5%	294
39-6012	Concierges	3	251	321	27.9%	137
39-7011	Tour Guides and Escorts	3	534	509	-4.7%	260
39-7012	Travel Guides	3	37	32	-13.5%	18
39-9011	Childcare Workers	3	8,505	8,085	-4.9%	2,121
39-9021	Personal Care Aides	2	22,243	32,986	48.3%	13,712
39-9031	Fitness Trainers and Aerobics Instructors	3	3,812	4,504	18.2%	1,359
39-9032	Recreation Workers	4	4,013	5,044	25.7%	1,511
39-9041	Residential Advisors	3	2,629	3,523	34.0%	2,213
39-9099	Personal Care and Service Workers, All Other	3	448	394	-12.1%	71
41-1011	First-Line Supervisors of Retail Sales Workers	2	12,891	13,552	5.1%	3,564
41-1012	First-Line Supervisors of Non-Retail Sales Workers	4	3,373	3,091	-8.4%	222
41-2011	Cashiers	1	42,945	42,671	-0.6%	19,921
41-2012	Gaming Change Persons and Booth Cashiers	2	96	103	7.3%	92
41-2021	Counter and Rental Clerks	1	4,786	5,006	4.6%	1,631
41-2022	Parts Salespersons	2	2,533	2,936	15.9%	1,160

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
41-2031	Retail Salespersons	2	61,999	65,065	4.9%	25,574
41-3011	Advertising Sales Agents	3	2,412	2,231	-7.5%	804
41-3021	Insurance Sales Agents	4	7,255	7,631	5.2%	2,575
41-3031	Securities, Commodities, and Financial Services Sales Agents	4	5,537	6,325	14.2%	2,332
41-3041	Travel Agents	3	1,058	996	-5.9%	489
41-3099	Sales Representatives, Services, All Other	4	12,322	15,646	27.0%	6,859
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	4	4,862	4,108	-15.5%	345
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	4	21,790	19,958	-8.4%	3,230
41-9011	Demonstrators and Product Promoters	2	700	700	0.0%	212
41-9012	Models	1	49	58	18.4%	25
41-9021	Real Estate Brokers	4	451	378	-16.2%	3
41-9022	Real Estate Sales Agents	3	2,918	3,164	8.4%	734
41-9031	Sales Engineers	4	1,187	1,243	4.7%	311
41-9041	Telemarketers	2	2,503	1,952	-22.0%	646
41-9091	Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	2	39	31	-20.5%	1
41-9099	Sales and Related Workers, All Other	3	645	600	-7.0%	69
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3	18,840	19,925	5.8%	5,596
43-2011	Switchboard Operators, Including Answering Service	2	1,750	1,474	-15.8%	345
43-2021	Telephone Operators	2	126	73	-42.1%	0
43-3011	Bill and Account Collectors	2	4,255	3,799	-10.7%	977
43-3021	Billing and Posting Clerks	2	9,199	9,939	8.0%	2,601
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3	22,402	24,503	9.4%	4,317
43-3041	Gaming Cage Workers	2	152	177	16.4%	103
43-3051	Payroll and Timekeeping Clerks	2	2,579	2,624	1.7%	666
43-3061	Procurement Clerks	3	835	701	-16.0%	192
43-3071	Tellers	2	6,216	4,933	-20.6%	2,363
43-3099	Financial Clerks, All Other	2	435	499	14.7%	215
43-4011	Brokerage Clerks	3	1,116	1,254	12.4%	564
43-4021	Correspondence Clerks	2	253	274	8.3%	105
43-4031	Court, Municipal, and License Clerks	3	774	791	2.2%	149
43-4041	Credit Authorizers, Checkers, and Clerks	3	434	331	-23.7%	1
43-4051	Customer Service Representatives	2	38,790	43,488	12.1%	16,418
43-4061	Eligibility Interviewers, Government Programs	3	2,773	2,583	-6.9%	412

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43-4071	File Clerks	2	2,004	1,680	-16.2%	262
43-4081	Hotel, Motel, and Resort Desk Clerks	2	2,087	2,241	7.4%	1,421
43-4111	Interviewers, Except Eligibility and Loan	2	3,320	3,880	16.9%	1,288
43-4121	Library Assistants, Clerical	2	1,811	1,786	-1.4%	809
43-4131	Loan Interviewers and Clerks	3	2,433	2,744	12.8%	667
43-4141	New Accounts Clerks	2	284	271	-4.6%	98
43-4151	Order Clerks	2	3,485	3,250	-6.7%	1,009
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	3	2,259	2,034	-10.0%	451
43-4171	Receptionists and Information Clerks	2	14,729	14,584	-1.0%	3,932
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	2	1,809	1,756	-2.9%	482
43-4199	Information and Record Clerks, All Other	2	1,554	1,278	-17.8%	170
43-5011	Cargo and Freight Agents	2	983	877	-10.8%	240
43-5021	Couriers and Messengers	2	1,099	917	-16.6%	75
43-5031	Police, Fire, and Ambulance Dispatchers	2	1,037	1,048	1.1%	341
43-5032	Dispatchers, Except Police, Fire, and Ambulance	2	2,146	2,462	14.7%	989
43-5041	Meter Readers, Utilities	2	351	292	-16.8%	86
43-5051	Postal Service Clerks	2	1,147	808	-29.6%	165
43-5052	Postal Service Mail Carriers	2	4,537	3,318	-26.9%	1,395
43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	2	2,110	1,353	-35.9%	69
43-5061	Production, Planning, and Expediting Clerks	3	4,392	4,541	3.4%	1,384
43-5071	Shipping, Receiving, and Traffic Clerks	2	7,447	7,110	-4.5%	1,884
43-5081	Stock Clerks and Order Fillers	2	24,507	24,927	1.7%	8,982
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	2	825	909	10.2%	296
43-6011	Executive Secretaries and Executive Administrative Assistants	3	9,330	8,880	-4.8%	1,058
43-6012	Legal Secretaries	3	6,117	6,662	8.9%	1,769
43-6013	Medical Secretaries	3	7,037	8,954	27.2%	2,738
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	3	38,586	43,972	14.0%	10,399
43-9011	Computer Operators	3	1,233	1,095	-11.2%	190
43-9021	Data Entry Keyers	2	3,888	3,226	-17.0%	695
43-9022	Word Processors and Typists	2	2,250	1,633	-27.4%	46
43-9031	Desktop Publishers	3	324	305	-5.9%	73
43-9041	Insurance Claims and Policy Processing Clerks	3	5,136	5,404	5.2%	1,941
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	2	2,424	2,043	-15.7%	552

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-9061	Office Clerks, General	2	44,406	43,585	-1.8%	9,404
43-9071	Office Machine Operators, Except Computer	2	1,019	765	-24.9%	152
43-9081	Proofreaders and Copy Markers	4	166	136	-18.1%	19
43-9111	Statistical Assistants	4	253	268	5.9%	91
43-9199	Office and Administrative Support Workers, All Other	3	1,922	2,215	15.2%	851
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	3	118	113	-4.2%	29
45-2011	Agricultural Inspectors	2	114	97	-14.9%	29
45-2041	Graders and Sorters, Agricultural Products	1	52	61	17.3%	21
45-2091	Agricultural Equipment Operators	2	123	137	11.4%	59
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1	589	459	-22.1%	113
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	1	329	299	-9.1%	106
45-2099	Agricultural Workers, All Other	1	4	3	-25.0%	0
45-4011	Forest and Conservation Workers	3	55	60	9.1%	13
45-4021	Fallers	1	14	10	-28.6%	0
45-4022	Logging Equipment Operators	1	121	126	4.1%	57
45-4023	Log Graders and Scalers	3	1	1	0.0%	0
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	3	4,797	5,963	24.3%	1,754
47-2011	Boilermakers	3	222	298	34.2%	193
47-2021	Brickmasons and Blockmasons	2	843	1,097	30.1%	342
47-2022	Stonemasons	3	116	109	-6.0%	1
47-2031	Carpenters	2	9,848	11,717	19.0%	3,318
47-2041	Carpet Installers	2	643	805	25.2%	323
47-2042	Floor Layers, Except Carpet, Wood, and Hard Tiles	2	158	149	-5.7%	27
47-2044	Tile and Marble Setters	2	292	381	30.5%	140
47-2051	Cement Masons and Concrete Finishers	2	1,496	1,723	15.2%	406
47-2053	Terrazzo Workers and Finishers	2	33	30	-9.1%	2
47-2061	Construction Laborers	2	9,091	11,578	27.4%	4,687
47-2071	Paving, Surfacing, and Tamping Equipment Operators	2	636	696	9.4%	193
47-2072	Pile-Driver Operators	2	14	14	0.0%	3
47-2073	Operating Engineers and Other Construction Equipment Operators	2	4,804	5,129	6.8%	1,715
47-2081	Drywall and Ceiling Tile Installers	2	610	588	-3.6%	104
47-2082	Tapers	2	188	230	22.3%	73
47-2111	Electricians	3	7,038	9,027	28.3%	3,906

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-2121	Glaziers	2	401	469	17.0%	200
47-2131	Insulation Workers, Floor, Ceiling, and Wall	2	229	289	26.2%	107
47-2132	Insulation Workers, Mechanical	2	141	195	38.3%	73
47-2141	Painters, Construction and Maintenance	2	1,982	2,322	17.2%	757
47-2142	Paperhangers	2	65	56	-13.8%	5
47-2151	Pipelayers	2	313	287	-8.3%	54
47-2152	Plumbers, Pipefitters, and Steamfitters	3	4,658	5,283	13.4%	1,473
47-2161	Plasterers and Stucco Masons	1	146	182	24.7%	37
47-2171	Reinforcing Iron and Rebar Workers	2	81	84	3.7%	17
47-2181	Roofers	2	1,174	1,310	11.6%	588
47-2211	Sheet Metal Workers	2	1,333	1,493	12.0%	446
47-2221	Structural Iron and Steel Workers	2	476	547	14.9%	252
47-3011	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	2	292	310	6.2%	52
47-3012	Helpers--Carpenters	2	292	398	36.3%	146
47-3013	Helpers--Electricians	2	495	749	51.3%	350
47-3014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	1	70	71	1.4%	16
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	2	372	369	-0.8%	55
47-3016	Helpers--Roofers	2	110	147	33.6%	63
47-3019	Helpers, Construction Trades, All Other	2	83	90	8.4%	14
47-4011	Construction and Building Inspectors	3	1,943	2,384	22.7%	977
47-4021	Elevator Installers and Repairers	3	131	125	-4.6%	38
47-4031	Fence Erectors	2	222	228	2.7%	68
47-4041	Hazardous Materials Removal Workers	3	535	682	27.5%	336
47-4051	Highway Maintenance Workers	2	3,549	3,416	-3.7%	553
47-4061	Rail-Track Laying and Maintenance Equipment Operators	2	67	80	19.4%	26
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	1	391	485	24.0%	219
47-4099	Construction and Related Workers, All Other	3	133	113	-15.0%	1
47-5011	Derrick Operators, Oil and Gas	1	2	3	50.0%	2
47-5012	Rotary Drill Operators, Oil and Gas	2	11	14	27.3%	11
47-5013	Service Unit Operators, Oil, Gas, and Mining	2	51	68	33.3%	50
47-5021	Earth Drillers, Except Oil and Gas	2	218	270	23.9%	150
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	2	29	35	20.7%	13
47-5041	Continuous Mining Machine Operators	1	8	9	12.5%	4
47-5042	Mine Cutting and Channeling Machine Operators	2	13	12	-7.7%	4
47-5049	Mining Machine Operators, All Other	2	0	0	#DIV/0!	0

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-5051	Rock Splitters, Quarry	1	47	49	4.3%	20
47-5061	Roof Bolters, Mining	2	0	0	#DIV/0!	0
47-5071	Roustabouts, Oil and Gas	1	105	136	29.5%	80
47-5081	Helpers--Extraction Workers	2	67	88	31.3%	55
47-5099	Extraction Workers, All Other	2	1	1	0.0%	0
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	3	5,096	5,836	14.5%	2,189
49-2011	Computer, Automated Teller, and Office Machine Repairers	3	1,761	1,915	8.7%	711
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	3	82	72	-12.2%	3
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	3	2,042	2,018	-1.2%	498
49-2091	Avionics Technicians	3	241	280	16.2%	117
49-2092	Electric Motor, Power Tool, and Related Repairers	3	211	212	0.5%	62
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	3	54	50	-7.4%	8
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	3	1,043	900	-13.7%	149
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	3	236	241	2.1%	71
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	3	49	57	16.3%	18
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	3	204	168	-17.6%	63
49-2098	Security and Fire Alarm Systems Installers	3	1,203	1,283	6.7%	377
49-3011	Aircraft Mechanics and Service Technicians	3	1,851	1,528	-17.5%	463
49-3021	Automotive Body and Related Repairers	2	2,076	2,428	17.0%	896
49-3022	Automotive Glass Installers and Repairers	2	301	348	15.6%	144
49-3023	Automotive Service Technicians and Mechanics	3	9,585	10,672	11.3%	3,873
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	3	2,699	3,381	25.3%	1,367
49-3041	Farm Equipment Mechanics and Service Technicians	3	228	192	-15.8%	52
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	3	1,348	1,410	4.6%	526
49-3043	Rail Car Repairers	2	127	138	8.7%	65
49-3051	Motorboat Mechanics and Service Technicians	3	63	63	0.0%	13
49-3052	Motorcycle Mechanics	3	174	220	26.4%	108
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	2	364	391	7.4%	121
49-3091	Bicycle Repairers	2	122	101	-17.2%	35
49-3092	Recreational Vehicle Service Technicians	2	60	56	-6.7%	21

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
49-3093	Tire Repairers and Changers	2	611	594	-2.8%	227
49-9011	Mechanical Door Repairers	2	187	194	3.7%	79
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	3	221	252	14.0%	112
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3	3,975	4,885	22.9%	2,125
49-9031	Home Appliance Repairers	3	494	449	-9.1%	171
49-9041	Industrial Machinery Mechanics	3	3,382	3,714	9.8%	1,436
49-9043	Maintenance Workers, Machinery	3	799	918	14.9%	262
49-9044	Millwrights	3	337	437	29.7%	183
49-9045	Refractory Materials Repairers, Except Brickmasons	2	7	7	0.0%	3
49-9051	Electrical Power-Line Installers and Repairers	3	1,079	1,273	18.0%	659
49-9052	Telecommunications Line Installers and Repairers	2	2,812	2,819	0.2%	1,129
49-9062	Medical Equipment Repairers	3	924	1,193	29.1%	592
49-9063	Musical Instrument Repairers and Tuners	3	133	121	-9.0%	42
49-9064	Watch Repairers	3	20	11	-45.0%	1
49-9069	Precision Instrument and Equipment Repairers, All Other	3	98	80	-18.4%	13
49-9071	Maintenance and Repair Workers, General	3	19,457	20,584	5.8%	5,414
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	2	448	366	-18.3%	45
49-9092	Commercial Divers	3	90	84	-6.7%	31
49-9094	Locksmiths and Safe Repairers	2	156	156	0.0%	46
49-9095	Manufactured Building and Mobile Home Installers	2	58	74	27.6%	41
49-9096	Riggers	2	110	142	29.1%	60
49-9098	Helpers--Installation, Maintenance, and Repair Workers	2	1,260	1,370	8.7%	509
49-9099	Installation, Maintenance, and Repair Workers, All Other	2	914	1,124	23.0%	354
51-1011	First-Line Supervisors of Production and Operating Workers	2	6,187	6,126	-1.0%	1,183
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	778	627	-19.4%	101
51-2021	Coil Winders, Tapers, and Finishers	2	85	79	-7.1%	13
51-2022	Electrical and Electronic Equipment Assemblers	2	2,559	2,286	-10.7%	338
51-2023	Electromechanical Equipment Assemblers	2	682	558	-18.2%	48
51-2031	Engine and Other Machine Assemblers	2	480	407	-15.2%	107
51-2041	Structural Metal Fabricators and Fitters	3	936	1,014	8.3%	541
51-2091	Fiberglass Laminators and Fabricators	2	54	60	11.1%	22
51-2092	Team Assemblers	2	7,713	7,182	-6.9%	1,258
51-2099	Assemblers and Fabricators, All Other	2	1,361	1,809	32.9%	697

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51-3011	Bakers	2	3,007	2,942	-2.2%	893
51-3021	Butchers and Meat Cutters	2	2,317	2,131	-8.0%	499
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	1	729	609	-16.5%	92
51-3023	Slaughterers and Meat Packers	1	941	968	2.9%	379
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	2	76	77	1.3%	27
51-3092	Food Batchmakers	2	1,160	1,197	3.2%	526
51-3093	Food Cooking Machine Operators and Tenders	2	285	319	11.9%	127
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3	1,890	2,366	25.2%	1,135
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	3	165	156	-5.5%	43
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	2	858	924	7.7%	376
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	2	121	129	6.6%	51
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	2	273	247	-9.5%	63
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	1,517	1,600	5.5%	376
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	138	99	-28.3%	23
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	830	861	3.7%	354
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	472	441	-6.6%	140
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	3	242	272	12.4%	116
51-4041	Machinists	3	4,228	4,613	9.1%	1,631
51-4051	Metal-Refining Furnace Operators and Tenders	2	100	107	7.0%	37
51-4052	Pourers and Casters, Metal	2	57	66	15.8%	31
51-4061	Model Makers, Metal and Plastic	3	21	16	-23.8%	1
51-4062	Patternmakers, Metal and Plastic	3	29	35	20.7%	17
51-4071	Foundry Mold and Coremakers	2	19	20	5.3%	6
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2	793	792	-0.1%	200
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	1,672	1,788	6.9%	706
51-4111	Tool and Die Makers	3	613	619	1.0%	121
51-4121	Welders, Cutters, Solderers, and Brazers	3	4,028	4,716	17.1%	1,999
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	2	311	338	8.7%	149

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	2	211	183	-13.3%	37
51-4192	Layout Workers, Metal and Plastic	2	29	32	10.3%	10
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	2	316	327	3.5%	121
51-4194	Tool Grinders, Filers, and Sharpeners	2	68	55	-19.1%	7
51-4199	Metal Workers and Plastic Workers, All Other	2	274	373	36.1%	160
51-5111	Prepress Technicians and Workers	3	626	455	-27.3%	101
51-5112	Printing Press Operators	3	2,995	2,628	-12.3%	613
51-5113	Print Binding and Finishing Workers	2	943	856	-9.2%	243
51-6011	Laundry and Dry-Cleaning Workers	1	2,484	2,830	13.9%	1,234
51-6021	Pressers, Textile, Garment, and Related Materials	1	398	448	12.6%	137
51-6031	Sewing Machine Operators	1	1,189	1,070	-10.0%	448
51-6041	Shoe and Leather Workers and Repairers	2	10	12	20.0%	11
51-6042	Shoe Machine Operators and Tenders	2	15	18	20.0%	19
51-6051	Sewers, Hand	2	1,226	1,398	14.0%	303
51-6052	Tailors, Dressmakers, and Custom Sewers	3	369	398	7.9%	123
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders	2	133	83	-37.6%	54
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	2	214	215	0.5%	130
51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	2	242	175	-27.7%	107
51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2	169	121	-28.4%	54
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	2	92	72	-21.7%	17
51-6092	Fabric and Apparel Patternmakers	3	35	33	-5.7%	5
51-6093	Upholsterers	2	199	213	7.0%	115
51-6099	Textile, Apparel, and Furnishings Workers, All Other	2	201	166	-17.4%	5
51-7011	Cabinetmakers and Bench Carpenters	2	917	1,070	16.7%	535
51-7021	Furniture Finishers	1	180	226	25.6%	149
51-7031	Model Makers, Wood	3	7	6	-14.3%	0
51-7032	Patternmakers, Wood	3	22	27	22.7%	9
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	2	223	317	42.2%	195
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	2	529	671	26.8%	263
51-7099	Woodworkers, All Other	2	10	8	-20.0%	0
51-8011	Nuclear Power Reactor Operators	3	96	109	13.5%	52
51-8012	Power Distributors and Dispatchers	3	199	230	15.6%	108

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-8013	Power Plant Operators	2	579	598	3.3%	289
51-8021	Stationary Engineers and Boiler Operators	3	572	648	13.3%	323
51-8031	Water and Wastewater Treatment Plant and System Operators	3	1,447	1,402	-3.1%	564
51-8091	Chemical Plant and System Operators	2	495	457	-7.7%	264
51-8092	Gas Plant Operators	3	215	223	3.7%	126
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	2	368	408	10.9%	235
51-8099	Plant and System Operators, All Other	2	135	128	-5.2%	52
51-9011	Chemical Equipment Operators and Tenders	2	2,079	2,066	-0.6%	1,108
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	2	784	778	-0.8%	355
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	2	160	185	15.6%	91
51-9022	Grinding and Polishing Workers, Hand	1	146	148	1.4%	56
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2	1,626	1,742	7.1%	748
51-9031	Cutters and Trimmers, Hand	2	52	43	-17.3%	5
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	2	592	502	-15.2%	76
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	2	588	491	-16.5%	136
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	2	56	46	-17.9%	14
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2	4,957	4,911	-0.9%	1,240
51-9071	Jewelers and Precious Stone and Metal Workers	3	177	137	-22.6%	9
51-9081	Dental Laboratory Technicians	2	357	393	10.1%	229
51-9082	Medical Appliance Technicians	3	319	299	-6.3%	140
51-9083	Ophthalmic Laboratory Technicians	2	363	342	-5.8%	141
51-9111	Packaging and Filling Machine Operators and Tenders	2	4,543	3,872	-14.8%	719
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	2	656	745	13.6%	260
51-9122	Painters, Transportation Equipment	2	618	598	-3.2%	160
51-9123	Painting, Coating, and Decorating Workers	2	177	167	-5.6%	40
51-9141	Semiconductor Processors	2	120	106	-11.7%	40
51-9151	Photographic Process Workers and Processing Machine Operators	2	435	315	-27.6%	54
51-9191	Adhesive Bonding Machine Operators and Tenders	2	117	123	5.1%	43
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	2	165	172	4.2%	55

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-9193	Cooling and Freezing Equipment Operators and Tenders	2	77	76	-1.3%	26
51-9194	Etchers and Engravers	2	120	132	10.0%	51
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	2	265	267	0.8%	123
51-9196	Paper Goods Machine Setters, Operators, and Tenders	2	1,918	1,899	-1.0%	427
51-9197	Tire Builders	2	54	62	14.8%	30
51-9198	Helpers--Production Workers	2	5,345	5,434	1.7%	1,453
51-9199	Production Workers, All Other	2	981	1,023	4.3%	289
53-1011	Aircraft Cargo Handling Supervisors	2	89	96	7.9%	31
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	2	2,106	2,271	7.8%	828
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	2	2,025	2,294	13.3%	873
53-2012	Commercial Pilots	3	437	552	26.3%	285
53-2021	Air Traffic Controllers	3	139	127	-8.6%	58
53-2022	Airfield Operations Specialists	3	242	249	2.9%	141
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	2	634	852	34.4%	352
53-3021	Bus Drivers, Transit and Intercity	2	1,132	1,170	3.4%	352
53-3022	Bus Drivers, School or Special Client	2	9,143	10,566	15.6%	3,734
53-3031	Driver/Sales Workers	2	5,229	5,379	2.9%	1,150
53-3032	Heavy and Tractor-Trailer Truck Drivers	2	14,070	16,964	20.6%	5,856
53-3033	Light Truck or Delivery Services Drivers	2	11,397	11,271	-1.1%	2,037
53-3041	Taxi Drivers and Chauffeurs	1	3,166	3,323	5.0%	795
53-3099	Motor Vehicle Operators, All Other	2	349	423	21.2%	164
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	2	32	36	12.5%	13
53-5011	Sailors and Marine Oilers	2	30	38	26.7%	27
53-5021	Captains, Mates, and Pilots of Water Vessels	3	294	291	-1.0%	181
53-5031	Ship Engineers	3	65	76	16.9%	41
53-6011	Bridge and Lock Tenders	1	39	30	-23.1%	9
53-6021	Parking Lot Attendants	2	2,825	3,466	22.7%	2,288
53-6031	Automotive and Watercraft Service Attendants	1	618	693	12.1%	273
53-6041	Traffic Technicians	3	19	22	15.8%	9
53-6051	Transportation Inspectors	3	258	242	-6.2%	78
53-6061	Transportation Attendants, Except Flight Attendants	2	387	342	-11.6%	54
53-6099	Transportation Workers, All Other	2	87	95	9.2%	46
53-7011	Conveyor Operators and Tenders	2	125	120	-4.0%	42
53-7021	Crane and Tower Operators	3	630	705	11.9%	323

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
53-7032	Excavating and Loading Machine and Dragline Operators	2	165	200	21.2%	61
53-7051	Industrial Truck and Tractor Operators	2	6,120	6,956	13.7%	2,844
53-7061	Cleaners of Vehicles and Equipment	2	3,165	3,501	10.6%	1,365
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2	32,784	38,143	16.3%	17,172
53-7063	Machine Feeders and Offbearers	2	782	691	-11.6%	109
53-7064	Packers and Packagers, Hand	2	9,227	10,101	9.5%	3,782
53-7071	Gas Compressor and Gas Pumping Station Operators	2	44	51	15.9%	33
53-7072	Pump Operators, Except Wellhead Pumpers	2	61	64	4.9%	38
53-7073	Wellhead Pumpers	2	11	11	0.0%	8
53-7081	Refuse and Recyclable Material Collectors	2	1,500	1,543	2.9%	527
53-7121	Tank Car, Truck, and Ship Loaders	2	121	102	-15.7%	27
53-7199	Material Moving Workers, All Other	2	56	78	39.3%	39

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 for Education and the Workforce. Oxford Economics completed the analysis and research work for this report, under the guidance of The State System's Office of the Chancellor, the team sought feedback and insight from senior administration and representatives from each of the 14 State System Universities. The team also drew on insight and feedback from subject matter experts involved in labor market intelligence and education program alignment.

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

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