

PENNSYLVANIA'S STATE SYSTEM OF HIGHER EDUCATION



CALU



CLARION
UNIVERSITY



MANSFIELD
UNIVERSITY

Millersville
University



SlipperyRock
University

WCU
WEST CHESTER
UNIVERSITY

Indiana University's

WORKFORCE CHARACTERISTICS TECHNICAL REPORT

A report for Pennsylvania's
State System of Higher Education

2016



Pennsylvania's
STATE SYSTEM
of Higher Education

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GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

ACRONYMS USED

ACS: American Community Survey

BLS: Bureau of Labor Statistics

EMSI: Economic Modeling Specialists International

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

IPEDS: Integrated Postsecondary Education Data System

LAUS: Local Area Unemployment Statistics

LEHD: Longitudinal Employment and Housing Dynamics

NCES: National Center for Education Statistics

OES: Occupational Employment Statistics

O*NET: Occupational Network

PUMS: Public Use Microdata Sample

QCEW: Quarterly Census of Employment and Wages

SAIPE: Small Area Income and Poverty Estimates

USDOE: US Department of Education

USDOL: US Department of Labor

1. INTRODUCTION

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

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

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

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

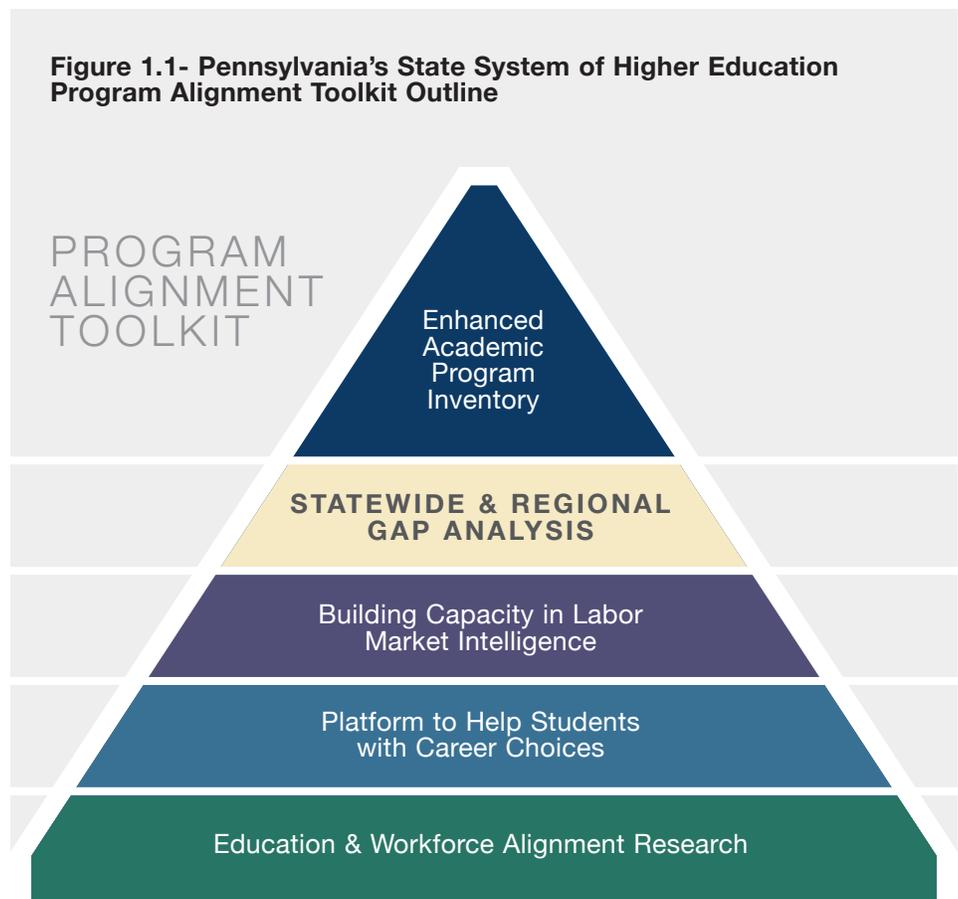
2 Source: The State System’s Economic and Employment Impact on the Commonwealth of Pennsylvania – released April 15, 2015.

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

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

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

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



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

1.2 Goal of the Workforce Characteristics Report

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

The intentions of this Workforce Characteristics report are fourfold.

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

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

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

2. PENNSYLVANIA'S STATE SYSTEM LEARNER ORIGIN

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

Pennsylvania's total four year institution enrollment in 2013 was approximately 618,700 learners. Of this, the Pennsylvania State System of Higher Education comprised 112,225 enrolled learners—of which almost 90% were Pennsylvania residents.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

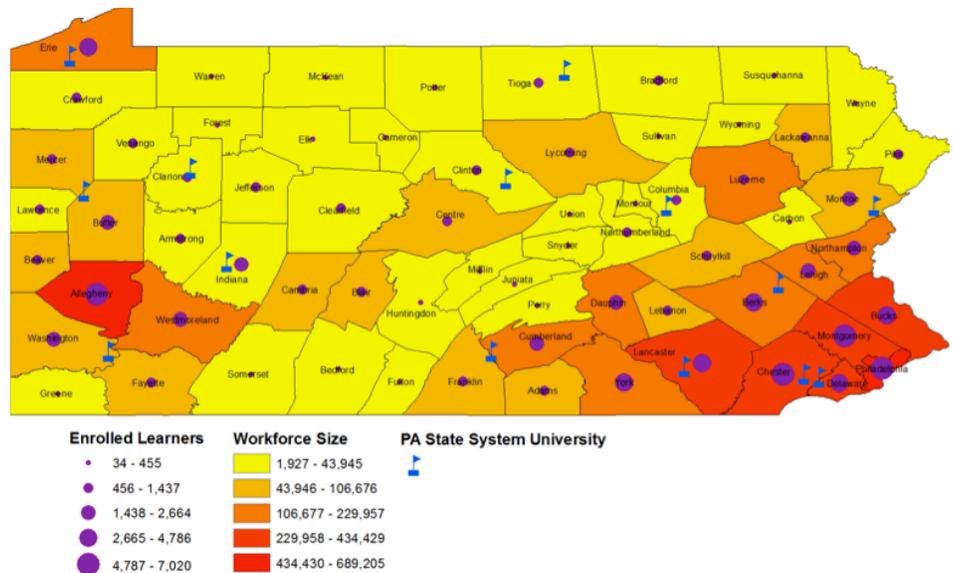
³ Based on Fall 2013 enrollment.

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

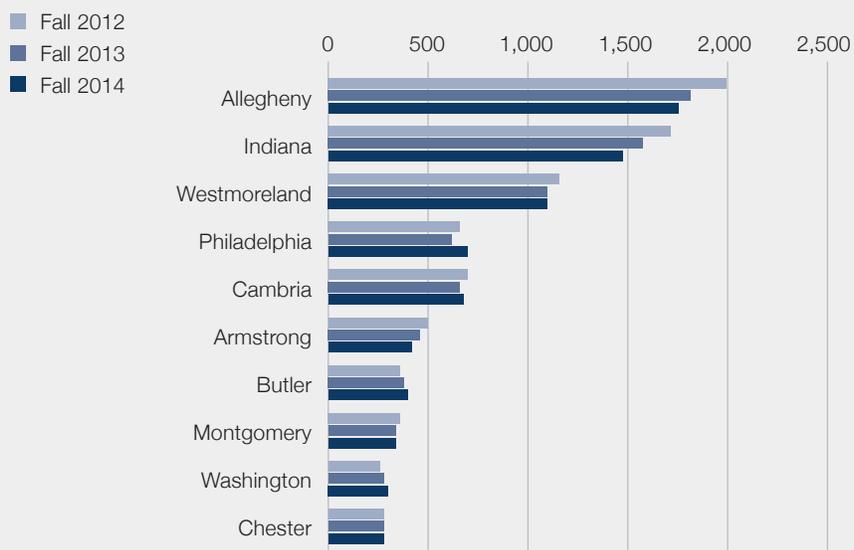


Source: Pennsylvania's State System of Higher Education, Oxford Economics mapping

2.1 Indiana University's Learner Origin

Indiana 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 southwest region. The top 10 learner enrollment counties account for about 60% of resident enrollment in Indiana 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 – Indiana University Learner Enrollment by County



Source: Pennsylvania's State System of Higher Education

Table 2.3 Indiana University Learner Enrollment by County

County	Fall 2012	Fall 2013	Fall 2014
Allegheny	2,000	1,824	1,768
Indiana	1,723	1,572	1,486
Westmoreland	1,156	1,092	1,097
Philadelphia	656	610	694
Cambria	702	658	680
Armstrong	501	452	428
Butler	365	379	406
Montgomery	362	341	331
Washington	258	283	292
Chester	272	272	281

Source: Pennsylvania's State System of Higher Education

3. SUMMARY OF INDIANA UNIVERSITY WORKFORCE REGION

Located in Indiana County, Pennsylvania, Indiana University (IUP) supports the southwestern region of Pennsylvania’s State System of Higher Education. It provides a breadth of degree programs and serves a student population of about 15,000 learners, of which about 83% are Pennsylvania residents.⁴

The following sections outline the supporting data used to select IUP’s Pennsylvania workforce region—defined as Indiana, Allegheny, Westmoreland, Cambria, Armstrong, Bedford, Blair, Somerset, and Jefferson 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 Indiana 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 three iterations, with the final selection of counties highlighted in green.⁶

When taken in the context of regional economic activity, about 67% 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, 91% 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- Indiana 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
Indiana, Allegheny	0.55	0.53	0.70	0.92	0.27
Indiana, Allegheny, Westmoreland	0.64	0.61	0.70	0.92	0.36
Indiana, Allegheny, Westmoreland, Cambria, Armstrong, Bedford, Blair, Somerset, Jefferson	0.74	0.77	0.67	0.91	0.50

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

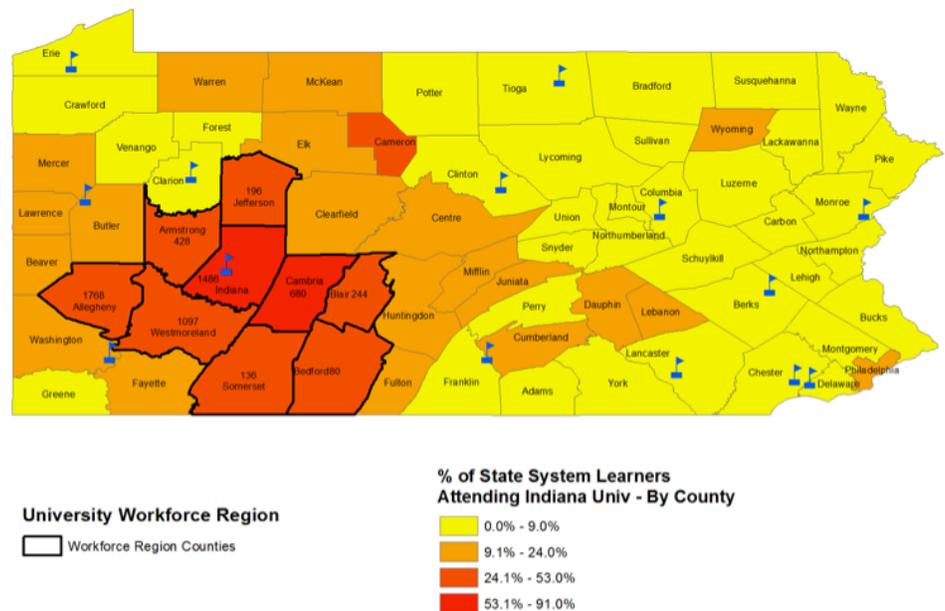
⁵ Bureau of Labor Statistics: Labor Market Area.

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

The majority of IUP workforce region residents also work in the region (74%). This reflects a very strong centralized connection between workers and economic activity in a region that has 1.1 million jobs. Additionally, learners at IUP originate from nearby surrounding counties. When looking at the percentage of learners attending State System universities, 50% (the capture rate) of State System learners in IUP’s workforce region attend IUP.

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

Figure 3.1 – Indiana 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 INDIANA 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 Indiana 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 Indiana University's workforce region and Pennsylvania.

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

Workforce Characteristic	IUP Workforce Region	Pennsylvania	Source
Population	2.2 million	12.7 million	2009-2013 American Community Survey 5-Year Estimates
Employed	1.06 million	5.6 million	2014 BLS Quarterly Census of Employment and Wages
Unemployed	62,600	370,000	2014 BLS Local Area Unemployment Statistics
Unemployment Rate	5.6%	5.8%	2014 BLS Local Area Unemployment Statistics
Poverty Rate	13.5%	13.7%	2013 Census Small Area Income and Poverty Estimates
Business Establishments	59,100	347,000	2014 BLS Quarterly Census of Employment and Wages
Educational Attainment (25+ Population with Bachelor's or Higher)	28.8%	27.4%	2009-2013 American Community Survey 5-Year Estimates
Bachelor's or Higher Completions	25,000	137,000	Integrated Postsecondary Education Data System 3-Year Average AY2010-11 to AY2012-13
Projected Jobs 2024	1.14 million	6.2 million	Oxford Economics Projections 2024

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

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

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

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

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

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

4.1 Employment Projections

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

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

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

The next section provides an analysis of industries in Indiana 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 INDIANA UNIVERSITY'S WORKFORCE REGION

Over the five years of 2009 to 2014, Indiana University's (IUP) workforce region experienced job growth in many service-based sectors. Sectors such as education and health services; professional and business services; and leisure and hospitality added a combined 26,000 new jobs between 2009 and 2014. Government experienced the largest nominal employment loss, while other job losses occurred within information; trade, transportation, and utilities; and manufacturing. Overall, the economy added about 12,300 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.

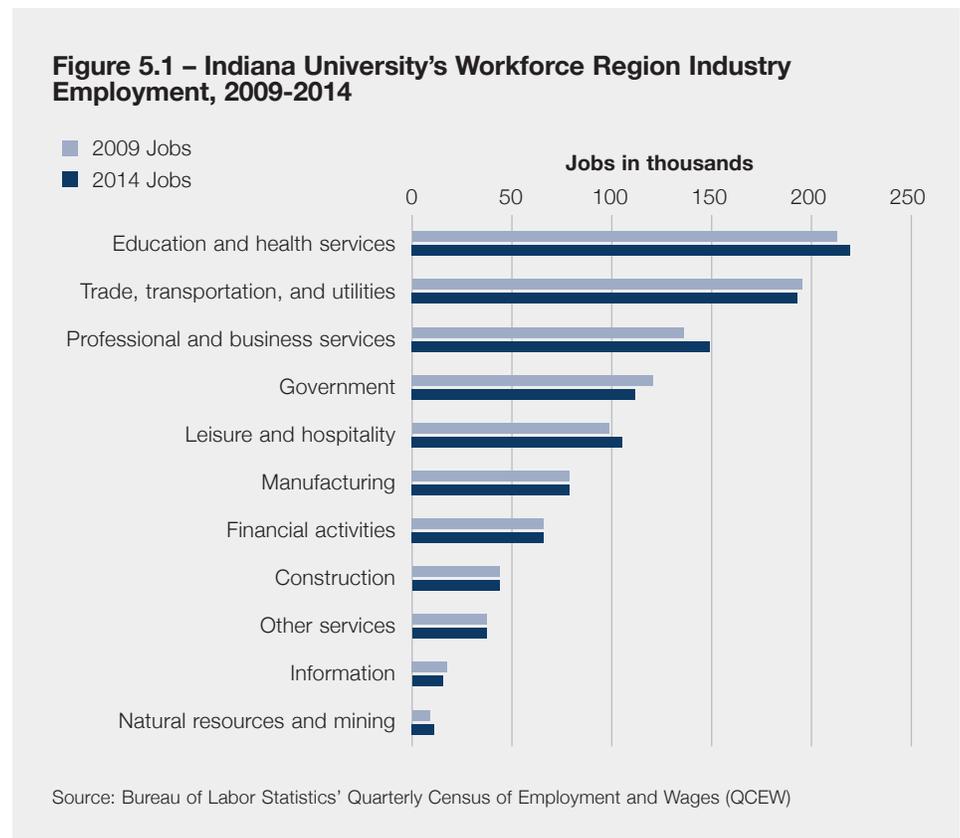


Table 5.1 – Indiana University’s Workforce Region Industry Employment, 2009-2014

Industry Employment	2009 Jobs	2014 Jobs	Absolute Change 09-14	% Change 09-14
Total, all industries	1,020,719	1,033,036	12,317	1.2%
Education and health services	213,248	219,936	6,688	3.1%
Trade, transportation, and utilities	195,402	193,478	-1,924	-1.0%
Professional and business services	137,130	149,740	12,610	9.2%
Government	121,955	111,223	-10,732	-8.8%
Leisure and hospitality	98,916	105,578	6,662	6.7%
Manufacturing	79,489	78,344	-1,145	-1.4%
Financial activities	65,880	66,526	646	1.0%
Construction	44,264	43,643	-621	-1.4%
Other services	37,134	36,847	-287	-0.8%
Information	18,173	16,064	-2,109	-11.6%
Natural resources and mining	9,107	11,661	2,554	28.0%

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

5.1 Top Employers in Indiana University’s Workforce Region

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

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

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

Table 5.2: Top Employers in Indiana University’s Workforce Region

Establishment Name
Armstrong County Memorial Hospital
Armstrong School District
Cambria County
Conemaugh Valley Memorial Hospital
Diamond Drugs
Federal Government
Halliburton Energy Services
Indiana Regional Medical Center
Miller Welding & Machine
New Enterprise Stone & Lime Company
Omni William Penn Hotel
Owens-Brockway Glass Container
Pennsylvania State System of Higher Education
PNC Bank
Punxsutawney Area School District
Rosebud Mining Company
Seven Springs Mountain Resort
Sheetz
Somerset Hospital
State Government
University of Pittsburgh
UMPC Altoona
UMPC Presbyterian Shadyside
Wal-Mart
Westmoreland Regional Hospital

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

6. OCCUPATIONS IN INDIANA 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 IUP'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, related on-the-job experience, or an associate's degree. Most occupations in

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

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

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

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

6.2 Top Skilled Occupations in Indiana University's Workforce Region

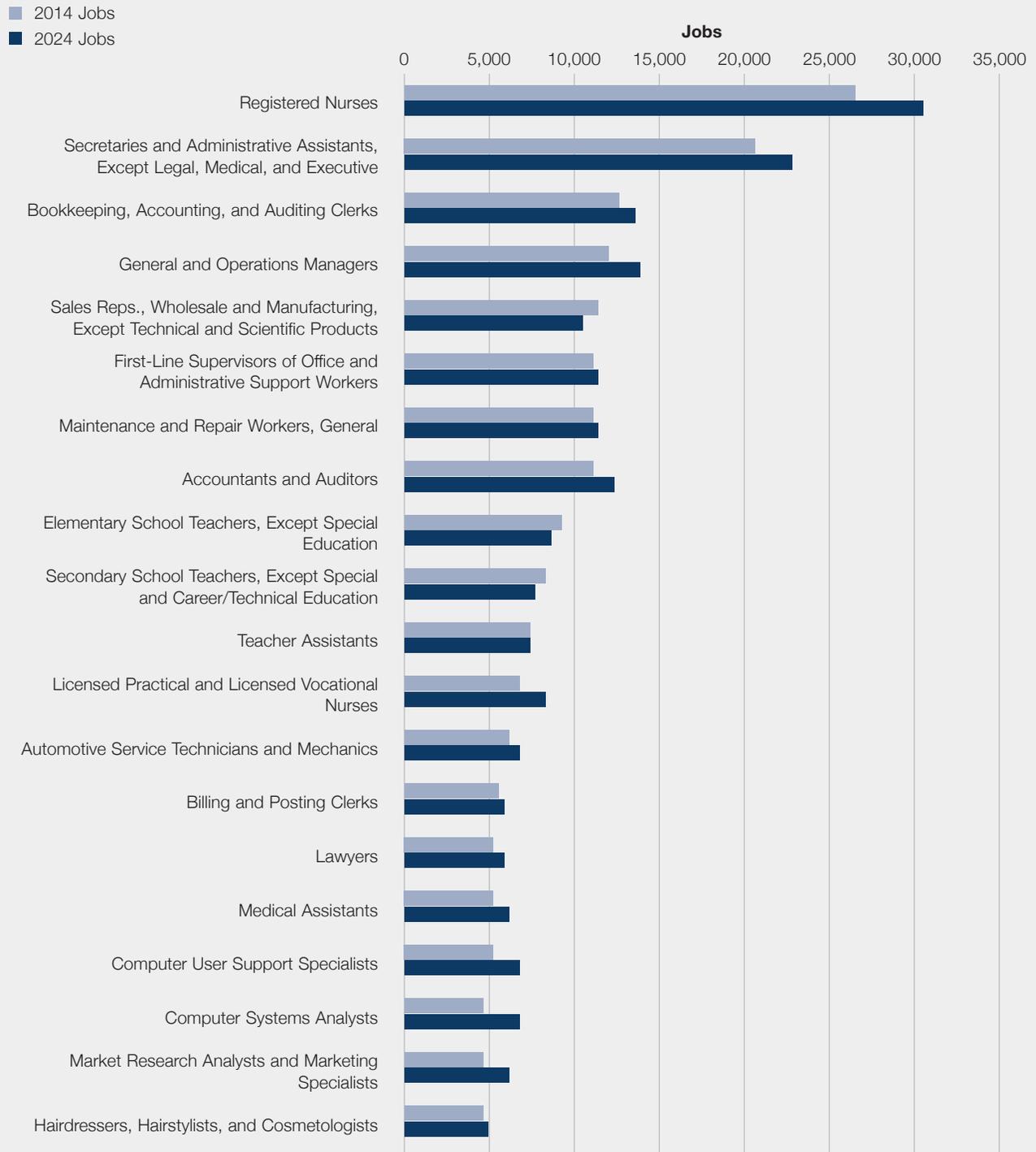
Top skilled occupations in the region are driven by industry composition. Medical centers employ a cadre of health professionals, while enterprise management companies employ a range of business professionals. Given the dominating presence of education and health services; trade, transportation and utilities;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

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

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

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 IUP’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 IUP’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	26,609	30,810	9,589
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	20,633	22,855	4,903
43-3031	Bookkeeping, Accounting, and Auditing Clerks	12,756	13,562	2,067
11-1021	General and Operations Managers	12,244	14,070	4,005
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	11,426	10,544	1,772
43-1011	First-Line Supervisors of Office and Administrative Support Workers	11,290	11,354	2,768
49-9071	Maintenance and Repair Workers, General	11,206	11,392	2,655
13-2011	Accountants and Auditors	11,171	12,262	4,809
25-2021	Elementary School Teachers, Except Special Education	9,197	8,674	1,790
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	8,466	7,629	2,046
25-9041	Teacher Assistants	7,538	7,571	1,907
29-2061	Licensed Practical and Licensed Vocational Nurses	6,894	8,497	3,424
49-3023	Automotive Service Technicians and Mechanics	6,336	6,877	2,383
43-3021	Billing and Posting Clerks	5,456	5,790	1,437
23-1011	Lawyers	5,225	5,949	1,615
31-9092	Medical Assistants	5,141	6,122	2,013
15-1151	Computer User Support Specialists	5,133	6,874	2,660
15-1121	Computer Systems Analysts	4,792	6,828	2,883
13-1161	Market Research Analysts and Marketing Specialists	4,687	6,231	2,295
39-5012	Hairdressers, Hairstylists, and Cosmetologists	4,653	5,104	1,767

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 IUP’s workforce region.

6.3.1 New and Replacement Demand for Key Skilled High Demand Occupations

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

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

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

Figure 6.2 and Table 6.2 outline the five key skilled high demand occupations for new and replacement jobs over the next 10 years, specifically: registered nurses, accountants and auditors, general and operations managers, computer system analysts, and civil engineers.¹²

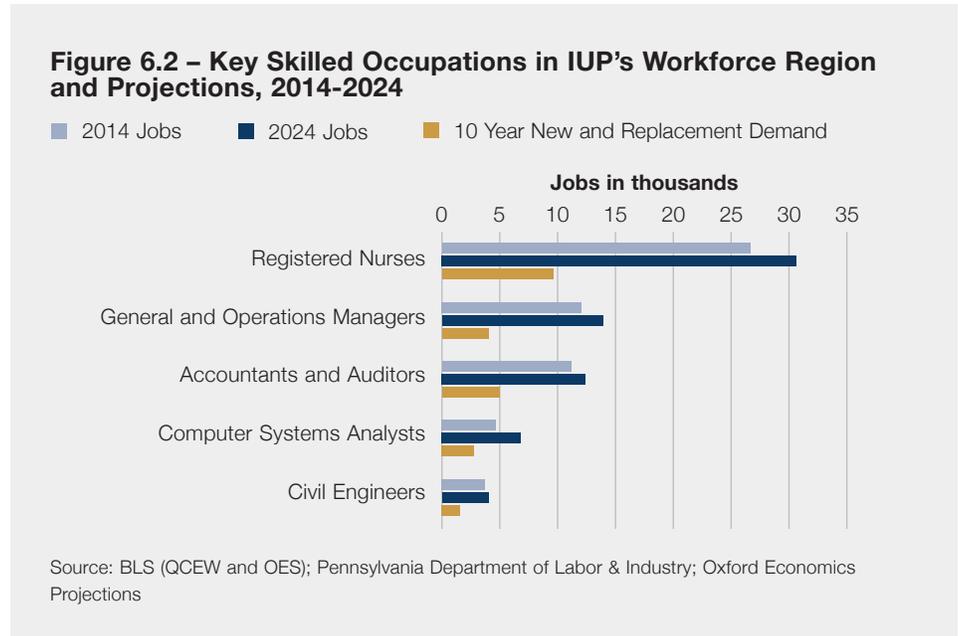


Table 6.2 – Key Skilled Occupations in IUP’s Workforce Region and Projections, 2014-2024

SOC Code	Occupation Title	2014 Jobs	2024 Jobs	10 Year New and Replacement Demand
29-1141	Registered Nurses	26,609	30,810	9,589
11-1021	General and Operations Managers	12,244	14,070	4,005
13-2011	Accountants and Auditors	11,171	12,262	4,809
15-1121	Computer Systems Analysts	4,792	6,828	2,883
17-2051	Civil Engineers	3,597	4,061	1,445

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

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

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

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

Analysis of job postings for key skilled high demand occupations generally supports the findings from Section 6.3.1. Between July 2014 and July 2015 approximately 3,000 unique (de-duplicated) job postings appeared in IUP’s Workforce Region for the top five key skilled high demand occupations (registered nurses, accountants and auditors, general and operations managers, computer system analysts, and civil engineers). Sizable job postings include: registered nurses (1,089 unique postings per month), and accountants and auditors (679 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)	Estimated Average Monthly Hires (Jul 2014 - Jul 2015)	Ratio of Postings to Hires
Registered Nurses	1,089	931	1.2
Accountants and Auditors	679	504	1.3
General and Operations Managers	525	638	0.8
Computer Systems Analysts	495	173	2.9
Civil Engineers	184	121	1.5

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)

Civil Engineers

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

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

General and Operations Managers

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

Certifications: Six Sigma, Project Management Professional (PMP)

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

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

6.4 Industry Staffing Patterns for Key Skilled High Demand Occupations in Indiana 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 15,318 registered nurses);
- The percentage of the occupation's employment in the region that is employed in the industry (e.g. the 15,318 registered nurses employed in general medical and surgical hospitals represent nearly 58% of the total registered nurse workforce in the region);
- The percentage of the industry sector's employment that is made up of the occupation (e.g. the 15,318 registered nurses make up about 27% of employment within general medical and surgical hospitals).

Staffing Patterns for Registered Nurses Employed in IUP'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	15,318	57.6%	27.2%
Offices of Physicians	2,278	8.6%	9.4%
Home Health Care Services	1,978	7.4%	21.0%
Nursing Care Facilities (Skilled Nursing Facilities)	1,580	5.9%	9.9%
Specialty (except Psychiatric and Substance Abuse) Hospitals	1,165	4.4%	27.6%

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

Staffing Patterns for General and Operations Managers Employed in IUP'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	906	7.4%	2.7%
Wholesale Electronic Markets and Agents and Brokers	320	2.6%	3.5%
Restaurants and Other Eating Places	315	2.6%	0.5%
Depository Credit Intermediation	307	2.5%	1.2%
Architectural, Engineering, and Related Services	282	2.3%	1.4%

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

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

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	3,058	27.4%	38.6%
Management of Companies and Enterprises	1,703	15.2%	5.0%
Other Financial Investment Activities	418	3.7%	8.9%
Insurance Carriers	348	3.1%	2.4%
Depository Credit Intermediation	336	3.0%	1.3%

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

Staffing Patterns for Civil Engineers Employed in IUP's Workforce Region

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Architectural, Engineering, and Related Services	2,911	80.9%	14.4%
Nonresidential Building Construction	142	4.0%	2.5%
Executive, Legislative, and Other General Government Support	137	3.8%	0.6%
Highway, Street, and Bridge Construction	55	1.5%	1.3%
Employment Services	50	1.4%	0.3%

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

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

Industry	Occupation Jobs in Industry (2014)	% of Occupation in Industry (2014)	% of Total Jobs in Industry (2014)
Computer Systems Design and Related Services	1,725	36.0%	12.8%
Management of Companies and Enterprises	807	16.8%	2.4%
Insurance Carriers	410	8.5%	2.8%
Wholesale Electronic Markets and Agents and Brokers	251	5.2%	2.7%
Depository Credit Intermediation	235	4.9%	0.9%

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

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

6.5 Key Skilled High Demand Occupational Profiles

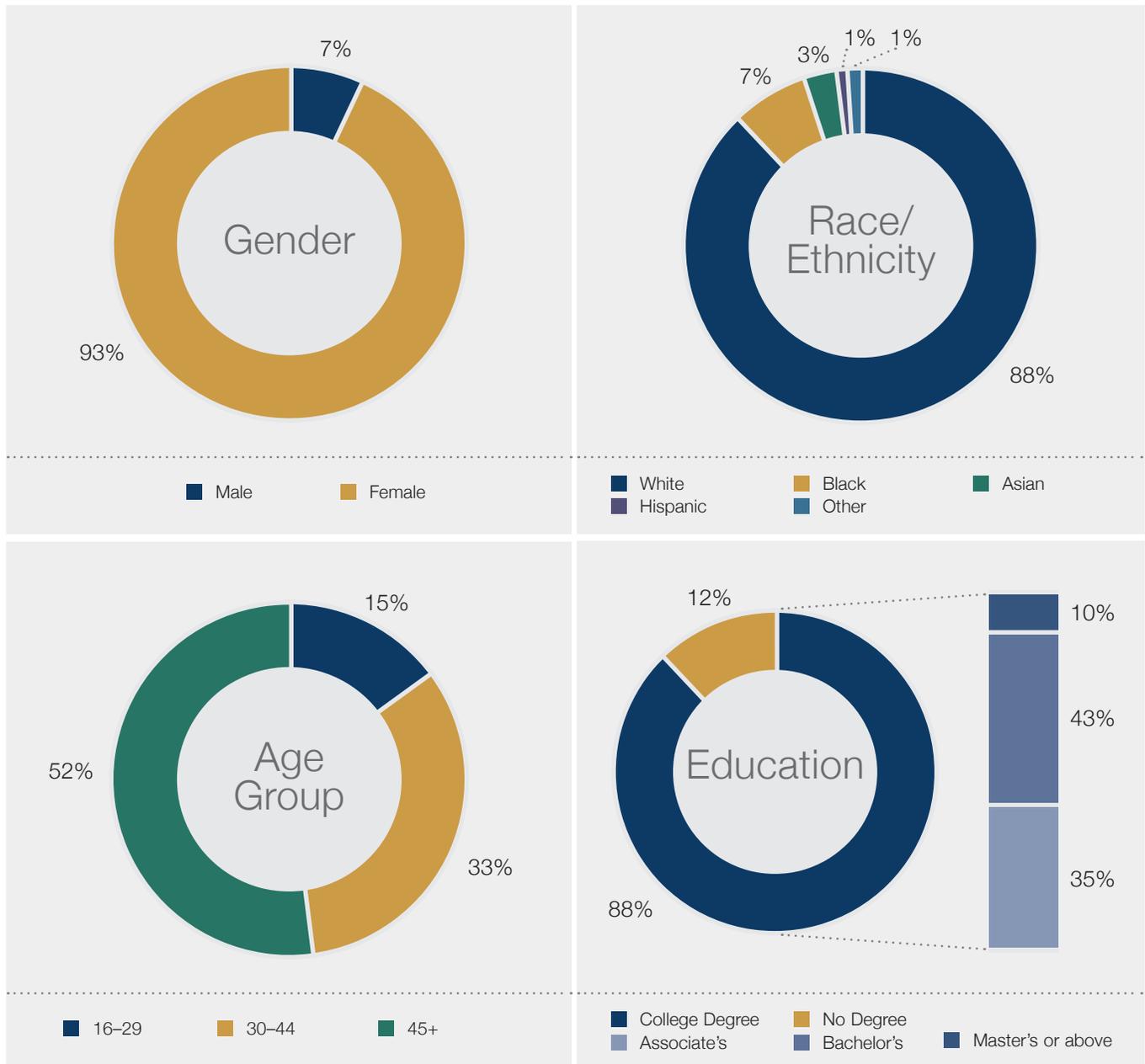
In addition to understanding the industries that employ key skilled high demand occupations, another lens to view key skilled high demand occupations focuses on the characteristics of those employed. The following section outlines the demographics for people from Pennsylvania who work in these key skilled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

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

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

REGISTERED NURSES IN PENNSYLVANIA

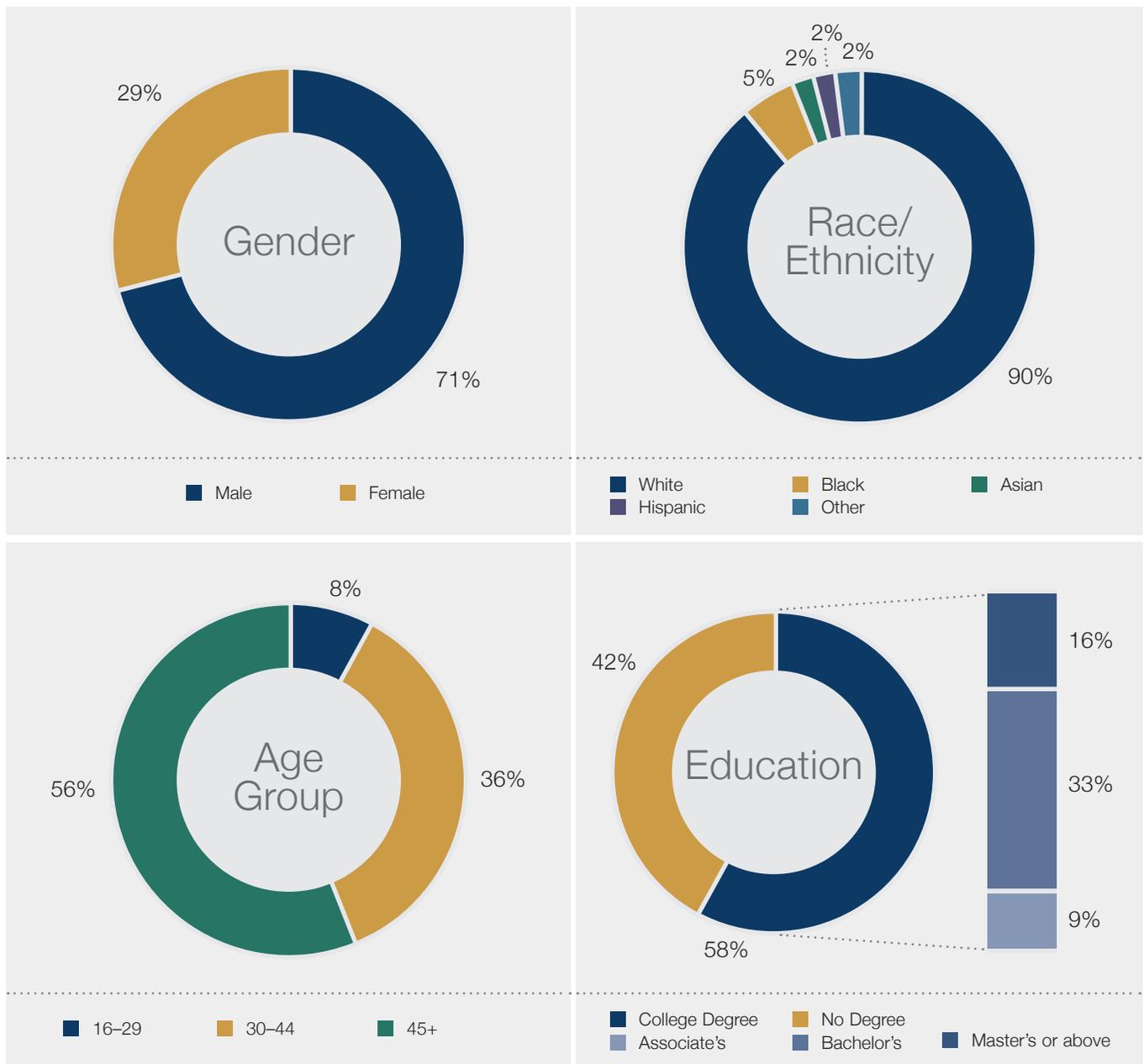
The demographic profile of registered nurses is dominated by white females. Age distribution indicates that registered nurses are a more mature cohort of workers (45 years and older), which can put increasing pressure on replacement jobs due to retirements over the next 10 years. Nearly 90% of registered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



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

GENERAL AND OPERATIONS MANAGERS IN PENNSYLVANIA

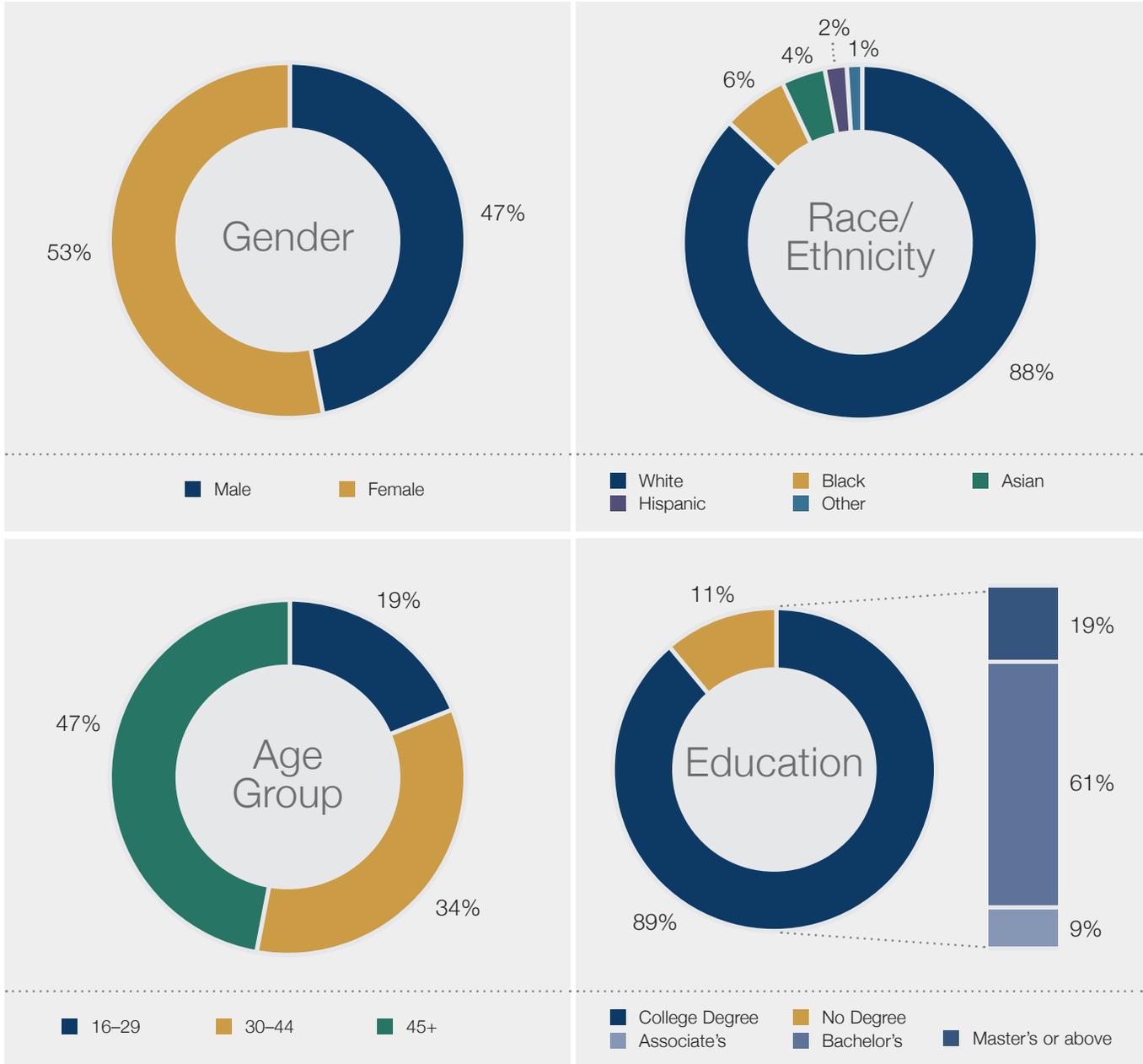
General and operations managers are typically male, though females occupy almost 30% of the employed population. The majority of those in this occupation are white. This occupation is represented by a more mature cohort of workers (45 years and older), though mid-career workers also occupy a significant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



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

ACCOUNTANTS AND AUDITORS IN PENNSYLVANIA

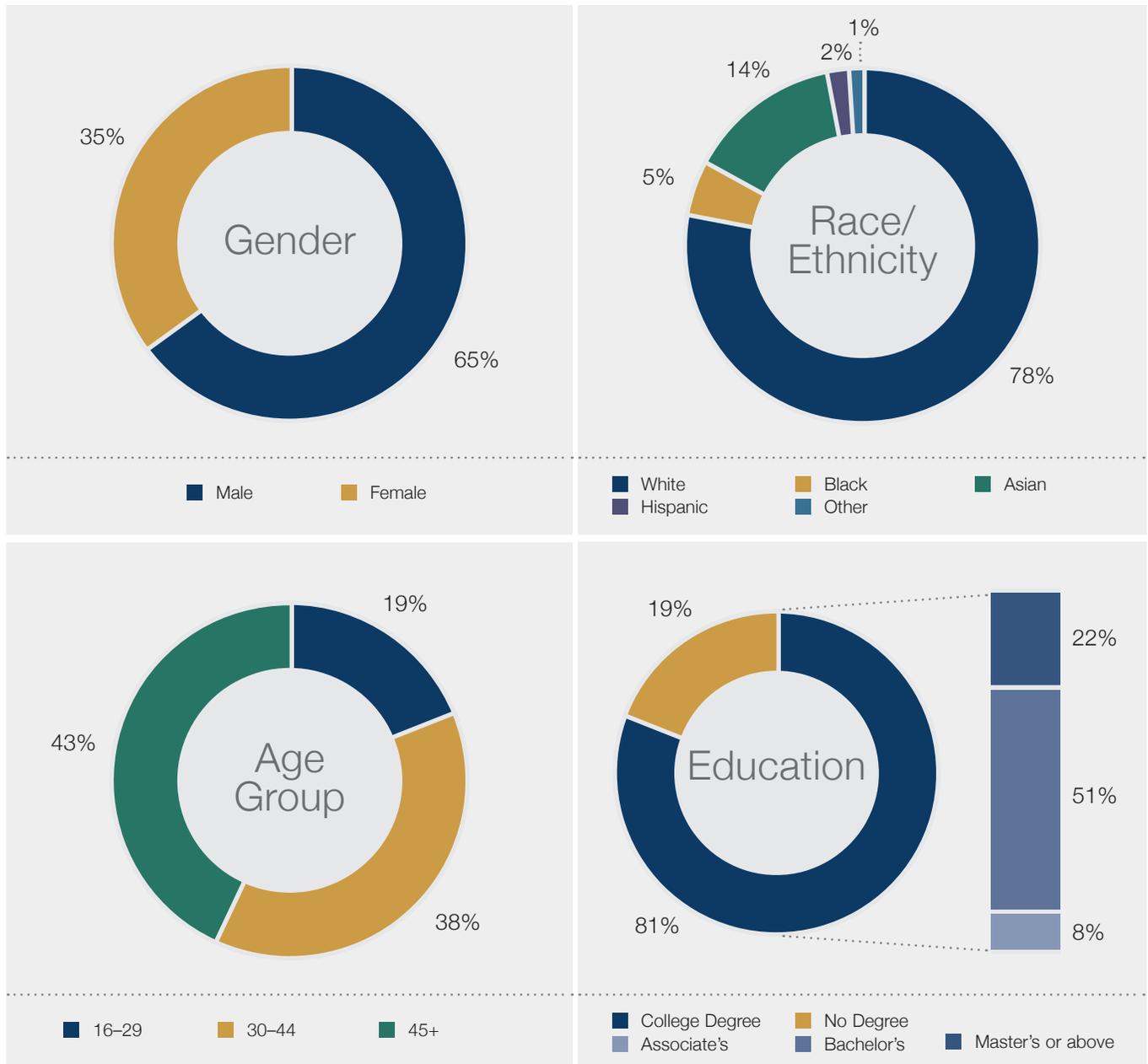
Accountants and auditors are fairly evenly split between male and female, though a slightly higher percent of employed accountants and auditors are female. A high proportion of white individuals are found in the occupation. Additionally, the age distribution is fairly even between entry-level and mature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



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

COMPUTER SYSTEMS ANALYSTS IN PENNSYLVANIA

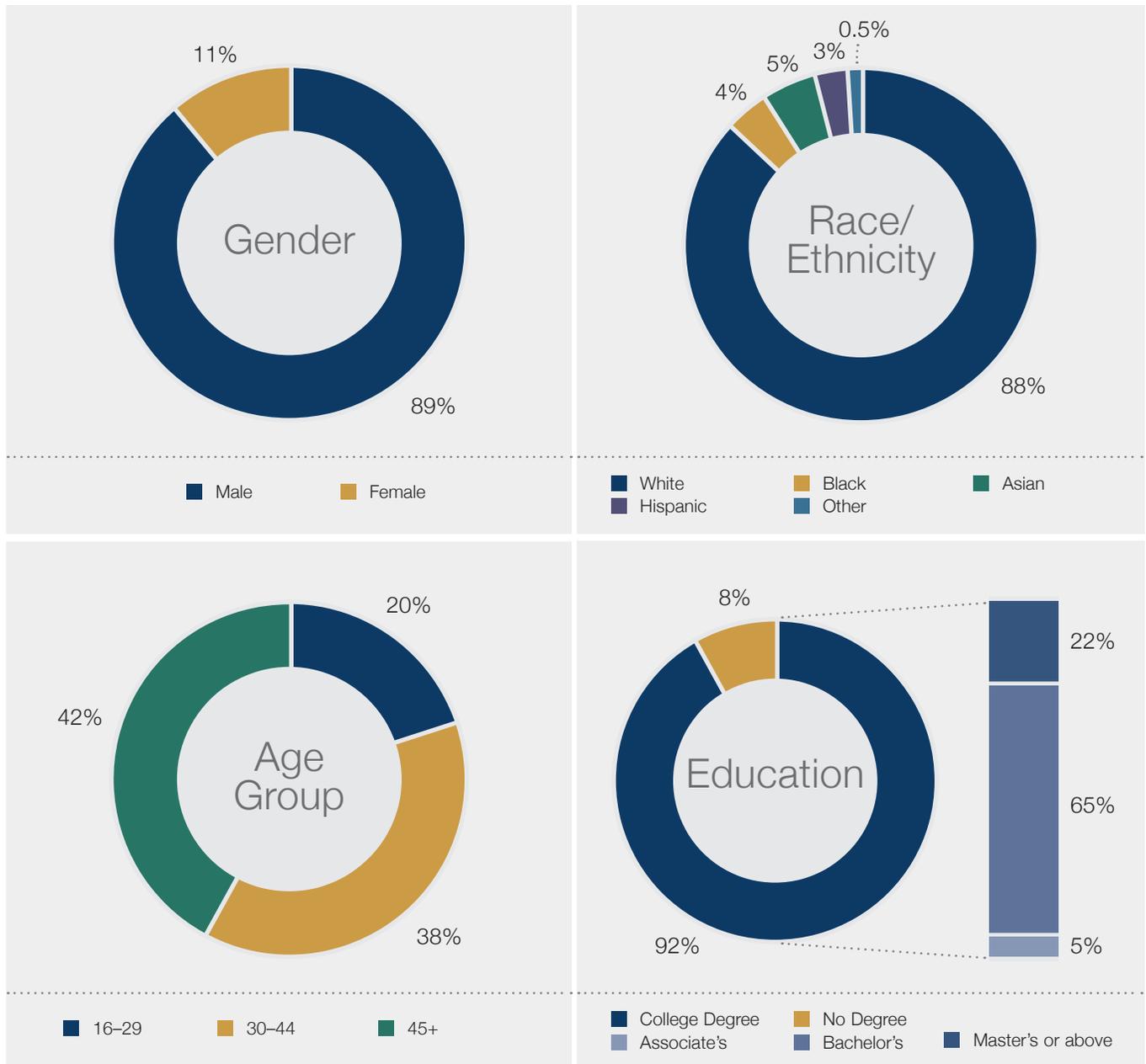
Computer systems analysts show a larger proportion of males in the occupation compared to females. While still represented by a larger share of white workers, a significant number of Asian workers are found in the occupation, making this occupation more diverse than the average Pennsylvania demographic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



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

CIVIL ENGINEERS IN PENNSYLVANIA

Civil engineers show a larger proportion of males in the occupation compared to females. A high proportion of white individuals are found in the occupation. Additionally, the age distribution is fairly even between entry-level and mature workers, indicating that the occupation provides good opportunities for first destinations of recent college graduates. Over 90% of civil engineers have an associate's degree or higher indicating that this is a highly educated occupation.



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

The final section of this report explores IUP'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 INDIANA UNIVERSITY'S WORKFORCE REGION

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

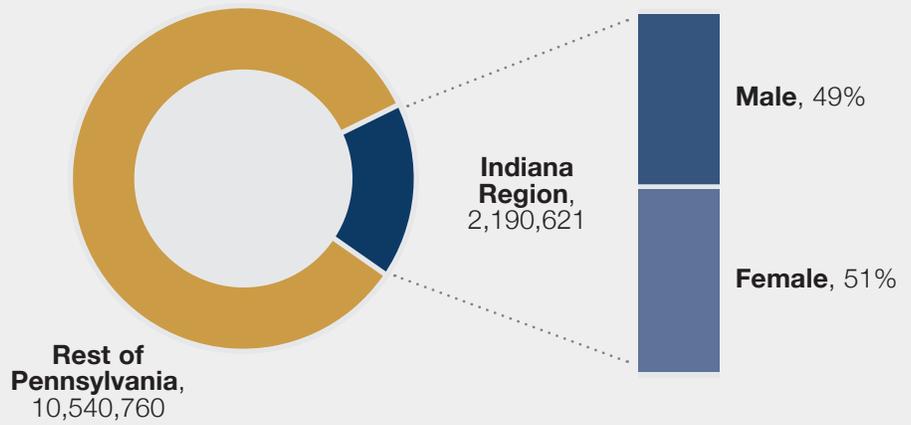
Analysis of three socio-economic indicators—education, unemployment, and poverty—also provides insight into the segment of the population that may be considered economically disadvantaged. Areas with high proportions of economically disadvantaged learners may require additional considerations in education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

7.1 Demographics of Indiana University's Workforce Region

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

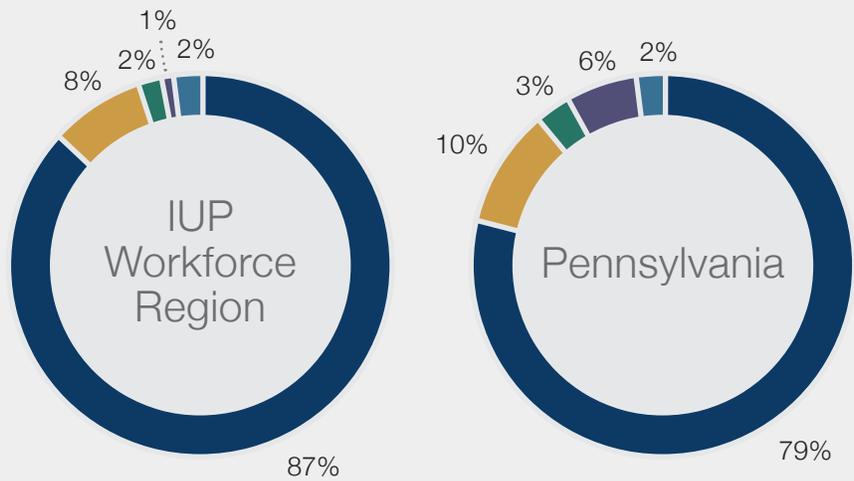
Fall 2014 data from the State System Research Office indicates that approximately 83% (90,966) of learners within the State System are traditional students—ages 18- to 22-year-old high school graduates—and 17% (18,640) are adult learners. A view of the change in population by age demographic indicates a diminishing number in the traditional age cohort and a growing rate of adults aged 25 to 34 years old. As illustrated in figure 7.3, the 10 to 19 year old cohort population declined by nearly 19,000 people between 2010 and 2014—a 7% decline. Conversely, the 25-34 year old cohort increased nearly 9%, or 22,800 people, over the same time period. This demographic shift presents an opportunity to incorporate a broader university recruitment strategy.

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



Source: U.S. Census - ACS

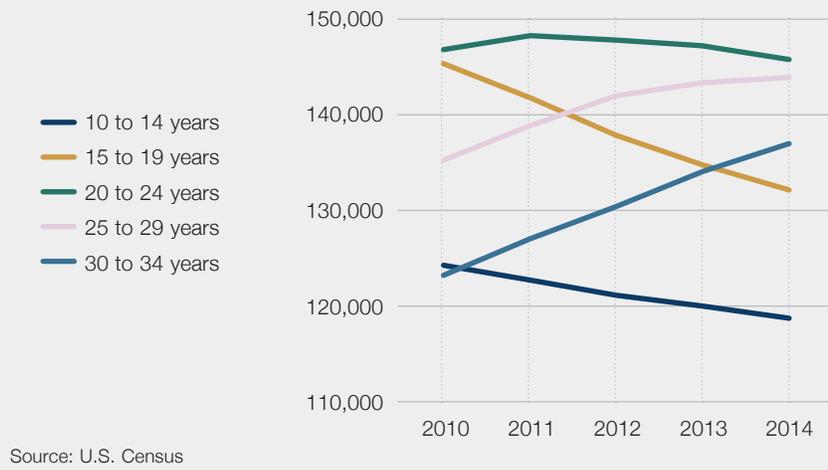
Figure 7.2 – Indiana University’s Workforce Region Race/Ethnicity Composition



■ White ■ Black ■ Asian ■ Hispanic ■ Other

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

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



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

7.2 Socio-economic Indicators of Indiana 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 Indiana University’s Workforce Region

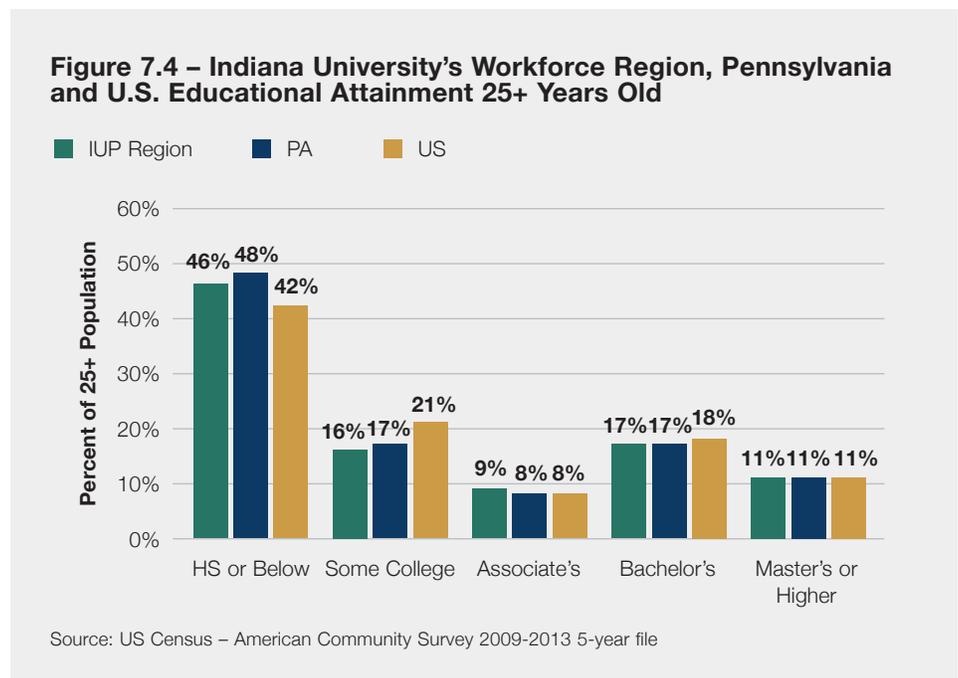
The levels of educational attainment of a population indicate several characteristics in an economy. Areas with better educated workers earn higher wages, are more productive and can typically adjust more quickly to changing economic conditions. Additionally, an educated workforce is less likely to be

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 IUP’s workforce region indicates that more than half (54%) of those over 25 years old have had some post-secondary education or higher. Some college is defined by ACS as having some college, but less than one year or one or more years of college credit, but no degree. This is slightly below the national average of 58% of the population having had at least some post-secondary education or higher.

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

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



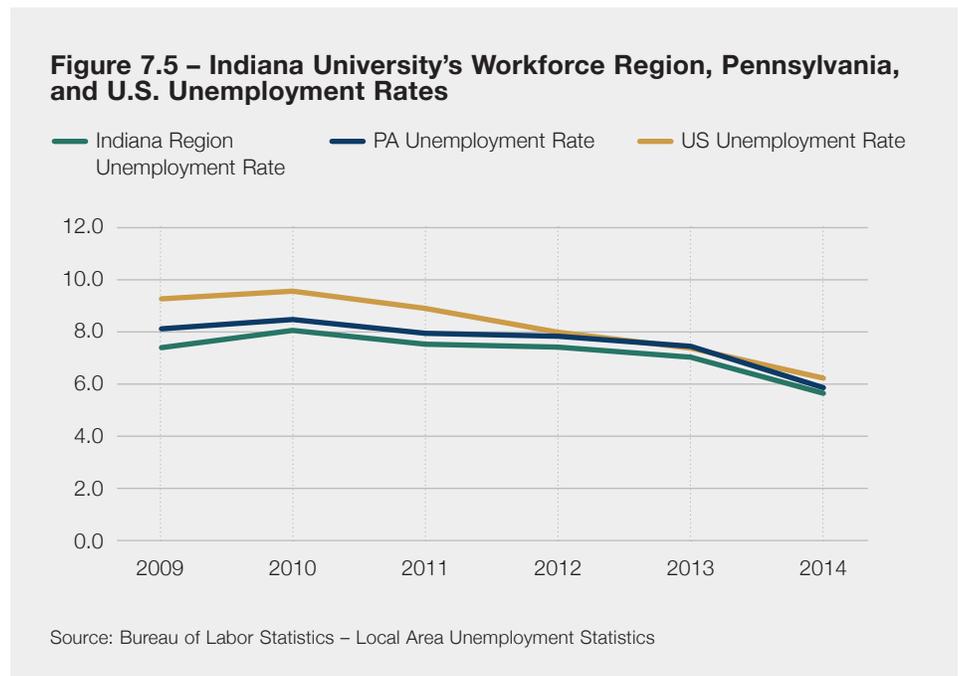
13 Feinstein et. al. (2006), “The effects of education on health: Concepts, evidence and policy implications: A review for the OECD Center for Educational Research and Innovation (CERI)”, unpublished manuscript, OECD, Paris.

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 Indiana University's Workforce Region

IUP's workforce region unemployment rate—5.6% 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.

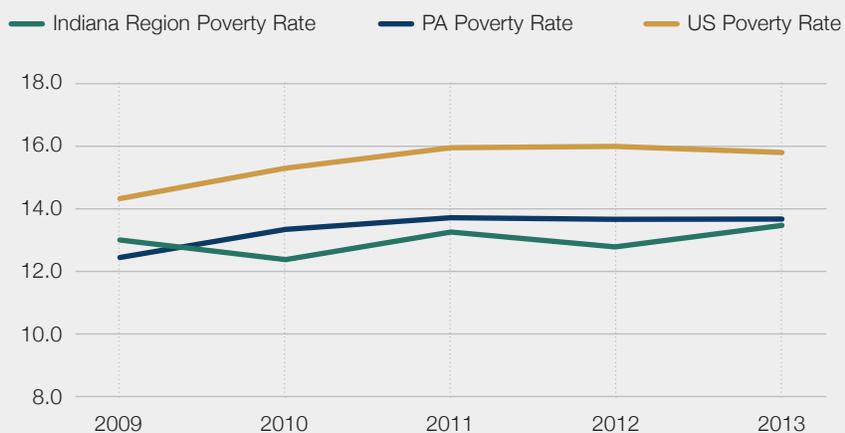
Figure 7.5 shows the convergence of the unemployment rates of IUP's workforce region, Pennsylvania, and the U.S. from 2009 to 2014.



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

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



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

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

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

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

8. NEXT STEPS

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

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

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

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

DATA SOURCES

Bureau of Labor Statistics (BLS):

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

U.S. Census Bureau (Census):

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

National Center for Education Statistics (NCES):

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

Pennsylvania Department of Labor and Industry (PADLI):

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

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

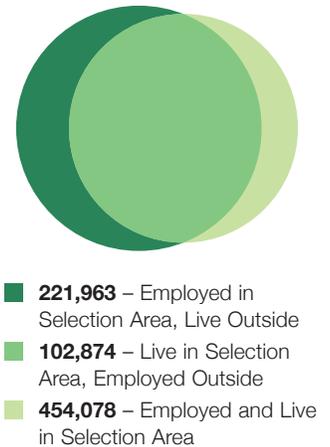
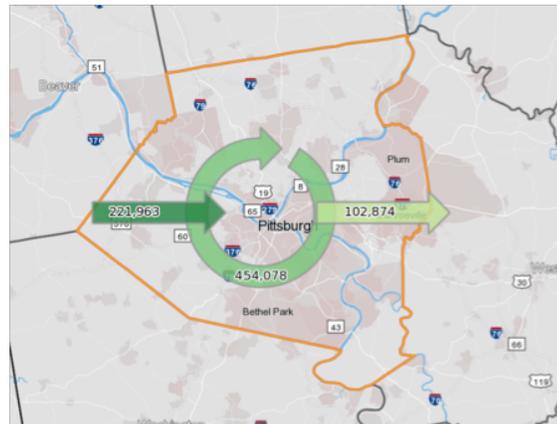
Given the workforce/commute, learner and economic variances that exist within the different geographies across Pennsylvania, an iterative process is used to define the workforce region. This multiple step, iterative process seeks to maximize the primary driver value (workforce flows), while adhering 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 Indiana University	2014 QCEW Employment
Adams	57	34,139
Allegheny	1,768	683,111
Armstrong	428	17,582
Beaver	210	52,811
Bedford	80	15,397
Berks	189	166,792
Blair	244	58,233
Bradford	20	24,568
Bucks	249	250,889
Butler	406	84,472
Cambria	680	53,915
Cameron	19	2,015
Carbon	14	16,974
Centre	70	67,147
Chester	281	240,469
Clarion	60	13,586
Clearfield	159	29,938
Clinton	21	13,043
Columbia	30	24,974
Crawford	80	31,113
Cumberland	242	126,939
Dauphin	189	176,004
Delaware	193	216,261
Elk	96	14,994
Erie	241	124,095
Fayette	124	39,979
Forest	2	2,053
Franklin	83	56,715
Fulton	7	4,807
Greene	12	14,844
Huntingdon	33	12,343

County	Fall 2014 Enrollment in Indiana University	2014 QCEW Employment
Indiana	1,486	32,653
Jefferson	196	15,435
Juniata	15	6,146
Lackawanna	58	97,259
Lancaster	264	225,673
Lawrence	89	29,500
Lebanon	74	48,869
Lehigh	114	180,757
Luzerne	95	140,329
Lycoming	73	53,197
McKean	53	15,770
Mercer	95	48,028
Mifflin	53	15,544
Monroe	92	52,933
Montgomery	331	472,655
Montour	22	15,578
Northampton	121	105,825
Northumberland	58	27,985
Perry	29	7,661
Philadelphia	694	640,987
Pike	29	10,748
Potter	8	5,291
Schuylkill	46	50,049
Snyder	20	15,522
Somerset	136	24,398
Sullivan	0	1,772
Susquehanna	16	9,281
Tioga	29	12,973
Union	20	16,597
Venango	48	19,251
Warren	45	15,031
Washington	292	86,961
Wayne	20	14,651
Westmoreland	1,097	132,312
Wyoming	15	10,181
York	280	172,145
Total Pennsylvania	12,400	5,643,676

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

APPENDIX C: INDUSTRY PROJECTIONS 2014-2024 FOR INDIANA 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 IUP's workforce region. Included in the table are the number of jobs in 2014 and the projected job growth/decline in 2024.

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
Total	All Industries	1,060,587	1,138,533	7.3%	1.0
1111	Oilseed and Grain Farming	73	87	19.2%	0.2
1112	Vegetable and Melon Farming	137	136	-0.7%	0.2
1113	Fruit and Tree Nut Farming	133	151	13.5%	0.1
1114	Greenhouse, Nursery, and Floriculture Production	359	346	-3.6%	0.3
1119	Other Crop Farming	19	17	-10.5%	0.0
1121	Cattle Ranching and Farming	432	448	3.7%	0.4
1122	Hog and Pig Farming	4	4	0.0%	0.0
1123	Poultry and Egg Production	61	66	8.2%	0.2
1124	Sheep and Goat Farming	13	15	15.4%	1.1
1125	Aquaculture	18	22	22.2%	0.4
1129	Other Animal Production	55	53	-3.6%	0.4
1131	Timber Tract Operations	26	31	19.2%	0.5
1132	Forest Nurseries and Gathering of Forest Products	7	8	14.3%	0.4
1133	Logging	96	98	2.1%	0.2
1142	Hunting and Trapping	12	15	25.0%	0.8
1151	Support Activities for Crop Production	116	129	11.2%	0.0
1152	Support Activities for Animal Production	90	78	-13.3%	0.4
1153	Support Activities for Forestry	26	30	15.4%	0.2
2111	Oil and Gas Extraction	2,699	3,549	31.5%	1.8
2121	Coal Mining	2,550	2,194	-14.0%	4.5
2122	Metal Ore Mining	21	24	14.3%	0.1
2123	Nonmetallic Mineral Mining and Quarrying	726	715	-1.5%	1.0
2131	Support Activities for Mining	5,065	5,419	7.0%	1.5
2211	Electric Power Generation, Transmission and Distribution	2,596	2,398	-7.6%	0.7
2212	Natural Gas Distribution	1,420	1,459	2.7%	1.6
2213	Water, Sewage and Other Systems	3,094	3,424	10.7%	1.9
2361	Residential Building Construction	5,229	6,622	26.6%	1.0
2362	Nonresidential Building Construction	5,663	6,727	18.8%	1.0
2371	Utility System Construction	3,476	4,128	18.8%	1.0
2372	Land Subdivision	423	508	20.1%	1.3
2373	Highway, Street, and Bridge Construction	4,216	5,348	26.9%	1.4
2379	Other Heavy and Civil Engineering Construction	1,028	1,374	33.7%	1.2
2381	Foundation, Structure, and Building Exterior Contractors	4,591	4,866	6.0%	0.8
2382	Building Equipment Contractors	12,746	14,432	13.2%	0.9
2383	Building Finishing Contractors	4,593	4,767	3.8%	0.8
2389	Other Specialty Trade Contractors	4,742	5,868	23.7%	1.0

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3111	Animal Food Manufacturing	238	283	18.9%	0.6
3112	Grain and Oilseed Milling	96	70	-27.1%	0.2
3113	Sugar and Confectionery Product Manufacturing	727	800	10.0%	1.3
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	1,063	1,199	12.8%	0.8
3115	Dairy Product Manufacturing	674	613	-9.1%	0.6
3116	Animal Slaughtering and Processing	548	580	5.8%	0.1
3118	Bakeries and Tortilla Manufacturing	2,014	1,983	-1.5%	0.9
3119	Other Food Manufacturing	1,238	1,424	15.0%	0.8
3121	Beverage Manufacturing	1,052	1,123	6.7%	0.7
3122	Tobacco Manufacturing	93	109	17.2%	0.9
3131	Fiber, Yarn, and Thread Mills	5	4	-20.0%	0.0
3132	Fabric Mills	188	137	-27.1%	0.4
3133	Textile and Fabric Finishing and Fabric Coating Mills	24	26	8.3%	0.1
3141	Textile Furnishings Mills	98	105	7.1%	0.2
3149	Other Textile Product Mills	526	547	4.0%	1.1
3152	Cut and Sew Apparel Manufacturing	124	119	-4.0%	0.1
3159	Apparel Accessories and Other Apparel Manufacturing	108	87	-19.4%	1.2
3161	Leather and Hide Tanning and Finishing	17	20	17.6%	0.5
3162	Footwear Manufacturing	184	151	-17.9%	1.8
3169	Other Leather and Allied Product Manufacturing	5	6	20.0%	0.1
3211	Sawmills and Wood Preservation	819	1,064	29.9%	1.2
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	179	221	23.5%	0.3
3219	Other Wood Product Manufacturing	1,136	1,508	32.7%	0.7
3221	Pulp, Paper, and Paperboard Mills	693	814	17.5%	0.9
3222	Converted Paper Product Manufacturing	1,365	1,140	-16.5%	0.7
3231	Printing and Related Support Activities	3,052	2,535	-16.9%	0.9
3241	Petroleum and Coal Products Manufacturing	1,898	1,830	-3.6%	2.2
3251	Basic Chemical Manufacturing	617	593	-3.9%	0.5
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	436	371	-14.9%	0.6
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	7	6	-14.3%	0.0
3254	Pharmaceutical and Medicine Manufacturing	289	234	-19.0%	0.1
3255	Paint, Coating, and Adhesive Manufacturing	556	468	-15.8%	1.2
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	800	905	13.1%	1.0
3259	Other Chemical Product and Preparation Manufacturing	554	585	5.6%	0.9
3261	Plastics Product Manufacturing	2,959	3,034	2.5%	0.7
3262	Rubber Product Manufacturing	644	590	-8.4%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3271	Clay Product and Refractory Manufacturing	772	757	-1.9%	2.5
3272	Glass and Glass Product Manufacturing	1,687	1,765	4.6%	2.6
3273	Cement and Concrete Product Manufacturing	929	971	4.5%	0.7
3274	Lime and Gypsum Product Manufacturing	28	22	-21.4%	0.3
3279	Other Nonmetallic Mineral Product Manufacturing	303	333	9.9%	0.5
3311	Iron and Steel Mills and Ferroalloy Manufacturing	4,720	4,591	-2.7%	6.7
3312	Steel Product Manufacturing from Purchased Steel	665	562	-15.5%	1.4
3313	Alumina and Aluminum Production and Processing	306	350	14.4%	0.7
3314	Nonferrous Metal (except Aluminum) Production and Processing	959	911	-5.0%	2.0
3315	Foundries	1,838	1,907	3.8%	1.9
3321	Forging and Stamping	1,320	1,329	0.7%	1.7
3322	Cutlery and Handtool Manufacturing	337	313	-7.1%	1.1
3323	Architectural and Structural Metals Manufacturing	3,244	3,628	11.8%	1.2
3324	Boiler, Tank, and Shipping Container Manufacturing	727	795	9.4%	1.0
3325	Hardware Manufacturing	119	126	5.9%	0.6
3326	Spring and Wire Product Manufacturing	294	298	1.4%	0.9
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	4,672	4,897	4.8%	1.6
3328	Coating, Engraving, Heat Treating, and Allied Activities	885	969	9.5%	0.8
3329	Other Fabricated Metal Product Manufacturing	1,177	1,234	4.8%	0.5
3331	Agriculture, Construction, and Mining Machinery Manufacturing	1,836	1,843	0.4%	0.9
3332	Industrial Machinery Manufacturing	454	472	4.0%	0.5
3333	Commercial and Service Industry Machinery Manufacturing	639	476	-25.5%	0.9
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	591	613	3.7%	0.6
3335	Metalworking Machinery Manufacturing	2,892	2,685	-7.2%	2.0
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	310	294	-5.2%	0.4
3339	Other General Purpose Machinery Manufacturing	3,122	3,425	9.7%	1.5
3341	Computer and Peripheral Equipment Manufacturing	435	404	-7.1%	0.4
3342	Communications Equipment Manufacturing	1,178	901	-23.5%	1.6
3344	Semiconductor and Other Electronic Component Manufacturing	1,011	816	-19.3%	0.4
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3,976	4,243	6.7%	1.3
3346	Manufacturing and Reproducing Magnetic and Optical Media	117	134	14.5%	0.9
3351	Electric Lighting Equipment Manufacturing	216	218	0.9%	0.6
3353	Electrical Equipment Manufacturing	2,754	2,862	3.9%	2.5
3359	Other Electrical Equipment and Component Manufacturing	801	886	10.6%	0.8
3361	Motor Vehicle Manufacturing	246	310	26.0%	0.2

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3362	Motor Vehicle Body and Trailer Manufacturing	824	815	-1.1%	0.8
3363	Motor Vehicle Parts Manufacturing	143	140	-2.1%	0.0
3364	Aerospace Product and Parts Manufacturing	409	356	-13.0%	0.1
3365	Railroad Rolling Stock Manufacturing	1,637	1,774	8.4%	7.7
3366	Ship and Boat Building	15	12	-20.0%	0.0
3369	Other Transportation Equipment Manufacturing	248	267	7.7%	1.0
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	509	513	0.8%	0.3
3372	Office Furniture (including Fixtures) Manufacturing	471	493	4.7%	0.6
3379	Other Furniture Related Product Manufacturing	97	109	12.4%	0.4
3391	Medical Equipment and Supplies Manufacturing	1,959	1,709	-12.8%	0.8
3399	Other Miscellaneous Manufacturing	1,491	1,507	1.1%	0.7
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	3,188	3,666	15.0%	1.2
4232	Furniture and Home Furnishing Merchant Wholesalers	529	565	6.8%	0.7
4233	Lumber and Other Construction Materials Merchant Wholesalers	2,015	2,056	2.0%	1.3
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	4,119	4,208	2.2%	0.9
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	1,018	1,129	10.9%	1.0
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	1,820	1,724	-5.3%	0.7
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	1,681	1,935	15.1%	0.9
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	4,726	5,022	6.3%	0.9
4239	Miscellaneous Durable Goods Merchant Wholesalers	2,705	3,022	11.7%	1.2
4241	Paper and Paper Product Merchant Wholesalers	636	651	2.4%	0.7
4242	Drugs and Druggists' Sundries Merchant Wholesalers	518	540	4.2%	0.3
4243	Apparel, Piece Goods, and Notions Merchant Wholesalers	187	210	12.3%	0.2
4244	Grocery and Related Product Merchant Wholesalers	4,479	4,800	7.2%	0.8
4245	Farm Product Raw Material Merchant Wholesalers	86	102	18.6%	0.1
4246	Chemical and Allied Products Merchant Wholesalers	1,053	1,078	2.4%	1.1
4247	Petroleum and Petroleum Products Merchant Wholesalers	951	988	3.9%	1.2
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	1,051	1,299	23.6%	0.7
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	1,591	1,551	-2.5%	0.6
4251	Wholesale Electronic Markets and Agents and Brokers	9,201	8,955	-2.7%	1.3
4411	Automobile Dealers	10,652	11,901	11.7%	1.2
4412	Other Motor Vehicle Dealers	620	625	0.8%	0.6
4413	Automotive Parts, Accessories, and Tire Stores	3,496	3,569	2.1%	0.8
4421	Furniture Stores	1,539	1,582	2.8%	0.9

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4422	Home Furnishings Stores	1,599	1,601	0.1%	0.9
4431	Electronics and Appliance Stores	3,152	2,850	-9.6%	0.8
4441	Building Material and Supplies Dealers	7,363	7,522	2.2%	0.9
4442	Lawn and Garden Equipment and Supplies Stores	958	987	3.0%	0.8
4451	Grocery Stores	20,443	18,207	-10.9%	1.0
4452	Specialty Food Stores	1,292	1,171	-9.4%	0.7
4453	Beer, Wine, and Liquor Stores	1,516	1,753	15.6%	1.2
4461	Health and Personal Care Stores	9,258	9,125	-1.4%	1.2
4471	Gasoline Stations	7,669	7,866	2.6%	1.1
4481	Clothing Stores	8,166	7,681	-5.9%	1.0
4482	Shoe Stores	1,287	1,328	3.2%	0.8
4483	Jewelry, Luggage, and Leather Goods Stores	1,084	1,020	-5.9%	1.0
4511	Sporting Goods, Hobby, and Musical Instrument Stores	4,346	4,692	8.0%	1.1
4512	Book Stores and News Dealers	705	679	-3.7%	1.0
4521	Department Stores	10,244	9,551	-6.8%	1.0
4529	Other General Merchandise Stores	11,860	12,357	4.2%	0.9
4531	Florists	715	506	-29.2%	1.5
4532	Office Supplies, Stationery, and Gift Stores	2,076	1,876	-9.6%	0.9
4533	Used Merchandise Stores	1,531	1,972	28.8%	1.2
4539	Other Miscellaneous Store Retailers	2,478	2,515	1.5%	1.1
4541	Electronic Shopping and Mail-Order Houses	4,170	5,247	25.8%	1.7
4542	Vending Machine Operators	436	447	2.5%	1.5
4543	Direct Selling Establishments	650	592	-8.9%	0.6
4811	Scheduled Air Transportation	2,210	2,341	5.9%	0.7
4812	Nonscheduled Air Transportation	306	351	14.7%	1.1
4832	Inland Water Transportation	200	174	-13.0%	0.9
4841	General Freight Trucking	5,875	6,642	13.1%	0.8
4842	Specialized Freight Trucking	3,763	4,316	14.7%	1.1
4851	Urban Transit Systems	2,339	2,555	9.2%	1.3
4852	Interurban and Rural Bus Transportation	184	185	0.5%	1.1
4853	Taxi and Limousine Service	369	388	5.1%	0.6
4854	School and Employee Bus Transportation	5,664	6,000	5.9%	2.9
4855	Charter Bus Industry	686	741	8.0%	3.0
4859	Other Transit and Ground Passenger Transportation	1,057	1,271	20.2%	1.4
4862	Pipeline Transportation of Natural Gas	299	340	13.7%	1.3
4869	Other Pipeline Transportation	79	105	32.9%	1.3
4871	Scenic and Sightseeing Transportation, Land	200	254	27.0%	1.9

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4872	Scenic and Sightseeing Transportation, Water	82	71	-13.4%	0.7
4879	Scenic and Sightseeing Transportation, Other	2	2	0.0%	0.1
4881	Support Activities for Air Transportation	1,097	1,130	3.0%	0.6
4882	Support Activities for Rail Transportation	422	531	25.8%	1.7
4883	Support Activities for Water Transportation	124	108	-12.9%	0.2
4884	Support Activities for Road Transportation	935	1,358	45.2%	1.1
4885	Freight Transportation Arrangement	865	1,068	23.5%	0.6
4889	Other Support Activities for Transportation	197	265	34.5%	0.8
4911	Postal Service	5,916	3,905	-34.0%	1.3
4921	Couriers and Express Delivery Services	5,193	5,747	10.7%	1.3
4922	Local Messengers and Local Delivery	151	131	-13.2%	0.4
4931	Warehousing and Storage	6,571	7,337	11.7%	1.1
5111	Newspaper, Periodical, Book, and Directory Publishers	3,052	2,563	-16.0%	1.0
5112	Software Publishers	1,397	1,657	18.6%	0.6
5121	Motion Picture and Video Industries	1,689	1,726	2.2%	0.6
5122	Sound Recording Industries	57	52	-8.8%	0.5
5151	Radio and Television Broadcasting	1,824	2,046	12.2%	1.1
5152	Cable and Other Subscription Programming	33	26	-21.2%	0.1
5171	Wired Telecommunications Carriers	5,248	4,663	-11.1%	1.1
5172	Wireless Telecommunications Carriers (except Satellite)	475	315	-33.7%	0.4
5174	Satellite Telecommunications	17	15	-11.8%	0.2
5179	Other Telecommunications	323	246	-23.8%	0.5
5182	Data Processing, Hosting, and Related Services	815	639	-21.6%	0.4
5191	Other Information Services	2,381	3,022	26.9%	0.9
5211	Monetary Authorities-Central Bank	5	4	-20.0%	0.0
5221	Depository Credit Intermediation	25,107	23,126	-7.9%	1.9
5222	Nondepository Credit Intermediation	2,309	1,917	-17.0%	0.5
5223	Activities Related to Credit Intermediation	969	767	-20.8%	0.4
5231	Securities and Commodity Contracts Intermediation and Brokerage	1,612	1,711	6.1%	0.5
5232	Securities and Commodity Exchanges	4	6	50.0%	0.1
5239	Other Financial Investment Activities	4,689	7,256	54.7%	1.4
5241	Insurance Carriers	14,642	15,695	7.2%	1.6
5242	Agencies, Brokerages, and Other Insurance Related Activities	8,009	9,299	16.1%	1.0
5251	Insurance and Employee Benefit Funds	6	5	-16.7%	0.4
5311	Lessors of Real Estate	4,326	4,647	7.4%	0.9
5312	Offices of Real Estate Agents and Brokers	1,250	1,271	1.7%	0.6
5313	Activities Related to Real Estate	2,909	2,888	-0.7%	0.6

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
5321	Automotive Equipment Rental and Leasing	1,452	1,697	16.9%	1.0
5322	Consumer Goods Rental	969	1,081	11.6%	0.8
5323	General Rental Centers	107	107	0.0%	0.4
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	1,046	1,227	17.3%	0.9
5331	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	93	87	-6.5%	0.5
5411	Legal Services	10,805	11,955	10.6%	1.2
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	7,920	8,648	9.2%	1.1
5413	Architectural, Engineering, and Related Services	20,216	22,513	11.4%	1.8
5414	Specialized Design Services	836	1,172	40.2%	0.8
5415	Computer Systems Design and Related Services	13,431	19,803	47.4%	1.0
5416	Management, Scientific, and Technical Consulting Services	9,015	10,957	21.5%	0.9
5417	Scientific Research and Development Services	7,483	9,557	27.7%	1.5
5418	Advertising, Public Relations, and Related Services	3,089	3,441	11.4%	0.8
5419	Other Professional, Scientific, and Technical Services	4,189	4,811	14.8%	0.8
5511	Management of Companies and Enterprises	33,933	36,936	8.8%	2.0
5611	Office Administrative Services	764	642	-16.0%	0.2
5612	Facilities Support Services	857	1,238	44.5%	0.8
5613	Employment Services	17,268	19,929	15.4%	0.6
5614	Business Support Services	7,483	7,047	-5.8%	1.1
5615	Travel Arrangement and Reservation Services	983	889	-9.6%	0.6
5616	Investigation and Security Services	7,873	7,842	-0.4%	1.2
5617	Services to Buildings and Dwellings	12,622	12,745	1.0%	0.8
5619	Other Support Services	2,324	2,901	24.8%	1.0
5621	Waste Collection	1,530	1,956	27.8%	1.2
5622	Waste Treatment and Disposal	564	664	17.7%	0.6
5629	Remediation and Other Waste Management Services	1,087	1,200	10.4%	1.0
6111	Elementary and Secondary Schools	48,856	46,183	-5.5%	0.8
6112	Junior Colleges	4,406	4,200	-4.7%	0.8
6113	Colleges, Universities, and Professional Schools	31,323	32,006	2.2%	1.4
6114	Business Schools and Computer and Management Training	179	202	12.8%	0.3
6115	Technical and Trade Schools	1,066	1,144	7.3%	0.9
6116	Other Schools and Instruction	1,841	2,034	10.5%	0.6
6117	Educational Support Services	477	537	12.6%	0.4
6211	Offices of Physicians	24,119	25,821	7.1%	1.2
6212	Offices of Dentists	5,764	6,382	10.7%	0.8
6213	Offices of Other Health Practitioners	10,317	13,234	28.3%	1.7

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
6214	Outpatient Care Centers	6,329	8,486	34.1%	1.1
6215	Medical and Diagnostic Laboratories	2,110	2,267	7.4%	1.1
6216	Home Health Care Services	9,432	13,586	44.0%	1.0
6219	Other Ambulatory Health Care Services	5,422	5,923	9.2%	2.4
6221	General Medical and Surgical Hospitals	56,327	60,779	7.9%	1.3
6222	Psychiatric and Substance Abuse Hospitals	2,001	2,013	0.6%	1.1
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	4,215	5,289	25.5%	2.2
6231	Nursing Care Facilities (Skilled Nursing Facilities)	15,918	17,664	11.0%	1.2
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	9,158	9,660	5.5%	1.7
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	9,372	11,373	21.4%	1.4
6239	Other Residential Care Facilities	1,434	1,720	19.9%	1.1
6241	Individual and Family Services	20,816	27,746	33.3%	1.2
6242	Community Food and Housing, and Emergency and Other Relief Services	826	910	10.2%	0.7
6243	Vocational Rehabilitation Services	2,297	2,945	28.2%	0.8
6244	Child Day Care Services	6,472	7,415	14.6%	1.0
7111	Performing Arts Companies	859	892	3.8%	1.0
7112	Spectator Sports	1,498	1,670	11.5%	1.4
7113	Promoters of Performing Arts, Sports, and Similar Events	1,572	1,705	8.5%	1.6
7114	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	68	81	19.1%	0.4
7115	Independent Artists, Writers, and Performers	99	128	29.3%	0.2
7121	Museums, Historical Sites, and Similar Institutions	2,201	2,499	13.5%	1.2
7131	Amusement Parks and Arcades	2,351	2,955	25.7%	1.6
7132	Gambling Industries	822	700	-14.8%	0.4
7139	Other Amusement and Recreation Industries	8,506	9,283	9.1%	0.8
7211	Traveler Accommodation	8,324	8,690	4.4%	0.6
7212	RV (Recreational Vehicle) Parks and Recreational Camps	174	182	4.6%	0.4
7213	Rooming and Boarding Houses	48	54	12.5%	0.4
7223	Special Food Services	7,182	8,070	12.4%	1.5
7224	Drinking Places (Alcoholic Beverages)	3,854	3,978	3.2%	1.4
7225	Restaurants and Other Eating Places	68,679	74,281	8.2%	0.9
8111	Automotive Repair and Maintenance	6,533	7,071	8.2%	1.0
8112	Electronic and Precision Equipment Repair and Maintenance	936	949	1.4%	1.2
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1,729	1,834	6.1%	1.1
8114	Personal and Household Goods Repair and Maintenance	414	458	10.6%	0.7

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
8121	Personal Care Services	6,998	7,676	9.7%	1.4
8122	Death Care Services	1,723	1,721	-0.1%	1.6
8123	Drycleaning and Laundry Services	2,297	2,206	-4.0%	1.0
8129	Other Personal Services	2,149	2,537	18.1%	1.0
8131	Religious Organizations	1,675	1,696	1.3%	1.2
8132	Grantmaking and Giving Services	1,078	1,050	-2.6%	1.0
8133	Social Advocacy Organizations	1,517	1,558	2.7%	0.9
8134	Civic and Social Organizations	6,037	6,383	5.7%	2.0
8139	Business, Professional, Labor, Political, and Similar Organizations	3,639	3,676	1.0%	1.1
8141	Private Households	854	718	-15.9%	0.4
9211	Executive, Legislative, and Other General Government Support	22,253	21,179	-4.8%	1.0
9221	Justice, Public Order, and Safety Activities	6,076	5,616	-7.6%	0.4
9231	Administration of Human Resource Programs	1,352	1,236	-8.6%	0.2
9241	Administration of Environmental Quality Programs	1,192	1,227	2.9%	0.5
9251	Administration of Housing Programs, Urban Planning, and Community Development	982	890	-9.4%	1.5
9261	Administration of Economic Programs	1,756	1,651	-6.0%	0.4
9281	National Security and International Affairs	1,010	995	-1.5%	0.2

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

APPENDIX D: OCCUPATION PROJECTIONS 2014-2024 FOR INDIANA 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.

JOB ZONE TWO: Some Preparation Needed

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

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

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

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

JOB ZONE THREE: Medium Preparation Needed

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

JOB ZONE FOUR: Considerable Preparation Needed

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

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

JOB ZONE FIVE: Extensive Preparation Needed

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

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
Total	All Occupations	NA	1,060,587	1,138,533	7.3%	376,812
11-1011	Chief Executives	5	2,112	2,016	-4.5%	405
11-1021	General and Operations Managers	4	12,244	14,070	14.9%	4,005
11-1031	Legislators	4	302	231	-23.5%	9
11-2011	Advertising and Promotions Managers	4	126	107	-15.1%	23
11-2021	Marketing Managers	4	1,112	1,243	11.8%	372
11-2022	Sales Managers	4	1,917	1,930	0.7%	428
11-2031	Public Relations and Fundraising Managers	4	354	333	-5.9%	54
11-3011	Administrative Services Managers	3	1,616	1,589	-1.7%	220
11-3021	Computer and Information Systems Managers	4	2,328	3,081	32.3%	1,093
11-3031	Financial Managers	4	3,310	3,197	-3.4%	499
11-3051	Industrial Production Managers	4	1,067	1,036	-2.9%	215
11-3061	Purchasing Managers	4	439	401	-8.7%	62
11-3071	Transportation, Storage, and Distribution Managers	4	557	614	10.2%	194
11-3111	Compensation and Benefits Managers	4	176	153	-13.1%	31
11-3121	Human Resources Managers	4	734	887	20.8%	343
11-3131	Training and Development Managers	4	194	231	19.1%	88
11-9021	Construction Managers	4	1,288	1,644	27.6%	543
11-9031	Education Administrators, Preschool and Childcare Center/Program	4	334	354	6.0%	110
11-9032	Education Administrators, Elementary and Secondary School	5	1,284	1,161	-9.6%	301
11-9033	Education Administrators, Postsecondary	5	1,110	1,045	-5.9%	250
11-9039	Education Administrators, All Other	5	141	170	20.6%	68
11-9041	Architectural and Engineering Managers	5	1,310	1,413	7.9%	442
11-9051	Food Service Managers	3	1,153	1,266	9.8%	346
11-9061	Funeral Service Managers	3	128	119	-7.0%	30
11-9071	Gaming Managers	3	14	12	-14.3%	1
11-9081	Lodging Managers	3	153	177	15.7%	90
11-9111	Medical and Health Services Managers	5	2,717	2,858	5.2%	801
11-9121	Natural Sciences Managers	5	350	430	22.9%	167
11-9131	Postmasters and Mail Superintendents	3	229	137	-40.2%	6
11-9141	Property, Real Estate, and Community Association Managers	4	663	760	14.6%	268
11-9151	Social and Community Service Managers	4	1,044	1,203	15.2%	399
11-9161	Emergency Management Directors	4	69	56	-18.8%	1
11-9199	Managers, All Other	4	1,617	1,773	9.6%	508

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	4	45	49	8.9%	20
13-1021	Buyers and Purchasing Agents, Farm Products	4	62	63	1.6%	17
13-1022	Wholesale and Retail Buyers, Except Farm Products	3	809	756	-6.6%	168
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	4	2,629	2,668	1.5%	601
13-1031	Claims Adjusters, Examiners, and Investigators	4	2,617	2,818	7.7%	976
13-1032	Insurance Appraisers, Auto Damage	3	145	180	24.1%	87
13-1041	Compliance Officers	4	2,068	2,404	16.2%	765
13-1051	Cost Estimators	4	1,860	2,056	10.5%	828
13-1071	Human Resources Specialists	4	3,751	4,466	19.1%	1,516
13-1075	Labor Relations Specialists	4	1,073	821	-23.5%	68
13-1081	Logisticians	4	909	1,098	20.8%	310
13-1111	Management Analysts	4	4,155	5,094	22.6%	1,630
13-1121	Meeting, Convention, and Event Planners	4	581	769	32.4%	278
13-1131	Fundraisers	4	561	677	20.7%	243
13-1141	Compensation, Benefits, and Job Analysis Specialists	4	787	714	-9.3%	103
13-1151	Training and Development Specialists	4	2,152	2,444	13.6%	718
13-1161	Market Research Analysts and Marketing Specialists	4	4,687	6,231	32.9%	2,295
13-1199	Business Operations Specialists, All Other	4	3,322	3,310	-0.4%	381
13-2011	Accountants and Auditors	4	11,171	12,262	9.8%	4,809
13-2021	Appraisers and Assessors of Real Estate	4	266	239	-10.2%	14
13-2031	Budget Analysts	4	325	349	7.4%	161
13-2041	Credit Analysts	4	551	598	8.5%	212
13-2051	Financial Analysts	4	2,474	2,920	18.0%	1,093
13-2052	Personal Financial Advisors	4	1,494	2,106	41.0%	890
13-2053	Insurance Underwriters	4	1,035	1,131	9.3%	499
13-2061	Financial Examiners	4	311	341	9.6%	130
13-2071	Credit Counselors	4	408	488	19.6%	168
13-2072	Loan Officers	3	3,214	3,473	8.1%	1,149
13-2081	Tax Examiners and Collectors, and Revenue Agents	3	593	507	-14.5%	155
13-2082	Tax Preparers	3	482	430	-10.8%	95
13-2099	Financial Specialists, All Other	4	834	800	-4.1%	77
15-1111	Computer and Information Research Scientists	5	56	61	8.9%	12
15-1121	Computer Systems Analysts	4	4,792	6,828	42.5%	2,883
15-1122	Information Security Analysts	4	517	797	54.2%	360
15-1131	Computer Programmers	4	2,932	3,949	34.7%	1,977

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
15-1132	Software Developers, Applications	4	4,431	6,217	40.3%	2,417
15-1133	Software Developers, Systems Software	4	2,180	2,253	3.3%	337
15-1134	Web Developers	3	820	1,121	36.7%	435
15-1141	Database Administrators	4	1,108	1,431	29.2%	553
15-1142	Network and Computer Systems Administrators	4	2,976	2,864	-3.8%	399
15-1143	Computer Network Architects	4	782	925	18.3%	267
15-1151	Computer User Support Specialists	3	5,133	6,874	33.9%	2,660
15-1152	Computer Network Support Specialists	4	1,133	1,220	7.7%	304
15-1199	Computer Occupations, All Other	4	1,340	1,607	19.9%	503
15-2011	Actuaries	4	293	392	33.8%	194
15-2031	Operations Research Analysts	5	544	662	21.7%	246
15-2041	Statisticians	5	395	539	36.5%	280
17-1011	Architects, Except Landscape and Naval	4	943	1,097	16.3%	488
17-1012	Landscape Architects	4	247	321	30.0%	152
17-1021	Cartographers and Photogrammetrists	4	64	68	6.3%	18
17-1022	Surveyors	4	490	548	11.8%	187
17-2011	Aerospace Engineers	4	345	476	38.0%	221
17-2021	Agricultural Engineers	4	19	26	36.8%	13
17-2031	Biomedical Engineers	4	242	233	-3.7%	57
17-2041	Chemical Engineers	4	279	277	-0.7%	80
17-2051	Civil Engineers	4	3,597	4,061	12.9%	1,445
17-2061	Computer Hardware Engineers	4	247	225	-8.9%	35
17-2071	Electrical Engineers	4	1,648	1,902	15.4%	663
17-2072	Electronics Engineers, Except Computer	4	805	704	-12.5%	98
17-2081	Environmental Engineers	5	839	1,026	22.3%	430
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	4	264	270	2.3%	91
17-2112	Industrial Engineers	4	1,620	1,625	0.3%	554
17-2131	Materials Engineers	4	337	421	24.9%	212
17-2141	Mechanical Engineers	4	2,322	2,339	0.7%	894
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	4	85	74	-12.9%	22
17-2161	Nuclear Engineers	4	362	427	18.0%	189
17-2171	Petroleum Engineers	4	303	454	49.8%	259
17-2199	Engineers, All Other	4	722	926	28.3%	350
17-3011	Architectural and Civil Drafters	4	1,371	1,454	6.1%	414
17-3012	Electrical and Electronics Drafters	3	301	262	-13.0%	9
17-3013	Mechanical Drafters	3	779	686	-11.9%	77

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
17-3019	Drafters, All Other	3	78	95	21.8%	29
17-3021	Aerospace Engineering and Operations Technicians	4	5	6	20.0%	2
17-3022	Civil Engineering Technicians	3	726	838	15.4%	294
17-3023	Electrical and Electronics Engineering Technicians	3	936	766	-18.2%	62
17-3024	Electro-Mechanical Technicians	3	157	142	-9.6%	31
17-3025	Environmental Engineering Technicians	4	337	435	29.1%	186
17-3026	Industrial Engineering Technicians	3	306	308	0.7%	79
17-3027	Mechanical Engineering Technicians	3	428	500	16.8%	175
17-3029	Engineering Technicians, Except Drafters, All Other	3	550	703	27.8%	290
17-3031	Surveying and Mapping Technicians	3	469	588	25.4%	222
19-1012	Food Scientists and Technologists	4	40	43	7.5%	17
19-1013	Soil and Plant Scientists	5	36	47	30.6%	26
19-1021	Biochemists and Biophysicists	5	474	768	62.0%	439
19-1022	Microbiologists	5	282	404	43.3%	217
19-1023	Zoologists and Wildlife Biologists	5	53	47	-11.3%	9
19-1029	Biological Scientists, All Other	5	80	81	1.3%	27
19-1031	Conservation Scientists	4	92	104	13.0%	42
19-1032	Foresters	4	62	63	1.6%	19
19-1041	Epidemiologists	5	23	20	-13.0%	2
19-1042	Medical Scientists, Except Epidemiologists	5	1,137	1,538	35.3%	674
19-1099	Life Scientists, All Other	5	24	27	12.5%	8
19-2012	Physicists	5	40	32	-20.0%	0
19-2021	Atmospheric and Space Scientists	4	19	16	-15.8%	2
19-2031	Chemists	4	1,097	1,373	25.2%	630
19-2032	Materials Scientists	5	77	86	11.7%	32
19-2041	Environmental Scientists and Specialists, Including Health	4	745	950	27.5%	443
19-2042	Geoscientists, Except Hydrologists and Geographers	4	335	399	19.1%	183
19-2043	Hydrologists	4	36	33	-8.3%	8
19-2099	Physical Scientists, All Other	5	46	36	-21.7%	1
19-3011	Economists	5	113	130	15.0%	56
19-3022	Survey Researchers	5	434	427	-1.6%	133
19-3031	Clinical, Counseling, and School Psychologists	5	1,017	1,050	3.2%	341
19-3039	Psychologists, All Other	5	70	87	24.3%	38
19-3041	Sociologists	5	30	32	6.7%	19
19-3051	Urban and Regional Planners	5	305	325	6.6%	166

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
19-3091	Anthropologists and Archeologists	5	13	17	30.8%	6
19-3093	Historians	5	13	10	-23.1%	0
19-3099	Social Scientists and Related Workers, All Other	4	72	70	-2.8%	13
19-4011	Agricultural and Food Science Technicians	3	28	23	-17.9%	5
19-4021	Biological Technicians	4	775	1,004	29.5%	484
19-4031	Chemical Technicians	3	903	1,136	25.8%	520
19-4041	Geological and Petroleum Technicians	4	220	318	44.5%	207
19-4051	Nuclear Technicians	3	196	220	12.2%	110
19-4061	Social Science Research Assistants	4	164	225	37.2%	136
19-4091	Environmental Science and Protection Technicians, Including Health	4	415	535	28.9%	307
19-4092	Forensic Science Technicians	4	22	22	0.0%	9
19-4093	Forest and Conservation Technicians	3	56	62	10.7%	33
19-4099	Life, Physical, and Social Science Technicians, All Other	3	397	419	5.5%	187
21-1011	Substance Abuse and Behavioral Disorder Counselors	5	1,349	1,345	-0.3%	380
21-1012	Educational, Guidance, School, and Vocational Counselors	5	2,011	2,010	0.0%	472
21-1013	Marriage and Family Therapists	5	216	270	25.0%	102
21-1014	Mental Health Counselors	5	2,004	2,128	6.2%	672
21-1015	Rehabilitation Counselors	5	1,286	1,663	29.3%	739
21-1019	Counselors, All Other	5	158	157	-0.6%	33
21-1021	Child, Family, and School Social Workers	4	2,790	3,156	13.1%	1,018
21-1022	Healthcare Social Workers	5	1,504	1,864	23.9%	710
21-1023	Mental Health and Substance Abuse Social Workers	5	1,771	2,066	16.7%	792
21-1029	Social Workers, All Other	5	166	170	2.4%	42
21-1091	Health Educators	4	530	578	9.1%	192
21-1092	Probation Officers and Correctional Treatment Specialists	4	599	558	-6.8%	153
21-1093	Social and Human Service Assistants	4	3,970	4,281	7.8%	1,496
21-1094	Community Health Workers	4	212	214	0.9%	56
21-1099	Community and Social Service Specialists, All Other	4	254	264	3.9%	71
21-2011	Clergy	5	370	435	17.6%	155
21-2021	Directors, Religious Activities and Education	4	308	358	16.2%	188
21-2099	Religious Workers, All Other	4	81	63	-22.2%	9
23-1011	Lawyers	5	5,225	5,949	13.9%	1,615
23-1012	Judicial Law Clerks	5	172	181	5.2%	44

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	106	92	-13.2%	8
23-1022	Arbitrators, Mediators, and Conciliators	5	59	75	27.1%	25
23-1023	Judges, Magistrate Judges, and Magistrates	5	40	34	-15.0%	3
23-2011	Paralegals and Legal Assistants	3	2,140	2,737	27.9%	959
23-2091	Court Reporters	3	172	174	1.2%	48
23-2093	Title Examiners, Abstractors, and Searchers	3	582	641	10.1%	190
23-2099	Legal Support Workers, All Other	3	104	97	-6.7%	11
25-1011	Business Teachers, Postsecondary	5	1,051	1,230	17.0%	336
25-1021	Computer Science Teachers, Postsecondary	5	472	568	20.3%	167
25-1022	Mathematical Science Teachers, Postsecondary	5	653	700	7.2%	146
25-1031	Architecture Teachers, Postsecondary	5	112	138	23.2%	43
25-1032	Engineering Teachers, Postsecondary	5	619	760	22.8%	233
25-1041	Agricultural Sciences Teachers, Postsecondary	5	81	69	-14.8%	1
25-1042	Biological Science Teachers, Postsecondary	5	838	882	5.3%	171
25-1043	Forestry and Conservation Science Teachers, Postsecondary	5	30	25	-16.7%	0
25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	5	188	212	12.8%	53
25-1052	Chemistry Teachers, Postsecondary	5	345	395	14.5%	102
25-1053	Environmental Science Teachers, Postsecondary	5	68	67	-1.5%	9
25-1054	Physics Teachers, Postsecondary	5	237	286	20.7%	84
25-1061	Anthropology and Archeology Teachers, Postsecondary	5	75	70	-6.7%	7
25-1062	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	5	104	116	11.5%	28
25-1063	Economics Teachers, Postsecondary	5	253	295	16.6%	81
25-1064	Geography Teachers, Postsecondary	5	77	86	11.7%	21
25-1065	Political Science Teachers, Postsecondary	5	256	291	13.7%	74
25-1066	Psychology Teachers, Postsecondary	5	531	579	9.0%	128
25-1067	Sociology Teachers, Postsecondary	5	353	443	25.5%	143
25-1069	Social Sciences Teachers, Postsecondary, All Other	5	107	133	24.3%	42
25-1071	Health Specialties Teachers, Postsecondary	5	1,537	1,541	0.3%	236
25-1072	Nursing Instructors and Teachers, Postsecondary	5	701	695	-0.9%	99
25-1081	Education Teachers, Postsecondary	5	799	800	0.1%	123
25-1082	Library Science Teachers, Postsecondary	5	77	91	18.2%	26
25-1111	Criminal Justice and Law Enforcement Teachers, Postsecondary	5	123	121	-1.6%	16
25-1112	Law Teachers, Postsecondary	5	122	136	11.5%	32

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-1113	Social Work Teachers, Postsecondary	5	139	130	-6.5%	12
25-1121	Art, Drama, and Music Teachers, Postsecondary	5	1,091	1,350	23.7%	422
25-1122	Communications Teachers, Postsecondary	5	351	400	14.0%	102
25-1123	English Language and Literature Teachers, Postsecondary	5	1,000	1,008	0.8%	159
25-1124	Foreign Language and Literature Teachers, Postsecondary	5	406	460	13.3%	115
25-1125	History Teachers, Postsecondary	5	331	362	9.4%	82
25-1126	Philosophy and Religion Teachers, Postsecondary	5	337	368	9.2%	83
25-1191	Graduate Teaching Assistants	5	335	395	17.9%	111
25-1192	Home Economics Teachers, Postsecondary	5	26	22	-15.4%	0
25-1193	Recreation and Fitness Studies Teachers, Postsecondary	5	221	222	0.5%	34
25-1194	Vocational Education Teachers, Postsecondary	3	1,011	900	-11.0%	42
25-1199	Postsecondary Teachers, All Other	5	962	1,175	22.1%	357
25-2011	Preschool Teachers, Except Special Education	3	2,342	2,879	22.9%	1,209
25-2012	Kindergarten Teachers, Except Special Education	4	972	898	-7.6%	224
25-2021	Elementary School Teachers, Except Special Education	4	9,197	8,674	-5.7%	1,790
25-2022	Middle School Teachers, Except Special and Career/Technical Education	4	3,991	4,307	7.9%	1,318
25-2023	Career/Technical Education Teachers, Middle School	4	103	119	15.5%	47
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	4	8,466	7,629	-9.9%	2,046
25-2032	Career/Technical Education Teachers, Secondary School	4	746	647	-13.3%	145
25-2051	Special Education Teachers, Preschool	4	110	129	17.3%	39
25-2052	Special Education Teachers, Kindergarten and Elementary School	4	1,773	1,775	0.1%	404
25-2053	Special Education Teachers, Middle School	4	620	599	-3.4%	121
25-2054	Special Education Teachers, Secondary School	4	1,302	1,309	0.5%	324
25-2059	Special Education Teachers, All Other	4	41	48	17.1%	12
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	4	253	223	-11.9%	23
25-3021	Self-Enrichment Education Teachers	3	1,361	1,296	-4.8%	225
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	3	870	1,004	15.4%	283
25-3098	Substitute Teachers	3	2,651	2,242	-15.4%	144
25-4011	Archivists	5	77	91	18.2%	32
25-4012	Curators	5	128	154	20.3%	57

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-4013	Museum Technicians and Conservators	4	133	169	27.1%	71
25-4021	Librarians	5	1,083	1,116	3.0%	301
25-4031	Library Technicians	4	629	676	7.5%	401
25-9011	Audio-Visual and Multimedia Collections Specialists	4	44	45	2.3%	10
25-9021	Farm and Home Management Advisors	5	11	8	-27.3%	0
25-9031	Instructional Coordinators	5	783	795	1.5%	80
25-9041	Teacher Assistants	3	7,538	7,571	0.4%	1,907
25-9099	Education, Training, and Library Workers, All Other	4	162	154	-4.9%	7
27-1011	Art Directors	4	231	273	18.2%	109
27-1012	Craft Artists	2	14	12	-14.3%	1
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	3	37	40	8.1%	15
27-1014	Multimedia Artists and Animators	4	105	128	21.9%	50
27-1019	Artists and Related Workers, All Other	4	16	12	-25.0%	0
27-1021	Commercial and Industrial Designers	4	148	126	-14.9%	22
27-1022	Fashion Designers	3	23	24	4.3%	8
27-1023	Floral Designers	2	439	276	-37.1%	64
27-1024	Graphic Designers	4	1,533	1,727	12.7%	680
27-1025	Interior Designers	4	327	411	25.7%	215
27-1026	Merchandise Displayers and Window Trimmers	3	530	642	21.1%	267
27-1027	Set and Exhibit Designers	5	59	71	20.3%	29
27-1029	Designers, All Other	4	1	1	0.0%	0
27-2011	Actors	2	325	280	-13.8%	80
27-2012	Producers and Directors	4	601	668	11.1%	329
27-2021	Athletes and Sports Competitors	2	216	249	15.3%	117
27-2022	Coaches and Scouts	4	1,406	1,246	-11.4%	286
27-2023	Umpires, Referees, and Other Sports Officials	3	70	62	-11.4%	13
27-2031	Dancers	3	29	23	-20.7%	4
27-2032	Choreographers	4	31	34	9.7%	14
27-2041	Music Directors and Composers	3	171	134	-21.6%	24
27-2042	Musicians and Singers	3	204	176	-13.7%	51
27-2099	Entertainers and Performers, Sports and Related Workers, All Other	3	19	19	0.0%	0
27-3011	Radio and Television Announcers	3	308	328	6.5%	164
27-3012	Public Address System and Other Announcers	2	20	27	35.0%	12
27-3022	Reporters and Correspondents	4	240	190	-20.8%	75
27-3031	Public Relations Specialists	4	1,914	1,823	-4.8%	202

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
27-3041	Editors	4	561	519	-7.5%	139
27-3042	Technical Writers	4	247	241	-2.4%	71
27-3043	Writers and Authors	4	282	285	1.1%	74
27-3091	Interpreters and Translators	4	158	154	-2.5%	16
27-3099	Media and Communication Workers, All Other	4	68	56	-17.6%	0
27-4011	Audio and Video Equipment Technicians	3	413	419	1.5%	96
27-4012	Broadcast Technicians	3	148	162	9.5%	54
27-4014	Sound Engineering Technicians	3	73	68	-6.8%	14
27-4021	Photographers	3	333	278	-16.5%	43
27-4031	Camera Operators, Television, Video, and Motion Picture	3	113	103	-8.8%	4
27-4032	Film and Video Editors	3	72	61	-15.3%	0
27-4099	Media and Communication Equipment Workers, All Other	3	39	30	-23.1%	0
29-1011	Chiropractors	5	324	438	35.2%	187
29-1021	Dentists, General	5	639	722	13.0%	244
29-1022	Oral and Maxillofacial Surgeons	5	23	24	4.3%	7
29-1023	Orthodontists	5	17	21	23.5%	8
29-1029	Dentists, All Other Specialists	5	16	15	-6.3%	3
29-1031	Dietitians and Nutritionists	5	609	624	2.5%	94
29-1041	Optometrists	5	323	412	27.6%	198
29-1051	Pharmacists	5	2,534	2,694	6.3%	830
29-1061	Anesthesiologists	5	337	351	4.2%	107
29-1062	Family and General Practitioners	5	1,425	1,517	6.5%	490
29-1063	Internists, General	5	220	207	-5.9%	41
29-1064	Obstetricians and Gynecologists	5	75	96	28.0%	38
29-1065	Pediatricians, General	5	82	105	28.0%	39
29-1066	Psychiatrists	5	185	175	-5.4%	41
29-1067	Surgeons	5	460	586	27.4%	248
29-1069	Physicians and Surgeons, All Other	5	3,233	3,465	7.2%	1,080
29-1071	Physician Assistants	5	1,062	1,158	9.0%	305
29-1081	Podiatrists	5	122	168	37.7%	95
29-1122	Occupational Therapists	5	1,320	1,760	33.3%	647
29-1123	Physical Therapists	5	2,332	3,056	31.0%	1,384
29-1124	Radiation Therapists	3	172	161	-6.4%	24
29-1125	Recreational Therapists	4	248	254	2.4%	66
29-1126	Respiratory Therapists	3	1,122	1,271	13.3%	311
29-1127	Speech-Language Pathologists	5	934	1,293	38.4%	497

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
29-1128	Exercise Physiologists	5	76	100	31.6%	34
29-1129	Therapists, All Other	4	85	123	44.7%	48
29-1131	Veterinarians	5	428	556	29.9%	281
29-1141	Registered Nurses	3	26,609	30,810	15.8%	9,589
29-1151	Nurse Anesthetists	5	449	481	7.1%	126
29-1161	Nurse Midwives	5	31	40	29.0%	15
29-1171	Nurse Practitioners	5	828	1,031	24.5%	353
29-1181	Audiologists	5	125	156	24.8%	59
29-1199	Health Diagnosing and Treating Practitioners, All Other	5	96	80	-16.7%	6
29-2011	Medical and Clinical Laboratory Technologists	4	1,819	1,915	5.3%	647
29-2012	Medical and Clinical Laboratory Technicians	3	2,028	2,243	10.6%	794
29-2021	Dental Hygienists	3	1,577	1,925	22.1%	775
29-2031	Cardiovascular Technologists and Technicians	3	653	810	24.0%	255
29-2032	Diagnostic Medical Sonographers	3	536	644	20.1%	183
29-2033	Nuclear Medicine Technologists	3	231	245	6.1%	48
29-2034	Radiologic Technologists	3	2,130	2,370	11.3%	570
29-2035	Magnetic Resonance Imaging Technologists	3	297	376	26.6%	126
29-2041	Emergency Medical Technicians and Paramedics	3	3,244	3,372	3.9%	1,198
29-2051	Dietetic Technicians	2	523	763	45.9%	302
29-2052	Pharmacy Technicians	3	2,953	3,170	7.3%	558
29-2053	Psychiatric Technicians	3	274	274	0.0%	56
29-2054	Respiratory Therapy Technicians	3	111	103	-7.2%	2
29-2055	Surgical Technologists	3	737	929	26.1%	263
29-2056	Veterinary Technologists and Technicians	3	674	840	24.6%	237
29-2057	Ophthalmic Medical Technicians	3	253	339	34.0%	117
29-2061	Licensed Practical and Licensed Vocational Nurses	3	6,894	8,497	23.3%	3,424
29-2071	Medical Records and Health Information Technicians	3	1,670	1,978	18.4%	758
29-2081	Opticians, Dispensing	3	703	963	37.0%	500
29-2091	Orthotists and Prosthetists	5	48	52	8.3%	9
29-2092	Hearing Aid Specialists	3	30	32	6.7%	5
29-2099	Health Technologists and Technicians, All Other	3	448	525	17.2%	113
29-9011	Occupational Health and Safety Specialists	4	488	518	6.1%	173
29-9012	Occupational Health and Safety Technicians	3	126	135	7.1%	44
29-9091	Athletic Trainers	5	285	380	33.3%	179
29-9099	Healthcare Practitioners and Technical Workers, All Other	4	191	162	-15.2%	19

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
31-1011	Home Health Aides	2	9,848	12,907	31.1%	5,767
31-1013	Psychiatric Aides	2	310	306	-1.3%	75
31-1014	Nursing Assistants	2	14,302	16,170	13.1%	4,756
31-1015	Orderlies	2	507	541	6.7%	132
31-2011	Occupational Therapy Assistants	3	541	726	34.2%	352
31-2012	Occupational Therapy Aides	3	126	190	50.8%	100
31-2021	Physical Therapist Assistants	3	1,048	1,483	41.5%	718
31-2022	Physical Therapist Aides	2	508	698	37.4%	309
31-9011	Massage Therapists	3	475	648	36.4%	221
31-9091	Dental Assistants	3	2,183	2,413	10.5%	708
31-9092	Medical Assistants	3	5,141	6,122	19.1%	2,013
31-9093	Medical Equipment Preparers	2	411	479	16.5%	146
31-9094	Medical Transcriptionists	3	870	717	-17.6%	83
31-9095	Pharmacy Aides	2	294	245	-16.7%	21
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	3	406	389	-4.2%	68
31-9097	Phlebotomists	3	1,209	1,420	17.5%	491
31-9099	Healthcare Support Workers, All Other	3	280	245	-12.5%	12
33-1011	First-Line Supervisors of Correctional Officers	3	194	199	2.6%	79
33-1012	First-Line Supervisors of Police and Detectives	3	442	492	11.3%	197
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	3	116	129	11.2%	66
33-1099	First-Line Supervisors of Protective Service Workers, All Other	3	452	559	23.7%	246
33-2011	Firefighters	3	718	713	-0.7%	212
33-2021	Fire Inspectors and Investigators	3	35	29	-17.1%	6
33-3011	Bailiffs	2	31	23	-25.8%	2
33-3012	Correctional Officers and Jailers	3	2,379	2,136	-10.2%	494
33-3021	Detectives and Criminal Investigators	3	396	391	-1.3%	97
33-3041	Parking Enforcement Workers	2	69	77	11.6%	34
33-3051	Police and Sheriff's Patrol Officers	3	4,109	3,886	-5.4%	1,250
33-3052	Transit and Railroad Police	3	12	9	-25.0%	1
33-9011	Animal Control Workers	2	47	46	-2.1%	12
33-9021	Private Detectives and Investigators	3	348	298	-14.4%	83
33-9031	Gaming Surveillance Officers and Gaming Investigators	2	44	38	-13.6%	14
33-9032	Security Guards	2	9,129	9,636	5.6%	3,064
33-9091	Crossing Guards	1	629	483	-23.2%	23

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	1,018	1,147	12.7%	866
33-9093	Transportation Security Screeners	2	186	168	-9.7%	32
33-9099	Protective Service Workers, All Other	2	557	660	18.5%	502
35-1011	Chefs and Head Cooks	3	906	973	7.4%	246
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	2	5,887	6,509	10.6%	2,430
35-2011	Cooks, Fast Food	1	1,752	1,515	-13.5%	146
35-2012	Cooks, Institution and Cafeteria	2	3,307	3,323	0.5%	703
35-2014	Cooks, Restaurant	2	8,173	10,404	27.3%	4,131
35-2015	Cooks, Short Order	1	1,495	1,812	21.2%	686
35-2021	Food Preparation Workers	1	6,539	5,816	-11.1%	1,345
35-3011	Bartenders	2	6,302	6,677	6.0%	3,032
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	1	26,709	30,260	13.3%	15,024
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	1	2,349	2,167	-7.7%	1,333
35-3031	Waiters and Waitresses	1	19,383	21,302	9.9%	12,177
35-3041	Food Servers, Nonrestaurant	1	2,328	2,578	10.7%	1,001
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	1	2,824	2,904	2.8%	1,446
35-9021	Dishwashers	1	4,216	3,939	-6.6%	1,769
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	1	2,961	3,094	4.5%	2,524
35-9099	Food Preparation and Serving Related Workers, All Other	1	228	293	28.5%	197
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2	1,065	1,086	2.0%	316
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	3	485	467	-3.7%	38
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2	15,313	15,063	-1.6%	3,261
37-2012	Maids and Housekeeping Cleaners	2	6,106	6,491	6.3%	1,943
37-2019	Building Cleaning Workers, All Other	2	61	52	-14.8%	3
37-2021	Pest Control Workers	2	281	321	14.2%	128
37-3011	Landscaping and Groundskeeping Workers	1	5,808	6,022	3.7%	1,907
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	2	83	70	-15.7%	10
37-3013	Tree Trimmers and Pruners	2	482	602	24.9%	286
37-3019	Grounds Maintenance Workers, All Other	2	17	14	-17.6%	0
39-1011	Gaming Supervisors	2	95	82	-13.7%	38
39-1012	Slot Supervisors	2	5	4	-20.0%	0

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	1,354	1,696	25.3%	612
39-2011	Animal Trainers	2	56	53	-5.4%	23
39-2021	Nonfarm Animal Caretakers	1	1,132	1,299	14.8%	343
39-3011	Gaming Dealers	2	429	374	-12.8%	161
39-3012	Gaming and Sports Book Writers and Runners	2	15	17	13.3%	7
39-3019	Gaming Service Workers, All Other	2	6	5	-16.7%	0
39-3021	Motion Picture Projectionists	2	68	63	-7.4%	35
39-3031	Ushers, Lobby Attendants, and Ticket Takers	2	1,159	1,287	11.0%	847
39-3091	Amusement and Recreation Attendants	1	2,862	3,351	17.1%	2,115
39-3092	Costume Attendants	2	28	25	-10.7%	13
39-3093	Locker Room, Coatroom, and Dressing Room Attendants	2	136	114	-16.2%	52
39-3099	Entertainment Attendants and Related Workers, All Other	2	143	143	0.0%	85
39-4021	Funeral Attendants	2	473	499	5.5%	178
39-4031	Morticians, Undertakers, and Funeral Directors	3	286	342	19.6%	141
39-5011	Barbers	3	132	133	0.8%	42
39-5012	Hairdressers, Hairstylists, and Cosmetologists	3	4,653	5,104	9.7%	1,767
39-5092	Manicurists and Pedicurists	2	637	676	6.1%	104
39-5093	Shampooers	2	272	258	-5.1%	33
39-5094	Skincare Specialists	3	217	195	-10.1%	1
39-6011	Baggage Porters and Bellhops	2	255	261	2.4%	103
39-6012	Concierges	3	128	158	23.4%	63
39-7011	Tour Guides and Escorts	3	371	399	7.5%	226
39-7012	Travel Guides	3	12	10	-16.7%	6
39-9011	Childcare Workers	3	3,718	3,402	-8.5%	795
39-9021	Personal Care Aides	2	10,684	16,420	53.7%	7,162
39-9031	Fitness Trainers and Aerobics Instructors	3	1,924	2,222	15.5%	635
39-9032	Recreation Workers	4	2,088	2,605	24.8%	767
39-9041	Residential Advisors	3	1,312	1,637	24.8%	984
39-9099	Personal Care and Service Workers, All Other	3	228	206	-9.6%	42
41-1011	First-Line Supervisors of Retail Sales Workers	2	8,018	8,046	0.3%	1,834
41-1012	First-Line Supervisors of Non-Retail Sales Workers	4	1,720	1,577	-8.3%	114
41-2011	Cashiers	1	27,101	24,411	-9.9%	10,054
41-2012	Gaming Change Persons and Booth Cashiers	2	25	20	-20.0%	17
41-2021	Counter and Rental Clerks	1	2,799	2,937	4.9%	963
41-2022	Parts Salespersons	2	1,819	2,057	13.1%	782
41-2031	Retail Salespersons	2	37,404	39,449	5.5%	15,624

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
41-3011	Advertising Sales Agents	3	1,073	1,036	-3.4%	402
41-3021	Insurance Sales Agents	4	3,053	3,193	4.6%	1,066
41-3031	Securities, Commodities, and Financial Services Sales Agents	4	2,364	2,407	1.8%	703
41-3041	Travel Agents	3	338	279	-17.5%	117
41-3099	Sales Representatives, Services, All Other	4	6,105	7,630	25.0%	3,276
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	4	1,933	1,759	-9.0%	255
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	4	11,426	10,544	-7.7%	1,772
41-9011	Demonstrators and Product Promoters	2	330	317	-3.9%	87
41-9012	Models	1	26	30	15.4%	12
41-9021	Real Estate Brokers	4	209	176	-15.8%	9
41-9022	Real Estate Sales Agents	3	1,492	1,579	5.8%	337
41-9031	Sales Engineers	4	617	645	4.5%	161
41-9041	Telemarketers	2	1,664	1,170	-29.7%	302
41-9091	Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	2	16	14	-12.5%	1
41-9099	Sales and Related Workers, All Other	3	390	334	-14.4%	13
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3	11,290	11,354	0.6%	2,768
43-2011	Switchboard Operators, Including Answering Service	2	1,109	854	-23.0%	138
43-2021	Telephone Operators	2	66	38	-42.4%	0
43-3011	Bill and Account Collectors	2	2,749	2,383	-13.3%	561
43-3021	Billing and Posting Clerks	2	5,456	5,790	6.1%	1,437
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3	12,756	13,562	6.3%	2,067
43-3041	Gaming Cage Workers	2	65	72	10.8%	40
43-3051	Payroll and Timekeeping Clerks	2	1,504	1,450	-3.6%	308
43-3061	Procurement Clerks	3	483	430	-11.0%	135
43-3071	Tellers	2	7,584	6,205	-18.2%	3,069
43-3099	Financial Clerks, All Other	2	325	355	9.2%	143
43-4011	Brokerage Clerks	3	482	444	-7.9%	146
43-4021	Correspondence Clerks	2	135	137	1.5%	47
43-4031	Court, Municipal, and License Clerks	3	352	352	0.0%	60
43-4041	Credit Authorizers, Checkers, and Clerks	3	306	215	-29.7%	0
43-4051	Customer Service Representatives	2	21,647	23,352	7.9%	8,246
43-4061	Eligibility Interviewers, Government Programs	3	1,263	1,160	-8.2%	171
43-4071	File Clerks	2	1,130	908	-19.6%	109

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-4081	Hotel, Motel, and Resort Desk Clerks	2	1,238	1,236	-0.2%	749
43-4111	Interviewers, Except Eligibility and Loan	2	1,808	1,958	8.3%	547
43-4121	Library Assistants, Clerical	2	974	1,056	8.4%	531
43-4131	Loan Interviewers and Clerks	3	1,773	1,928	8.7%	414
43-4141	New Accounts Clerks	2	354	351	-0.8%	136
43-4151	Order Clerks	2	1,994	1,909	-4.3%	627
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	3	1,286	1,116	-13.2%	215
43-4171	Receptionists and Information Clerks	2	8,070	7,718	-4.4%	1,881
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	2	475	426	-10.3%	92
43-4199	Information and Record Clerks, All Other	2	648	497	-23.3%	40
43-5011	Cargo and Freight Agents	2	283	246	-13.1%	63
43-5021	Couriers and Messengers	2	614	513	-16.4%	42
43-5031	Police, Fire, and Ambulance Dispatchers	2	532	528	-0.8%	165
43-5032	Dispatchers, Except Police, Fire, and Ambulance	2	1,280	1,454	13.6%	575
43-5041	Meter Readers, Utilities	2	345	300	-13.0%	97
43-5051	Postal Service Clerks	2	737	483	-34.5%	67
43-5052	Postal Service Mail Carriers	2	2,912	1,987	-31.8%	753
43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	2	1,354	730	-46.1%	15
43-5061	Production, Planning, and Expediting Clerks	3	2,429	2,500	2.9%	754
43-5071	Shipping, Receiving, and Traffic Clerks	2	4,187	3,969	-5.2%	1,031
43-5081	Stock Clerks and Order Fillers	2	13,679	12,850	-6.1%	3,950
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	2	397	443	11.6%	148
43-6011	Executive Secretaries and Executive Administrative Assistants	3	4,568	4,185	-8.4%	355
43-6012	Legal Secretaries	3	2,566	2,970	15.7%	917
43-6013	Medical Secretaries	3	4,582	5,864	28.0%	1,817
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	3	20,633	22,855	10.8%	4,903
43-9011	Computer Operators	3	609	537	-11.8%	90
43-9021	Data Entry Keyers	2	2,019	1,650	-18.3%	336
43-9022	Word Processors and Typists	2	1,110	780	-29.7%	9
43-9031	Desktop Publishers	3	144	142	-1.4%	39
43-9041	Insurance Claims and Policy Processing Clerks	3	2,315	2,442	5.5%	881
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	2	1,154	933	-19.2%	224
43-9061	Office Clerks, General	2	24,491	23,073	-5.8%	4,222

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43-9071	Office Machine Operators, Except Computer	2	585	432	-26.2%	80
43-9081	Proofreaders and Copy Markers	4	90	78	-13.3%	14
43-9111	Statistical Assistants	4	115	126	9.6%	45
43-9199	Office and Administrative Support Workers, All Other	3	1,030	1,241	20.5%	510
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	3	32	30	-6.3%	7
45-2011	Agricultural Inspectors	2	52	45	-13.5%	14
45-2041	Graders and Sorters, Agricultural Products	1	37	43	16.2%	15
45-2091	Agricultural Equipment Operators	2	27	31	14.8%	14
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1	156	129	-17.3%	37
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	1	95	89	-6.3%	33
45-2099	Agricultural Workers, All Other	1	2	2	0.0%	0
45-4011	Forest and Conservation Workers	3	25	26	4.0%	5
45-4021	Fallers	1	5	3	-40.0%	0
45-4022	Logging Equipment Operators	1	45	46	2.2%	20
45-4023	Log Graders and Scalers	3	18	21	16.7%	6
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	3	3,827	4,476	17.0%	1,118
47-2011	Boilermakers	3	132	161	22.0%	99
47-2021	Brickmasons and Blockmasons	2	539	623	15.6%	140
47-2022	Stonemasons	3	74	66	-10.8%	0
47-2031	Carpenters	2	6,691	7,631	14.0%	1,925
47-2041	Carpet Installers	2	372	436	17.2%	157
47-2042	Floor Layers, Except Carpet, Wood, and Hard Tiles	2	91	78	-14.3%	8
47-2044	Tile and Marble Setters	2	168	205	22.0%	66
47-2051	Cement Masons and Concrete Finishers	2	995	1,103	10.9%	227
47-2053	Terrazzo Workers and Finishers	2	19	16	-15.8%	0
47-2061	Construction Laborers	2	6,574	8,339	26.8%	3,356
47-2071	Paving, Surfacing, and Tamping Equipment Operators	2	454	513	13.0%	154
47-2072	Pile-Driver Operators	2	10	10	0.0%	2
47-2073	Operating Engineers and Other Construction Equipment Operators	2	3,766	4,045	7.4%	1,369
47-2081	Drywall and Ceiling Tile Installers	2	356	310	-12.9%	27
47-2082	Tapers	2	108	117	8.3%	27
47-2111	Electricians	3	4,095	4,816	17.6%	1,836
47-2121	Glaziers	2	266	291	9.4%	112

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-2131	Insulation Workers, Floor, Ceiling, and Wall	2	131	150	14.5%	45
47-2132	Insulation Workers, Mechanical	2	80	122	52.5%	53
47-2141	Painters, Construction and Maintenance	2	1,143	1,206	5.5%	303
47-2142	Paperhangers	2	32	28	-12.5%	1
47-2151	Pipelayers	2	248	241	-2.8%	56
47-2152	Plumbers, Pipefitters, and Steamfitters	3	3,048	3,186	4.5%	694
47-2161	Plasterers and Stucco Masons	1	83	93	12.0%	11
47-2171	Reinforcing Iron and Rebar Workers	2	56	57	1.8%	11
47-2181	Roofers	2	753	703	-6.6%	241
47-2211	Sheet Metal Workers	2	811	802	-1.1%	165
47-2221	Structural Iron and Steel Workers	2	332	344	3.6%	139
47-3011	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	2	183	165	-9.8%	5
47-3012	Helpers--Carpenters	2	194	243	25.3%	75
47-3013	Helpers--Electricians	2	281	377	34.2%	150
47-3014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	1	40	36	-10.0%	4
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	2	221	208	-5.9%	21
47-3016	Helpers--Roofers	2	70	90	28.6%	36
47-3019	Helpers, Construction Trades, All Other	2	60	63	5.0%	8
47-4011	Construction and Building Inspectors	3	1,481	1,847	24.7%	774
47-4021	Elevator Installers and Repairers	3	74	65	-12.2%	16
47-4031	Fence Erectors	2	153	160	4.6%	50
47-4041	Hazardous Materials Removal Workers	3	338	372	10.1%	154
47-4051	Highway Maintenance Workers	2	1,727	1,712	-0.9%	319
47-4061	Rail-Track Laying and Maintenance Equipment Operators	2	186	223	19.9%	74
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	1	229	237	3.5%	81
47-4099	Construction and Related Workers, All Other	3	77	68	-11.7%	2
47-5011	Derrick Operators, Oil and Gas	1	179	170	-5.0%	90
47-5012	Rotary Drill Operators, Oil and Gas	2	712	770	8.1%	585
47-5013	Service Unit Operators, Oil, Gas, and Mining	2	384	407	6.0%	270
47-5021	Earth Drillers, Except Oil and Gas	2	231	251	8.7%	123
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	2	26	28	7.7%	9
47-5041	Continuous Mining Machine Operators	1	196	174	-11.2%	69
47-5042	Mine Cutting and Channeling Machine Operators	2	158	126	-20.3%	33
47-5049	Mining Machine Operators, All Other	2	53	58	9.4%	21
47-5051	Rock Splitters, Quarry	1	73	73	0.0%	28

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-5061	Roof Bolters, Mining	2	231	203	-12.1%	88
47-5071	Roustabouts, Oil and Gas	1	538	630	17.1%	344
47-5081	Helpers--Extraction Workers	2	455	469	3.1%	243
47-5099	Extraction Workers, All Other	2	58	48	-17.2%	6
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	3	2,924	3,226	10.3%	1,134
49-2011	Computer, Automated Teller, and Office Machine Repairers	3	887	957	7.9%	350
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	3	45	37	-17.8%	1
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	3	1,067	1,042	-2.3%	248
49-2091	Avionics Technicians	3	67	77	14.9%	32
49-2092	Electric Motor, Power Tool, and Related Repairers	3	147	145	-1.4%	40
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	3	26	25	-3.8%	5
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	3	632	540	-14.6%	86
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	3	165	182	10.3%	64
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	3	27	30	11.1%	9
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	3	119	94	-21.0%	33
49-2098	Security and Fire Alarm Systems Installers	3	661	617	-6.7%	119
49-3011	Aircraft Mechanics and Service Technicians	3	558	471	-15.6%	150
49-3021	Automotive Body and Related Repairers	2	1,263	1,463	15.8%	531
49-3022	Automotive Glass Installers and Repairers	2	170	191	12.4%	76
49-3023	Automotive Service Technicians and Mechanics	3	6,336	6,877	8.5%	2,383
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	3	2,062	2,506	21.5%	968
49-3041	Farm Equipment Mechanics and Service Technicians	3	118	98	-16.9%	25
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	3	757	800	5.7%	304
49-3043	Rail Car Repairers	2	184	199	8.2%	93
49-3051	Motorboat Mechanics and Service Technicians	3	37	20	-45.9%	3
49-3052	Motorcycle Mechanics	3	134	166	23.9%	80
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	2	214	235	9.8%	77
49-3091	Bicycle Repairers	2	84	69	-17.9%	24
49-3092	Recreational Vehicle Service Technicians	2	46	41	-10.9%	14
49-3093	Tire Repairers and Changers	2	492	436	-11.4%	140
49-9011	Mechanical Door Repairers	2	107	101	-5.6%	35

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	3	234	278	18.8%	130
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3	2,173	2,495	14.8%	986
49-9031	Home Appliance Repairers	3	290	288	-0.7%	125
49-9041	Industrial Machinery Mechanics	3	2,561	2,793	9.1%	1,068
49-9043	Maintenance Workers, Machinery	3	804	866	7.7%	206
49-9044	Millwrights	3	258	331	28.3%	137
49-9045	Refractory Materials Repairers, Except Brickmasons	2	53	46	-13.2%	15
49-9051	Electrical Power-Line Installers and Repairers	3	658	755	14.7%	380
49-9052	Telecommunications Line Installers and Repairers	2	1,477	1,466	-0.7%	578
49-9062	Medical Equipment Repairers	3	541	694	28.3%	342
49-9063	Musical Instrument Repairers and Tuners	3	92	90	-2.2%	35
49-9064	Watch Repairers	3	14	13	-7.1%	3
49-9069	Precision Instrument and Equipment Repairers, All Other	3	50	40	-20.0%	6
49-9071	Maintenance and Repair Workers, General	3	11,206	11,392	1.7%	2,655
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	2	337	317	-5.9%	73
49-9092	Commercial Divers	3	62	62	0.0%	25
49-9094	Locksmiths and Safe Repairers	2	80	68	-15.0%	13
49-9095	Manufactured Building and Mobile Home Installers	2	33	40	21.2%	22
49-9096	Riggers	2	61	77	26.2%	32
49-9098	Helpers--Installation, Maintenance, and Repair Workers	2	803	830	3.4%	282
49-9099	Installation, Maintenance, and Repair Workers, All Other	2	524	647	23.5%	205
51-1011	First-Line Supervisors of Production and Operating Workers	2	4,121	4,184	1.5%	892
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	59	52	-11.9%	12
51-2021	Coil Winders, Tapers, and Finishers	2	123	115	-6.5%	19
51-2022	Electrical and Electronic Equipment Assemblers	2	1,764	1,586	-10.1%	246
51-2023	Electromechanical Equipment Assemblers	2	588	473	-19.6%	33
51-2031	Engine and Other Machine Assemblers	2	312	272	-12.8%	77
51-2041	Structural Metal Fabricators and Fitters	3	784	814	3.8%	417
51-2091	Fiberglass Laminators and Fabricators	2	40	41	2.5%	14
51-2092	Team Assemblers	2	4,762	4,605	-3.3%	948
51-2099	Assemblers and Fabricators, All Other	2	760	950	25.0%	329
51-3011	Bakers	2	1,523	1,431	-6.0%	393
51-3021	Butchers and Meat Cutters	2	865	703	-18.7%	93

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	1	209	170	-18.7%	22
51-3023	Slaughterers and Meat Packers	1	104	107	2.9%	42
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	2	50	54	8.0%	22
51-3092	Food Batchmakers	2	693	713	2.9%	312
51-3093	Food Cooking Machine Operators and Tenders	2	207	228	10.1%	89
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3	1,413	1,751	23.9%	830
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	3	170	158	-7.1%	42
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	2	652	627	-3.8%	210
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	2	261	238	-8.8%	70
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	2	627	514	-18.0%	92
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	1,349	1,284	-4.8%	196
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	228	149	-34.6%	12
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	899	921	2.4%	371
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	470	443	-5.7%	143
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	3	250	247	-1.2%	85
51-4041	Machinists	3	3,605	3,841	6.5%	1,297
51-4051	Metal-Refining Furnace Operators and Tenders	2	335	292	-12.8%	58
51-4052	Pourers and Casters, Metal	2	263	265	0.8%	104
51-4061	Model Makers, Metal and Plastic	3	63	49	-22.2%	2
51-4062	Patternmakers, Metal and Plastic	3	62	71	14.5%	34
51-4071	Foundry Mold and Coremakers	2	131	117	-10.7%	26
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2	773	711	-8.0%	134
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	1,059	1,125	6.2%	440
51-4111	Tool and Die Makers	3	751	762	1.5%	151
51-4121	Welders, Cutters, Solderers, and Brazers	3	3,017	3,517	16.6%	1,482
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	2	332	333	0.3%	131
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	2	241	201	-16.6%	34
51-4192	Layout Workers, Metal and Plastic	2	31	30	-3.2%	7

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	2	283	276	-2.5%	91
51-4194	Tool Grinders, Filers, and Sharpeners	2	105	85	-19.0%	11
51-4199	Metal Workers and Plastic Workers, All Other	2	190	211	11.1%	63
51-5111	Prepress Technicians and Workers	3	248	148	-40.3%	12
51-5112	Printing Press Operators	3	1,238	976	-21.2%	143
51-5113	Print Binding and Finishing Workers	2	389	319	-18.0%	66
51-6011	Laundry and Dry-Cleaning Workers	1	1,505	1,569	4.3%	602
51-6021	Pressers, Textile, Garment, and Related Materials	1	277	274	-1.1%	58
51-6031	Sewing Machine Operators	1	514	526	2.3%	257
51-6041	Shoe and Leather Workers and Repairers	2	3	4	33.3%	3
51-6042	Shoe Machine Operators and Tenders	2	184	151	-17.9%	161
51-6051	Sewers, Hand	2	477	556	16.6%	130
51-6052	Tailors, Dressmakers, and Custom Sewers	3	183	212	15.8%	76
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders	2	12	12	0.0%	10
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	2	133	142	6.8%	89
51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	2	71	63	-11.3%	43
51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2	26	16	-38.5%	6
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	2	47	35	-25.5%	6
51-6092	Fabric and Apparel Patternmakers	3	15	17	13.3%	4
51-6093	Upholsterers	2	120	132	10.0%	73
51-6099	Textile, Apparel, and Furnishings Workers, All Other	2	36	39	8.3%	9
51-7011	Cabinetmakers and Bench Carpenters	2	331	349	5.4%	156
51-7021	Furniture Finishers	1	78	95	21.8%	62
51-7031	Model Makers, Wood	3	8	9	12.5%	2
51-7032	Patternmakers, Wood	3	16	20	25.0%	7
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	2	347	552	59.1%	362
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	2	384	552	43.8%	256
51-7099	Woodworkers, All Other	2	6	6	0.0%	0
51-8011	Nuclear Power Reactor Operators	3	60	65	8.3%	29
51-8012	Power Distributors and Dispatchers	3	128	140	9.4%	62
51-8013	Power Plant Operators	2	360	339	-5.8%	148
51-8021	Stationary Engineers and Boiler Operators	3	1,099	1,271	15.7%	647

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-8031	Water and Wastewater Treatment Plant and System Operators	3	1,352	1,434	6.1%	652
51-8091	Chemical Plant and System Operators	2	209	192	-8.1%	111
51-8092	Gas Plant Operators	3	316	355	12.3%	213
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	2	358	412	15.1%	244
51-8099	Plant and System Operators, All Other	2	89	85	-4.5%	35
51-9011	Chemical Equipment Operators and Tenders	2	472	476	0.8%	258
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	2	229	249	8.7%	125
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	2	223	226	1.3%	94
51-9022	Grinding and Polishing Workers, Hand	1	156	158	1.3%	60
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2	820	871	6.2%	370
51-9031	Cutters and Trimmers, Hand	2	33	28	-15.2%	4
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	2	291	226	-22.3%	20
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	2	485	469	-3.3%	176
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	2	169	136	-19.5%	39
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2	3,033	3,038	0.2%	792
51-9071	Jewelers and Precious Stone and Metal Workers	3	91	70	-23.1%	4
51-9081	Dental Laboratory Technicians	2	190	202	6.3%	115
51-9082	Medical Appliance Technicians	3	174	138	-20.7%	51
51-9083	Ophthalmic Laboratory Technicians	2	232	212	-8.6%	83
51-9111	Packaging and Filling Machine Operators and Tenders	2	2,027	1,995	-1.6%	588
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	2	568	692	21.8%	273
51-9122	Painters, Transportation Equipment	2	350	353	0.9%	106
51-9123	Painting, Coating, and Decorating Workers	2	113	108	-4.4%	27
51-9141	Semiconductor Processors	2	58	52	-10.3%	21
51-9151	Photographic Process Workers and Processing Machine Operators	2	218	158	-27.5%	26
51-9191	Adhesive Bonding Machine Operators and Tenders	2	40	38	-5.0%	11
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	2	76	86	13.2%	32
51-9193	Cooling and Freezing Equipment Operators and Tenders	2	58	56	-3.4%	19
51-9194	Etchers and Engravers	2	60	63	5.0%	23

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	2	371	369	-0.5%	167
51-9196	Paper Goods Machine Setters, Operators, and Tenders	2	733	716	-2.3%	154
51-9197	Tire Builders	2	61	56	-8.2%	20
51-9198	Helpers--Production Workers	2	3,150	3,160	0.3%	815
51-9199	Production Workers, All Other	2	443	467	5.4%	136
53-1011	Aircraft Cargo Handling Supervisors	2	50	53	6.0%	16
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	2	1,107	1,225	10.7%	466
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	2	1,418	1,581	11.5%	586
53-2012	Commercial Pilots	3	354	421	18.9%	204
53-2021	Air Traffic Controllers	3	63	60	-4.8%	29
53-2022	Airfield Operations Specialists	3	62	58	-6.5%	30
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	2	471	612	29.9%	242
53-3021	Bus Drivers, Transit and Intercity	2	2,340	2,556	9.2%	867
53-3022	Bus Drivers, School or Special Client	2	6,158	6,750	9.6%	2,148
53-3031	Driver/Sales Workers	2	3,222	3,381	4.9%	775
53-3032	Heavy and Tractor-Trailer Truck Drivers	2	11,266	13,151	16.7%	4,256
53-3033	Light Truck or Delivery Services Drivers	2	6,673	6,488	-2.8%	1,082
53-3041	Taxi Drivers and Chauffeurs	1	1,515	1,635	7.9%	426
53-3099	Motor Vehicle Operators, All Other	2	169	204	20.7%	79
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	2	75	67	-10.7%	15
53-5011	Sailors and Marine Oilers	2	200	174	-13.0%	102
53-5021	Captains, Mates, and Pilots of Water Vessels	3	82	71	-13.4%	40
53-6011	Bridge and Lock Tenders	1	18	14	-22.2%	5
53-6021	Parking Lot Attendants	2	1,122	1,436	28.0%	968
53-6031	Automotive and Watercraft Service Attendants	1	461	512	11.1%	199
53-6041	Traffic Technicians	3	9	10	11.1%	4
53-6051	Transportation Inspectors	3	80	73	-8.8%	22
53-6061	Transportation Attendants, Except Flight Attendants	2	189	173	-8.5%	32
53-6099	Transportation Workers, All Other	2	40	43	7.5%	21
53-7011	Conveyor Operators and Tenders	2	226	205	-9.3%	62
53-7021	Crane and Tower Operators	3	349	404	15.8%	192
53-7032	Excavating and Loading Machine and Dragline Operators	2	416	402	-3.4%	63
53-7033	Loading Machine Operators, Underground Mining	2	63	57	-9.5%	6
53-7051	Industrial Truck and Tractor Operators	2	3,374	3,823	13.3%	1,556

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
53-7061	Cleaners of Vehicles and Equipment	2	2,129	2,318	8.9%	881
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2	17,014	19,962	17.3%	9,079
53-7063	Machine Feeders and Offbearers	2	602	552	-8.3%	104
53-7064	Packers and Packagers, Hand	2	4,217	4,598	9.0%	1,711
53-7071	Gas Compressor and Gas Pumping Station Operators	2	215	239	11.2%	152
53-7072	Pump Operators, Except Wellhead Pumpers	2	305	316	3.6%	186
53-7073	Wellhead Pumpers	2	317	353	11.4%	273
53-7081	Refuse and Recyclable Material Collectors	2	854	1,022	19.7%	442
53-7111	Mine Shuttle Car Operators	2	105	110	4.8%	54
53-7121	Tank Car, Truck, and Ship Loaders	2	116	106	-8.6%	35
53-7199	Material Moving Workers, All Other	2	34	43	26.5%	19

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

ABOUT THE STATE SYSTEM'S GAP ANALYSIS PROJECT

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

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

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