

PENNSYLVANIA'S STATE SYSTEM OF HIGHER EDUCATION



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

A report for Pennsylvania's
State System of Higher Education

2016



CONTENTS

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

38	7. Demographic and Socio-economic Indicators of California University’s Workforce Region
38	7.1 Demographics of California University’s Workforce Region
40	7.2 Socio-economic Indicators of California University’s Workforce Region
44	8. Next Steps
45	Data Sources
46	Appendix A: Methodology for Identifying State System University Workforce Regions
52	Appendix B: Pennsylvania State and County Enrollment and Employment
54	Appendix C: Industry Projections 2014-2024 for California University Workforce Region
64	Appendix D: Occupation Projections 2014-2024 for California University’s Workforce Region
91	About The State System’s Gap Analysis Project

GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

ACRONYMS USED

ACS: American Community Survey

BLS: Bureau of Labor Statistics

EMSI: Economic Modeling Specialists International

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

IPEDS: Integrated Postsecondary Education Data System

LAUS: Local Area Unemployment Statistics

LEHD: Longitudinal Employment and Housing Dynamics

NCES: National Center for Education Statistics

OES: Occupational Employment Statistics

O*NET: Occupational Network

PUMS: Public Use Microdata Sample

QCEW: Quarterly Census of Employment and Wages

SAIPE: Small Area Income and Poverty Estimates

USDOE: US Department of Education

USDOL: US Department of Labor

1. INTRODUCTION

Pennsylvania’s State System of Higher Education (State System) comprises 14 universities, four branch campuses, multiple regional centers and the McKeever Environmental Learning Center.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.

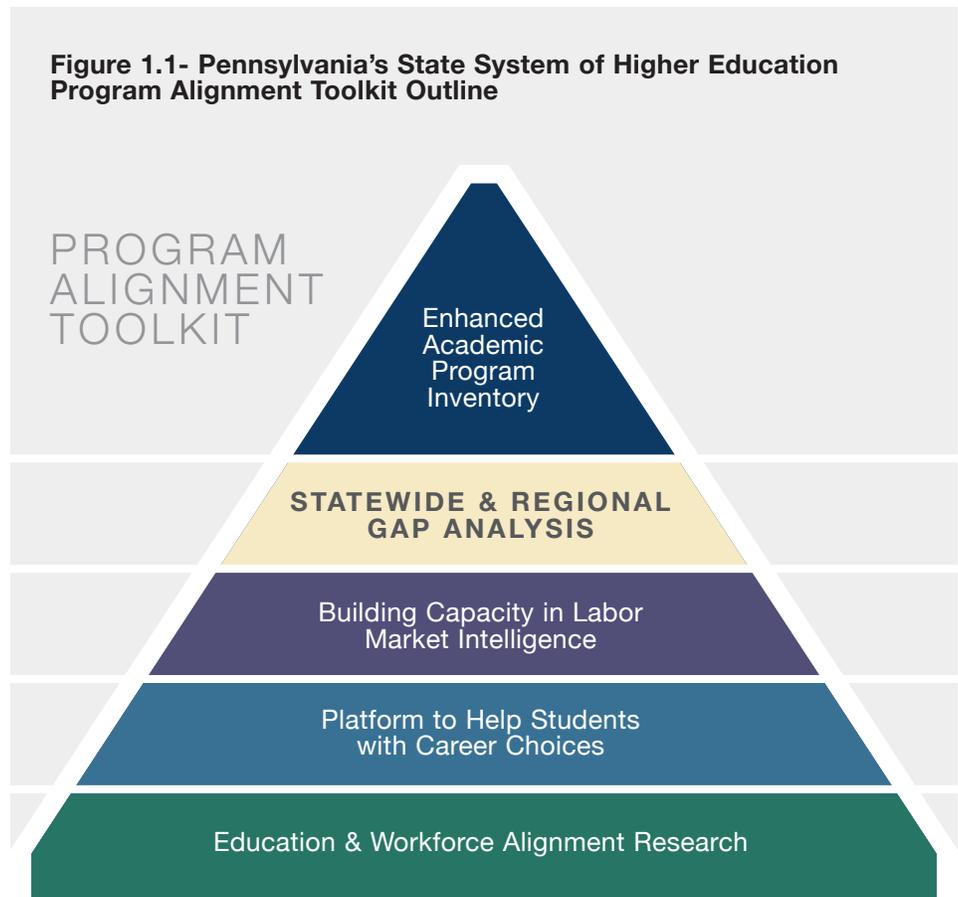
2 Source: The State System’s Economic and Employment Impact on the Commonwealth of Pennsylvania – released April 15, 2015.

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.

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

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

2. PENNSYLVANIA'S STATE SYSTEM LEARNER ORIGIN

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

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

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

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

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

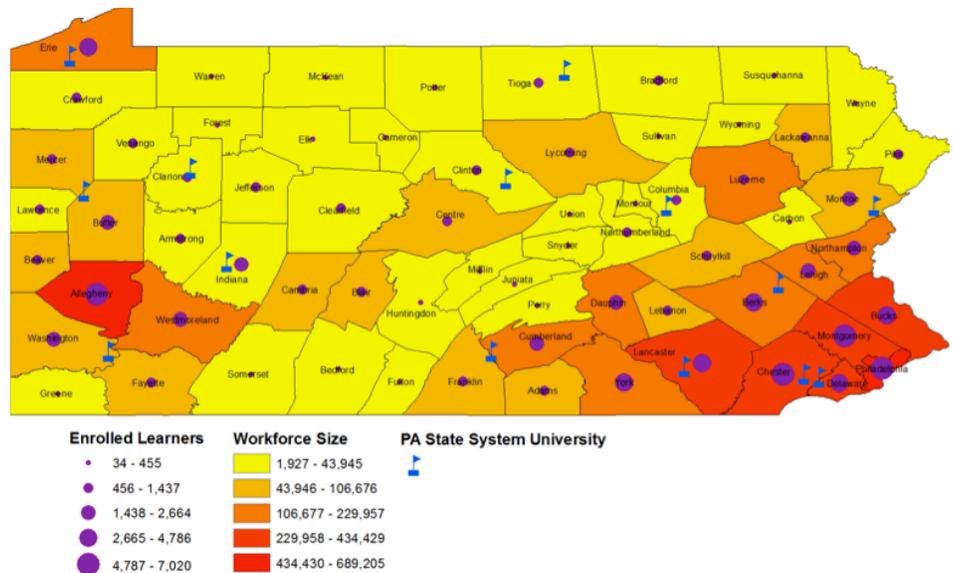
³ Based on Fall 2013 enrollment.

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

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

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

Figure 2.1 – State System Learner Origin and Workforce Size County

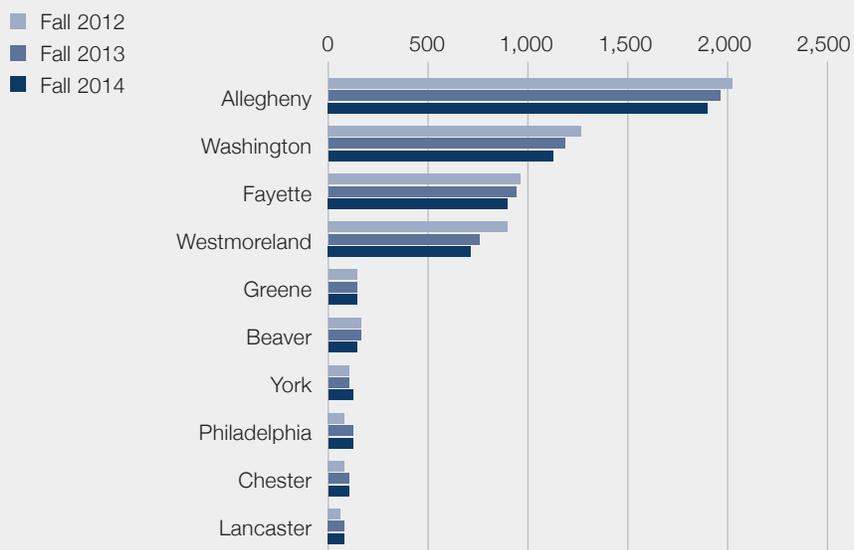


Source: Pennsylvania's State System of Higher Education, Oxford Economics mapping

2.1 California University's Learner Origin

California 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 80% of resident enrollment in California 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 – California University Learner Enrollment by County



Source: Pennsylvania's State System of Higher Education

Table 2.3 California University Learner Enrollment by County

County	Fall 2012	Fall 2013	Fall 2014
Allegheny	2,038	1,960	1,902
Washington	1,261	1,185	1,137
Fayette	969	951	893
Westmoreland	912	767	712
Greene	149	148	145
Beaver	165	159	139
York	108	112	125
Philadelphia	77	114	123
Chester	83	94	107
Lancaster	71	77	86

Source: Pennsylvania's State System of Higher Education

3. SUMMARY OF CALIFORNIA UNIVERSITY WORKFORCE REGION

Located in Washington County, Pennsylvania, California University (Cal U) 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 8,300 learners, of which about 81% are Pennsylvania residents.⁴

The following sections outline the supporting data used to select Cal U’s Pennsylvania workforce region—defined as Washington, Allegheny, Fayette, Westmoreland, and Greene 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 California University’s Workforce Region

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

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

When taken in the context of regional economic activity, about 70% of regional demand for goods and services are produced by businesses located within the region. This indicates that regional business activity is locally contained. Similarly, 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- California 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
Washington, Allegheny	0.78	0.68	0.71	0.92	0.45
Washington, Allegheny, Fayette	0.80	0.73	0.70	0.92	0.58
Washington, Allegheny, Fayette, Westmoreland, Greene	0.86	0.83	0.70	0.91	0.72

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

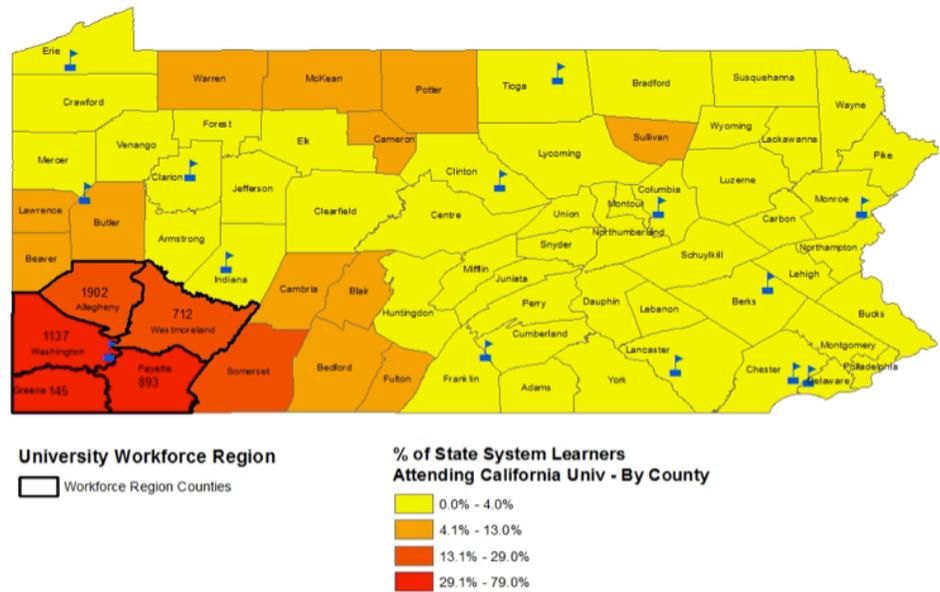
5 Bureau of Labor Statistics: Labor Market Area.

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 Cal U workforce region residents also work in the region (86%). This reflects a very strong centralized connection between workers and economic activity in a region that has nearly 985,000 jobs. Additionally, learners at Cal U originate from nearby surrounding counties. When looking at the percentage of learners attending State System universities, 72% (the capture rate) of State System learners in Cal U's workforce region attend Cal U.

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

Figure 3.1 – California University's 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 CALIFORNIA 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 California 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 California University's workforce region and Pennsylvania.

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

Workforce Characteristic	Cal U Workforce Region	Pennsylvania	Source
Population	2 million	12.7 million	2009-2013 American Community Survey 5-Year Estimates
Employed	985,000	5.6 million	2014 BLS Quarterly Census of Employment and Wages
Unemployed	56,200	370,000	2014 BLS Local Area Unemployment Statistics
Unemployment Rate	5.6%	5.8%	2014 BLS Local Area Unemployment Statistics
Poverty Rate	13.2%	13.7%	2013 Census Small Area Income and Poverty Estimates
Business Establishments	53,200	347,000	2014 BLS Quarterly Census of Employment and Wages
Educational Attainment (25+ Population with Bachelor's or Higher)	30.8%	27.4%	2009-2013 American Community Survey 5-Year Estimates
Bachelor's or Higher Completions	23,700	137,000	Integrated Postsecondary Education Data System 3-Year Average AY2010-11 to AY2012-13
Projected Jobs 2024	1.1 million	6.2 million	Oxford Economics Projections 2024

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

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

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

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

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

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

4.1 Employment Projections

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

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

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

The next section provides an analysis of industries in California 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 CALIFORNIA UNIVERSITY'S WORKFORCE REGION

Over the five years of 2009 to 2014, California University's (Cal U) workforce region experienced job growth in many service-based sectors. Sectors such as education and health care, professional and business services, leisure and hospitality added a combined 28,300 new jobs between 2009 and 2014. Natural resources and mining grew nearly 83%, adding nearly 5,900 jobs during this time. Some job losses occurred within information and government. Overall, the economy added about 25,900 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.

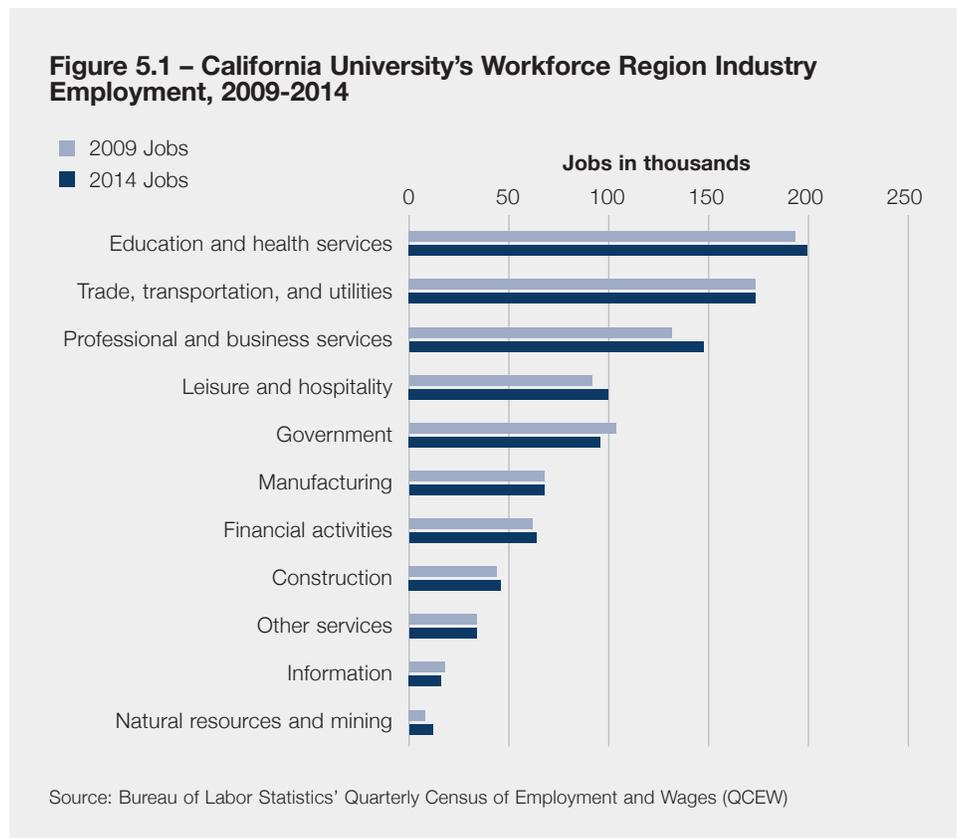


Table 5.1 – California University’s Workforce Region Industry Employment, 2009-2014

Industry Employment	2009 Jobs	2014 Jobs	Absolute Change 09-14	% Change 09-14
Total, all industries	931,304	957,207	25,903	2.8%
Education and health services	194,433	199,982	5,549	2.9%
Trade, transportation, and utilities	174,212	174,227	15	0.0%
Professional and business services	132,248	147,144	14,896	11.3%
Leisure and hospitality	92,947	100,798	7,851	8.4%
Government	104,835	96,872	-7,963	-7.6%
Manufacturing	67,949	67,613	-336	-0.5%
Financial activities	61,813	63,867	2,054	3.3%
Construction	44,022	45,011	989	2.2%
Other services	34,347	33,683	-664	-1.9%
Information	17,388	15,066	-2,322	-13.4%
Natural resources and mining	7,088	12,946	5,858	82.6%

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

5.1 Top Employers in California University’s Workforce Region

Amongst the top employers within Cal U’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 mining establishments.

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

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

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

Establishment Name
Connellsville Area School District
Consol Pennsylvania Coal Company
Cumberland Coal Resources
Emerald Coal Resources
Federal Government
Giant Eagle
GMS Mine Repair & Maintenance
Monongahela Valley Hospital
Monongalia County Coal Company
Nemacolin Woodlands
Pennsylvania State System of Higher Education
PNC Bank
Respironics
State Government
Teletch Services Corporation
The Uniontown Hospital
The Washington Hospital
United Parcel Service
University of Pittsburgh
UPMC Presbyterian Shadyside
Wal-Mart
Washington Trotting Association
Washington County
Westmoreland County
Westmoreland Regional Hospital

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

6. OCCUPATIONS IN CALIFORNIA 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 Cal U'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 California University's Workforce Region

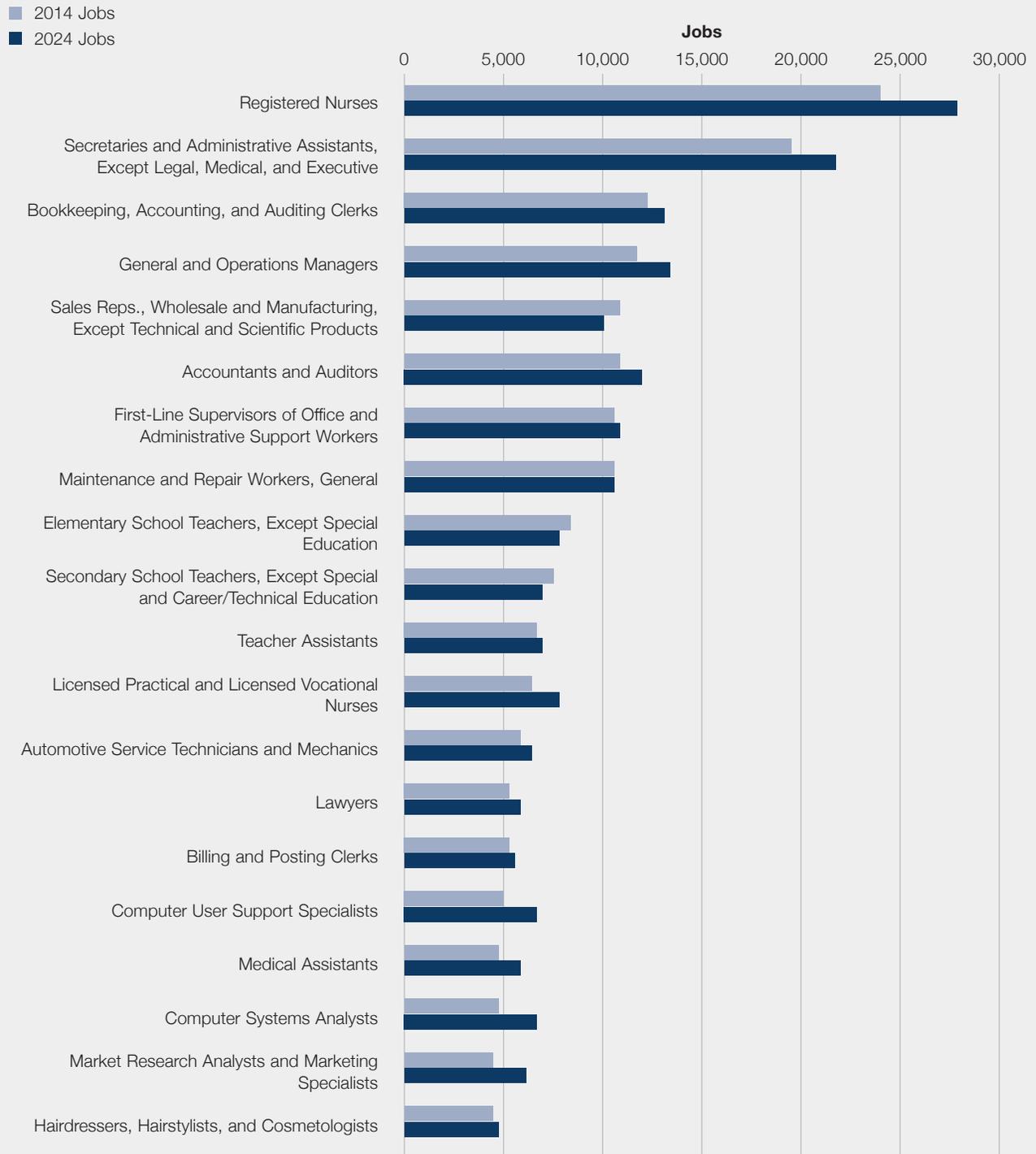
Top skilled occupations in the region are driven by industry composition. Medical centers employ a cadre of health professionals, while enterprise management companies employ a range of business professionals. Given the dominating presence of trade, transportation and utilities; healthcare and education services; and professional and business services establishments in Cal U'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 Cal U’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 Cal U’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	23,838	27,569	8,558
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	19,424	21,607	4,706
43-3031	Bookkeeping, Accounting, and Auditing Clerks	12,175	12,993	2,022
11-1021	General and Operations Managers	11,546	13,299	3,808
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	10,899	9,992	1,624
13-2011	Accountants and Auditors	10,817	11,945	4,729
43-1011	First-Line Supervisors of Office and Administrative Support Workers	10,605	10,710	2,644
49-9071	Maintenance and Repair Workers, General	10,449	10,621	2,474
25-2021	Elementary School Teachers, Except Special Education	8,197	7,832	1,697
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	7,548	6,887	1,910
25-9041	Teacher Assistants	6,716	6,845	1,798
29-2061	Licensed Practical and Licensed Vocational Nurses	6,221	7,756	3,178
49-3023	Automotive Service Technicians and Mechanics	5,738	6,217	2,148
23-1011	Lawyers	5,163	5,906	1,625
43-3021	Billing and Posting Clerks	5,157	5,517	1,403
15-1151	Computer User Support Specialists	4,955	6,608	2,540
31-9092	Medical Assistants	4,786	5,794	1,969
15-1121	Computer Systems Analysts	4,697	6,620	2,754
13-1161	Market Research Analysts and Marketing Specialists	4,528	6,036	2,233
39-5012	Hairdressers, Hairstylists, and Cosmetologists	4,380	4,789	1,648

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 Cal U'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

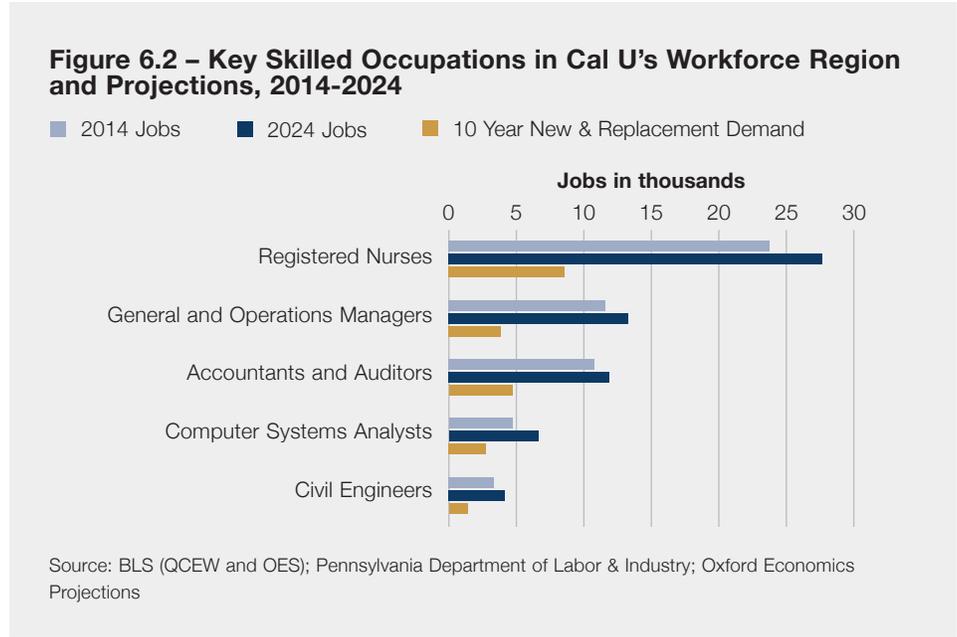


Table 6.2 – Key Skilled Occupations in Cal U’s Workforce Region and Projections, 2014-2024

SOC Code	Occupation Title	2014 Jobs	2024 Jobs	10 Year New & Replacement Demand
29-1141	Registered Nurses	23,838	27,569	8,558
11-1021	General and Operations Managers	11,546	13,299	3,808
13-2011	Accountants and Auditors	10,817	11,945	4,729
15-1121	Computer Systems Analysts	4,697	6,620	2,754
17-2051	Civil Engineers	3,438	4,015	1,514

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 Cal U'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 (1,062 unique postings per month), and accountants and auditors (714 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	1,062	868	1.2
Accountants and Auditors	714	505	1.4
General and Operations Managers	554	624	0.9
Computer Systems Analysts	520	182	2.9
Civil Engineers	209	126	1.7

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)

General and Operations Managers

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

Certifications: Six Sigma, Project Management Professional (PMP)

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)

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

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

6.4 Industry Staffing Patterns for Key Skilled High Demand Occupations in California 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 13,283 registered nurses);
- The percent of the occupation's employment in the region that is employed in the industry (e.g. the 13,283 registered nurses employed in general medical and surgical hospitals represent nearly 56% of the total registered nurse workforce in the region);
- The percent of the industry sector's employment that is made up of the occupation (e.g. the 13,283 registered nurses make up about 27% of employment within general medical and surgical hospitals).

Staffing Patterns for Registered Nurses Employed in Cal U'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	13,283	55.7%	27.2%
Offices of Physicians	2,175	9.1%	9.4%
Home Health Care Services	1,917	8.0%	21.0%
Nursing Care Facilities (Skilled Nursing Facilities)	1,443	6.1%	9.9%
Specialty (except Psychiatric and Substance Abuse) Hospitals	1,115	4.7%	27.6%

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

Staffing Patterns for General and Operations Managers Employed in Cal U'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	944	8.2%	2.7%
Wholesale Electronic Markets and Agents and Brokers	326	2.8%	3.5%
Restaurants and Other Eating Places	295	2.6%	0.5%
Depository Credit Intermediation	283	2.4%	1.2%
Architectural, Engineering, and Related Services	267	2.3%	1.4%

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

Staffing Patterns for Accountants and Auditors Employed in Cal U'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	2,963	27.4%	38.6%
Management of Companies and Enterprises	1,775	16.4%	5.0%
Other Financial Investment Activities	417	3.9%	8.9%
Insurance Carriers	326	3.0%	2.4%
Depository Credit Intermediation	310	2.9%	1.3%

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

Staffing Patterns for Civil Engineers Employed in Cal U'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	2,763	80.4%	14.4%
Nonresidential Building Construction	159	4.6%	2.5%
Executive, Legislative, and Other General Government Support	126	3.7%	0.6%
Employment Services	47	1.4%	0.3%
Highway, Street, and Bridge Construction	45	1.3%	1.3%

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

Staffing Patterns for Computer Systems Analysts Employed in Cal U'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	1,715	36.5%	12.8%
Management of Companies and Enterprises	841	17.9%	2.4%
Insurance Carriers	384	8.2%	2.8%
Wholesale Electronic Markets and Agents and Brokers	256	5.4%	2.7%
Depository Credit Intermediation	216	4.6%	0.9%

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

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

6.5 Key Skilled High Demand Occupational Profiles

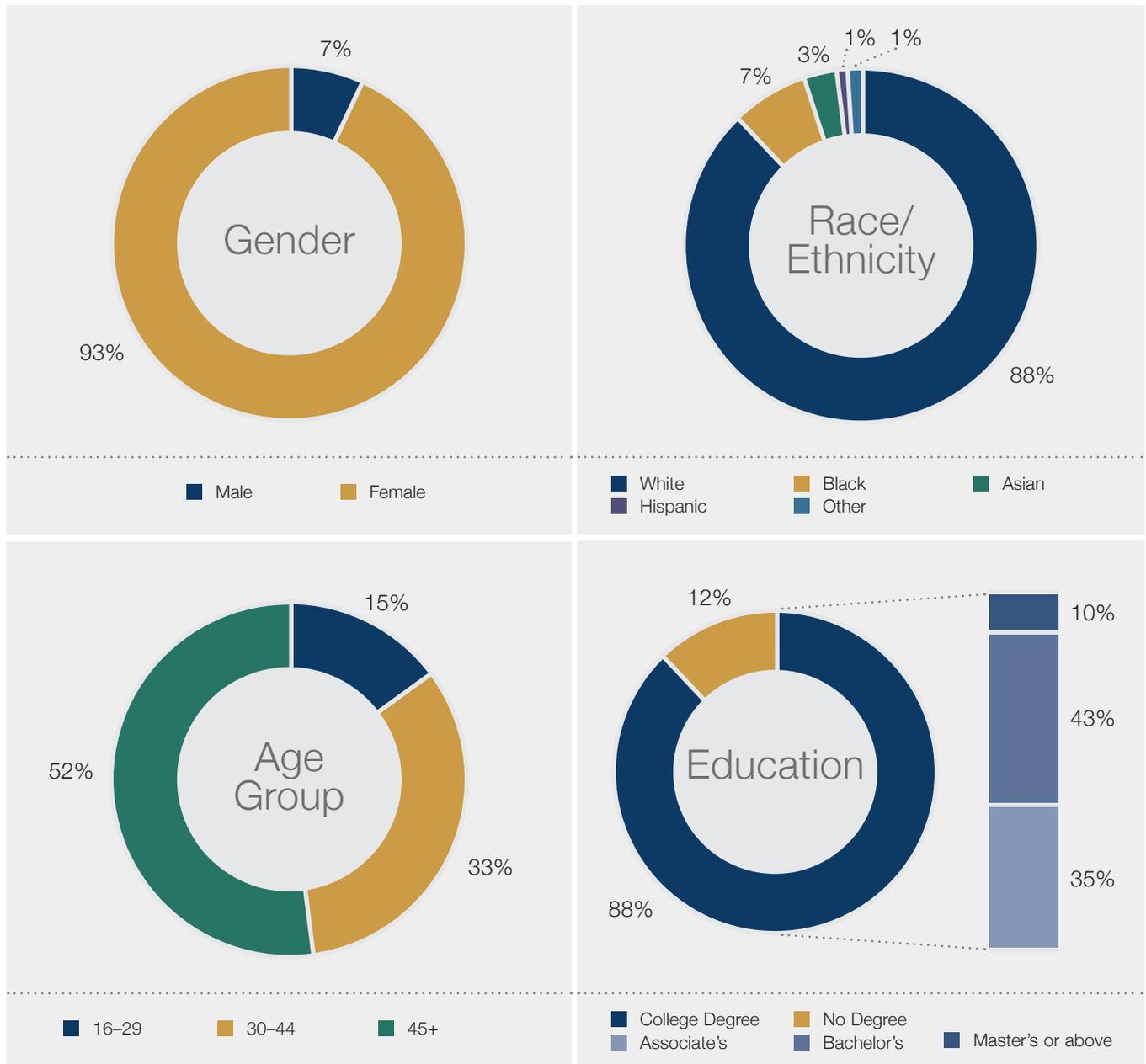
In addition to understanding the industries that employ key skilled high demand occupations, another lens to view key skilled high demand occupations focuses on the characteristics of those employed. The following section outlines the demographics for people from Pennsylvania who work in these key skilled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

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

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

REGISTERED NURSES IN PENNSYLVANIA

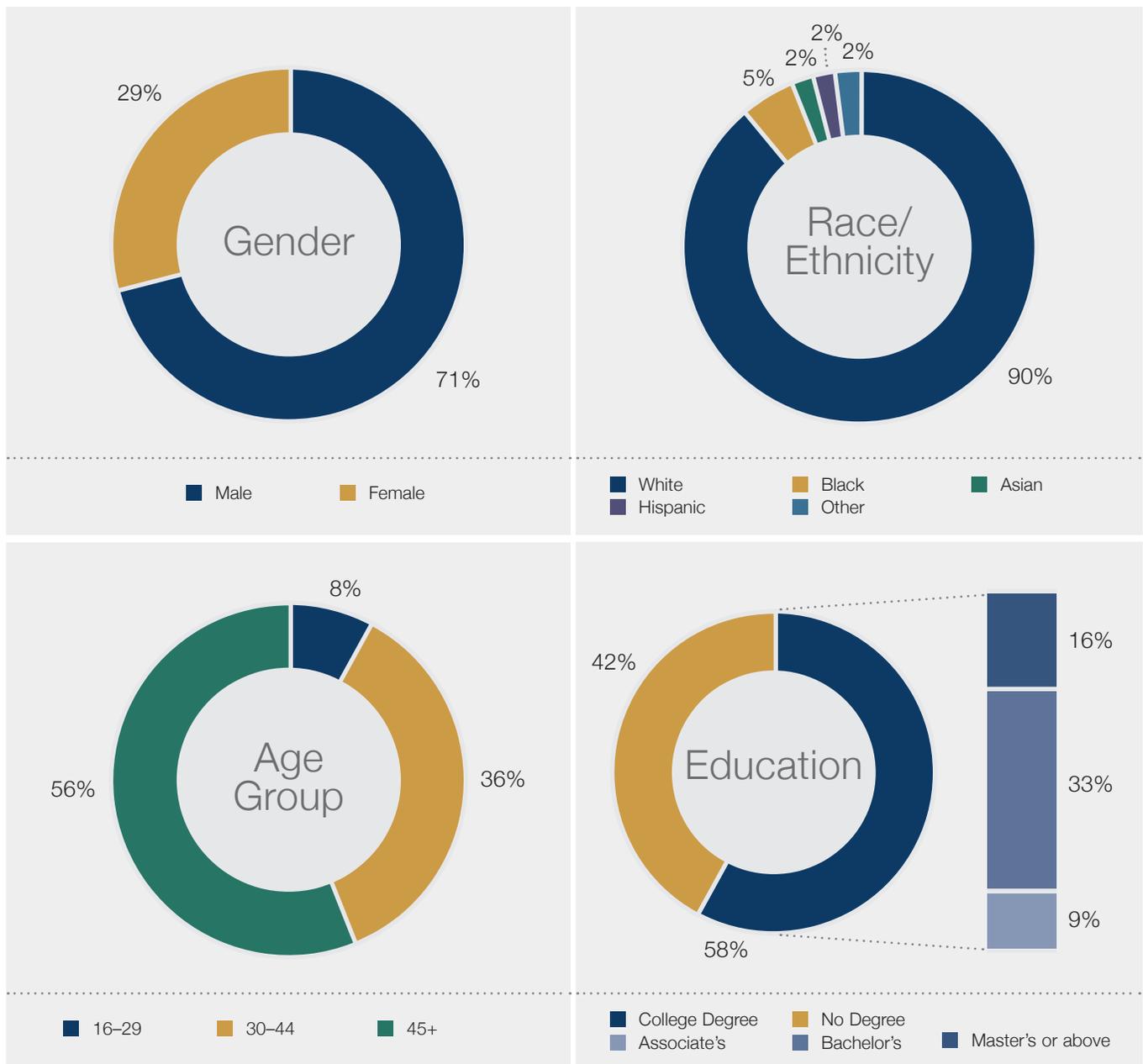
The demographic profile of registered nurses is largely dominated by white females. Age distribution indicates that registered nurses are a more mature cohort of workers (45 years and older), which can put increasing pressure on replacement jobs due to retirements over the next 10 years. Nearly 90% of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



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

GENERAL AND OPERATIONS MANAGERS IN PENNSYLVANIA

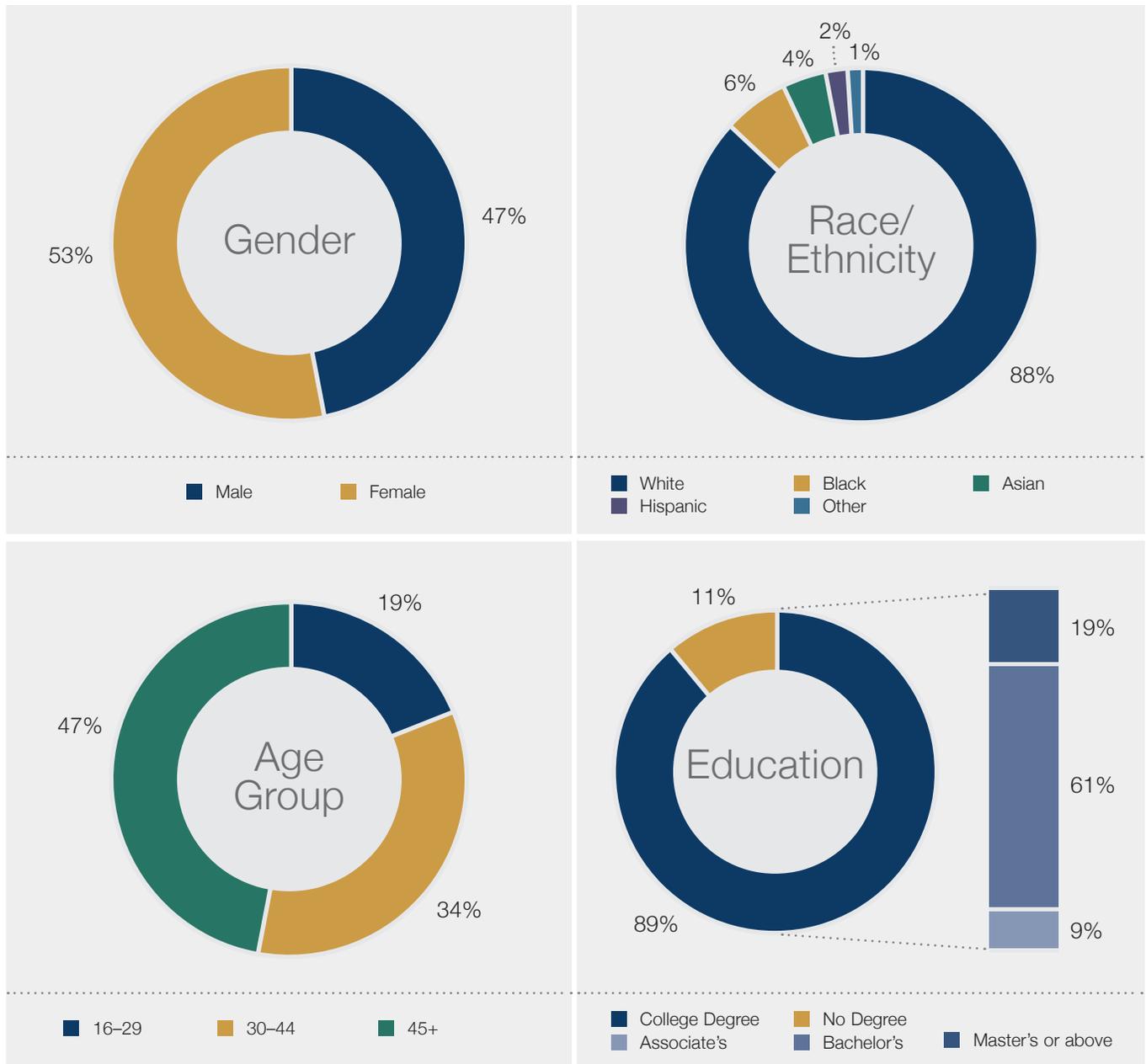
General and operations managers are typically male, though females occupy almost 30% of the employed population. The majority of those in this occupation are white. This occupation is represented by a more mature cohort of workers (45 years and older), though mid-career workers also occupy a significant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



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

ACCOUNTANTS AND AUDITORS IN PENNSYLVANIA

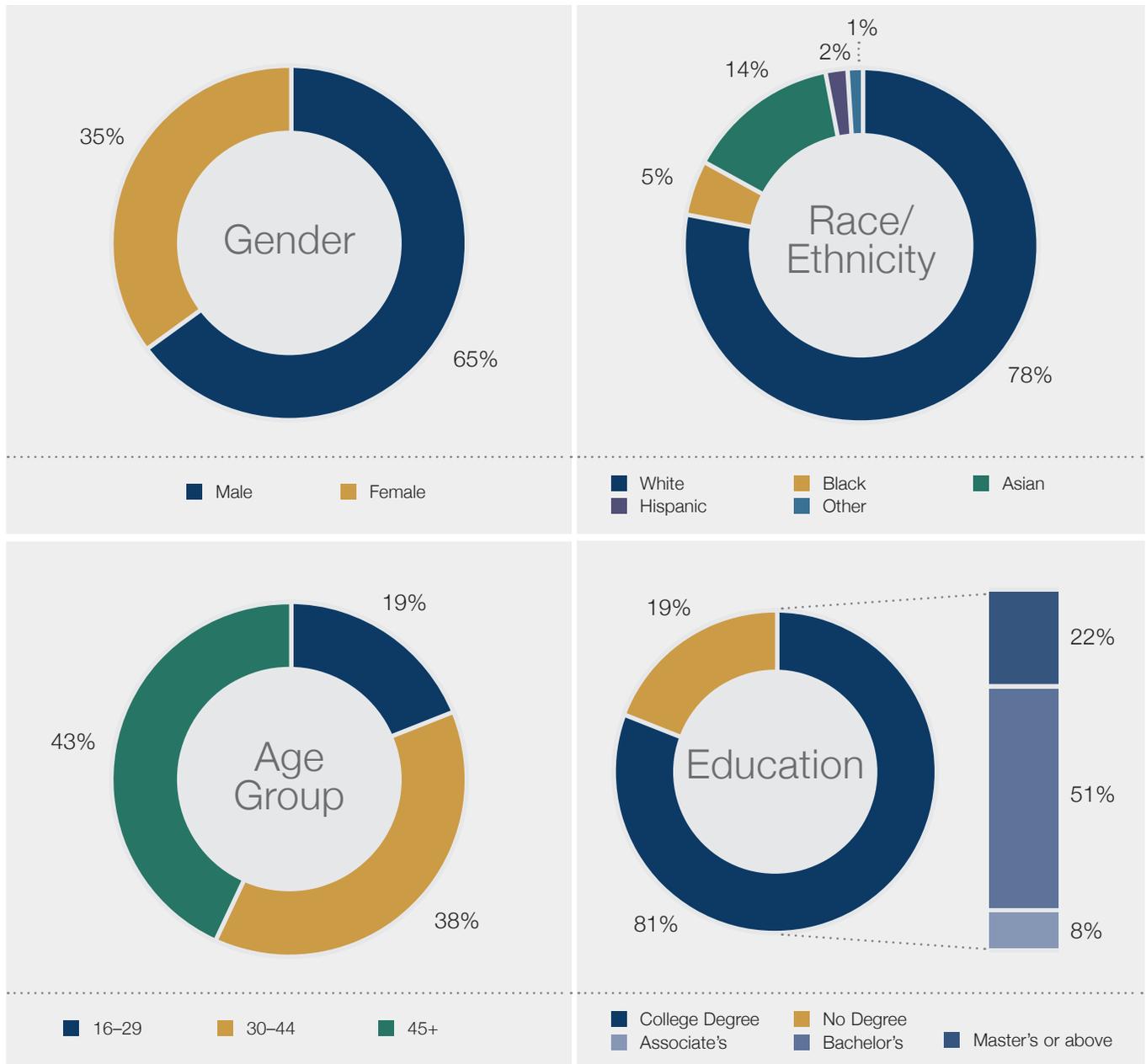
Accountants and auditors are fairly equally split between male and female, though a slightly higher percent of employed accountants and auditors are female. A high proportion of white individuals are found in the occupation. Additionally, the age distribution is fairly even between entry-level and mature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



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

COMPUTER SYSTEMS ANALYSTS IN PENNSYLVANIA

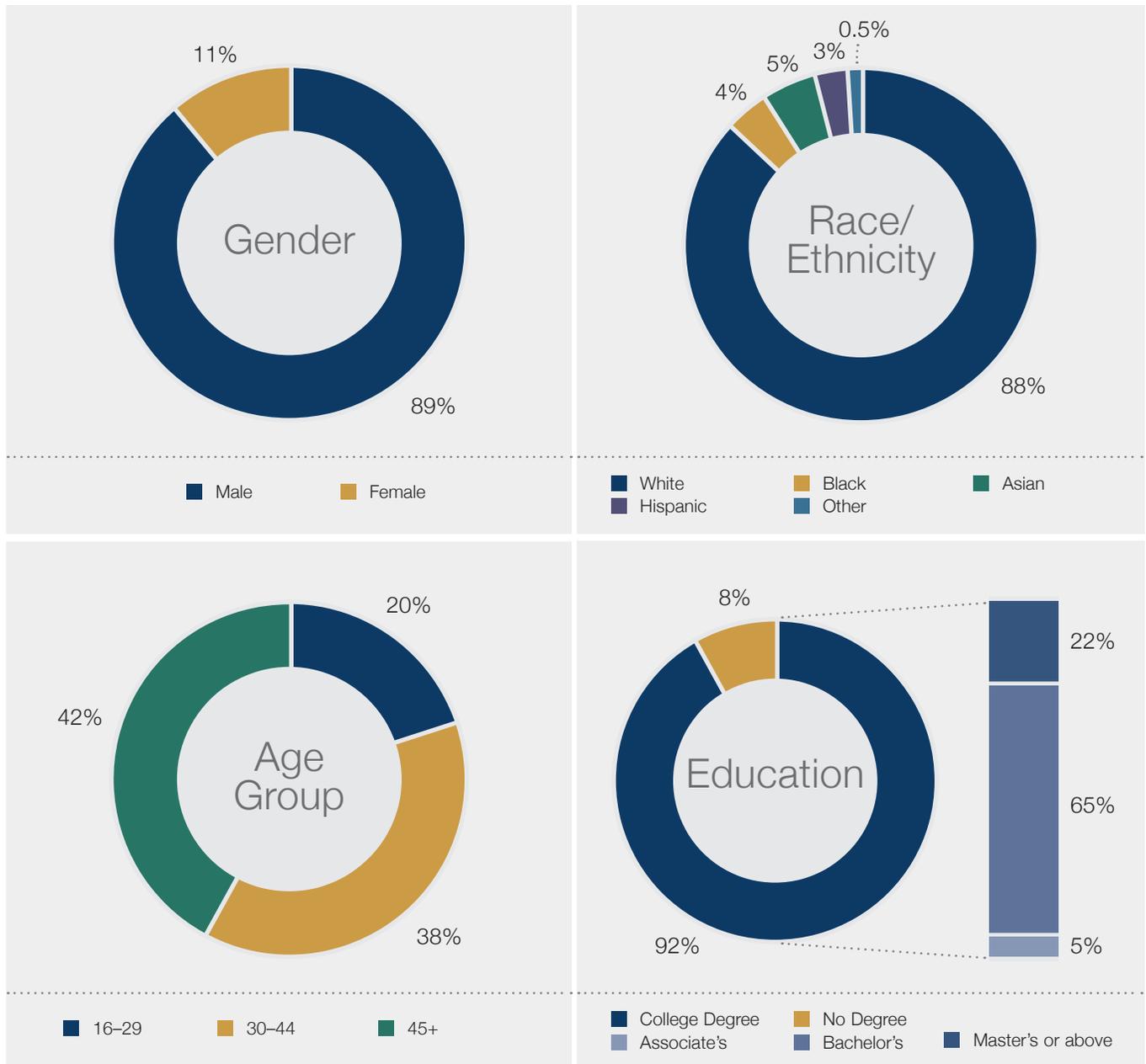
Computer systems analysts show a larger proportion of males in the occupation compared to females. While still represented by a larger share of white workers, a significant number of Asian workers are found in the occupation, making this occupation more diverse than the average Pennsylvania demographic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



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

CIVIL ENGINEERS IN PENNSYLVANIA

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



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

The final section of this report explores Cal U'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 CALIFORNIA UNIVERSITY'S WORKFORCE REGION

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

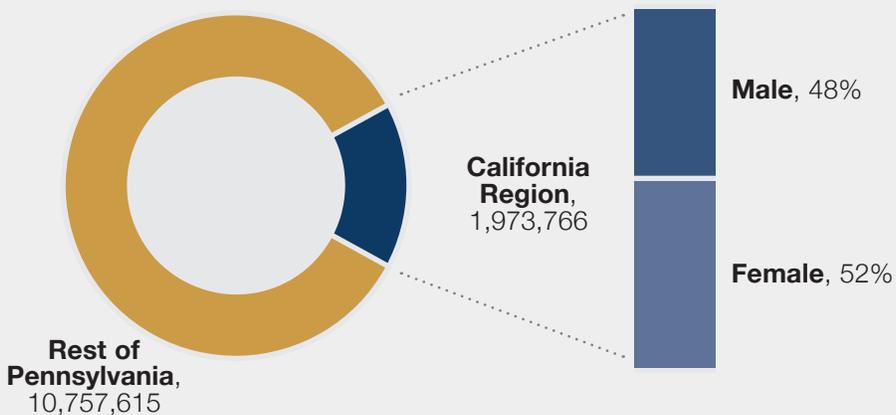
Analysis of three socio-economic indicators—education, unemployment, and poverty—also provides insight into the segment of the population that may be considered economically disadvantaged. Areas with high proportions of economically disadvantaged learners may require additional considerations in education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

7.1 Demographics of California University's Workforce Region

The Cal U workforce region has a population of about 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.

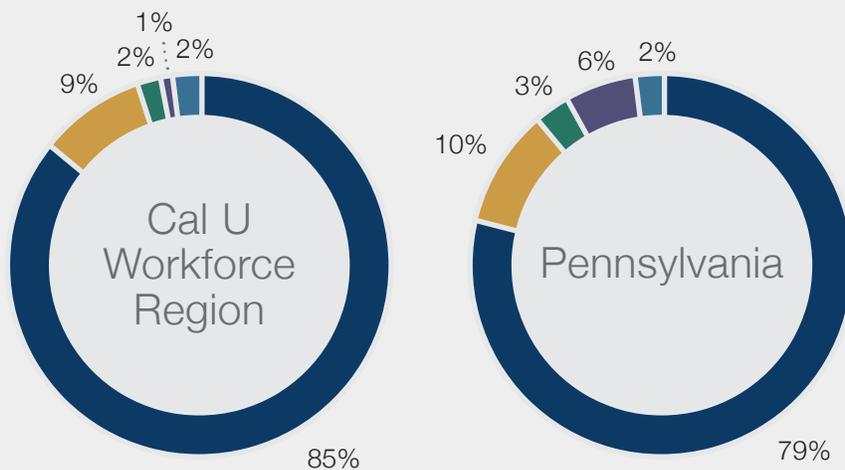
Fall 2014 data from the State System Research Office indicates that approximately 83% (90,966) of learners within the State System are traditional students—ages 18- to 22-year-old high school graduates—and 17% (18,640) are adult learners. A view of the change in population by age demographic indicates 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 15,500 people between 2010 and 2014—a 6% decline. Conversely, the 25-34 year old cohort increased nearly 10%, or 23,400 people, over the same time period. This demographic shift presents an opportunity to incorporate a broader university recruitment strategy.

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



Source: U.S. Census - ACS

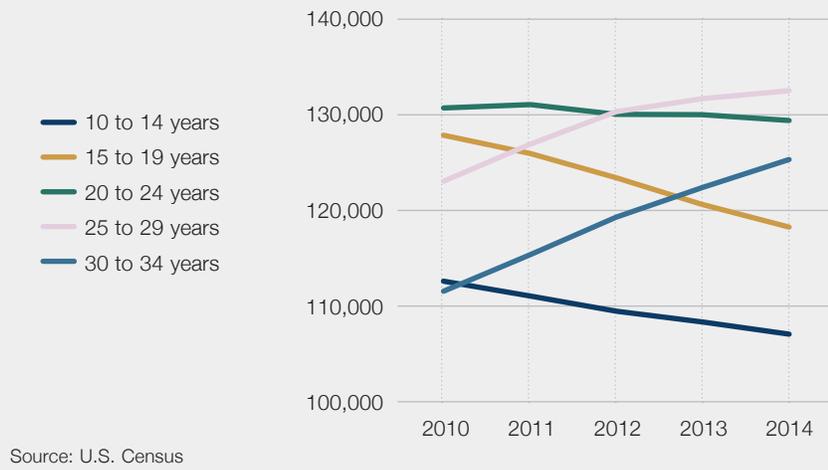
Figure 7.2 – California University’s Workforce Region Race/Ethnicity Composition



■ White ■ Black ■ Asian ■ Hispanic ■ Other

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

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



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

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

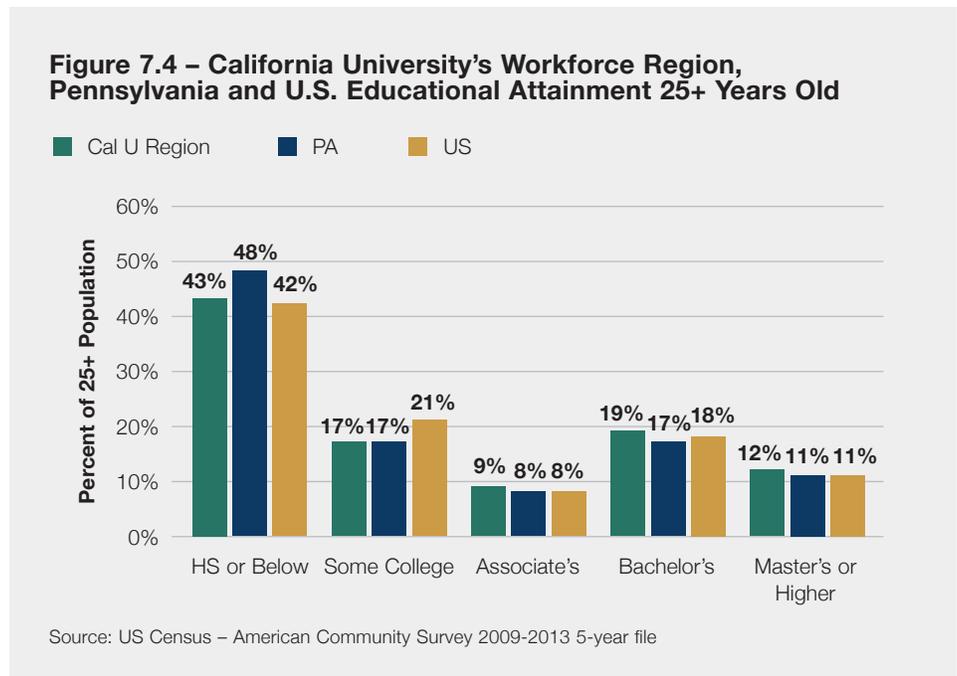
The levels of educational attainment of a population indicate several characteristics in an economy. Areas with better educated workers earn higher wages, are more productive and can typically adjust more quickly to changing economic conditions. Additionally, an educated workforce is less likely to be

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

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

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



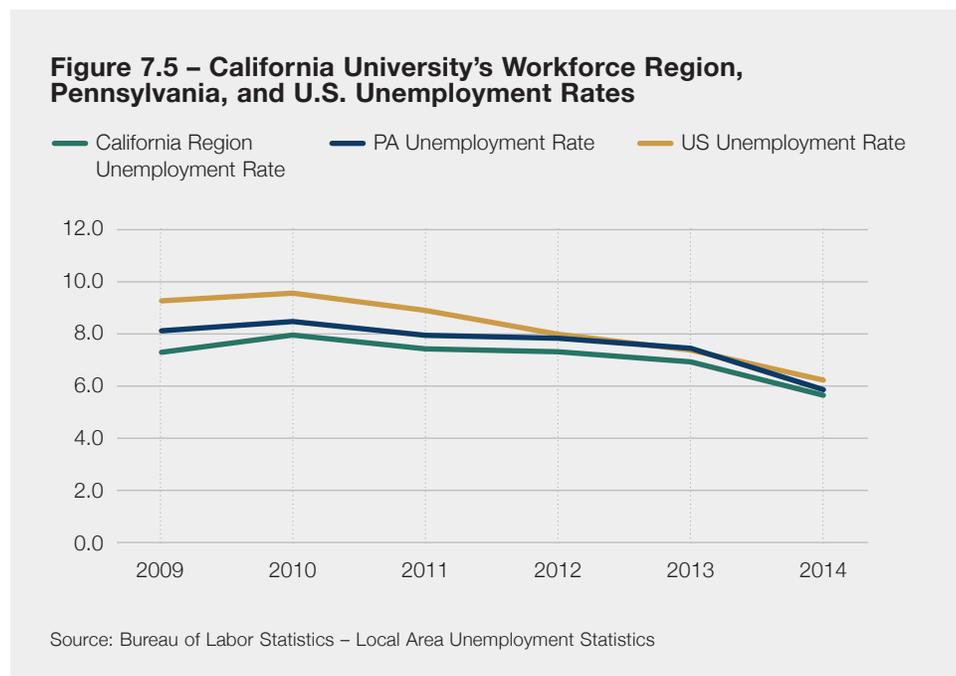
13 Feinstein et. al. (2006), “The effects of education on health: Concepts, evidence and policy implications: A review for the OECD Center for Educational Research and Innovation (CERI)”, unpublished manuscript, OECD, Paris.

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 California University's Workforce Region

Cal U'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 Cal U's workforce region, Pennsylvania, and the U.S. from 2009 to 2014.

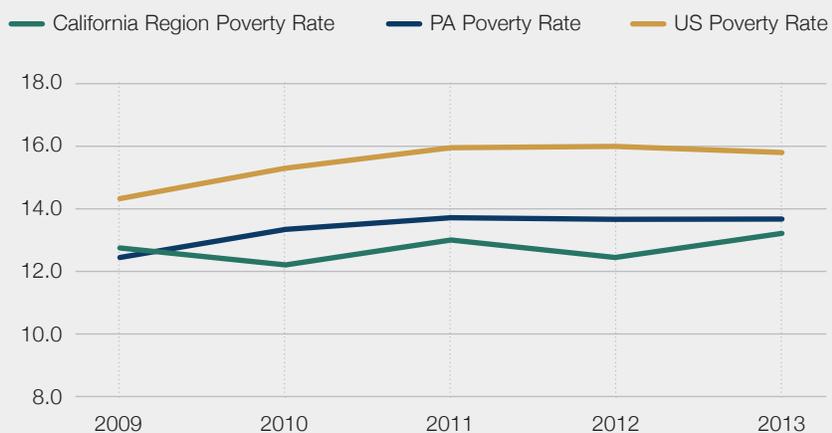


In Cal U's workforce region, the poverty rate trended upward since 2009 but declined slightly from 2011 to 2012. The region's poverty rate is below both the state poverty rate and the U.S. average.¹⁵ Given the lower poverty rate compared with the nation, there is an underlying assumption that the compensation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

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

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

Figure 7.6 – California University's Workforce Region, Pennsylvania, and U.S. Poverty Rates



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

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

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

8. NEXT STEPS

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

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

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

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

DATA SOURCES

Bureau of Labor Statistics (BLS):

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

U.S. Census Bureau (Census):

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

National Center for Education Statistics (NCES):

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

Pennsylvania Department of Labor and Industry (PADLI):

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

O*NET Resource Center (O*NET)

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

Economic Modeling Specialists International (EMSI)

APPENDIX A: METHODOLOGY FOR IDENTIFYING STATE SYSTEM UNIVERSITY WORKFORCE REGIONS

Introduction

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

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

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

¹⁶ Bureau of Labor Statistics: Labor Market Area.

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

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

Further information on each of the measurements is detailed later.

Geographic Consideration

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

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

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

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

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

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

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

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

Process

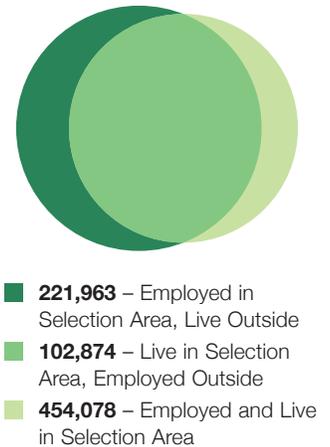
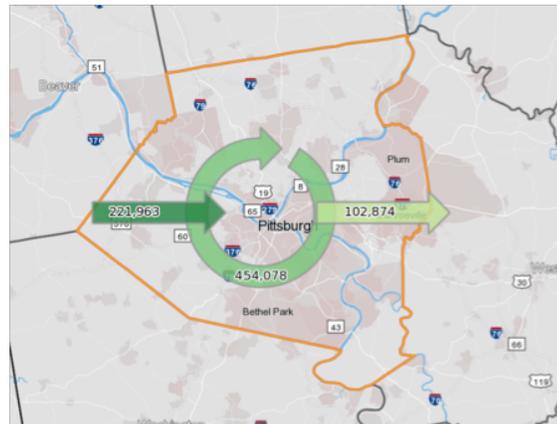
Given the workforce/commute, learner and economic variances that exist within the different geographies across Pennsylvania, an iterative process is used to define the workforce region. This multiple step, iterative process seeks to maximize the primary driver value (workforce flows), while adhering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

Workforce Flows:

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

When these numbers are converted into percentages, we find that

Inflow/Outflow Job Counts in 2013



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

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

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

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

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

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

Learner Capture Rates and Inclusiveness:

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

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

Economic Activity and Concentration:

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

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

Table A.1 – State System Workforce Region by University

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

Source: Oxford Economics modeling and tabulations

APPENDIX B: PENNSYLVANIA STATE AND COUNTY ENROLLMENT AND EMPLOYMENT

County	Fall 2014 Enrollment in California University	2014 QCEW Employment
Adams	34	34,139
Allegheny	1,902	683,111
Armstrong	23	17,582
Beaver	139	52,811
Bedford	20	15,397
Berks	47	166,792
Blair	43	58,233
Bradford	1	24,568
Bucks	64	250,889
Butler	75	84,472
Cambria	76	53,915
Cameron	4	2,015
Carbon	6	16,974
Centre	29	67,147
Chester	107	240,469
Clarion	19	13,586
Clearfield	23	29,938
Clinton	8	13,043
Columbia	6	24,974
Crawford	21	31,113
Cumberland	57	126,939
Dauphin	69	176,004
Delaware	46	216,261
Elk	16	14,994
Erie	55	124,095
Fayette	893	39,979
Forest	4	2,053
Franklin	41	56,715
Fulton	7	4,807
Greene	145	14,844
Huntingdon	3	12,343

County	Fall 2014 Enrollment in California University	2014 QCEW Employment
Indiana	32	32,653
Jefferson	17	15,435
Juniata	1	6,146
Lackawanna	16	97,259
Lancaster	86	225,673
Lawrence	39	29,500
Lebanon	21	48,869
Lehigh	27	180,757
Luzerne	20	140,329
Lycoming	13	53,197
McKean	17	15,770
Mercer	48	48,028
Mifflin	6	15,544
Monroe	17	52,933
Montgomery	58	472,655
Montour	1	15,578
Northampton	31	105,825
Northumberland	14	27,985
Perry	13	7,661
Philadelphia	123	640,987
Pike	8	10,748
Potter	8	5,291
Schuylkill	15	50,049
Snyder	8	15,522
Somerset	82	24,398
Sullivan	3	1,772
Susquehanna	6	9,281
Tioga	13	12,973
Union	2	16,597
Venango	12	19,251
Warren	19	15,031
Washington	1,137	86,961
Wayne	7	14,651
Westmoreland	712	132,312
Wyoming	5	10,181
York	125	172,145
Total Pennsylvania	6,745	5,643,676

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

APPENDIX C: INDUSTRY PROJECTIONS 2014-2024 FOR CALIFORNIA UNIVERSITY 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 Cal U'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	984,555	1,056,526	7.3%	1.0
1111	Oilseed and Grain Farming	13	16	23.1%	0.0
1112	Vegetable and Melon Farming	105	104	-1.0%	0.1
1113	Fruit and Tree Nut Farming	35	42	20.0%	0.0
1114	Greenhouse, Nursery, and Floriculture Production	100	85	-15.0%	0.1
1119	Other Crop Farming	11	11	0.0%	0.0
1121	Cattle Ranching and Farming	60	69	15.0%	0.1
1122	Hog and Pig Farming	2	2	0.0%	0.0
1123	Poultry and Egg Production	52	57	9.6%	0.2
1124	Sheep and Goat Farming	15	18	20.0%	1.4
1129	Other Animal Production	29	23	-20.7%	0.2
1131	Timber Tract Operations	12	15	25.0%	0.2
1132	Forest Nurseries and Gathering of Forest Products	2	3	50.0%	0.1
1133	Logging	7	9	28.6%	0.0
1142	Hunting and Trapping	7	9	28.6%	0.5
1151	Support Activities for Crop Production	92	104	13.0%	0.0
1152	Support Activities for Animal Production	90	82	-8.9%	0.4
1153	Support Activities for Forestry	22	27	22.7%	0.2
2111	Oil and Gas Extraction	3,303	4,513	36.6%	2.3
2121	Coal Mining	3,549	2,928	-17.5%	6.8
2123	Nonmetallic Mineral Mining and Quarrying	585	586	0.2%	0.9
2131	Support Activities for Mining	6,070	6,875	13.3%	1.9
2211	Electric Power Generation, Transmission and Distribution	1,669	1,553	-7.0%	0.5
2212	Natural Gas Distribution	1,481	1,508	1.8%	1.7
2213	Water, Sewage and Other Systems	2,923	3,159	8.1%	1.9
2361	Residential Building Construction	4,614	5,856	26.9%	1.0
2362	Nonresidential Building Construction	6,330	7,319	15.6%	1.3
2371	Utility System Construction	4,291	4,907	14.4%	1.3
2372	Land Subdivision	452	542	19.9%	1.5
2373	Highway, Street, and Bridge Construction	3,479	4,226	21.5%	1.2
2379	Other Heavy and Civil Engineering Construction	893	1,093	22.4%	1.2
2381	Foundation, Structure, and Building Exterior Contractors	4,852	5,039	3.9%	0.9
2382	Building Equipment Contractors	12,455	13,826	11.0%	0.9
2383	Building Finishing Contractors	4,617	4,849	5.0%	0.9
2389	Other Specialty Trade Contractors	6,205	7,573	22.0%	1.5
3111	Animal Food Manufacturing	31	35	12.9%	0.1
3112	Grain and Oilseed Milling	96	70	-27.1%	0.2

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3113	Sugar and Confectionery Product Manufacturing	734	756	3.0%	1.5
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	1,049	1,166	11.2%	0.9
3115	Dairy Product Manufacturing	414	386	-6.8%	0.4
3116	Animal Slaughtering and Processing	344	331	-3.8%	0.1
3118	Bakeries and Tortilla Manufacturing	1,756	1,751	-0.3%	0.8
3119	Other Food Manufacturing	282	295	4.6%	0.2
3121	Beverage Manufacturing	759	801	5.5%	0.5
3122	Tobacco Manufacturing	93	109	17.2%	1.0
3131	Fiber, Yarn, and Thread Mills	36	41	13.9%	0.2
3132	Fabric Mills	228	195	-14.5%	0.6
3133	Textile and Fabric Finishing and Fabric Coating Mills	55	63	14.5%	0.2
3141	Textile Furnishings Mills	102	112	9.8%	0.3
3149	Other Textile Product Mills	420	426	1.4%	0.9
3152	Cut and Sew Apparel Manufacturing	67	63	-6.0%	0.1
3159	Apparel Accessories and Other Apparel Manufacturing	95	72	-24.2%	1.1
3162	Footwear Manufacturing	11	9	-18.2%	0.1
3211	Sawmills and Wood Preservation	302	425	40.7%	0.5
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	116	130	12.1%	0.2
3219	Other Wood Product Manufacturing	892	1,129	26.6%	0.6
3222	Converted Paper Product Manufacturing	1,289	1,162	-9.9%	0.7
3231	Printing and Related Support Activities	2,681	2,153	-19.7%	0.8
3241	Petroleum and Coal Products Manufacturing	1,876	1,821	-2.9%	2.4
3251	Basic Chemical Manufacturing	833	848	1.8%	0.8
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	561	500	-10.9%	0.8
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	20	15	-25.0%	0.1
3254	Pharmaceutical and Medicine Manufacturing	257	210	-18.3%	0.1
3255	Paint, Coating, and Adhesive Manufacturing	632	546	-13.6%	1.5
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	267	263	-1.5%	0.4
3259	Other Chemical Product and Preparation Manufacturing	946	917	-3.1%	1.6
3261	Plastics Product Manufacturing	2,349	2,302	-2.0%	0.6
3262	Rubber Product Manufacturing	538	546	1.5%	0.6
3271	Clay Product and Refractory Manufacturing	543	519	-4.4%	1.9
3272	Glass and Glass Product Manufacturing	1,145	1,211	5.8%	1.9
3273	Cement and Concrete Product Manufacturing	858	909	5.9%	0.7
3274	Lime and Gypsum Product Manufacturing	21	17	-19.0%	0.2
3279	Other Nonmetallic Mineral Product Manufacturing	254	309	21.7%	0.5

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3311	Iron and Steel Mills and Ferroalloy Manufacturing	4,375	4,169	-4.7%	6.6
3312	Steel Product Manufacturing from Purchased Steel	534	452	-15.4%	1.2
3313	Alumina and Aluminum Production and Processing	306	350	14.4%	0.7
3314	Nonferrous Metal (except Aluminum) Production and Processing	1,263	1,269	0.5%	2.8
3315	Foundries	1,787	1,901	6.4%	2.0
3321	Forging and Stamping	946	945	-0.1%	1.3
3322	Cutlery and Handtool Manufacturing	468	441	-5.8%	1.7
3323	Architectural and Structural Metals Manufacturing	2,742	3,018	10.1%	1.1
3324	Boiler, Tank, and Shipping Container Manufacturing	875	928	6.1%	1.2
3325	Hardware Manufacturing	94	94	0.0%	0.5
3326	Spring and Wire Product Manufacturing	371	382	3.0%	1.2
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	4,067	4,211	3.5%	1.5
3328	Coating, Engraving, Heat Treating, and Allied Activities	914	988	8.1%	0.9
3329	Other Fabricated Metal Product Manufacturing	936	903	-3.5%	0.5
3331	Agriculture, Construction, and Mining Machinery Manufacturing	764	805	5.4%	0.4
3332	Industrial Machinery Manufacturing	546	566	3.7%	0.7
3333	Commercial and Service Industry Machinery Manufacturing	633	500	-21.0%	1.0
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	281	264	-6.0%	0.3
3335	Metalworking Machinery Manufacturing	2,655	2,405	-9.4%	2.0
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	520	515	-1.0%	0.7
3339	Other General Purpose Machinery Manufacturing	3,003	3,270	8.9%	1.6
3341	Computer and Peripheral Equipment Manufacturing	435	404	-7.1%	0.4
3342	Communications Equipment Manufacturing	1,276	907	-28.9%	1.9
3344	Semiconductor and Other Electronic Component Manufacturing	772	624	-19.2%	0.3
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3,957	4,262	7.7%	1.4
3346	Manufacturing and Reproducing Magnetic and Optical Media	8	5	-37.5%	0.1
3351	Electric Lighting Equipment Manufacturing	194	200	3.1%	0.6
3353	Electrical Equipment Manufacturing	2,905	3,084	6.2%	2.8
3359	Other Electrical Equipment and Component Manufacturing	1,167	1,267	8.6%	1.3
3362	Motor Vehicle Body and Trailer Manufacturing	178	190	6.7%	0.2
3363	Motor Vehicle Parts Manufacturing	274	268	-2.2%	0.1
3364	Aerospace Product and Parts Manufacturing	220	191	-13.2%	0.1
3365	Railroad Rolling Stock Manufacturing	1,275	1,320	3.5%	6.5
3366	Ship and Boat Building	146	119	-18.5%	0.1
3369	Other Transportation Equipment Manufacturing	163	198	21.5%	0.7

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	357	352	-1.4%	0.2
3372	Office Furniture (including Fixtures) Manufacturing	326	347	6.4%	0.4
3379	Other Furniture Related Product Manufacturing	13	13	0.0%	0.1
3391	Medical Equipment and Supplies Manufacturing	1,805	1,552	-14.0%	0.8
3399	Other Miscellaneous Manufacturing	1,115	1,172	5.1%	0.6
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	2,475	2,863	15.7%	1.0
4232	Furniture and Home Furnishing Merchant Wholesalers	511	555	8.6%	0.7
4233	Lumber and Other Construction Materials Merchant Wholesalers	1,759	1,813	3.1%	1.2
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	4,147	4,222	1.8%	0.9
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	1,047	1,136	8.5%	1.1
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	1,702	1,566	-8.0%	0.7
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	1,590	1,846	16.1%	0.9
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	5,250	5,517	5.1%	1.1
4239	Miscellaneous Durable Goods Merchant Wholesalers	2,553	2,866	12.3%	1.2
4241	Paper and Paper Product Merchant Wholesalers	551	516	-6.4%	0.6
4242	Drugs and Druggists' Sundries Merchant Wholesalers	281	235	-16.4%	0.2
4243	Apparel, Piece Goods, and Notions Merchant Wholesalers	190	212	11.6%	0.2
4244	Grocery and Related Product Merchant Wholesalers	3,477	3,705	6.6%	0.7
4245	Farm Product Raw Material Merchant Wholesalers	19	16	-15.8%	0.0
4246	Chemical and Allied Products Merchant Wholesalers	1,031	1,039	0.8%	1.1
4247	Petroleum and Petroleum Products Merchant Wholesalers	798	898	12.5%	1.1
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	866	1,085	25.3%	0.7
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	1,326	1,225	-7.6%	0.6
4251	Wholesale Electronic Markets and Agents and Brokers	9,390	9,141	-2.7%	1.5
4411	Automobile Dealers	10,146	11,322	11.6%	1.2
4412	Other Motor Vehicle Dealers	501	513	2.4%	0.5
4413	Automotive Parts, Accessories, and Tire Stores	3,109	3,083	-0.8%	0.8
4421	Furniture Stores	1,433	1,500	4.7%	0.9
4422	Home Furnishings Stores	1,435	1,415	-1.4%	0.8
4431	Electronics and Appliance Stores	2,810	2,516	-10.5%	0.8
4441	Building Material and Supplies Dealers	6,503	6,733	3.5%	0.8
4442	Lawn and Garden Equipment and Supplies Stores	839	860	2.5%	0.8
4451	Grocery Stores	19,019	16,708	-12.2%	1.0
4452	Specialty Food Stores	1,171	1,026	-12.4%	0.7

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4453	Beer, Wine, and Liquor Stores	1,171	1,309	11.8%	1.0
4461	Health and Personal Care Stores	8,293	8,287	-0.1%	1.1
4471	Gasoline Stations	5,772	5,964	3.3%	0.9
4481	Clothing Stores	8,311	8,019	-3.5%	1.1
4482	Shoe Stores	1,308	1,343	2.7%	0.9
4483	Jewelry, Luggage, and Leather Goods Stores	1,017	966	-5.0%	1.0
4511	Sporting Goods, Hobby, and Musical Instrument Stores	3,883	4,208	8.4%	1.0
4512	Book Stores and News Dealers	599	562	-6.2%	0.9
4521	Department Stores	9,564	8,839	-7.6%	1.0
4529	Other General Merchandise Stores	9,965	10,526	5.6%	0.8
4531	Florists	662	462	-30.2%	1.5
4532	Office Supplies, Stationery, and Gift Stores	1,905	1,705	-10.5%	0.9
4533	Used Merchandise Stores	1,443	1,842	27.7%	1.2
4539	Other Miscellaneous Store Retailers	2,198	2,125	-3.3%	1.0
4541	Electronic Shopping and Mail-Order Houses	4,023	5,129	27.5%	1.7
4542	Vending Machine Operators	353	331	-6.2%	1.3
4543	Direct Selling Establishments	446	430	-3.6%	0.5
4811	Scheduled Air Transportation	2,199	2,326	5.8%	0.7
4812	Nonscheduled Air Transportation	295	332	12.5%	1.1
4832	Inland Water Transportation	228	203	-11.0%	1.1
4841	General Freight Trucking	5,032	5,695	13.2%	0.7
4842	Specialized Freight Trucking	3,305	3,910	18.3%	1.0
4851	Urban Transit Systems	2,255	2,463	9.2%	1.3
4852	Interurban and Rural Bus Transportation	151	143	-5.3%	0.9
4853	Taxi and Limousine Service	356	367	3.1%	0.6
4854	School and Employee Bus Transportation	4,871	5,214	7.0%	2.7
4855	Charter Bus Industry	646	660	2.2%	3.0
4859	Other Transit and Ground Passenger Transportation	781	908	16.3%	1.1
4862	Pipeline Transportation of Natural Gas	487	630	29.4%	2.3
4869	Other Pipeline Transportation	69	93	34.8%	1.2
4871	Scenic and Sightseeing Transportation, Land	198	252	27.3%	2.0
4872	Scenic and Sightseeing Transportation, Water	82	71	-13.4%	0.8
4879	Scenic and Sightseeing Transportation, Other	2	2	0.0%	0.1
4881	Support Activities for Air Transportation	1,030	1,066	3.5%	0.6
4882	Support Activities for Rail Transportation	365	450	23.3%	1.6
4883	Support Activities for Water Transportation	118	100	-15.3%	0.2
4884	Support Activities for Road Transportation	1,040	1,508	45.0%	1.3

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
4885	Freight Transportation Arrangement	800	972	21.5%	0.6
4889	Other Support Activities for Transportation	229	286	24.9%	1.0
4911	Postal Service	5,333	3,438	-35.5%	1.2
4921	Couriers and Express Delivery Services	4,895	5,462	11.6%	1.3
4922	Local Messengers and Local Delivery	160	138	-13.8%	0.4
4931	Warehousing and Storage	4,738	5,532	16.8%	0.9
5111	Newspaper, Periodical, Book, and Directory Publishers	2,841	2,363	-16.8%	1.0
5112	Software Publishers	1,480	1,778	20.1%	0.7
5121	Motion Picture and Video Industries	1,702	1,732	1.8%	0.6
5122	Sound Recording Industries	57	52	-8.8%	0.5
5151	Radio and Television Broadcasting	1,561	1,820	16.6%	1.0
5152	Cable and Other Subscription Programming	33	26	-21.2%	0.1
5171	Wired Telecommunications Carriers	4,797	4,175	-13.0%	1.1
5172	Wireless Telecommunications Carriers (except Satellite)	458	301	-34.3%	0.4
5174	Satellite Telecommunications	17	15	-11.8%	0.3
5179	Other Telecommunications	286	212	-25.9%	0.5
5182	Data Processing, Hosting, and Related Services	802	630	-21.4%	0.4
5191	Other Information Services	2,282	2,890	26.6%	0.9
5211	Monetary Authorities-Central Bank	5	4	-20.0%	0.0
5221	Depository Credit Intermediation	23,139	21,388	-7.6%	1.9
5222	Nondepository Credit Intermediation	2,202	1,781	-19.1%	0.5
5223	Activities Related to Credit Intermediation	937	732	-21.9%	0.5
5231	Securities and Commodity Contracts Intermediation and Brokerage	1,619	1,711	5.7%	0.5
5232	Securities and Commodity Exchanges	4	6	50.0%	0.1
5239	Other Financial Investment Activities	4,678	7,182	53.5%	1.5
5241	Insurance Carriers	13,726	14,625	6.5%	1.6
5242	Agencies, Brokerages, and Other Insurance Related Activities	7,650	8,819	15.3%	1.1
5251	Insurance and Employee Benefit Funds	6	5	-16.7%	0.3
5311	Lessors of Real Estate	4,010	4,302	7.3%	0.9
5312	Offices of Real Estate Agents and Brokers	1,272	1,270	-0.2%	0.6
5313	Activities Related to Real Estate	2,800	2,772	-1.0%	0.6
5321	Automotive Equipment Rental and Leasing	1,292	1,502	16.3%	0.9
5322	Consumer Goods Rental	941	1,017	8.1%	0.8
5323	General Rental Centers	124	131	5.6%	0.4
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	2,255	2,683	19.0%	2.2
5331	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	84	80	-4.8%	0.5

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
5411	Legal Services	10,767	12,008	11.5%	1.3
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	7,674	8,439	10.0%	1.1
5413	Architectural, Engineering, and Related Services	19,184	21,842	13.9%	1.9
5414	Specialized Design Services	895	1,248	39.4%	1.0
5415	Computer Systems Design and Related Services	13,355	19,366	45.0%	1.0
5416	Management, Scientific, and Technical Consulting Services	8,988	11,023	22.6%	1.0
5417	Scientific Research and Development Services	6,909	8,980	30.0%	1.5
5418	Advertising, Public Relations, and Related Services	2,812	3,055	8.6%	0.8
5419	Other Professional, Scientific, and Technical Services	3,964	4,536	14.4%	0.9
5511	Management of Companies and Enterprises	35,368	38,979	10.2%	2.3
5611	Office Administrative Services	734	614	-16.3%	0.2
5612	Facilities Support Services	759	1,117	47.2%	0.8
5613	Employment Services	16,164	18,192	12.5%	0.7
5614	Business Support Services	7,088	6,654	-6.1%	1.1
5615	Travel Arrangement and Reservation Services	887	790	-10.9%	0.6
5616	Investigation and Security Services	7,704	7,737	0.4%	1.2
5617	Services to Buildings and Dwellings	12,343	12,519	1.4%	0.9
5619	Other Support Services	2,251	2,861	27.1%	1.0
5621	Waste Collection	1,329	1,745	31.3%	1.1
5622	Waste Treatment and Disposal	544	657	20.8%	0.6
5629	Remediation and Other Waste Management Services	1,097	1,191	8.6%	1.1
6111	Elementary and Secondary Schools	43,465	41,623	-4.2%	0.8
6112	Junior Colleges	4,390	4,096	-6.7%	0.9
6113	Colleges, Universities, and Professional Schools	29,399	30,046	2.2%	1.4
6114	Business Schools and Computer and Management Training	172	197	14.5%	0.3
6115	Technical and Trade Schools	884	982	11.1%	0.8
6116	Other Schools and Instruction	1,818	1,934	6.4%	0.7
6117	Educational Support Services	464	536	15.5%	0.4
6211	Offices of Physicians	23,024	25,016	8.7%	1.3
6212	Offices of Dentists	5,513	6,033	9.4%	0.9
6213	Offices of Other Health Practitioners	9,242	12,176	31.7%	1.6
6214	Outpatient Care Centers	5,819	7,623	31.0%	1.1
6215	Medical and Diagnostic Laboratories	2,133	2,297	7.7%	1.2
6216	Home Health Care Services	9,141	13,490	47.6%	1.0
6219	Other Ambulatory Health Care Services	4,345	4,643	6.9%	2.0
6221	General Medical and Surgical Hospitals	48,846	52,119	6.7%	1.2
6222	Psychiatric and Substance Abuse Hospitals	2,150	2,203	2.5%	1.3

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	4,034	5,129	27.1%	2.3
6231	Nursing Care Facilities (Skilled Nursing Facilities)	14,542	16,420	12.9%	1.2
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	7,382	7,424	0.6%	1.4
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	7,361	8,880	20.6%	1.2
6239	Other Residential Care Facilities	1,140	1,383	21.3%	0.9
6241	Individual and Family Services	17,715	23,013	29.9%	1.1
6242	Community Food and Housing, and Emergency and Other Relief Services	999	1,090	9.1%	0.9
6243	Vocational Rehabilitation Services	1,677	1,952	16.4%	0.7
6244	Child Day Care Services	5,820	6,654	14.3%	1.0
7111	Performing Arts Companies	865	902	4.3%	1.0
7112	Spectator Sports	1,625	1,819	11.9%	1.6
7113	Promoters of Performing Arts, Sports, and Similar Events	1,797	1,983	10.4%	2.0
7114	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	64	76	18.8%	0.4
7115	Independent Artists, Writers, and Performers	108	144	33.3%	0.3
7121	Museums, Historical Sites, and Similar Institutions	2,173	2,504	15.2%	1.3
7131	Amusement Parks and Arcades	2,334	2,933	25.7%	1.7
7132	Gambling Industries	1,856	1,673	-9.9%	1.0
7139	Other Amusement and Recreation Industries	8,505	9,404	10.6%	0.9
7211	Traveler Accommodation	7,682	7,956	3.6%	0.6
7212	RV (Recreational Vehicle) Parks and Recreational Camps	143	157	9.8%	0.3
7213	Rooming and Boarding Houses	44	53	20.5%	0.4
7223	Special Food Services	6,682	7,662	14.7%	1.5
7224	Drinking Places (Alcoholic Beverages)	3,366	3,467	3.0%	1.3
7225	Restaurants and Other Eating Places	64,175	69,000	7.5%	0.9
8111	Automotive Repair and Maintenance	5,855	6,295	7.5%	0.9
8112	Electronic and Precision Equipment Repair and Maintenance	791	815	3.0%	1.1
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1,637	1,794	9.6%	1.1
8114	Personal and Household Goods Repair and Maintenance	458	495	8.1%	0.9
8121	Personal Care Services	6,590	7,207	9.4%	1.4
8122	Death Care Services	1,612	1,616	0.2%	1.6
8123	Drycleaning and Laundry Services	2,220	2,119	-4.5%	1.0
8129	Other Personal Services	2,076	2,464	18.7%	1.0
8131	Religious Organizations	1,443	1,444	0.1%	1.1
8132	Grantmaking and Giving Services	1,075	1,031	-4.1%	1.1

NAICS Code	Industry Title	2014 Jobs	2024 Jobs	% Change 2014-2024	2014 LQ
8133	Social Advocacy Organizations	1,376	1,391	1.1%	0.9
8134	Civic and Social Organizations	4,941	5,154	4.3%	1.7
8139	Business, Professional, Labor, Political, and Similar Organizations	3,476	3,578	2.9%	1.1
8141	Private Households	815	681	-16.4%	0.4
9211	Executive, Legislative, and Other General Government Support	20,610	19,719	-4.3%	1.0
9221	Justice, Public Order, and Safety Activities	4,860	4,570	-6.0%	0.4
9231	Administration of Human Resource Programs	1,141	1,063	-6.8%	0.2
9241	Administration of Environmental Quality Programs	795	747	-6.0%	0.3
9251	Administration of Housing Programs, Urban Planning, and Community Development	947	861	-9.1%	1.6
9261	Administration of Economic Programs	1,686	1,570	-6.9%	0.4
9281	National Security and International Affairs	824	769	-6.7%	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 CALIFORNIA 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	984,555	1,056,526	7.3%	349,171
11-1011	Chief Executives	5	1,998	1,904	-4.7%	380
11-1021	General and Operations Managers	4	11,546	13,299	15.2%	3,808
11-1031	Legislators	4	270	206	-23.7%	8
11-2011	Advertising and Promotions Managers	4	117	101	-13.7%	23
11-2021	Marketing Managers	4	1,090	1,229	12.8%	376
11-2022	Sales Managers	4	1,816	1,828	0.7%	405
11-2031	Public Relations and Fundraising Managers	4	341	317	-7.0%	49
11-3011	Administrative Services Managers	3	1,526	1,505	-1.4%	212
11-3021	Computer and Information Systems Managers	4	2,272	2,979	31.1%	1,039
11-3031	Financial Managers	4	3,203	3,121	-2.6%	510
11-3051	Industrial Production Managers	4	1,007	996	-1.1%	221
11-3061	Purchasing Managers	4	429	390	-9.1%	59
11-3071	Transportation, Storage, and Distribution Managers	4	499	557	11.6%	181
11-3111	Compensation and Benefits Managers	4	175	153	-12.6%	32
11-3121	Human Resources Managers	4	717	874	21.9%	343
11-3131	Training and Development Managers	4	190	223	17.4%	84
11-9021	Construction Managers	4	1,335	1,697	27.1%	556
11-9031	Education Administrators, Preschool and Childcare Center/Program	4	298	309	3.7%	91
11-9032	Education Administrators, Elementary and Secondary School	5	1,142	1,048	-8.2%	283
11-9033	Education Administrators, Postsecondary	5	1,047	988	-5.6%	239
11-9039	Education Administrators, All Other	5	130	158	21.5%	63
11-9041	Architectural and Engineering Managers	5	1,252	1,380	10.2%	452
11-9051	Food Service Managers	3	1,087	1,193	9.8%	326
11-9061	Funeral Service Managers	3	120	111	-7.5%	28
11-9071	Gaming Managers	3	31	29	-6.5%	5
11-9081	Lodging Managers	3	141	163	15.6%	84
11-9111	Medical and Health Services Managers	5	2,491	2,633	5.7%	748
11-9121	Natural Sciences Managers	5	332	416	25.3%	166
11-9131	Postmasters and Mail Superintendents	3	207	122	-41.1%	3
11-9141	Property, Real Estate, and Community Association Managers	4	634	723	14.0%	252
11-9151	Social and Community Service Managers	4	928	1,038	11.9%	323
11-9161	Emergency Management Directors	4	61	49	-19.7%	0
11-9199	Managers, All Other	4	1,550	1,709	10.3%	496

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	43	47	9.3%	18
13-1021	Buyers and Purchasing Agents, Farm Products	4	52	51	-1.9%	13
13-1022	Wholesale and Retail Buyers, Except Farm Products	3	766	712	-7.0%	155
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	4	2,491	2,543	2.1%	585
13-1031	Claims Adjusters, Examiners, and Investigators	4	2,462	2,631	6.9%	898
13-1032	Insurance Appraisers, Auto Damage	3	136	168	23.5%	81
13-1041	Compliance Officers	4	1,975	2,325	17.7%	760
13-1051	Cost Estimators	4	1,831	2,004	9.4%	795
13-1071	Human Resources Specialists	4	3,563	4,249	19.3%	1,446
13-1075	Labor Relations Specialists	4	1,027	811	-21.0%	87
13-1081	Logisticians	4	849	1,065	25.4%	329
13-1111	Management Analysts	4	4,077	5,027	23.3%	1,628
13-1121	Meeting, Convention, and Event Planners	4	558	733	31.4%	261
13-1131	Fundraisers	4	534	640	19.9%	227
13-1141	Compensation, Benefits, and Job Analysis Specialists	4	764	696	-8.9%	102
13-1151	Training and Development Specialists	4	2,043	2,323	13.7%	685
13-1161	Market Research Analysts and Marketing Specialists	4	4,528	6,036	33.3%	2,233
13-1199	Business Operations Specialists, All Other	4	3,185	3,260	2.4%	451
13-2011	Accountants and Auditors	4	10,817	11,945	10.4%	4,729
13-2021	Appraisers and Assessors of Real Estate	4	251	228	-9.2%	15
13-2031	Budget Analysts	4	304	331	8.9%	155
13-2041	Credit Analysts	4	529	580	9.6%	209
13-2051	Financial Analysts	4	2,434	2,908	19.5%	1,111
13-2052	Personal Financial Advisors	4	1,459	2,052	40.6%	865
13-2053	Insurance Underwriters	4	976	1,058	8.4%	462
13-2061	Financial Examiners	4	309	344	11.3%	134
13-2071	Credit Counselors	4	383	458	19.6%	157
13-2072	Loan Officers	3	3,024	3,270	8.1%	1,082
13-2081	Tax Examiners and Collectors, and Revenue Agents	3	529	451	-14.7%	137
13-2082	Tax Preparers	3	467	416	-10.9%	91
13-2099	Financial Specialists, All Other	4	806	758	-6.0%	59
15-1111	Computer and Information Research Scientists	5	55	59	7.3%	11
15-1121	Computer Systems Analysts	4	4,697	6,620	40.9%	2,754
15-1122	Information Security Analysts	4	499	766	53.5%	344
15-1131	Computer Programmers	4	2,873	3,821	33.0%	1,888

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
15-1132	Software Developers, Applications	4	4,342	5,931	36.6%	2,209
15-1133	Software Developers, Systems Software	4	2,156	2,220	3.0%	325
15-1134	Web Developers	3	799	1,074	34.4%	406
15-1141	Database Administrators	4	1,066	1,397	31.1%	551
15-1142	Network and Computer Systems Administrators	4	2,850	2,763	-3.1%	402
15-1143	Computer Network Architects	4	766	896	17.0%	252
15-1151	Computer User Support Specialists	3	4,955	6,608	33.4%	2,540
15-1152	Computer Network Support Specialists	4	1,090	1,167	7.1%	285
15-1199	Computer Occupations, All Other	4	1,277	1,531	19.9%	479
15-2011	Actuaries	4	280	377	34.6%	188
15-2031	Operations Research Analysts	5	520	635	22.1%	238
15-2041	Statisticians	5	376	514	36.7%	268
17-1011	Architects, Except Landscape and Naval	4	897	1,075	19.8%	497
17-1012	Landscape Architects	4	235	310	31.9%	149
17-1021	Cartographers and Photogrammetrists	4	60	66	10.0%	18
17-1022	Surveyors	4	468	541	15.6%	195
17-2011	Aerospace Engineers	4	323	455	40.9%	215
17-2021	Agricultural Engineers	4	19	26	36.8%	13
17-2031	Biomedical Engineers	4	222	217	-2.3%	55
17-2041	Chemical Engineers	4	286	287	0.3%	84
17-2051	Civil Engineers	4	3,438	4,015	16.8%	1,514
17-2061	Computer Hardware Engineers	4	247	224	-9.3%	35
17-2071	Electrical Engineers	4	1,563	1,845	18.0%	670
17-2072	Electronics Engineers, Except Computer	4	779	674	-13.5%	88
17-2081	Environmental Engineers	5	812	1,004	23.6%	427
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	4	253	273	7.9%	102
17-2112	Industrial Engineers	4	1,498	1,524	1.7%	534
17-2131	Materials Engineers	4	327	414	26.6%	211
17-2141	Mechanical Engineers	4	2,169	2,205	1.7%	855
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	4	89	75	-15.7%	20
17-2161	Nuclear Engineers	4	277	336	21.3%	153
17-2171	Petroleum Engineers	4	373	557	49.3%	317
17-2199	Engineers, All Other	4	667	865	29.7%	333
17-3011	Architectural and Civil Drafters	4	1,305	1,429	9.5%	439
17-3012	Electrical and Electronics Drafters	3	290	257	-11.4%	12
17-3013	Mechanical Drafters	3	718	635	-11.6%	73

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
17-3019	Drafters, All Other	3	73	91	24.7%	28
17-3021	Aerospace Engineering and Operations Technicians	4	2	3	50.0%	1
17-3022	Civil Engineering Technicians	3	686	805	17.3%	290
17-3023	Electrical and Electronics Engineering Technicians	3	898	751	-16.4%	75
17-3024	Electro-Mechanical Technicians	3	155	138	-11.0%	29
17-3025	Environmental Engineering Technicians	4	322	434	34.8%	196
17-3026	Industrial Engineering Technicians	3	285	282	-1.1%	69
17-3027	Mechanical Engineering Technicians	3	409	476	16.4%	166
17-3029	Engineering Technicians, Except Drafters, All Other	3	507	656	29.4%	276
17-3031	Surveying and Mapping Technicians	3	446	565	26.7%	216
19-1012	Food Scientists and Technologists	4	26	28	7.7%	11
19-1013	Soil and Plant Scientists	5	35	45	28.6%	25
19-1021	Biochemists and Biophysicists	5	438	702	60.3%	398
19-1022	Microbiologists	5	261	379	45.2%	206
19-1023	Zoologists and Wildlife Biologists	5	51	46	-9.8%	9
19-1029	Biological Scientists, All Other	5	72	75	4.2%	25
19-1031	Conservation Scientists	4	82	95	15.9%	39
19-1032	Foresters	4	36	39	8.3%	14
19-1041	Epidemiologists	5	20	17	-15.0%	1
19-1042	Medical Scientists, Except Epidemiologists	5	1,060	1,459	37.6%	654
19-1099	Life Scientists, All Other	5	21	25	19.0%	8
19-2012	Physicists	5	37	30	-18.9%	1
19-2021	Atmospheric and Space Scientists	4	17	15	-11.8%	2
19-2031	Chemists	4	1,051	1,344	27.9%	632
19-2032	Materials Scientists	5	85	97	14.1%	37
19-2041	Environmental Scientists and Specialists, Including Health	4	741	948	27.9%	445
19-2042	Geoscientists, Except Hydrologists and Geographers	4	348	433	24.4%	208
19-2043	Hydrologists	4	35	33	-5.7%	9
19-2099	Physical Scientists, All Other	5	41	34	-17.1%	2
19-3011	Economists	5	105	123	17.1%	54
19-3022	Survey Researchers	5	413	405	-1.9%	124
19-3031	Clinical, Counseling, and School Psychologists	5	918	957	4.2%	317
19-3039	Psychologists, All Other	5	64	80	25.0%	35
19-3041	Sociologists	5	28	30	7.1%	18
19-3051	Urban and Regional Planners	5	281	304	8.2%	158

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
19-3091	Anthropologists and Archeologists	5	12	17	41.7%	6
19-3093	Historians	5	12	9	-25.0%	0
19-3099	Social Scientists and Related Workers, All Other	4	65	63	-3.1%	11
19-4011	Agricultural and Food Science Technicians	3	16	13	-18.8%	3
19-4021	Biological Technicians	4	717	950	32.5%	470
19-4031	Chemical Technicians	3	888	1,128	27.0%	522
19-4041	Geological and Petroleum Technicians	4	249	328	31.7%	203
19-4051	Nuclear Technicians	3	126	144	14.3%	73
19-4061	Social Science Research Assistants	4	152	211	38.8%	129
19-4091	Environmental Science and Protection Technicians, Including Health	4	395	517	30.9%	299
19-4092	Forensic Science Technicians	4	20	20	0.0%	9
19-4093	Forest and Conservation Technicians	3	50	57	14.0%	31
19-4099	Life, Physical, and Social Science Technicians, All Other	3	367	388	5.7%	174
21-1011	Substance Abuse and Behavioral Disorder Counselors	5	1,177	1,155	-1.9%	312
21-1012	Educational, Guidance, School, and Vocational Counselors	5	1,791	1,774	-0.9%	403
21-1013	Marriage and Family Therapists	5	186	228	22.6%	83
21-1014	Mental Health Counselors	5	1,792	1,862	3.9%	560
21-1015	Rehabilitation Counselors	5	1,082	1,361	25.8%	584
21-1019	Counselors, All Other	5	140	134	-4.3%	25
21-1021	Child, Family, and School Social Workers	4	2,454	2,693	9.7%	813
21-1022	Healthcare Social Workers	5	1,343	1,660	23.6%	629
21-1023	Mental Health and Substance Abuse Social Workers	5	1,554	1,762	13.4%	644
21-1029	Social Workers, All Other	5	146	144	-1.4%	31
21-1091	Health Educators	4	481	513	6.7%	163
21-1092	Probation Officers and Correctional Treatment Specialists	4	534	498	-6.7%	137
21-1093	Social and Human Service Assistants	4	3,452	3,661	6.1%	1,239
21-1094	Community Health Workers	4	193	200	3.6%	56
21-1099	Community and Social Service Specialists, All Other	4	235	241	2.6%	63
21-2011	Clergy	5	328	384	17.1%	136
21-2021	Directors, Religious Activities and Education	4	267	309	15.7%	161
21-2099	Religious Workers, All Other	4	70	54	-22.9%	7
23-1011	Lawyers	5	5,163	5,906	14.4%	1,625
23-1012	Judicial Law Clerks	5	153	161	5.2%	39

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	94	79	-16.0%	4
23-1022	Arbitrators, Mediators, and Conciliators	5	57	73	28.1%	25
23-1023	Judges, Magistrate Judges, and Magistrates	5	35	30	-14.3%	2
23-2011	Paralegals and Legal Assistants	3	2,114	2,719	28.6%	963
23-2091	Court Reporters	3	159	154	-3.1%	37
23-2093	Title Examiners, Abstractors, and Searchers	3	565	628	11.2%	190
23-2099	Legal Support Workers, All Other	3	93	88	-5.4%	11
25-1011	Business Teachers, Postsecondary	5	995	1,165	17.1%	319
25-1021	Computer Science Teachers, Postsecondary	5	449	535	19.2%	154
25-1022	Mathematical Science Teachers, Postsecondary	5	622	663	6.6%	134
25-1031	Architecture Teachers, Postsecondary	5	106	131	23.6%	41
25-1032	Engineering Teachers, Postsecondary	5	582	717	23.2%	222
25-1041	Agricultural Sciences Teachers, Postsecondary	5	77	66	-14.3%	1
25-1042	Biological Science Teachers, Postsecondary	5	792	831	4.9%	159
25-1043	Forestry and Conservation Science Teachers, Postsecondary	5	28	24	-14.3%	0
25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	5	176	200	13.6%	50
25-1052	Chemistry Teachers, Postsecondary	5	327	369	12.8%	92
25-1053	Environmental Science Teachers, Postsecondary	5	64	63	-1.6%	8
25-1054	Physics Teachers, Postsecondary	5	224	270	20.5%	80
25-1061	Anthropology and Archeology Teachers, Postsecondary	5	70	66	-5.7%	6
25-1062	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	5	98	109	11.2%	26
25-1063	Economics Teachers, Postsecondary	5	239	281	17.6%	78
25-1064	Geography Teachers, Postsecondary	5	72	81	12.5%	19
25-1065	Political Science Teachers, Postsecondary	5	240	261	8.8%	58
25-1066	Psychology Teachers, Postsecondary	5	504	546	8.3%	118
25-1067	Sociology Teachers, Postsecondary	5	335	427	27.5%	142
25-1069	Social Sciences Teachers, Postsecondary, All Other	5	100	125	25.0%	40
25-1071	Health Specialties Teachers, Postsecondary	5	1,444	1,444	0.0%	219
25-1072	Nursing Instructors and Teachers, Postsecondary	5	656	645	-1.7%	89
25-1081	Education Teachers, Postsecondary	5	754	755	0.1%	115
25-1082	Library Science Teachers, Postsecondary	5	72	86	19.4%	24
25-1111	Criminal Justice and Law Enforcement Teachers, Postsecondary	5	118	114	-3.4%	14
25-1112	Law Teachers, Postsecondary	5	116	129	11.2%	30

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25-1113	Social Work Teachers, Postsecondary	5	131	122	-6.9%	11
25-1121	Art, Drama, and Music Teachers, Postsecondary	5	1,034	1,271	22.9%	392
25-1122	Communications Teachers, Postsecondary	5	331	381	15.1%	99
25-1123	English Language and Literature Teachers, Postsecondary	5	953	953	0.0%	144
25-1124	Foreign Language and Literature Teachers, Postsecondary	5	385	440	14.3%	113
25-1125	History Teachers, Postsecondary	5	314	343	9.2%	76
25-1126	Philosophy and Religion Teachers, Postsecondary	5	317	348	9.8%	79
25-1191	Graduate Teaching Assistants	5	314	373	18.8%	106
25-1192	Home Economics Teachers, Postsecondary	5	24	21	-12.5%	0
25-1193	Recreation and Fitness Studies Teachers, Postsecondary	5	210	210	0.0%	32
25-1194	Vocational Education Teachers, Postsecondary	3	912	811	-11.1%	35
25-1199	Postsecondary Teachers, All Other	5	909	1,114	22.6%	341
25-2011	Preschool Teachers, Except Special Education	3	2,092	2,571	22.9%	1,080
25-2012	Kindergarten Teachers, Except Special Education	4	866	809	-6.6%	210
25-2021	Elementary School Teachers, Except Special Education	4	8,197	7,832	-4.5%	1,697
25-2022	Middle School Teachers, Except Special and Career/Technical Education	4	3,568	3,884	8.9%	1,212
25-2023	Career/Technical Education Teachers, Middle School	4	92	106	15.2%	42
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	4	7,548	6,887	-8.8%	1,910
25-2032	Career/Technical Education Teachers, Secondary School	4	664	594	-10.5%	147
25-2051	Special Education Teachers, Preschool	4	96	113	17.7%	35
25-2052	Special Education Teachers, Kindergarten and Elementary School	4	1,577	1,602	1.6%	382
25-2053	Special Education Teachers, Middle School	4	551	539	-2.2%	114
25-2054	Special Education Teachers, Secondary School	4	1,150	1,151	0.1%	280
25-2059	Special Education Teachers, All Other	4	37	43	16.2%	11
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	4	222	191	-14.0%	15
25-3021	Self-Enrichment Education Teachers	3	1,281	1,195	-6.7%	187
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	3	828	938	13.3%	251
25-3098	Substitute Teachers	3	2,368	2,036	-14.0%	161
25-4011	Archivists	5	74	88	18.9%	32
25-4012	Curators	5	125	153	22.4%	59

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
25-4013	Museum Technicians and Conservators	4	131	169	29.0%	73
25-4021	Librarians	5	1,007	1,041	3.4%	283
25-4031	Library Technicians	4	591	638	8.0%	380
25-9011	Audio-Visual and Multimedia Collections Specialists	4	40	42	5.0%	10
25-9021	Farm and Home Management Advisors	5	10	8	-20.0%	0
25-9031	Instructional Coordinators	5	731	744	1.8%	76
25-9041	Teacher Assistants	3	6,716	6,845	1.9%	1,798
25-9099	Education, Training, and Library Workers, All Other	4	153	146	-4.6%	7
27-1011	Art Directors	4	222	263	18.5%	105
27-1012	Craft Artists	2	11	9	-18.2%	1
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	3	34	38	11.8%	15
27-1014	Multimedia Artists and Animators	4	101	123	21.8%	48
27-1019	Artists and Related Workers, All Other	4	14	11	-21.4%	0
27-1021	Commercial and Industrial Designers	4	145	123	-15.2%	22
27-1022	Fashion Designers	3	18	19	5.6%	6
27-1023	Floral Designers	2	404	255	-36.9%	60
27-1024	Graphic Designers	4	1,474	1,685	14.3%	678
27-1025	Interior Designers	4	329	416	26.4%	218
27-1026	Merchandise Displayers and Window Trimmers	3	488	592	21.3%	247
27-1027	Set and Exhibit Designers	5	58	70	20.7%	29
27-1029	Designers, All Other	4	1	1	0.0%	0
27-2011	Actors	2	327	282	-13.8%	81
27-2012	Producers and Directors	4	565	638	12.9%	319
27-2021	Athletes and Sports Competitors	2	232	271	16.8%	128
27-2022	Coaches and Scouts	4	1,316	1,164	-11.6%	265
27-2023	Umpires, Referees, and Other Sports Officials	3	73	65	-11.0%	14
27-2031	Dancers	3	31	24	-22.6%	4
27-2032	Choreographers	4	30	32	6.7%	12
27-2041	Music Directors and Composers	3	152	119	-21.7%	21
27-2042	Musicians and Singers	3	190	165	-13.2%	49
27-2099	Entertainers and Performers, Sports and Related Workers, All Other	3	18	17	-5.6%	0
27-3011	Radio and Television Announcers	3	267	292	9.4%	151
27-3012	Public Address System and Other Announcers	2	22	30	36.4%	14
27-3022	Reporters and Correspondents	4	218	174	-20.2%	71
27-3031	Public Relations Specialists	4	1,817	1,729	-4.8%	190

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
27-3041	Editors	4	527	484	-8.2%	127
27-3042	Technical Writers	4	237	234	-1.3%	71
27-3043	Writers and Authors	4	264	265	0.4%	67
27-3091	Interpreters and Translators	4	147	145	-1.4%	17
27-3099	Media and Communication Workers, All Other	4	66	54	-18.2%	0
27-4011	Audio and Video Equipment Technicians	3	448	457	2.0%	107
27-4012	Broadcast Technicians	3	128	146	14.1%	53
27-4014	Sound Engineering Technicians	3	70	66	-5.7%	15
27-4021	Photographers	3	310	262	-15.5%	43
27-4031	Camera Operators, Television, Video, and Motion Picture	3	106	98	-7.5%	4
27-4032	Film and Video Editors	3	68	58	-14.7%	0
27-4099	Media and Communication Equipment Workers, All Other	3	36	29	-19.4%	0
29-1011	Chiropractors	5	290	406	40.0%	181
29-1021	Dentists, General	5	610	688	12.8%	231
29-1022	Oral and Maxillofacial Surgeons	5	22	23	4.5%	6
29-1023	Orthodontists	5	16	20	25.0%	8
29-1029	Dentists, All Other Specialists	5	15	14	-6.7%	3
29-1031	Dietitians and Nutritionists	5	546	555	1.6%	80
29-1041	Optometrists	5	294	383	30.3%	187
29-1051	Pharmacists	5	2,280	2,444	7.2%	766
29-1061	Anesthesiologists	5	316	332	5.1%	104
29-1062	Family and General Practitioners	5	1,315	1,413	7.5%	465
29-1063	Internists, General	5	201	193	-4.0%	41
29-1064	Obstetricians and Gynecologists	5	70	90	28.6%	36
29-1065	Pediatricians, General	5	75	96	28.0%	36
29-1066	Psychiatrists	5	172	164	-4.7%	41
29-1067	Surgeons	5	423	546	29.1%	235
29-1069	Physicians and Surgeons, All Other	5	2,992	3,242	8.4%	1,036
29-1071	Physician Assistants	5	987	1,101	11.6%	308
29-1081	Podiatrists	5	110	159	44.5%	93
29-1122	Occupational Therapists	5	1,189	1,610	35.4%	607
29-1123	Physical Therapists	5	2,111	2,798	32.5%	1,285
29-1124	Radiation Therapists	3	149	138	-7.4%	19
29-1125	Recreational Therapists	4	224	234	4.5%	64
29-1126	Respiratory Therapists	3	993	1,120	12.8%	271
29-1127	Speech-Language Pathologists	5	841	1,210	43.9%	494

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
29-1128	Exercise Physiologists	5	67	89	32.8%	30
29-1129	Therapists, All Other	4	75	112	49.3%	45
29-1131	Veterinarians	5	404	522	29.2%	262
29-1141	Registered Nurses	3	23,838	27,569	15.7%	8,558
29-1151	Nurse Anesthetists	5	417	456	9.4%	126
29-1161	Nurse Midwives	5	29	37	27.6%	14
29-1171	Nurse Practitioners	5	772	964	24.9%	333
29-1181	Audiologists	5	114	144	26.3%	56
29-1199	Health Diagnosing and Treating Practitioners, All Other	5	87	72	-17.2%	4
29-2011	Medical and Clinical Laboratory Technologists	4	1,653	1,736	5.0%	583
29-2012	Medical and Clinical Laboratory Technicians	3	1,836	1,984	8.1%	672
29-2021	Dental Hygienists	3	1,507	1,814	20.4%	715
29-2031	Cardiovascular Technologists and Technicians	3	577	706	22.4%	215
29-2032	Diagnostic Medical Sonographers	3	479	569	18.8%	158
29-2033	Nuclear Medicine Technologists	3	202	208	3.0%	36
29-2034	Radiologic Technologists	3	1,916	2,130	11.2%	511
29-2035	Magnetic Resonance Imaging Technologists	3	266	336	26.3%	113
29-2041	Emergency Medical Technicians and Paramedics	3	2,641	2,669	1.1%	899
29-2051	Dietetic Technicians	2	459	668	45.5%	263
29-2052	Pharmacy Technicians	3	2,649	2,874	8.5%	530
29-2053	Psychiatric Technicians	3	271	273	0.7%	57
29-2054	Respiratory Therapy Technicians	3	96	89	-7.3%	2
29-2055	Surgical Technologists	3	653	820	25.6%	229
29-2056	Veterinary Technologists and Technicians	3	636	784	23.3%	215
29-2057	Ophthalmic Medical Technicians	3	237	321	35.4%	114
29-2061	Licensed Practical and Licensed Vocational Nurses	3	6,221	7,756	24.7%	3,178
29-2071	Medical Records and Health Information Technicians	3	1,522	1,813	19.1%	701
29-2081	Opticians, Dispensing	3	636	891	40.1%	472
29-2091	Orthotists and Prosthetists	5	44	48	9.1%	9
29-2092	Hearing Aid Specialists	3	27	29	7.4%	5
29-2099	Health Technologists and Technicians, All Other	3	399	461	15.5%	94
29-9011	Occupational Health and Safety Specialists	4	484	523	8.1%	181
29-9012	Occupational Health and Safety Technicians	3	130	140	7.7%	46
29-9091	Athletic Trainers	5	261	345	32.2%	161
29-9099	Healthcare Practitioners and Technical Workers, All Other	4	170	141	-17.1%	14

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
31-1011	Home Health Aides	2	8,647	11,184	29.3%	4,915
31-1013	Psychiatric Aides	2	310	309	-0.3%	78
31-1014	Nursing Assistants	2	12,662	14,354	13.4%	4,249
31-1015	Orderlies	2	444	464	4.5%	106
31-2011	Occupational Therapy Assistants	3	486	682	40.3%	346
31-2012	Occupational Therapy Aides	3	112	175	56.3%	95
31-2021	Physical Therapist Assistants	3	942	1,378	46.3%	691
31-2022	Physical Therapist Aides	2	454	653	43.8%	305
31-9011	Massage Therapists	3	439	609	38.7%	214
31-9091	Dental Assistants	3	2,084	2,288	9.8%	661
31-9092	Medical Assistants	3	4,786	5,794	21.1%	1,969
31-9093	Medical Equipment Preparers	2	362	406	12.2%	114
31-9094	Medical Transcriptionists	3	793	648	-18.3%	70
31-9095	Pharmacy Aides	2	264	222	-15.9%	21
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	3	383	369	-3.7%	66
31-9097	Phlebotomists	3	1,051	1,222	16.3%	415
31-9099	Healthcare Support Workers, All Other	3	253	226	-10.7%	11
33-1011	First-Line Supervisors of Correctional Officers	3	173	178	2.9%	71
33-1012	First-Line Supervisors of Police and Detectives	3	396	450	13.6%	186
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	3	103	115	11.7%	59
33-1099	First-Line Supervisors of Protective Service Workers, All Other	3	431	538	24.8%	240
33-2011	Firefighters	3	640	637	-0.5%	190
33-2021	Fire Inspectors and Investigators	3	31	26	-16.1%	6
33-3011	Bailiffs	2	27	21	-22.2%	2
33-3012	Correctional Officers and Jailers	3	2,121	1,914	-9.8%	450
33-3021	Detectives and Criminal Investigators	3	353	341	-3.4%	79
33-3041	Parking Enforcement Workers	2	62	70	12.9%	32
33-3051	Police and Sheriff's Patrol Officers	3	3,672	3,480	-5.2%	1,125
33-3052	Transit and Railroad Police	3	10	8	-20.0%	1
33-9011	Animal Control Workers	2	42	40	-4.8%	9
33-9021	Private Detectives and Investigators	3	339	294	-13.3%	85
33-9031	Gaming Surveillance Officers and Gaming Investigators	2	99	84	-15.2%	30
33-9032	Security Guards	2	8,821	9,361	6.1%	3,010
33-9091	Crossing Guards	1	580	434	-25.2%	12

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33-9092	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	2	921	1,042	13.1%	789
33-9093	Transportation Security Screeners	2	166	142	-14.5%	21
33-9099	Protective Service Workers, All Other	2	494	581	17.6%	442
35-1011	Chefs and Head Cooks	3	851	914	7.4%	232
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	2	5,452	6,012	10.3%	2,235
35-2011	Cooks, Fast Food	1	1,646	1,418	-13.9%	132
35-2012	Cooks, Institution and Cafeteria	2	2,947	3,002	1.9%	667
35-2014	Cooks, Restaurant	2	7,603	9,680	27.3%	3,845
35-2015	Cooks, Short Order	1	1,364	1,664	22.0%	637
35-2021	Food Preparation Workers	1	5,974	5,299	-11.3%	1,214
35-3011	Bartenders	2	5,668	5,977	5.5%	2,699
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	1	24,753	27,882	12.6%	13,763
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	1	2,231	2,072	-7.1%	1,280
35-3031	Waiters and Waitresses	1	18,043	19,737	9.4%	11,243
35-3041	Food Servers, Nonrestaurant	1	2,031	2,214	9.0%	838
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	1	2,630	2,688	2.2%	1,330
35-9021	Dishwashers	1	3,909	3,626	-7.2%	1,614
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	1	2,764	2,873	3.9%	2,341
35-9099	Food Preparation and Serving Related Workers, All Other	1	212	274	29.2%	185
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2	992	1,012	2.0%	295
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	3	471	454	-3.6%	38
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2	14,339	14,173	-1.2%	3,122
37-2012	Maids and Housekeeping Cleaners	2	5,504	5,862	6.5%	1,761
37-2019	Building Cleaning Workers, All Other	2	59	51	-13.6%	3
37-2021	Pest Control Workers	2	275	316	14.9%	127
37-3011	Landscaping and Groundskeeping Workers	1	5,624	5,863	4.2%	1,878
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	2	80	68	-15.0%	10
37-3013	Tree Trimmers and Pruners	2	471	585	24.2%	276
37-3019	Grounds Maintenance Workers, All Other	2	15	12	-20.0%	0
39-1011	Gaming Supervisors	2	214	209	-2.3%	110
39-1012	Slot Supervisors	2	12	11	-8.3%	2

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	1,202	1,493	24.2%	530
39-2011	Animal Trainers	2	56	53	-5.4%	23
39-2021	Nonfarm Animal Caretakers	1	1,081	1,241	14.8%	328
39-3011	Gaming Dealers	2	947	894	-5.6%	423
39-3012	Gaming and Sports Book Writers and Runners	2	24	25	4.2%	10
39-3019	Gaming Service Workers, All Other	2	14	13	-7.1%	0
39-3021	Motion Picture Projectionists	2	68	63	-7.4%	35
39-3031	Ushers, Lobby Attendants, and Ticket Takers	2	1,239	1,370	10.6%	899
39-3091	Amusement and Recreation Attendants	1	2,855	3,360	17.7%	2,127
39-3092	Costume Attendants	2	28	26	-7.1%	13
39-3093	Locker Room, Coatroom, and Dressing Room Attendants	2	142	118	-16.9%	53
39-3099	Entertainment Attendants and Related Workers, All Other	2	134	133	-0.7%	79
39-4021	Funeral Attendants	2	443	471	6.3%	171
39-4031	Morticians, Undertakers, and Funeral Directors	3	268	324	20.9%	135
39-5011	Barbers	3	124	124	0.0%	39
39-5012	Hairdressers, Hairstylists, and Cosmetologists	3	4,380	4,789	9.3%	1,648
39-5092	Manicurists and Pedicurists	2	600	627	4.5%	88
39-5093	Shampooers	2	256	240	-6.3%	28
39-5094	Skincare Specialists	3	204	182	-10.8%	0
39-6011	Baggage Porters and Bellhops	2	239	242	1.3%	94
39-6012	Concierges	3	116	141	21.6%	56
39-7011	Tour Guides and Escorts	3	364	391	7.4%	222
39-7012	Travel Guides	3	11	9	-18.2%	5
39-9011	Childcare Workers	3	3,284	2,958	-9.9%	655
39-9021	Personal Care Aides	2	9,035	13,679	51.4%	5,850
39-9031	Fitness Trainers and Aerobics Instructors	3	1,813	2,097	15.7%	602
39-9032	Recreation Workers	4	1,835	2,301	25.4%	685
39-9041	Residential Advisors	3	1,118	1,404	25.6%	847
39-9099	Personal Care and Service Workers, All Other	3	207	186	-10.1%	36
41-1011	First-Line Supervisors of Retail Sales Workers	2	7,267	7,297	0.4%	1,667
41-1012	First-Line Supervisors of Non-Retail Sales Workers	4	1,641	1,501	-8.5%	106
41-2011	Cashiers	1	23,790	21,258	-10.6%	8,655
41-2012	Gaming Change Persons and Booth Cashiers	2	57	50	-12.3%	44
41-2021	Counter and Rental Clerks	1	2,806	2,955	5.3%	976
41-2022	Parts Salespersons	2	1,651	1,849	12.0%	691
41-2031	Retail Salespersons	2	34,530	36,465	5.6%	14,470

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
41-3011	Advertising Sales Agents	3	986	951	-3.5%	367
41-3021	Insurance Sales Agents	4	2,902	3,021	4.1%	999
41-3031	Securities, Commodities, and Financial Services Sales Agents	4	2,272	2,329	2.5%	691
41-3041	Travel Agents	3	305	247	-19.0%	101
41-3099	Sales Representatives, Services, All Other	4	5,906	7,382	25.0%	3,170
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	4	1,880	1,686	-10.3%	223
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	4	10,899	9,992	-8.3%	1,624
41-9011	Demonstrators and Product Promoters	2	298	271	-9.1%	64
41-9012	Models	1	24	28	16.7%	12
41-9021	Real Estate Brokers	4	210	176	-16.2%	10
41-9022	Real Estate Sales Agents	3	1,466	1,557	6.2%	336
41-9031	Sales Engineers	4	618	642	3.9%	157
41-9041	Telemarketers	2	1,582	1,134	-28.3%	308
41-9091	Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	2	15	12	-20.0%	0
41-9099	Sales and Related Workers, All Other	3	364	311	-14.6%	11
43-1011	First-Line Supervisors of Office and Administrative Support Workers	3	10,605	10,710	1.0%	2,644
43-2011	Switchboard Operators, Including Answering Service	2	1,028	792	-23.0%	128
43-2021	Telephone Operators	2	60	34	-43.3%	0
43-3011	Bill and Account Collectors	2	2,619	2,286	-12.7%	550
43-3021	Billing and Posting Clerks	2	5,157	5,517	7.0%	1,403
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3	12,175	12,993	6.7%	2,022
43-3041	Gaming Cage Workers	2	94	99	5.3%	53
43-3051	Payroll and Timekeeping Clerks	2	1,442	1,396	-3.2%	302
43-3061	Procurement Clerks	3	450	394	-12.4%	119
43-3071	Tellers	2	6,994	5,757	-17.7%	2,865
43-3099	Financial Clerks, All Other	2	327	363	11.0%	149
43-4011	Brokerage Clerks	3	468	431	-7.9%	141
43-4021	Correspondence Clerks	2	129	131	1.6%	45
43-4031	Court, Municipal, and License Clerks	3	314	315	0.3%	55
43-4041	Credit Authorizers, Checkers, and Clerks	3	289	206	-28.7%	1
43-4051	Customer Service Representatives	2	20,464	22,026	7.6%	7,745
43-4061	Eligibility Interviewers, Government Programs	3	1,125	1,035	-8.0%	154
43-4071	File Clerks	2	1,062	855	-19.5%	103

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-4081	Hotel, Motel, and Resort Desk Clerks	2	1,142	1,110	-2.8%	661
43-4111	Interviewers, Except Eligibility and Loan	2	1,649	1,778	7.8%	491
43-4121	Library Assistants, Clerical	2	916	988	7.9%	495
43-4131	Loan Interviewers and Clerks	3	1,703	1,859	9.2%	405
43-4141	New Accounts Clerks	2	326	325	-0.3%	126
43-4151	Order Clerks	2	1,920	1,857	-3.3%	622
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	3	1,217	1,062	-12.7%	209
43-4171	Receptionists and Information Clerks	2	7,560	7,261	-4.0%	1,793
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	2	467	417	-10.7%	88
43-4199	Information and Record Clerks, All Other	2	603	460	-23.7%	38
43-5011	Cargo and Freight Agents	2	271	236	-12.9%	60
43-5021	Couriers and Messengers	2	584	495	-15.2%	45
43-5031	Police, Fire, and Ambulance Dispatchers	2	462	459	-0.6%	144
43-5032	Dispatchers, Except Police, Fire, and Ambulance	2	1,206	1,391	15.3%	562
43-5041	Meter Readers, Utilities	2	316	277	-12.3%	91
43-5051	Postal Service Clerks	2	664	423	-36.3%	48
43-5052	Postal Service Mail Carriers	2	2,625	1,744	-33.6%	632
43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	2	1,221	644	-47.3%	10
43-5061	Production, Planning, and Expediting Clerks	3	2,281	2,349	3.0%	710
43-5071	Shipping, Receiving, and Traffic Clerks	2	3,818	3,592	-5.9%	914
43-5081	Stock Clerks and Order Fillers	2	12,348	11,565	-6.3%	3,531
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	2	362	420	16.0%	151
43-6011	Executive Secretaries and Executive Administrative Assistants	3	4,342	3,983	-8.3%	342
43-6012	Legal Secretaries	3	2,545	2,977	17.0%	941
43-6013	Medical Secretaries	3	4,239	5,441	28.4%	1,697
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	3	19,424	21,607	11.2%	4,706
43-9011	Computer Operators	3	576	511	-11.3%	88
43-9021	Data Entry Keyers	2	1,929	1,571	-18.6%	316
43-9022	Word Processors and Typists	2	1,012	713	-29.5%	10
43-9031	Desktop Publishers	3	139	138	-0.7%	38
43-9041	Insurance Claims and Policy Processing Clerks	3	2,186	2,258	3.3%	784
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	2	1,080	872	-19.3%	207
43-9061	Office Clerks, General	2	22,949	21,567	-6.0%	3,902

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
43-9071	Office Machine Operators, Except Computer	2	553	404	-26.9%	72
43-9081	Proofreaders and Copy Markers	4	87	76	-12.6%	14
43-9111	Statistical Assistants	4	107	118	10.3%	44
43-9199	Office and Administrative Support Workers, All Other	3	966	1,159	20.0%	473
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	3	15	14	-6.7%	3
45-2011	Agricultural Inspectors	2	46	40	-13.0%	12
45-2041	Graders and Sorters, Agricultural Products	1	30	36	20.0%	13
45-2091	Agricultural Equipment Operators	2	11	13	18.2%	6
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1	82	67	-18.3%	19
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	1	55	50	-9.1%	18
45-2099	Agricultural Workers, All Other	1	2	2	0.0%	0
45-4011	Forest and Conservation Workers	3	22	24	9.1%	5
45-4021	Fallers	1	1	1	0.0%	0
45-4022	Logging Equipment Operators	1	12	13	8.3%	6
45-4023	Log Graders and Scalers	3	7	6	-14.3%	0
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	3	4,052	4,672	15.3%	1,117
47-2011	Boilermakers	3	148	174	17.6%	104
47-2021	Brickmasons and Blockmasons	2	571	641	12.3%	129
47-2022	Stonemasons	3	78	69	-11.5%	0
47-2031	Carpenters	2	6,616	7,429	12.3%	1,786
47-2041	Carpet Installers	2	353	414	17.3%	149
47-2042	Floor Layers, Except Carpet, Wood, and Hard Tiles	2	92	79	-14.1%	8
47-2044	Tile and Marble Setters	2	166	206	24.1%	69
47-2051	Cement Masons and Concrete Finishers	2	1,050	1,127	7.3%	202
47-2053	Terrazzo Workers and Finishers	2	19	16	-15.8%	0
47-2061	Construction Laborers	2	6,954	8,624	24.0%	3,352
47-2071	Paving, Surfacing, and Tamping Equipment Operators	2	450	500	11.1%	145
47-2072	Pile-Driver Operators	2	9	8	-11.1%	1
47-2073	Operating Engineers and Other Construction Equipment Operators	2	4,131	4,441	7.5%	1,506
47-2081	Drywall and Ceiling Tile Installers	2	360	315	-12.5%	29
47-2082	Tapers	2	109	119	9.2%	28
47-2111	Electricians	3	4,069	4,662	14.6%	1,701
47-2121	Glaziers	2	271	285	5.2%	104

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-2131	Insulation Workers, Floor, Ceiling, and Wall	2	132	151	14.4%	46
47-2132	Insulation Workers, Mechanical	2	78	119	52.6%	52
47-2141	Painters, Construction and Maintenance	2	1,129	1,211	7.3%	319
47-2142	Paperhangers	2	31	27	-12.9%	1
47-2151	Pipelayers	2	259	252	-2.7%	59
47-2152	Plumbers, Pipefitters, and Steamfitters	3	3,040	3,101	2.0%	615
47-2161	Plasterers and Stucco Masons	1	83	94	13.3%	11
47-2171	Reinforcing Iron and Rebar Workers	2	54	53	-1.9%	8
47-2181	Roofers	2	792	739	-6.7%	252
47-2211	Sheet Metal Workers	2	772	751	-2.7%	145
47-2221	Structural Iron and Steel Workers	2	352	355	0.9%	138
47-3011	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	2	192	170	-11.5%	3
47-3012	Helpers--Carpenters	2	191	237	24.1%	71
47-3013	Helpers--Electricians	2	278	363	30.6%	139
47-3014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	1	40	37	-7.5%	5
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	2	224	213	-4.9%	23
47-3016	Helpers--Roofers	2	74	94	27.0%	37
47-3019	Helpers, Construction Trades, All Other	2	64	65	1.6%	7
47-4011	Construction and Building Inspectors	3	1,396	1,786	27.9%	775
47-4021	Elevator Installers and Repairers	3	72	63	-12.5%	15
47-4031	Fence Erectors	2	200	207	3.5%	63
47-4041	Hazardous Materials Removal Workers	3	326	354	8.6%	144
47-4051	Highway Maintenance Workers	2	1,520	1,488	-2.1%	261
47-4061	Rail-Track Laying and Maintenance Equipment Operators	2	187	209	11.8%	57
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	1	226	222	-1.8%	68
47-4099	Construction and Related Workers, All Other	3	97	85	-12.4%	2
47-5011	Derrick Operators, Oil and Gas	1	215	184	-14.4%	87
47-5012	Rotary Drill Operators, Oil and Gas	2	858	976	13.8%	753
47-5013	Service Unit Operators, Oil, Gas, and Mining	2	482	535	11.0%	363
47-5021	Earth Drillers, Except Oil and Gas	2	274	295	7.7%	143
47-5031	Explosives Workers, Ordnance Handling Experts, and Blasters	2	22	23	4.5%	7
47-5041	Continuous Mining Machine Operators	1	264	224	-15.2%	82
47-5042	Mine Cutting and Channeling Machine Operators	2	207	135	-34.8%	14
47-5049	Mining Machine Operators, All Other	2	73	75	2.7%	24
47-5051	Rock Splitters, Quarry	1	59	58	-1.7%	22

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
47-5061	Roof Bolters, Mining	2	320	256	-20.0%	97
47-5071	Roustabouts, Oil and Gas	1	664	784	18.1%	431
47-5081	Helpers--Extraction Workers	2	579	572	-1.2%	283
47-5099	Extraction Workers, All Other	2	70	60	-14.3%	10
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	3	2,758	3,040	10.2%	1,066
49-2011	Computer, Automated Teller, and Office Machine Repairers	3	839	899	7.2%	325
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	3	51	42	-17.6%	2
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	3	988	955	-3.3%	219
49-2091	Avionics Technicians	3	58	66	13.8%	27
49-2092	Electric Motor, Power Tool, and Related Repairers	3	142	140	-1.4%	40
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	3	21	20	-4.8%	3
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	3	580	496	-14.5%	78
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	3	136	153	12.5%	55
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	3	24	27	12.5%	8
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	3	104	84	-19.2%	31
49-2098	Security and Fire Alarm Systems Installers	3	644	594	-7.8%	109
49-3011	Aircraft Mechanics and Service Technicians	3	542	460	-15.1%	148
49-3021	Automotive Body and Related Repairers	2	1,153	1,335	15.8%	484
49-3022	Automotive Glass Installers and Repairers	2	152	170	11.8%	67
49-3023	Automotive Service Technicians and Mechanics	3	5,738	6,217	8.3%	2,148
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	3	1,895	2,323	22.6%	909
49-3041	Farm Equipment Mechanics and Service Technicians	3	111	91	-18.0%	23
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	3	878	907	3.3%	332
49-3043	Rail Car Repairers	2	172	175	1.7%	76
49-3051	Motorboat Mechanics and Service Technicians	3	34	17	-50.0%	2
49-3052	Motorcycle Mechanics	3	108	133	23.1%	64
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	2	197	218	10.7%	72
49-3091	Bicycle Repairers	2	75	63	-16.0%	22
49-3092	Recreational Vehicle Service Technicians	2	37	39	5.4%	17
49-3093	Tire Repairers and Changers	2	431	374	-13.2%	115
49-9011	Mechanical Door Repairers	2	107	102	-4.7%	36

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	230	273	18.7%	127
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3	2,048	2,331	13.8%	908
49-9031	Home Appliance Repairers	3	289	290	0.3%	127
49-9041	Industrial Machinery Mechanics	3	2,567	2,814	9.6%	1,085
49-9043	Maintenance Workers, Machinery	3	751	820	9.2%	203
49-9044	Millwrights	3	237	303	27.8%	124
49-9045	Refractory Materials Repairers, Except Brickmasons	2	44	37	-15.9%	11
49-9051	Electrical Power-Line Installers and Repairers	3	606	709	17.0%	364
49-9052	Telecommunications Line Installers and Repairers	2	1,441	1,428	-0.9%	562
49-9062	Medical Equipment Repairers	3	513	656	27.9%	322
49-9063	Musical Instrument Repairers and Tuners	3	86	84	-2.3%	33
49-9064	Watch Repairers	3	16	15	-6.3%	3
49-9069	Precision Instrument and Equipment Repairers, All Other	3	45	37	-17.8%	6
49-9071	Maintenance and Repair Workers, General	3	10,449	10,621	1.6%	2,474
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	2	290	249	-14.1%	39
49-9092	Commercial Divers	3	81	80	-1.2%	32
49-9094	Locksmiths and Safe Repairers	2	77	67	-13.0%	13
49-9095	Manufactured Building and Mobile Home Installers	2	29	34	17.2%	18
49-9096	Riggers	2	59	74	25.4%	31
49-9098	Helpers--Installation, Maintenance, and Repair Workers	2	800	819	2.4%	273
49-9099	Installation, Maintenance, and Repair Workers, All Other	2	497	615	23.7%	196
51-1011	First-Line Supervisors of Production and Operating Workers	2	3,688	3,713	0.7%	766
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	27	22	-18.5%	3
51-2021	Coil Winders, Tapers, and Finishers	2	127	121	-4.7%	22
51-2022	Electrical and Electronic Equipment Assemblers	2	1,731	1,574	-9.1%	257
51-2023	Electromechanical Equipment Assemblers	2	562	443	-21.2%	22
51-2031	Engine and Other Machine Assemblers	2	221	203	-8.1%	65
51-2041	Structural Metal Fabricators and Fitters	3	676	698	3.3%	356
51-2091	Fiberglass Laminators and Fabricators	2	31	31	0.0%	9
51-2092	Team Assemblers	2	3,905	3,683	-5.7%	684
51-2099	Assemblers and Fabricators, All Other	2	692	858	24.0%	293
51-3011	Bakers	2	1,385	1,299	-6.2%	355
51-3021	Butchers and Meat Cutters	2	775	613	-20.9%	66

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	173	138	-20.2%	16
51-3023	Slaughterers and Meat Packers	1	66	61	-7.6%	19
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	2	29	30	3.4%	11
51-3092	Food Batchmakers	2	534	528	-1.1%	220
51-3093	Food Cooking Machine Operators and Tenders	2	135	145	7.4%	54
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3	1,259	1,553	23.4%	733
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	3	143	126	-11.9%	28
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	2	620	602	-2.9%	206
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	2	219	193	-11.9%	51
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	2	590	466	-21.0%	69
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	1,176	1,077	-8.4%	128
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	206	127	-38.3%	3
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	869	899	3.5%	368
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	421	380	-9.7%	112
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	3	220	212	-3.6%	70
51-4041	Machinists	3	3,251	3,452	6.2%	1,159
51-4051	Metal-Refining Furnace Operators and Tenders	2	360	316	-12.2%	64
51-4052	Pourers and Casters, Metal	2	259	264	1.9%	106
51-4061	Model Makers, Metal and Plastic	3	55	41	-25.5%	1
51-4062	Patternmakers, Metal and Plastic	3	59	68	15.3%	33
51-4071	Foundry Mold and Coremakers	2	127	115	-9.4%	27
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2	709	648	-8.6%	119
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2	984	1,054	7.1%	417
51-4111	Tool and Die Makers	3	687	693	0.9%	134
51-4121	Welders, Cutters, Solderers, and Brazers	3	2,684	3,085	14.9%	1,274
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	2	214	214	0.0%	84
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	2	228	185	-18.9%	28
51-4192	Layout Workers, Metal and Plastic	2	25	24	-4.0%	6

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	277	273	-1.4%	92
51-4194	Tool Grinders, Filers, and Sharpeners	2	95	73	-23.2%	7
51-4199	Metal Workers and Plastic Workers, All Other	2	175	189	8.0%	53
51-5111	Prepress Technicians and Workers	3	222	126	-43.2%	4
51-5112	Printing Press Operators	3	1,111	860	-22.6%	112
51-5113	Print Binding and Finishing Workers	2	344	272	-20.9%	48
51-6011	Laundry and Dry-Cleaning Workers	1	1,394	1,436	3.0%	540
51-6021	Pressers, Textile, Garment, and Related Materials	1	267	262	-1.9%	53
51-6031	Sewing Machine Operators	1	415	417	0.5%	200
51-6042	Shoe Machine Operators and Tenders	2	11	9	-18.2%	10
51-6051	Sewers, Hand	2	431	505	17.2%	120
51-6052	Tailors, Dressmakers, and Custom Sewers	3	181	212	17.1%	77
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders	2	23	26	13.0%	21
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	2	112	118	5.4%	74
51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	2	78	76	-2.6%	54
51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2	59	56	-5.1%	32
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	2	42	31	-26.2%	5
51-6092	Fabric and Apparel Patternmakers	3	12	13	8.3%	3
51-6093	Upholsterers	2	116	124	6.9%	67
51-6099	Textile, Apparel, and Furnishings Workers, All Other	2	46	50	8.7%	13
51-7011	Cabinetmakers and Bench Carpenters	2	245	254	3.7%	112
51-7021	Furniture Finishers	1	61	73	19.7%	47
51-7031	Model Makers, Wood	3	6	6	0.0%	1
51-7032	Patternmakers, Wood	3	14	18	28.6%	6
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	2	195	328	68.2%	221
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	2	261	364	39.5%	163
51-7099	Woodworkers, All Other	2	5	4	-20.0%	0
51-8011	Nuclear Power Reactor Operators	3	38	41	7.9%	18
51-8012	Power Distributors and Dispatchers	3	90	99	10.0%	44
51-8013	Power Plant Operators	2	237	228	-3.8%	102
51-8021	Stationary Engineers and Boiler Operators	3	997	1,151	15.4%	585
51-8031	Water and Wastewater Treatment Plant and System Operators	3	1,262	1,313	4.0%	583

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-8091	Chemical Plant and System Operators	2	256	239	-6.6%	139
51-8092	Gas Plant Operators	3	373	428	14.7%	261
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	2	365	428	17.3%	257
51-8099	Plant and System Operators, All Other	2	84	81	-3.6%	34
51-9011	Chemical Equipment Operators and Tenders	2	593	596	0.5%	323
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	2	154	153	-0.6%	69
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	2	180	186	3.3%	80
51-9022	Grinding and Polishing Workers, Hand	1	126	127	0.8%	48
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2	693	723	4.3%	300
51-9031	Cutters and Trimmers, Hand	2	26	24	-7.7%	5
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	2	215	159	-26.0%	8
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	2	377	360	-4.5%	132
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	2	118	91	-22.9%	23
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2	2,692	2,695	0.1%	701
51-9071	Jewelers and Precious Stone and Metal Workers	3	83	64	-22.9%	4
51-9081	Dental Laboratory Technicians	2	176	187	6.3%	106
51-9082	Medical Appliance Technicians	3	160	125	-21.9%	45
51-9083	Ophthalmic Laboratory Technicians	2	215	198	-7.9%	79
51-9111	Packaging and Filling Machine Operators and Tenders	2	1,618	1,558	-3.7%	434
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	2	457	558	22.1%	222
51-9122	Painters, Transportation Equipment	2	301	289	-4.0%	75
51-9123	Painting, Coating, and Decorating Workers	2	85	82	-3.5%	20
51-9141	Semiconductor Processors	2	48	44	-8.3%	18
51-9151	Photographic Process Workers and Processing Machine Operators	2	201	147	-26.9%	26
51-9191	Adhesive Bonding Machine Operators and Tenders	2	35	35	0.0%	11
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	2	56	64	14.3%	24
51-9193	Cooling and Freezing Equipment Operators and Tenders	2	42	43	2.4%	16
51-9194	Etchers and Engravers	2	51	52	2.0%	18
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	2	283	284	0.4%	130

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
51-9196	Paper Goods Machine Setters, Operators, and Tenders	2	421	405	-3.8%	82
51-9197	Tire Builders	2	51	53	3.9%	23
51-9198	Helpers--Production Workers	2	2,804	2,773	-1.1%	685
51-9199	Production Workers, All Other	2	388	402	3.6%	112
53-1011	Aircraft Cargo Handling Supervisors	2	47	50	6.4%	16
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	2	994	1,115	12.2%	433
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	2	1,303	1,480	13.6%	565
53-2012	Commercial Pilots	3	343	402	17.2%	191
53-2021	Air Traffic Controllers	3	56	51	-8.9%	23
53-2022	Airfield Operations Specialists	3	61	57	-6.6%	29
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	2	379	486	28.2%	188
53-3021	Bus Drivers, Transit and Intercity	2	2,256	2,464	9.2%	835
53-3022	Bus Drivers, School or Special Client	2	5,242	5,783	10.3%	1,866
53-3031	Driver/Sales Workers	2	2,813	2,916	3.7%	641
53-3032	Heavy and Tractor-Trailer Truck Drivers	2	10,082	11,989	18.9%	4,029
53-3033	Light Truck or Delivery Services Drivers	2	6,104	5,938	-2.7%	992
53-3041	Taxi Drivers and Chauffeurs	1	1,334	1,408	5.5%	344
53-3099	Motor Vehicle Operators, All Other	2	159	193	21.4%	75
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	2	80	63	-21.3%	10
53-5011	Sailors and Marine Oilers	2	228	203	-11.0%	120
53-5021	Captains, Mates, and Pilots of Water Vessels	3	82	71	-13.4%	40
53-6011	Bridge and Lock Tenders	1	16	13	-18.8%	5
53-6021	Parking Lot Attendants	2	1,076	1,381	28.3%	932
53-6031	Automotive and Watercraft Service Attendants	1	394	442	12.2%	174
53-6041	Traffic Technicians	3	8	9	12.5%	4
53-6051	Transportation Inspectors	3	76	70	-7.9%	22
53-6061	Transportation Attendants, Except Flight Attendants	2	163	150	-8.0%	29
53-6099	Transportation Workers, All Other	2	35	39	11.4%	19
53-7011	Conveyor Operators and Tenders	2	215	177	-17.7%	42
53-7021	Crane and Tower Operators	3	362	408	12.7%	189
53-7032	Excavating and Loading Machine and Dragline Operators	2	495	489	-1.2%	72
53-7033	Loading Machine Operators, Underground Mining	2	87	68	-21.8%	4
53-7051	Industrial Truck and Tractor Operators	2	2,687	3,052	13.6%	1,246
53-7061	Cleaners of Vehicles and Equipment	2	1,932	2,082	7.8%	777

SOC Code	Occupation Title	Job Zone	2014	2024	% Change 2014-2024	New and Replacement Jobs
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2	15,026	17,584	17.0%	7,972
53-7063	Machine Feeders and Offbearers	2	466	410	-12.0%	64
53-7064	Packers and Packagers, Hand	2	3,485	3,767	8.1%	1,380
53-7071	Gas Compressor and Gas Pumping Station Operators	2	291	344	18.2%	227
53-7072	Pump Operators, Except Wellhead Pumpers	2	367	402	9.5%	246
53-7073	Wellhead Pumpers	2	389	460	18.3%	360
53-7081	Refuse and Recyclable Material Collectors	2	760	905	19.1%	390
53-7111	Mine Shuttle Car Operators	2	146	137	-6.2%	60
53-7121	Tank Car, Truck, and Ship Loaders	2	117	105	-10.3%	33
53-7199	Material Moving Workers, All Other	2	30	37	23.3%	17

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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