



CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

SACRAMENTO REGION PUBLIC SECTOR WORKFORCE NEEDS ASSESSMENT

Innovative Pathways to Public Service (IPPS)



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Center of Excellence

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EXECUTIVE SUMMARY

Across the nation and in California, public agencies are experiencing difficulty finding qualified candidates to fill positions. This is especially the case for specialized, highly skilled jobs in finance, management, IT, skilled trades, health care, and public safety.¹ Factors affecting public agencies include a shortage of applicants, a high number of baby boomers retiring, antiquated systems that deter the best and brightest job seekers from applying for public sector jobs, and rural agencies frequently facing a dearth of jobs applicants.² Staffing shortages are expected to get worse as tight budgets limit hiring and investing in the workforce.³ In addition, the consequences can be far reaching, resulting in overworked employees due to understaffing, unsafe working conditions, and rising costs in employee overtime.

In the greater Sacramento region, the Institute for Local Government (ILG) and a cohort of partners convened the Innovative Pathways to Public Service (IPPS) consortium to support government workforce readiness at all levels, in particular local, state, and special districts. IPPS has directed attention toward addressing workforce challenges in greater Sacramento as roughly a quarter of the region's workforce is employed by public service agencies. As part of its efforts, IPPS asked the North/Far North Center of Excellence to undertake a comprehensive study of public sector workforce needs in the region. Given the breadth and scope of the public sector, the research team measured regional public sector and private sector employment, examined seven key industry sectors comprising the majority of public sector employment, and took a close look at the business establishments in public sector industries. These findings are presented in this report, which also breaks down public sector employment by county; provides age, gender, and race and ethnicity demographics; and details annual wages for the seven industry sectors of focus. To assist with educational pathway development leading to promising careers, the study includes an in-depth analysis in Appendix D of career clusters in the public sector.

The research reveals that the six-county Sacramento region has 245,000 public sector jobs, representing 24% of all jobs in the economy and more than a quarter of all of California's state government jobs. Almost half of the region's public sector jobs are state government jobs, nearly



¹ Elizabeth K. Kellar, "The growing urgency of government's quest for talent," *Governing*, June 21, 2016, accessed July 15, 2019, <https://www.governing.com/columns/smart-mgmt/col-challenge-recruiting-retaining-state-local-government-workforce.html>.

² Katherine Barrett and Richard Greene, "Can government hiring get out of the Stone Age?" *Governing*, February 2016, accessed July 15, 2019, <https://www.governing.com/topics/mgmt/gov-government-hiring-best-practices.html>.

³ Howard Risher, "Unlocking the Talent in Government's Workforce," *International Public Management Association for Human Resources*, 2017-2018.

120,000 jobs. The Sacramento region has about a 10% larger share of public sector jobs than California, mostly due to the presence of state government jobs in the capital region.

The industry sectors with the most public sector jobs are utilities; transportation and warehousing; information; professional, scientific, and consulting services; health care and social assistance; educational services; and public administration.

One of the study's most noteworthy findings dispels a commonly held belief that the public sector pays less than the private sector. The seven public sectors pay, on average annually, \$25,000 more than private sector jobs (for all sectors and industries) in the Sacramento region. The regional average annual public sector wage is \$76,700 compared to \$51,400 for the private sector. (The regional living wage for a one-adult, one-child household is \$55,000.) This finding is even more staggering given that the average public sector annual wage in California for the seven industry sectors is \$69,000 compared to \$65,500 for the private sector. This indicates the regional economy is highly dependent on the public sector for the wealth circulating in the economy.



The research team also conducted 12 executive interviews with representatives from public agencies in the region. The interviews revealed consternation over the systems in place and existing capacity to recruit candidates and upskill the existing workforce. Based on interview findings and a literature review, recruitment and advancement is likely to become more challenging as aging workers retire. Three leading clearinghouse services—CalOpps, NEOGOV, and Careers in Government—were the most frequently cited method for recruitment, and are used more often than direct outreach, school partnerships, or other community-based means. This indicates that agencies may be over-relying on online services to recruit candidates, rather than fostering direct community partnerships that can be more effective in creating successful recruitment pipelines. Furthermore, interviewees from public agencies that have fostered pathways with secondary and postsecondary schools, developed internships, and created training academies reported having successfully overcome challenges in recruiting and retaining qualified applicants.

Additional key findings include:

Job concentration—Most public sector jobs, approximately 160,000, are in Sacramento County. Nearly 90,000 of Sacramento County’s public sector jobs are state government jobs.

Agency establishments—Of the nearly 50,000 business establishments (offices or facilities) in the region, 6,300 of them are in the public sector.

Largest career clusters—Three career clusters have high job numbers. The educational services sector leads the group with 45,000 jobs, followed by business management and administration, 42,000 jobs, and public safety, corrections, and security, 29,600 jobs.

Age demographics—In the Sacramento region, eight out of 10 workers in the public sector are over age 35, compared to seven out of 10 workers in the private sector.

Race demographics—Three out of four public sector workers identify as “white alone.” The public sector is less diverse, with 6%-11% higher shares of “white alone” than the private sector.

Educational levels—About 40% of the public sector workforce requires a bachelor’s degree or higher, a number that is influenced by the large concentration of teachers in the region. The research indicates that the educational path to most higher paying, management positions is often a bachelor’s degree. Many jobs at the “middle-skill” level, that require some postsecondary education and training, but less than a bachelor’s degree, also pay well. Middle-skill jobs occupy 36% of the public sector workforce.

The report makes several recommendations for the IPPS to encourage the Sacramento region’s agencies to improve systems to connect qualified applicants with job opportunities in a more efficient and inclusive manner. The recommendations address the major challenges outlined in the findings from the literature review, interviews, and data analysis. The report provides a framework for the specific recommendations that include the following:

- Create and support committees to focus on key strategic priorities
- Identify best practices, resources, and technical assistance for key project areas
- Disseminate resources and practices to regional agency offices through workshops and other capacity-building activities
- Advocate for additional resources and coordinate multi-agency efforts
- Continue to engage regional stakeholders for strategic planning, project development, and progress evaluation

INTRODUCTION

As California's state capitol, Sacramento is anchored by its public sector workforce, which accounts for nearly a quarter of the jobs in the six-county greater Sacramento region. The region has nearly 120,000 state government workers, most of them in the urban core, including major state offices for health care services, corrections and rehabilitation, Caltrans, water resources, administration of justice, GovOps, general services, and the state library system. The list of state offices is long: There are more than 4,800 state government entities in the region.

Rural agency offices and post office facilities, water treatment and irrigation districts, city and county governments, elementary and high schools, and community colleges form an important part of the economies in the surrounding counties. These public sector employers are staple workforce institutions that frequently offer good salaries with benefits. These are jobs that pay living wages that support families. The agencies offer vital services to local communities and communities across the state. They are unmistakably critical employers in the local regional economy and for the management of local and state services.

However, these agencies face a primary workforce threat—an aging workforce and retirements. They also continue to recover from the shock of the Great Recession, during which positions were eliminated or never refilled.

Challenges to workforce preparation and pipeline development abound. Public misconceptions about government employment lead prospective candidates to the private sector. Weak ties with regional schools and other community partners result in a persistent lack of awareness about job opportunities and career pathways. Often insufficient professional development planning yields inefficient promotion timelines and pathway development. A legacy system of job postings and software that lacks streamlined competency-and-interest matching contribute to non-specific applicant pools. Uneven diversity policies have resulted in a workforce that lacks diversity and skews white compared to the private sector.

Numerous national and statewide studies have identified strategies to address these challenges, which include the need to interest young people in public sector careers and to provide training and education resources in house and with partner organizations to upskill the existing workforce to move into supervisory, management, and advanced technician roles. Improved systems are needed to support candidates in navigating job application requirements and the application process to be appropriately matched with career opportunities. Technical assistance is needed for strategic planning and increasing the capacity of human resource offices to implement work plans.

A number of professional and agency initiatives have emerged to tackle these challenges. Among them, a multi-stakeholder group of education, nonprofit, civic leadership, workforce development, and local and state government agency partners has come together to form the Innovative Pathways to Public Service (IPPS) consortium in the Sacramento region to address these challenges. The Institute of Local Government (ILG) and a cohort of partners convened the IPPS consortium. The ILG is a nonprofit research and education affiliate of the League of California Cities, California Special Districts Association (CSDA), and California State Association of Counties.

The IPPS consortium includes the following organizations:

Innovative Pathways to Public Service (IPPS) consortium members	
Local government	City of Elk Grove
	City of Sacramento
	County of Sacramento
	Placer County
Nonprofit	Institute for Local Government (ILG)
	Valley Vision
	Social Venture Partners
	NXTGOV
Workforce development	Sacramento Employment & Training Agency (SETA)
Utilities	Sacramento Municipal Utilities District (SMUD)
Education	California State University, Sacramento (CSUS)
	California Community Colleges Chancellor's Office
	Los Rios Community College District
	Sacramento County Office of Education (SCOE)
	Sacramento City Unified School District
	Elk Grove Unified School District
	Twin Rivers Unified School District

The IPPS has identified a number of project areas to build talent pipelines (recruitment strategies and work-based learning programs). The group meets regularly as an advisory body to align efforts. The consortium successfully created several “Youth in Government” job awareness days. It also worked with NxtGov, a nonprofit leadership group that promotes awareness of public sector careers, to gather testimonials from millennial public sector workers for promotional videos.

As part of its work to align the region in addressing public sector hiring needs, the IPPS commissioned a study by the North/Far North Center of Excellence, which is part of the California Community Colleges Chancellor's Office Economic and Workforce Development Division (EWD) and is hosted by the Los Rios Community College District in Sacramento. With regional offices throughout the state, the Centers of Excellence is a research group that provides labor market data and other forms of technical assistance to the community colleges and other community partners especially for developing Career Education (CE) investment strategies. The goal of the research presented in this report is to provide a foundational analysis that IPPS can use to refine and advance programs and projects that address major challenges facing the public sector workforce in the region.

OVERVIEW AND METHODOLOGY

This report quantifies and describes the public sector workforce and major trends in the six-county Sacramento region including Sacramento, Placer, El Dorado, Yolo, Yuba, and Sutter counties. The research uses quantitative data analysis from public and private sources to describe the public sector workforce. A qualitative literature review was compiled and interviews with government agency representatives were conducted to identify major regional workforce trends and challenges.

Tips for using the industry and establishment data

Industry sectors with high levels of employment and high earnings represent key targets and partners for pipeline and pathway development.

The business establishment data in the report body and appendices shows top employers who could be strategic partners for pipeline development.

Tips for using the demographic data

The demographic data shows public sector industries where diversity policies and practices need additional support and technical assistance.

The data also shows industry sectors that may face particular retirement challenges or trouble recruiting a younger workforce.

Public sector industry sector analysis

The first section of the report uses the Quarterly Census of Employment and Wages (QCEW), a data product from the Employment Development Department (EDD) and the Bureau of Labor Statistics (BLS). The QCEW codes business establishments by ownership, so analysis can parse out job counts and wages for federal, state, and local government, and the private sector. The research imputed some data where suppression posed a data analysis challenge. In certain cases, this was not possible for large state employers since estimates were based on average number of jobs per establishment.

The section offers an analysis of public sector employment across the economy and identifies seven key sectors comprising a significant share of jobs and total number of jobs. The report further details public sector jobs for each county in the region. The section also reports on the number of public sector business establishments and average annual wages for each of the study's seven industry sectors, using QCEW data. Another data source, EconoVue, Dun & Bradstreet presents detailed establishment-level data to enumerate the offices and facilities counted in the general descriptive industry categories from the BLS.

Public and private sector demographics

The second section of the report uses the Longitudinal Employer-Household Dynamics (LED) survey from the U.S. Census and the EDD to compare the private and public sector demographics in the seven key industry sectors. The analysis used the LED extraction tool from the Quarterly Workforce Indicators (QWI) and describes the differences in shares of the workforce by gender, ethnicity, race, and age. The data analysis reveals diversity challenges and those industry sectors with a higher percentage of aging workers.

Skill-level occupational analysis

In the third section of the report, the analysis employs a skill-level model that evaluates occupations according to typical entry-level education, on-the-job-training requirements, and experience based on surveys of employers. A separate national survey of existing workers shows educational attainment levels by occupation category. Middle-skill jobs are relevant to community college programs because they require workers to possess more education than a high school diploma but less than a bachelor's degree. The estimates show postsecondary education and training providers where training and education preparation could impact

the workforce. Analysis of above-middle-skill jobs presents opportunities for four-year universities, while below-middle-skill jobs offer entry-level training targets for high school graduates and workers in transition.

The occupational analysis uses staffing patterns from the Occupational Employment Survey (OES) from the BLS to explore public sector workforce education levels within industry sectors. The analysis applies the OES staffing pattern ratios to the QCEW to determine occupational estimates by skill level for the public industry sectors.

Career cluster occupational analysis

The report makes use of O*NET career clusters to summarize more than 800 occupations into 16 categories to more easily understand the major categories of occupations across and within industry sectors. The skill-level tool is overlaid with the career clusters to show potential career pathways in the occupational clusters.

Interviews and literature review

Interviews with 12 representatives from key public sector agencies in the region and a literature review of national and statewide public sector workforce literature inform specific findings and recommendations for project and program initiatives that the IPPS should explore for investment. The interviews and literature review identify human resources challenges—training and education requirements, school and training partnerships, and trends affecting hiring and retention. These sources offer context and insight into the phenomenon observed in the data analysis.

Finally, please note that the research did not include a supply-and-demand gap analysis. Considering the large and diverse swath of the workforce included in the research, the report does not attempt to quantify workforce education and training shortages. Instead, the tools employed describe the general characteristics of the industry sectors and the type of workers employed within and across public industry sectors, and career pathways. These represent opportunities for advancement with additional education and training. The appendices present detailed public industry sector profiles with career clusters and individual sector metrics from the body of the report. Appendix D provides detailed occupational data for 13 of the 16 career clusters. Appendix E contains notes on data sources and methodology.



Tips for using the occupational analysis and career clusters

The skill-level occupational analysis and career clusters provide a first-level look at the education, training, and skill profiles of the industry sectors. These offer targets for new entrants to public service.

Prominent career clusters and industry sectors with evenly split shares of jobs in each of three skill levels indicate areas that are promising for talent development through additional education and training.

Industry sector profiles and detailed occupational analysis in the appendices show potential areas for pipeline and pathway development.

REGIONAL PUBLIC AND PRIVATE SECTOR EMPLOYMENT

Key Findings

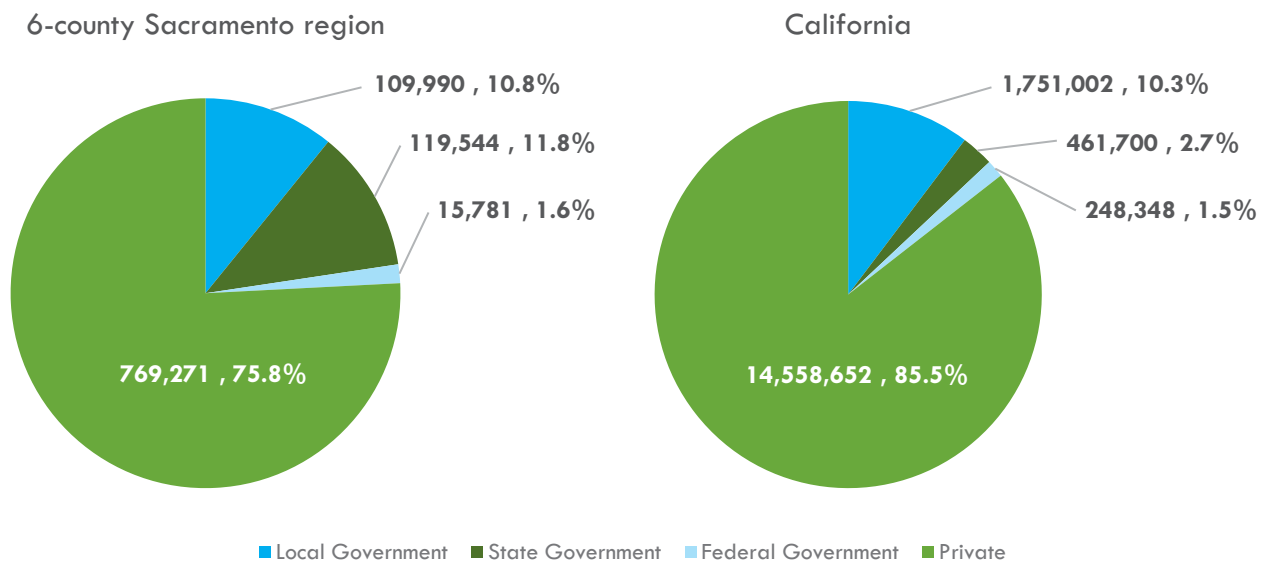
- 24% of all jobs in the six-county Sacramento region are public sector jobs.
- 14.5% of the jobs in California are public sector jobs.
- The region has 245,000 jobs in local, state, and federal government, including 119,500 state government jobs, more than a quarter of all of California's state government jobs.

There are just over 1 million jobs in the six-county Sacramento region.⁴ Most jobs, about three-quarters, are classified as private sector jobs. Public sector employment makes up 24% of jobs in the six-county Sacramento region, a total of 245,000 jobs. State government accounts for half of the government jobs in the region, 119,000 jobs, representing 12% of the region's total jobs. Local government jobs comprise just under half of all government jobs, 110,000 jobs, about 11% of all jobs in the economy. There are nearly 16,000 federal government jobs in the region, the smallest segment of public sector employment.⁵

The Sacramento region has a 10% higher share of public sector jobs than the state. The share of state jobs occupied by the public sector is 14.5%. The difference is largely due to the number of state government jobs that are concentrated in and around the capital. The Sacramento region is home to more than a quarter, 25.9%, of total state government jobs in California.

Exhibit 1 displays the totals from 10-level QCEW data, which is the highest level of aggregation for the Sacramento region and California. At this level, gathering agencies disclose available data.

Exhibit 1: Public and private sector employment, six-county Sacramento region and California, 10s level, 2017⁶



⁴ The Sacramento region definition includes Sacramento, Placer, El Dorado, Yolo, Yuba, and Sutter counties.

⁵ The figures are derived from the 10-level of QCEW, the highest level of aggregation, which minimizes suppression. The remainder of the report uses QCEW's standard 2-digit NAICS codes for analysis of industry sectors. The methodology section outlines the suppression challenges for analysis. The 2-digit NAICS with suppression yields a regional total of just over 217,000 jobs. (The COE created an estimate to interpolate some jobs at the 2-digit level.)

⁶ Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), 2017 annual averages. Note, at the time the research was conducted, 2017 annual average was the most current available data. <https://www.bls.gov/cew/downloadable-data-files.htm>.

PUBLIC AND PRIVATE SECTOR EMPLOYMENT BY INDUSTRY SECTOR

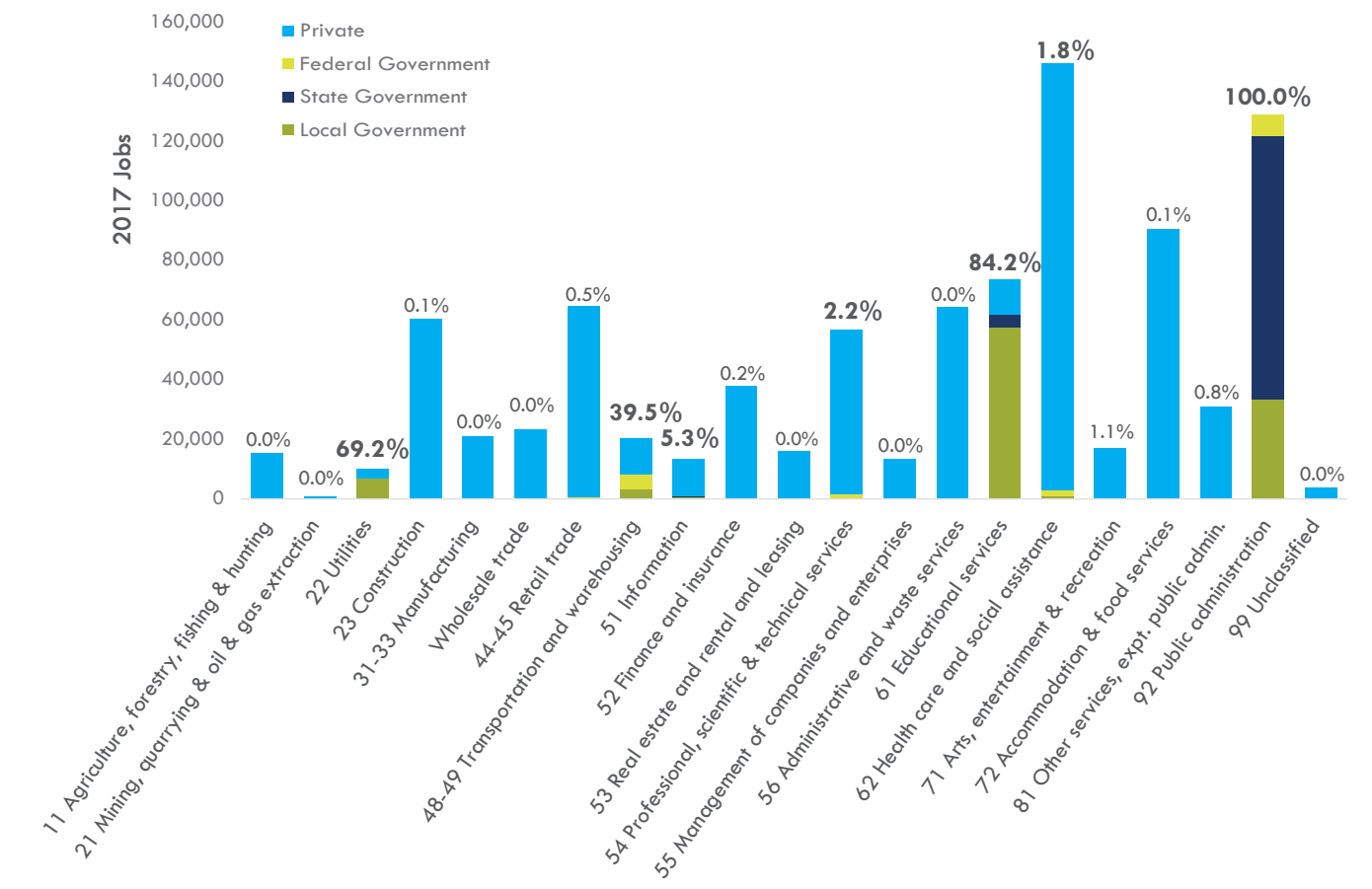
Exhibit 2 shows the number and share of jobs for public and private sector employment for all sectors in the economy. The percentages at the top of each bar show the share of public sector jobs for each industry sector. Seven sectors comprise the most significant share and total number of public sector jobs. These include utilities; transportation and warehousing; information; professional, scientific & technical services; educational services; health care and social assistance; and public administration. These seven industry sectors are used for all detailed industry and occupational analyses in the study.

Exhibit 2: Local, state, and federal public and private sector jobs by sector, Sacramento region, 2017⁷

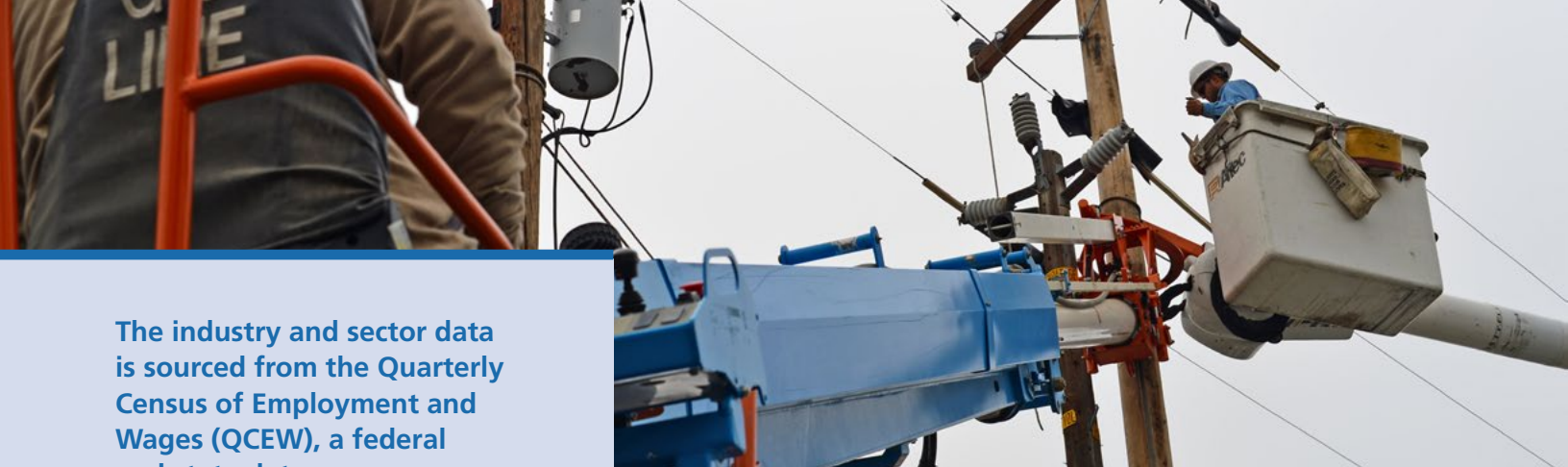
Number of jobs by ownership. Share of total jobs that are public sector jobs. Seven study sectors highlighted.

The industry and occupational analysis focuses on the seven sectors with the largest number and percentage of public sector jobs:

- Utilities
- Transportation and warehousing
- Information
- Professional and technical services
- Educational services
- Health care and social assistance
- Public administration



⁷ Ibid.



The industry and sector data is sourced from the Quarterly Census of Employment and Wages (QCEW), a federal and state data source. The data includes workers covered by state and federal unemployment insurance programs. The counts do not include self-employed workers, some agricultural workers, railroad workers, or the military.

Exhibit 3 displays the number and share of local, state, and federal public and private sector jobs for seven industry sectors in the six-county Sacramento region. In total, there are 211,000 public sector jobs, just over 23% of all jobs in the region's economy.

At this lower level of data aggregation (2-digit NAICS), the reporting agencies suppress some employment data for privacy of the reporting establishments. Reported employment is lower than the higher level aggregation.

Exhibit 3: Local, state, and federal public and private sector jobs in the seven sectors, Sacramento region, 2017⁸

Industry Sector	Local Govt. Jobs	State Govt. Jobs	Federal Govt. Jobs	Public Sector Jobs	Private Sector Jobs	Total Jobs	Public Sector Share of total
22 Utilities	6,891	0	0	6,891	3,064	9,955	69.2%
48-49 Transportation & warehousing	3,180	0	4,798	7,978	12,197	20,175	39.5%
51 Information	576	121	8	705	12,482	13,187	5.3%
54 Professional, scientific & technical services	0	0	1,252	1,252	55,238	56,490	2.2%
61 Educational services	57,476	4,259	0	61,735	11,562	73,297	84.2%
62 Health care & social assistance	695	0	1,966	2,661	143,234	145,895	1.8%
92 Public administration	33,425	88,100	7,274	128,799	0	128,799	100.0%
<i>Total, seven study sectors</i>	<i>102,243</i>	<i>92,480</i>	<i>15,298</i>	<i>210,021</i>	<i>237,777</i>	<i>447,798</i>	<i>46.9%</i>
Total, all sectors	102,579	92,637	15,782	210,998	692,734	903,732	23.3%

⁸ Ibid.

A word on suppression

To maintain privacy, the BLS and EDD “suppress” or do not disclose employment numbers when a large employer, or just a few employers, account for most of the jobs, what is known as the 80/3 rule.

The major impacts to analysis include educational services (state universities, probably the University of California-Davis), health care and social assistance (state medical facilities, probably UC Davis Medical Center), and professional and technical services, again with state government suppressed. The 10-level analysis shows nearly 120,000 state government jobs in the region. The sector-level analysis shows 92,600 state government jobs, a difference of about 27,000 jobs not counted in the industry sector analysis.

The COE imputed some data based on average size of establishment where possible. NAICS code 56-administrative and waste services, and NAICS code 71-arts, entertainment, and recreation were not included in the study since most or all employment data has majority suppression for state, local, and federal public sector jobs.



PUBLIC AND PRIVATE SECTOR ESTABLISHMENTS AND DETAILED INDUSTRIES

Key Findings

- There are 6,300 public sector business establishments (sites, facilities, offices) in the Sacramento region.
- Most are in public administration and educational services.

In the seven sectors, nearly 50% of jobs are public sector jobs. All public administration jobs, nearly 129,000 in the Sacramento region, are, by definition, public sector jobs. (There are no private sector public administration jobs.) Nearly 70% of the 10,000 jobs in utilities are in local government. Four in 10 jobs in transportation and warehousing are public sector, including the federal and local government. About eight in 10 jobs in educational services are in the public sector, mostly in local schools and community colleges. The information, professional, scientific & technical services, and health care and social

assistance sectors show smaller shares of public sector employment but display large enough job numbers to warrant inclusion in the study. Appendix A contains historical and projected growth for the seven sectors. Of the nearly 50,000 business establishments (sites or locations) across the economy in the Sacramento region, 6,300 of them are public sector, approximately 13% of all establishments (Exhibit 4). The vast majority of public sector establishments are in public administration and educational services. Fifty of the 58 utility establishments are designated as public sector. A much smaller share of public sector establishments is found in information; professional, scientific & technical services; and health care and social assistance.

Exhibit 4: Number of local, state, federal, and private sector establishments in the seven study sectors, Sacramento region, 2017⁹

	NAICS 22 Utilities	NAICS 51 Information	NAICS 54 Professional, scientific & technical services	NAICS 61 Educational services	NAICS 62 Health care and social assistance	NAICS 92 Public administration	NAICS 48-49 Transportation and warehousing
Local Government	50	48	9	884	50	179	25
State Government	0	20	24	270	14	4,521	0
Federal Government	0	1	8	0	5	141	116
Private	58	580	6,391	673	34,294	0	1,131
<i>Public Sector Total</i>	<i>50</i>	<i>69</i>	<i>41</i>	<i>1,154</i>	<i>69</i>	<i>4,841</i>	<i>141</i>
<i>Public Sector Grand Total</i>							<i>6,365</i>
Subtotal Public & Private	108	649	6,432	1,827	34,363	4,841	1,272
Grand Total Public & Private							49,492

⁹ Ibid.

A handful of industries (and employers in some cases) make up most public sector establishments (and jobs) in all seven study sectors, except public administration, where dozens of industries have large numbers of business establishments and jobs. Exhibit 5 shows the public sector industries with the most establishments in the sectors.

Exhibit 5: Industries with the most establishments (sites) in the seven sectors, Sacramento region¹⁰

Sector	Primary Public Sector Industries (# establishments)
NAICS 22 Utilities	<ul style="list-style-type: none"> • NAICS 221310 Water supply & irrigation systems (44) • NAICS 221320 Sewage treatment facilities (4)
NAICS 48-49 Transportation and warehousing	<ul style="list-style-type: none"> • NAICS 491110 Postal service (116) • NAICS 485410 School & employee bus transportation (10) • NAICS 493110 General warehousing and storage (7) • NAICS 488119 Other airport operations (4)
NAICS 51 Information	<ul style="list-style-type: none"> • NAICS 519120 Libraries and archives (49)
NAICS 54 Professional, scientific & technical services	<ul style="list-style-type: none"> • NAICS 541330 Engineering services (28) • NAICS 541820 Public relations agencies (3) • NAICS 541512 Computer systems design services (2)
NAICS 61 Educational services	<ul style="list-style-type: none"> • NAICS 611110 Elementary & secondary schools (869) • NAICS 611310 Colleges & universities (269) • NAICS 611210 Junior colleges (14)
NAICS 62 Health care and social assistance	<ul style="list-style-type: none"> • NAICS 624410 Child day care services (30) • NAICS 624310 Vocational rehabilitation services (25) • NAICS 621111 Offices of physicians (4) • NAICS 624120 Services for the elderly & disabled (3) • NAICS 622110 General medical & surgical hospitals (1)
NAICS 92 Public administration	<ul style="list-style-type: none"> • NAICS 921190 Other government support (534) • NAICS 921130 Public finance activities (523) • NAICS 924120 Administration of conservation programs (447) • NAICS 924110 Air, water, & waste program administration (378) • NAICS 923130 Other human resource programs administration (366) • NAICS 923120 Administration of public health programs (357) • NAICS 926120 Transportation program administration (295)

¹⁰ Ibid.



The research makes use of a different data source, Dun & Bradstreet establishment-level data, to show likely offices and facilities counted in the government data.¹¹ Exhibit 6 shows a sample of the top employers for each of the study's seven industry sectors. The table shows top employers representing different industries and counties in each sector. Appendix B lists the top 30 public sector employers in the six-county Sacramento region.

Exhibit 6: Top public sector employer sites by number of employees, sample of the study's seven sectors, showing distribution of industries and counties

Industry Sector	Registered Company Name	NAICS	NAICS Description	County	Employment
22-Utilities	El Dorado Irrigation District	221310	Water Supply and Irrigation Systems	El Dorado	300
48-49-Trans. & Warehousing	United States Postal Service	491110	Postal Service	Sacramento	2,566
48-49-Trans. & Warehousing	United States Postal Service	491110	Postal Service	Yolo	1,400
48-49-Trans. & Warehousing	Sacramento Regional Transit District	485113 & 488490	Bus and Other Motor Vehicle Transit Systems & Other Support Activities for Road Transportation	Sacramento	1,052
51-Information	California State Library	519120	Libraries and Archives	Sacramento	1,042
54-Prof.&Tech. Svcs	US Army Corps of Engineers	541330	Engineering Services	Sacramento	982
54-Prof.&Tech. Svcs	County of Placer	541330	Engineering Services	Placer	150
61-Educational Svcs	University of California, Davis	611310	Colleges, Universities, and Professional Schools	Yolo	7,830
61-Educational Svcs	Grove Elk Unified School District	611110	Elementary and Secondary Schools	Sacramento	7,710
61-Educational Svcs	Yuba City Unified School District	611110	Elementary and Secondary Schools	Sutter	1,137
62-Health Care & Social Assistance	University of California, Davis	622110	General Medical and Surgical Hospitals	Sacramento	11,004
92-Public Admin.	County of Sacramento	Multiple	Multiple	Sacramento	13,557
92-Public Admin.	Department of Health Care Services	923120	Administration of Public Health Programs	Sacramento	10,161
92-Public Admin.	California Department of General Services	921190	Other General Government Support	Yolo	3,474
92-Public Admin.	County of Placer	Multiple	Multiple	Placer	3,113
92-Public Admin.	County of El Dorado	Multiple	Multiple	El Dorado	2,940

¹¹ Econovue, Dun & Bradstreet. Econovue.com, 2019.3.

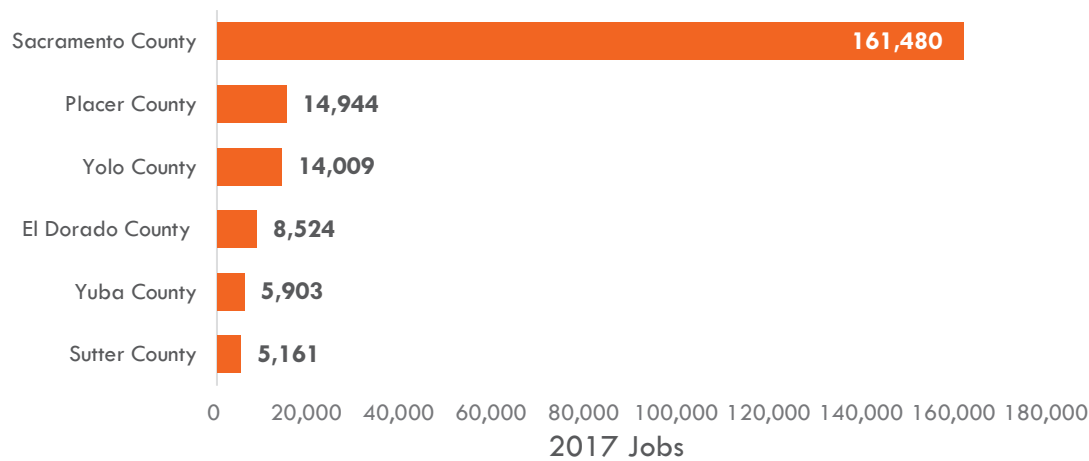
PUBLIC SECTOR JOBS BY COUNTY

For the seven study sectors, there are three times as many public sector jobs in Sacramento county than the combined five counties in the region. The seven sectors have more than 160,000 jobs in Sacramento County (Exhibit 7). Placer and Yolo counties have the next highest number of public sector jobs. Yuba and Sutter counties have the fewest number of public sector jobs in the region.

Key Findings

- Sacramento County has more than 160,000 public sector jobs in the seven sectors.
- Nearly 90,000 of these are state government jobs.

Exhibit 7: Public sector jobs by county, seven sectors, Sacramento region, 2017¹²



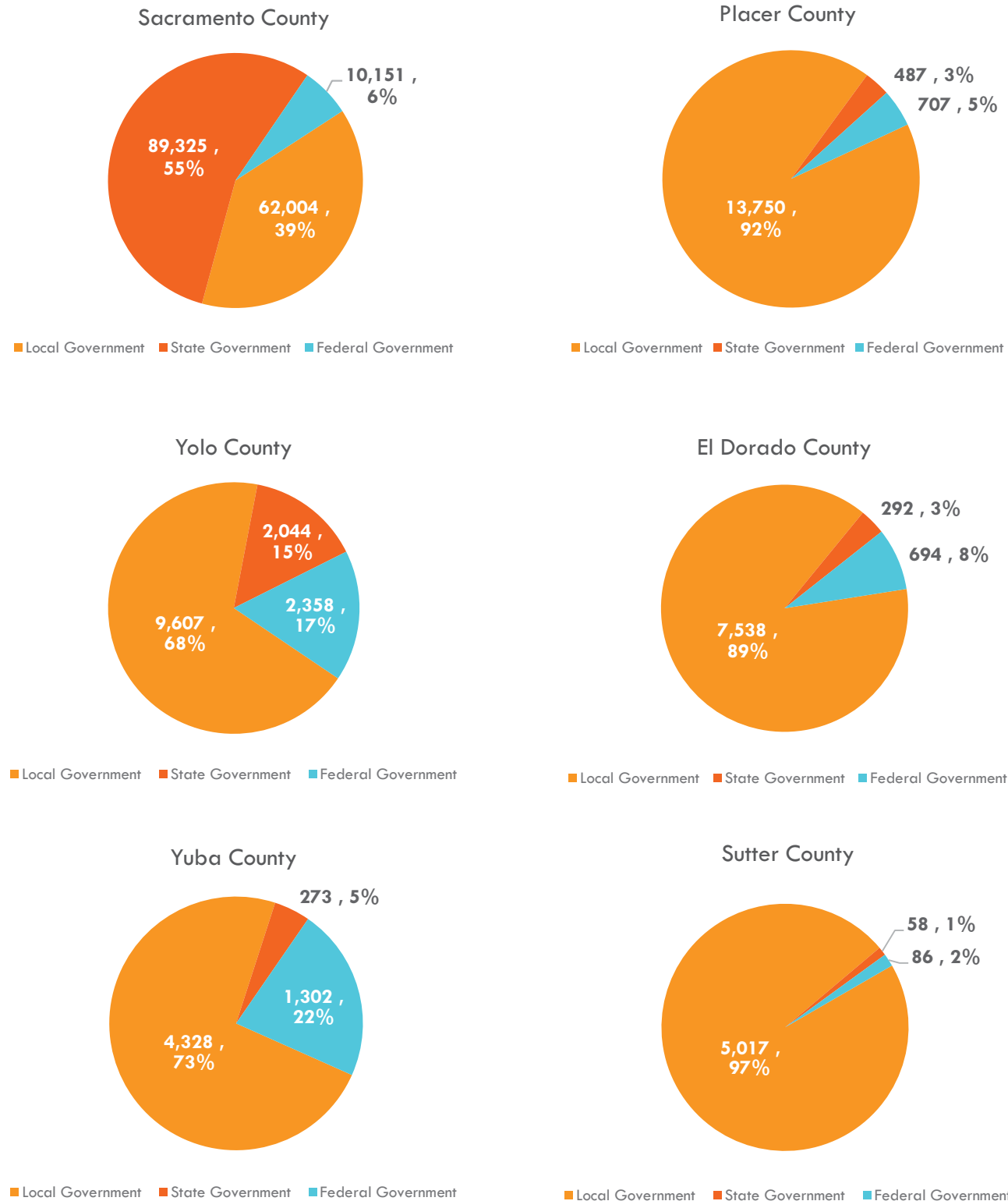
For most of the counties, except Sacramento County, local government jobs comprise the vast majority of public sector jobs. Nearly all state jobs are in public administration. Sacramento County has overwhelmingly the largest number of state jobs, 89,000. Yolo County has 2,000 state jobs. Other counties have state jobs numbering in the hundreds. Most local government jobs are in educational services and public administration, and to a lesser extent, utilities, and transportation and warehousing.



¹² Ibid.

Exhibit 8 displays the share of public sector jobs in local, state, and federal government for each county in the study region.

Exhibit 8: Share of public sector jobs in local, state, and federal government, seven sectors, Sacramento region, 2017¹³



¹³ Ibid.

PUBLIC SECTOR ANNUAL WAGES

Comparing public and private sector average annual wages in the Sacramento region reveals a staggering finding: Public sector wages are much higher than those offered by the private sector.

The public sector industries in the study's seven industry sectors pay, on average, \$25,000 more annually than private sector industries. For the public sector, the average annual wages across all seven sectors is \$76,700. The average annual salary for private sector industries is \$51,443.¹⁴

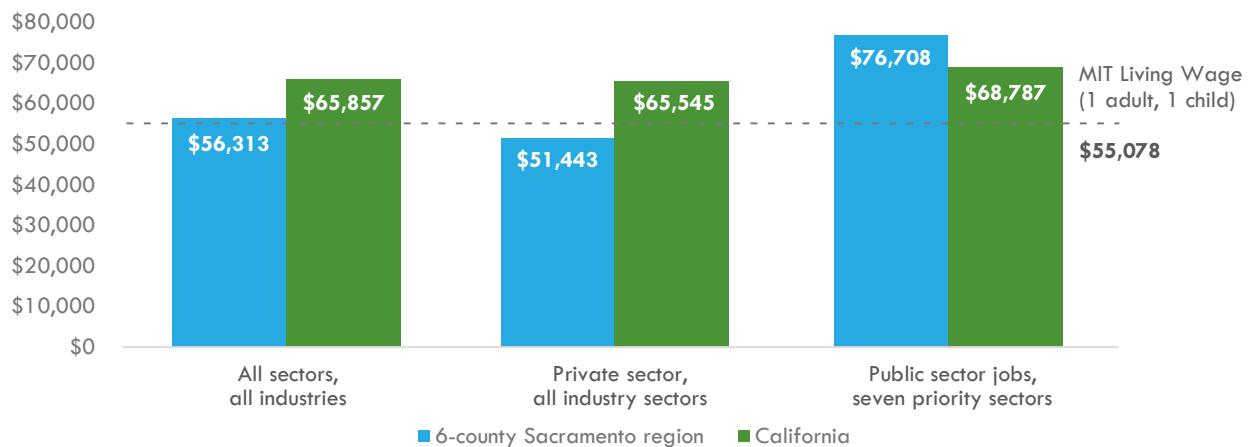
The wage data for the Sacramento region is more dramatic when comparing the average annual wages for the same public and private industries in California, where private sector and public sector industries pay a similar annual wage. In the seven sectors, public sector industries in California pay nearly \$69,000 annually. All private sector industries in California pay \$65,500 annually.

Exhibit 9 compares public and private sector average annual wages in the Sacramento region and California to a living wage calculator. The public sector annual wages are derived from the seven study sectors. Private sector annual wages are derived from all industries. The living wage calculator determines the cost of basic subsistence necessities for housing, food, and transportation for local counties by family size. For a family of one adult and one child, the basic required household income is estimated at \$55,000 in the Sacramento region. Public sector industries, on average, far exceed the subsistence wage. Private sector industries fall below the threshold.¹⁵

Key Findings

- Public sector jobs pay, on average annually, \$25,000 more than the private sector in the Sacramento region.
- The regional average annual public sector wage is \$76,700, compared to \$51,400 in the private sector.

Exhibit 9: Average annual wages, seven sectors public sector industries, private sector industries, and all sectors, all industries, Sacramento region and California, 2017¹⁶



¹⁴ Ibid. Average annual wages are calculated by taking the average annual wages for the public sector in the seven industry sectors and dividing by the number of public sector jobs in those industry sectors. Total annual wages include salary, bonuses, stocks, meals and lodging, and tips. Employee contributions to benefits, such as retirement plans and health insurance, are reported, but employer contributions are not reported. Withholdings for taxes and disabilities are also reported. https://www.labormarketinfo.edd.ca.gov/data/QCEW_About_the_Data.html#Q9.

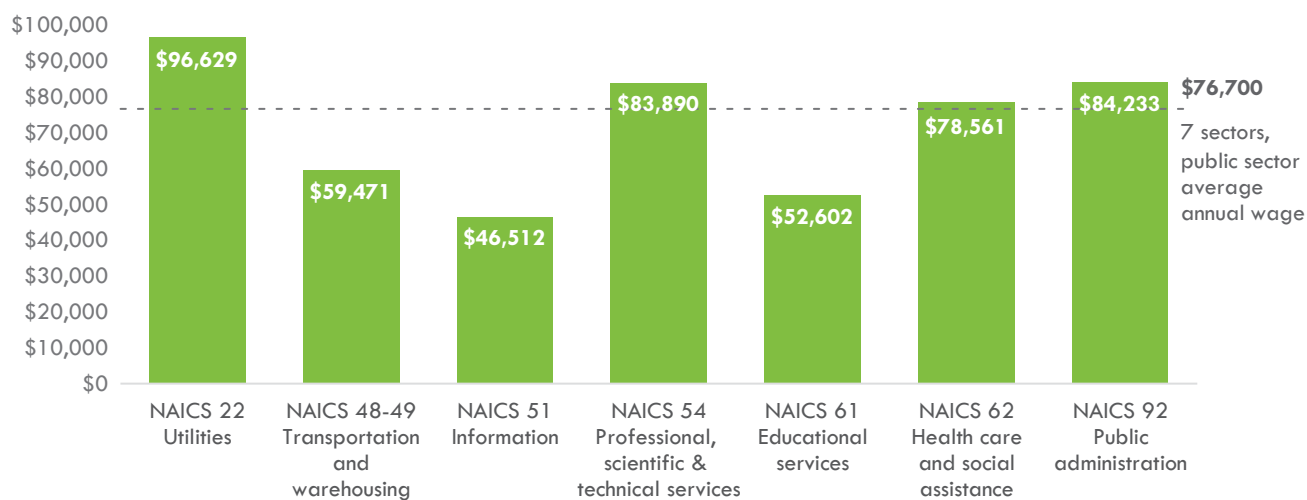
¹⁵ MIT Living Wage calculator, <http://livingwage.mit.edu/>.

¹⁶ Ibid.

Four of the seven public sectors have higher than the average annual wages across all public sector industries (Exhibit 10). (The average annual wages use a weighted average to account for the volume of jobs in each sector to compare wages across sectors.) Public sector utilities have the highest average annual wage of the seven sectors studied—\$96,600. Public administration, and professional, scientific & technical services have equivalent annual average wages, about \$84,000. Health care and social assistance pays an annual average wage of \$78,500.

Transportation and warehousing, and educational services hover near the living wage for a one-adult, one-child household, \$55,000 annually. Transportation and warehousing workers earn \$59,500 on average annually. Educational services pays \$52,600. Information pays the lowest of the seven public sectors, \$46,500. The information sector’s dominant public sector industry is libraries and archives.

Exhibit 10: Public sector average annual wages, seven sectors, Sacramento region, 2017¹⁷



¹⁷ Ibid.

PUBLIC AND PRIVATE SECTOR DEMOGRAPHICS

The research compares public sector industry demographics to the private sector using U.S. Census data for age, sex, race, and ethnicity. The data is skewed partly because by definition public administration is entirely comprised of public sector jobs. The data compares the seven industry sectors to private sector counterparts with an average for the seven industry sectors in the public sector and an average for six industry sectors in the private sector.

Demographics by age

Age demographics speak to issues of building a pipeline of young workers entering the public sector and impending retirements.

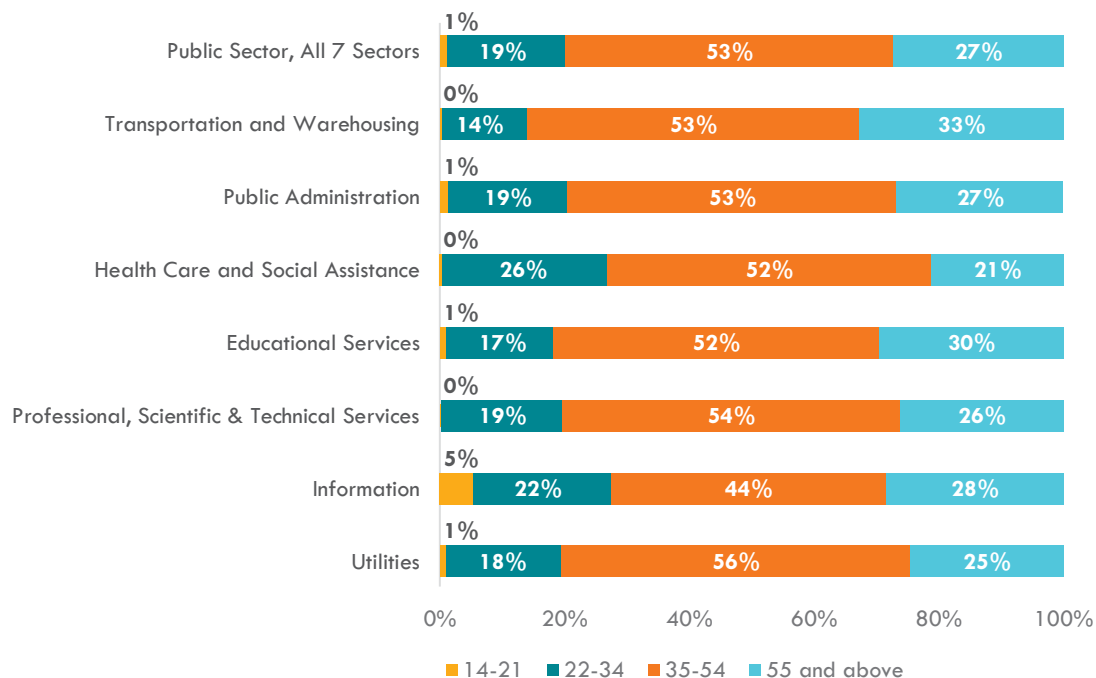
On average, the public sector workforce is older than the private sector workforce. Eight out of 10 workers in the public sector are over age 35; in the private sector, seven out of 10 workers are over age 35 (Exhibits 11 and 12).¹⁸

The data shows that pending retirements are generally a more acute issue in the public sector. The public sector's share of workers 55 and older is 27%; the private sector's share of workers 55 and older is 23%. In the public sector, an aging workforce and impending retirements are most acute for transportation and warehousing, educational services, and utilities. The situation is slightly less acute in health care and social assistance.

Key Findings

- In the Sacramento region, eight out of 10 workers in the public sector are over age 35, compared to seven out of 10 workers in the private sector.
- One in four public sector workers is 55 or older.

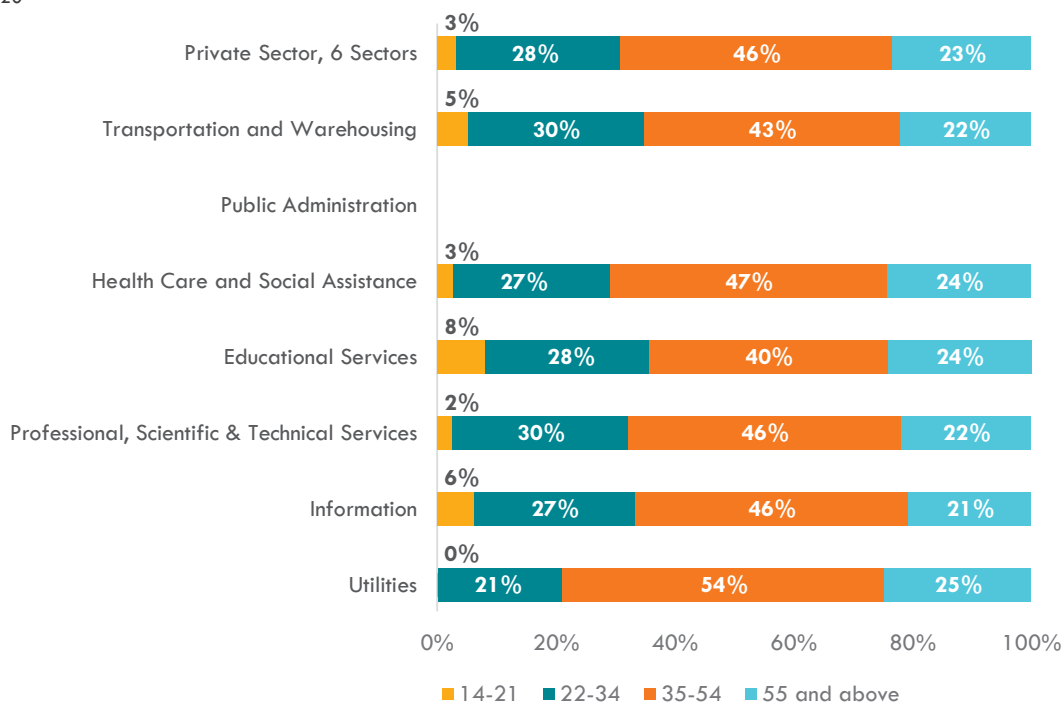
Exhibit 11: Public sector demographics by age, seven sectors, Sacramento region, Q3 2018¹⁹



¹⁸ U.S. Census Bureau, Quarterly Workforce Indicators, Longitudinal-Employer Household Dynamics (LEHD), <https://ledextract.ces.census.gov>.

¹⁹ Ibid.

Exhibit 12: Private sector demographics by age, six sectors, Sacramento region, Q3 2018²⁰



Demographics by gender

Overall the seven study sectors are skewed toward women, especially in health care and social assistance, and educational services (Exhibit 13). Men make up a significant majority in other industries, especially utilities, and professional and technical consulting services.

Gender demographics data shows some differences between public and private sector employment (Exhibit 14). Public sector health care and social assistance is 37% male, versus 26% male in the private sector. The utilities sector presents a reverse picture. There is a slightly higher share of women in public sector utilities, 33% versus 28% in the private sector. Transportation and warehousing is dramatically skewed toward men in the private sector who comprise 70% of the workforce. In the public sector, the figure is half that, owing to postal service employment. The information sector is mostly female in the public sector, but the reverse is true in the private sector. (Public sector employment in information is entirely in libraries and archives.)



²⁰ Ibid.

Exhibit 13: Public sector demographics by gender, seven sectors, Sacramento region, Q3 2018²¹

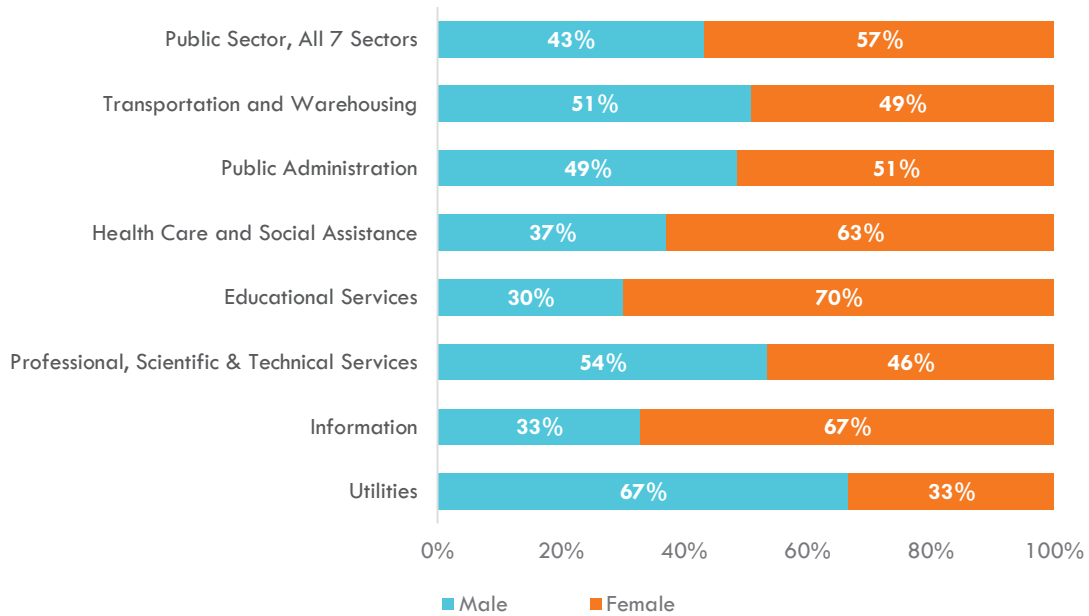
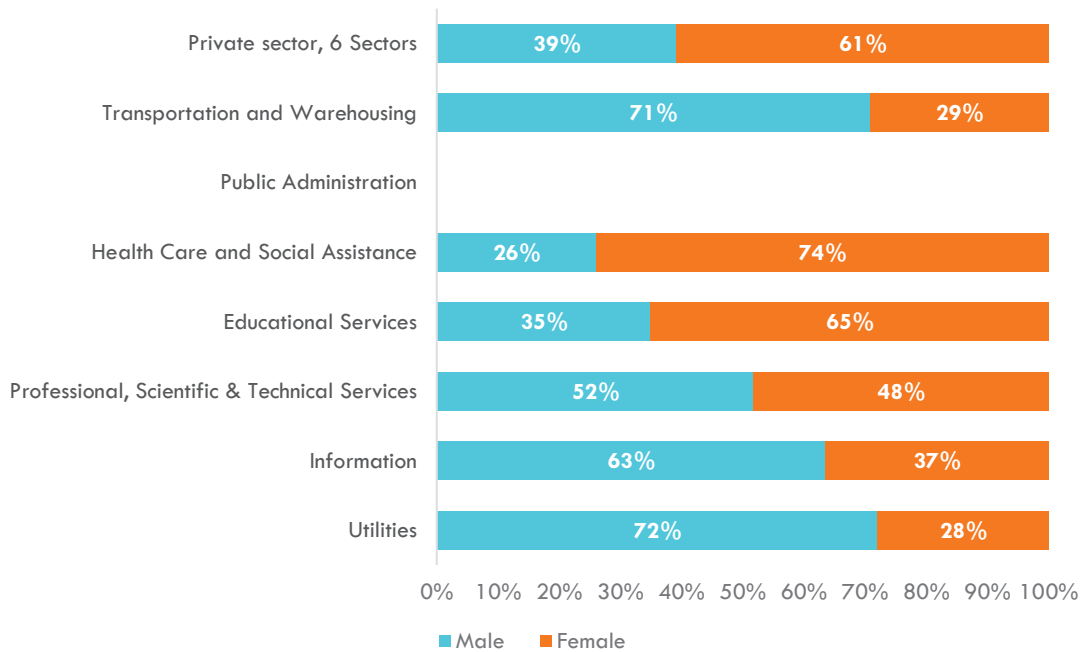


Exhibit 14: Private sector demographics by gender, six sectors, Sacramento region, Q3 2018²²



²¹ Ibid.

²² Ibid.

Key Findings

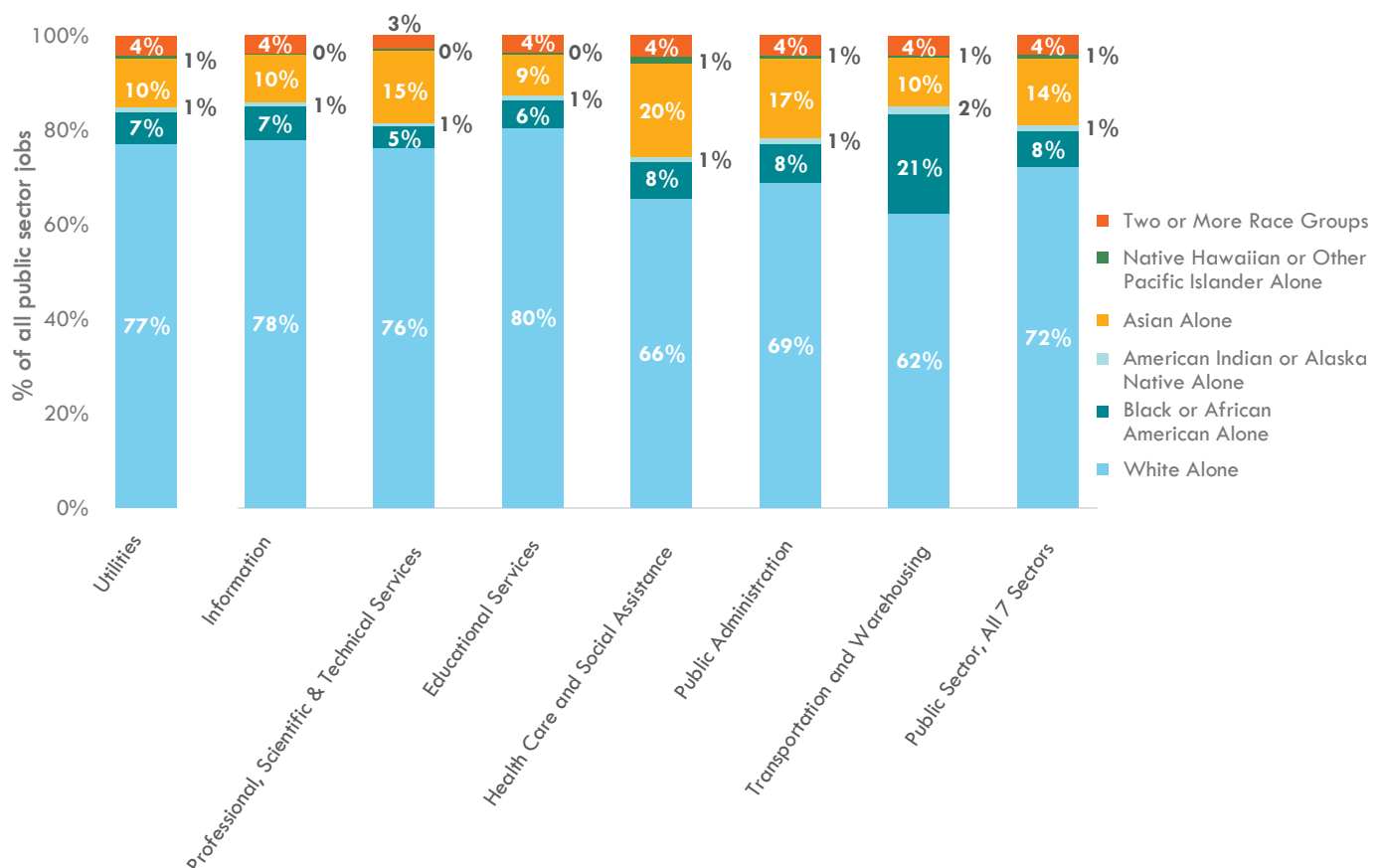
- Three out of four public sector workers in the Sacramento region are characterized as “white alone” by the U.S. Census.
- Separate estimates show that the public sector has 6%-11% more “white alone” workers than the private sector.

Race and ethnicity demographics

Analysis of race demographics focuses on the share of people identifying as “white alone, not Hispanic or Latino” in the industry sectors as a proxy for comparing diversity between the public and private sectors. The public sector is generally less diverse than the private sector. Nearly three out of four public sector workers, 72%, in the Sacramento region identify as “white alone” (Exhibit 15). The figure is six percentage points lower, 66%, for the private sector. When taking public administration out of the calculation, the public sector is 11 percentage points more white than the private sector when comparing the six industry sectors with private sector data.

When comparing all seven sectors, educational services, and health care and social assistance have slightly more public sector workers who are “white alone” than the private sector. The transportation and warehousing sector and the health care and social assistance sector are the most diverse, with the lowest percentages of “white alone” in the public and the private sectors.

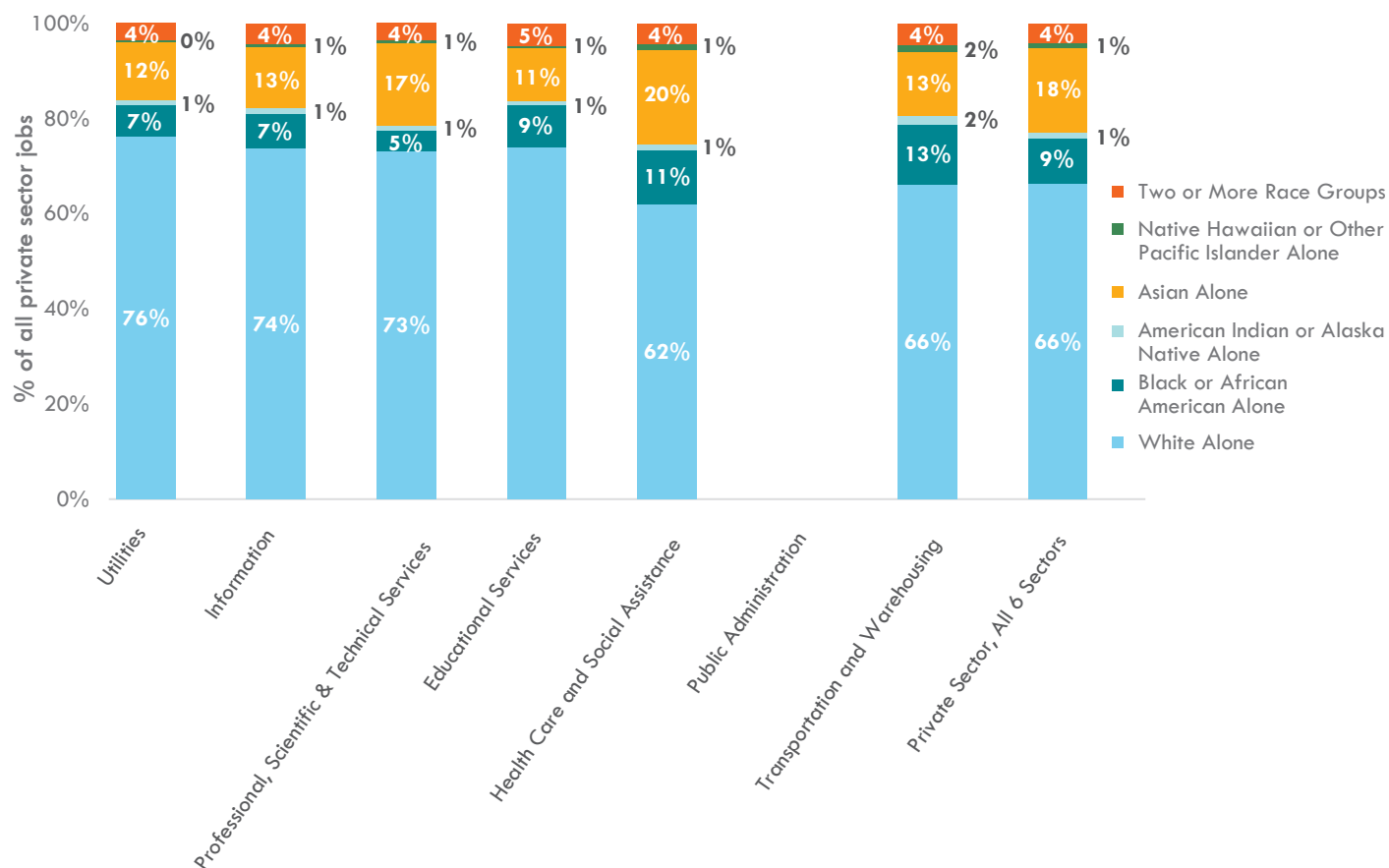
Exhibit 15: Public sector demographics by race, seven sectors, Sacramento region, Q3 2018²³



²³ Ibid.



Exhibit 16: Private sector demographics by race, six sectors, Sacramento region, Q3 2018²⁴



²⁴ Ibid.

Estimates of worker ethnicity (Hispanic or Latino) in the seven industries shows little difference between the public sector and private sector in the Sacramento region (Exhibits 17 and 18). Just under a fifth (18%) of workers in the private sector and the public sector identified as Hispanic or Latino. The most appreciable difference in terms of ethnicity is in the transportation and warehousing sector, with 25% Hispanic or Latino workers in the private sector and 18% in the public sector. Public sector utilities, and professional, scientific & technical services have the smallest shares of Hispanic and Latino in the workforce, 15% and 13% respectively.

Exhibit 17: Public sector demographics by ethnicity, seven sectors, Sacramento region, Q3 2018²⁵

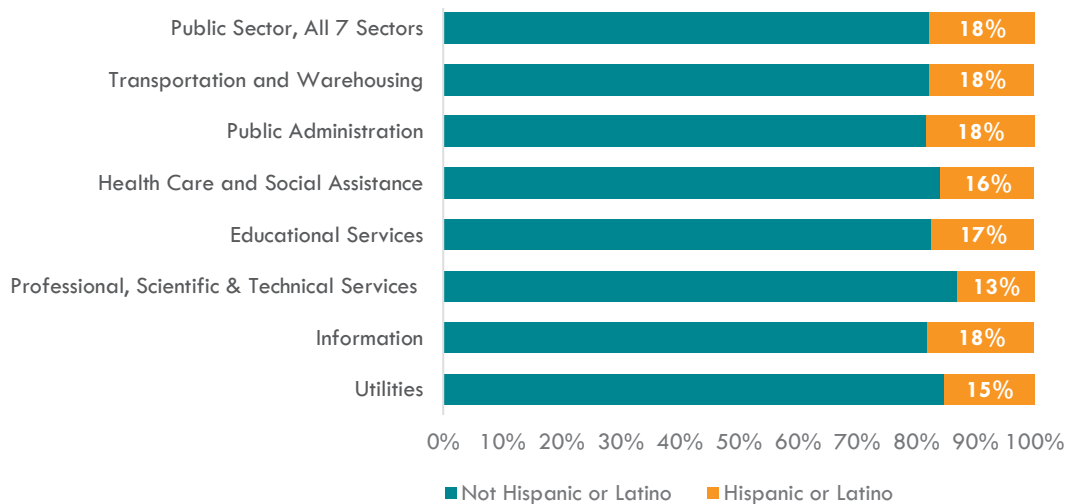
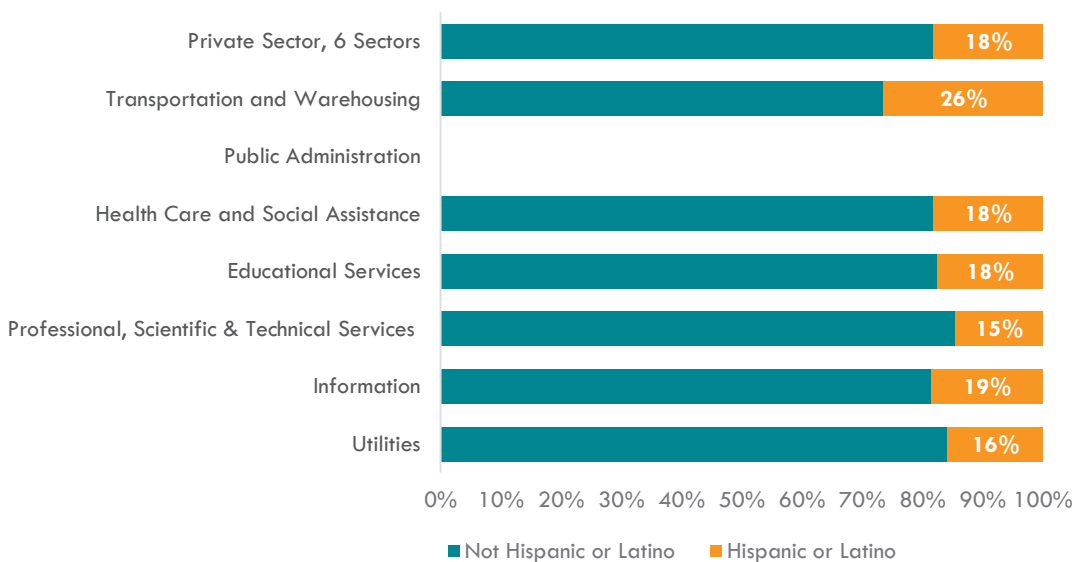


Exhibit 18: Private sector demographics by ethnicity, six sectors, Sacramento region, Q3 2018²⁶



²⁵ Ibid.

²⁶ Ibid.

OCCUPATIONAL ANALYSIS AND CAREER CLUSTERS

Industry sectors and occupations

In the previous section, the data summarized counts of public and private sector businesses or agency entities. The industry sector data is a “near census” of sites, offices, or locations, in the region. The counts present data in terms of an “industry sector” based on the type of activity, a product produced, or service conducted at the reporting site.

This section summarizes occupational data from surveys of agency offices or businesses to quantify the types of workers across the economy and in certain types of organizations. “Occupations” are categories that generalize similar workers. Occupational analysis provides a glimpse into the types of workers who share common tasks and duties, skills and abilities, education, training and experience, and hourly wages.

The occupational surveys also function like giant organizational charts of a regional economy, showing the types of workers in industry sectors. The estimates, called “staffing patterns,” show the number and type of workers in certain industry sectors. But since knowledge and skills are relevant to different types of organizations, occupations cut across different industry sectors. Human resource managers, and maintenance and repair workers are employed by many different types of organizations. The staffing pattern estimates enable occupational analysis by skill level and career cluster for each of the seven sectors.

Slicing industry and occupational data by career cluster and skill level offers insights into the kind of workforce that may need targeted intervention for training and education, entry-level pipeline development, targeted outreach, and upskilling for advancement. It shows major types of workers that are common across the seven sectors, and opportunities for entry-level workers to enter the workforce, and for experienced workers to advance with additional education and training.

Skill-level analysis groups workers by type of education, training, and experience. The COE uses an occupation definition that codes each occupation by skill level based on the amount of education, training, and experience required. A middle-skill occupation is one that requires some postsecondary education, training, or experience beyond high school (such as an apprenticeship, long-term on-the-job training, or an associate degree). Middle-skill jobs may present training and education opportunities for education pipeline development or HR recruitment strategy (Exhibit 19). Occupations requiring a high school diploma or less, and no additional training or experience, are designated below middle skill. Occupations requiring a bachelor’s degree or higher are called above middle skill. The analysis estimates the number of jobs for each skill level in each of the seven public industry sectors and each of the career clusters.

Exhibit 19: Occupational skill level definition

Skill level designation	Criteria for education, training, experience requirements
Above Middle Skill	<ul style="list-style-type: none">• Bachelor's degree or advanced degree
Middle skill	<ul style="list-style-type: none">• Typical entry level education of some college, a postsecondary non-degree award, or an associate degree• Long-term on-the-job-training• More than five years work experience• Large share of national workforce with postsecondary educational attainment• Apprenticeship listed as on-the-job-training• High school diploma or no formal education
Below middle skill	<ul style="list-style-type: none">• No work experience required• Short-term on-the-job-training

Key Findings

- High levels of education and training are required in the public sector. Eight out of 10 of public sector jobs require at least some postsecondary education, training, or experience.
- Middle-skill jobs—Many jobs that pay well and offer benefits do not require a bachelor's degree in the public sector. Middle-skill jobs comprise more than a third, 36%, of the public sector workforce. The percentage is greater when removing educational services from the calculation, 43%.
- Entry-level, below-middle-skill jobs—A quarter of public sector jobs, 24%, require little education or training (below middle skill) indicating entry-level opportunities to enter the public sector workforce.

Skill-level occupational totals across the seven sectors

The research analyzed the seven public sectors for the share of occupational employment by skill level. Generally, the seven sectors have a balanced share of jobs that are below middle skill, middle skill, and above middle skill.

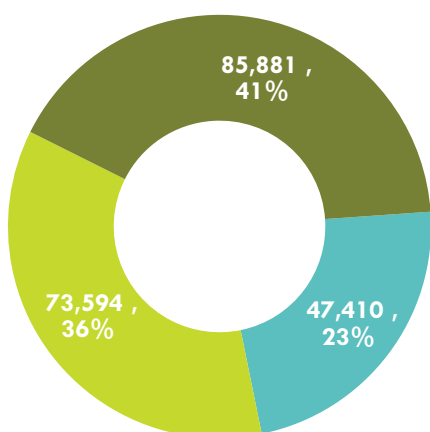
However, public sector jobs mostly require at least some postsecondary education, training, or experience. Roughly eight out of 10, 77%, of all public sector jobs in the seven sectors qualify as middle skill or above middle skill (Exhibit 20). Four out of 10 public sector jobs in the seven sectors, a total of 86,000 jobs, require a bachelor's degree or higher. Middle-skill jobs comprise a major portion of the public sector workforce, more than a third, 36%. A minority of jobs are below middle skill, about a quarter, and require a high school diploma or less, and little or no experience or training.

The above totals are partly skewed by the large number of elementary and secondary teachers and other educational professionals in the region, and by public administration jobs that require a bachelor's degree. Taking educational services out of the calculation shows an increase in the percentage of middle-skill jobs—from 36% to 43% of the public sector workforce.

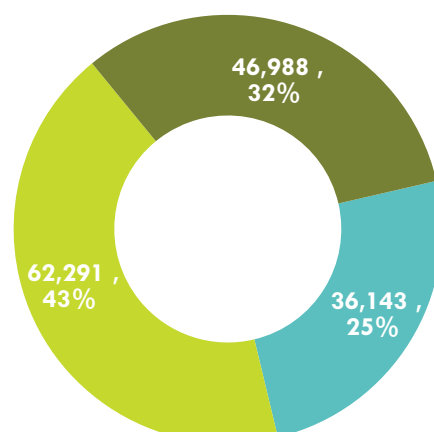
The finding indicates there are opportunities for entry-level workers to enter the workforce and for workers receiving additional education and training to advance to middle-skill jobs. The analysis reveals that many good jobs—jobs that pay well and offer benefits—are available to workers without a bachelor's degree.

Exhibit 20: Occupational employment by skill level, seven sectors, Sacramento region, 2017²⁷

Total, 7 sectors



Total 6 sectors w/o educational services



■ Below Middle Skill ■ Middle Skill ■ Above Middle Skill

■ Below Middle Skill ■ Middle Skill ■ Above Middle Skill

²⁷ QCEW, 2017, OES, COE Crosswalk.

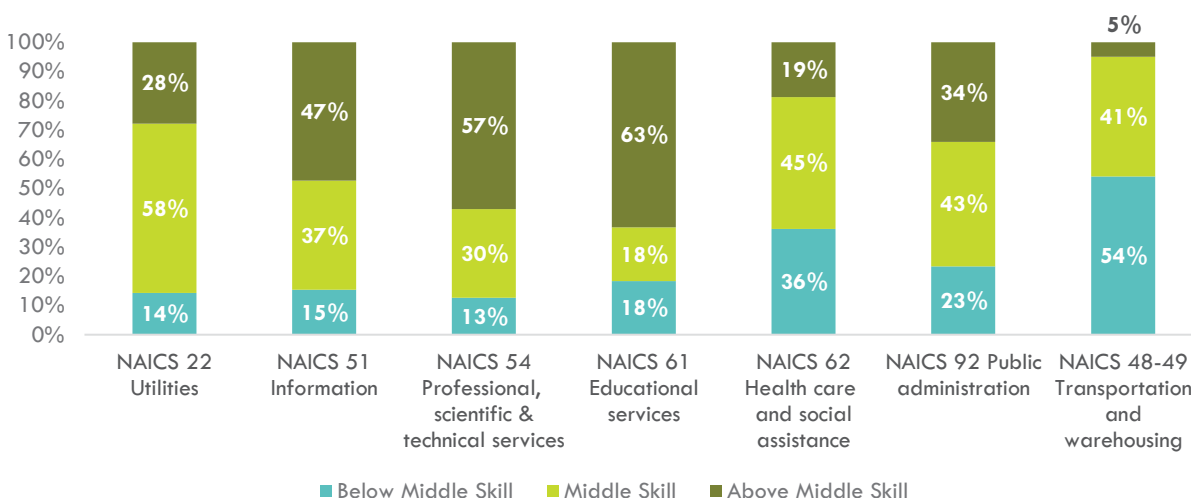
Skill-level occupational totals within each sector

Each sector displays different shares of skill-level employment. The utilities sector has the most even split of employment by skill level. Professional, scientific & technical services, health care and social assistance, and transportation and warehousing have the largest shares of below-middle-skill jobs. Public administration, educational services, information, and utilities have the highest shares of above-middle-skill jobs. All appear to have advancement opportunities with additional education and training. Appendix C has a detailed profile of each industry sector that includes primary career clusters, sector trend data, and top employers.

Key Findings

- 40% of public sector jobs, about 86,000 jobs, require a bachelor's degree or above.
- The share is lower, about a third (32%) when removing educational services from the picture.
- The route to many, but not all, of the highest paying professional and management positions is a bachelor's degree.

Exhibit 21: Share of total occupational employment by skill level, seven sectors, Sacramento region, 2017²⁸



Career clusters group similar occupations

Given the massive scale of the public sector in the Sacramento region, the analysis uses a tool that enables broad messages across wide swaths of the region's workforce. Career clusters available from O*NET OnLine through the U.S. Department of Labor's Employment and Training Administration group more than 900 occupations according to similar functions and skills into 16 categories (Exhibit 22).²⁹ The categories shed light on the strategic areas needing attention for policy making, community outreach, and program development. These strategies might include:

- Pipeline development and outreach efforts for young, entry level workers
- Recruitment of experienced workers transitioning from other industries with related skills
- Developing pathways for advancement for junior and mid-level workers in the system

By streamlining the more than 900 occupations, the 16 categories provide a strategic, big-picture view of the workforce needs in the public sector.

²⁸ QCEW, 2017, OES, COE Crosswalk.

²⁹ O*NET OnLine career clusters, <https://www.onetonline.org/find/career>.

Exhibit 22: O*NET career clusters with key public sector occupations³⁰

O*NET Career Cluster	Key occupations with education / training requirements & median wage range			
	Requires a bachelor's degree or higher "Above Middle Skill"		Requires some postsecondary education / training "Middle Skill"	
Agriculture, Food & Natural Resources	Environmental engineers; biological technicians	\$21–\$52	Water & wastewater treatment plants & systems operators; Forest & conservation technicians	\$15–\$33
Architecture & Construction	Civil engineers; construction managers	\$30–\$55	Operating engineers; Electricians; Civil engineering technicians; plumbers and pipefitters	\$20–\$47
Business Management & Administration	Labor relations specialists; General operations managers; Training & development specialists	\$31–\$64	Executive secretaries; Customer service reps; Human resources assistants	\$16–\$45
Education & Training	Elementary school teachers; Secondary school teachers; Middle school teachers; Library technicians; Librarians	\$14–\$58	Library technicians, Preschool teachers	\$14–\$15
Finance	Accountants & auditors; financial managers	\$32–\$51	Claims adjusters, examiner & investigators	\$19–\$36
Government & Public Administration	Compliance officers; Urban & regional planners	\$35–\$46	Tax examiners & collectors; Transportation security screeners; construction & building inspectors	\$15–\$38
Health Science	Physicians & surgeons; Speech–language pathologists; medical & health services managers	\$42–\$125	Registered nurses; Licensed Practical and vocational nurses; nursing assistants	\$17–\$58
Human Services	Social workers; Community and social services specialists; Clinical, counseling & school psychologists	\$17–\$41	Childcare workers; Social & human services assistants	\$11–\$19
Information Technology	Computer systems analysts; software developers	\$40–\$46	Computer user support specialists; network & computer systems administrators	\$26–\$43
Law, Public Safety, Corrections & Security	Lawyers; Probation officers	\$31–\$63	Police & sheriff's patrol officers; Correctional officers; firefighters; paralegals	\$22–\$68
Manufacturing	N/A	–	Maintenance & repair workers; mechanics, installers, & repairers; power plant operators; engineering technicians	\$19–\$55
Science, Technology, Engineering & Mathematics	Environmental scientists; Engineers; Electrical engineers; Architectural & engineering managers; Biological scientists	\$35–\$54	N/A	–
Transportation, Distribution & Logistics	Airline pilots	\$75	Heavy & tractor–trailer truck drivers; Bus & truck mechanics; Logisticians; Mobile Heavy equipment mechanics	\$13–\$66

³⁰ O*NET, QCEW, 2017, OES, EMSI, 2019.3.

Occupational employment by career cluster

Career cluster analysis of the more than 200,000 public sector jobs in the Sacramento region reveals a large concentration of jobs in education and training; business management and administration; and law, public safety, corrections and security (Exhibit 23).

The education and training career cluster has 45,300 jobs and is dominated by above-middle-skill jobs, such as teachers, counselors, and other staff with positions requiring at least a bachelor's degree. Just two occupations, teacher assistants and preschool teachers, account for all the middle-skill jobs.

With 42,000 jobs, the business-management-and-administration career cluster offers an array of administrative positions in human resources, bookkeeping, accounting, labor relations, purchasing, and administrative assistance. The skill-level analysis shows a top-and-bottom heavy workforce: Almost half of these positions are below middle skill, while about 14,000 jobs require a bachelor's degree or higher.

By contrast, the law, public safety, corrections, and security career cluster has 29,600 jobs and the majority are middle skill. Legal support workers, legal secretaries, court reporters, fish and game wardens, title examiners, firefighters, and paralegals are a few of the middle-skill occupations in the career cluster. Parking enforcement and security guards are two below-middle-skill occupations. Lawyers and judges are among a handful of above-middle-skill occupations.

The next largest career cluster—transportation, distribution and logistics—has less than half of the number of jobs as the law and public safety cluster.

The shares of above-middle-skill, middle-skill, and below-middle-skill jobs vary among career cluster. Nearly all career clusters have significant shares of middle-skill and above-middle-skill jobs, indicating a significant opportunity for advancement through additional training and education.

Appendix D provides a detailed analysis of 13 of the 16 career clusters including:

- Industry sector occupational employment
- Skill-level occupational employment
- Detailed occupations by skill level

The data analysis provides clues for further investigation on career pathways. Career pathways offer opportunities for workers to enter employment, and advance with additional education, training, and experience.

Key Findings

The top three career clusters, by number of jobs, in the Sacramento region are:

- Education and training, 45,000 jobs
- Business management and administration, 42,000 jobs
- Public safety, corrections, and security, 29,600 jobs

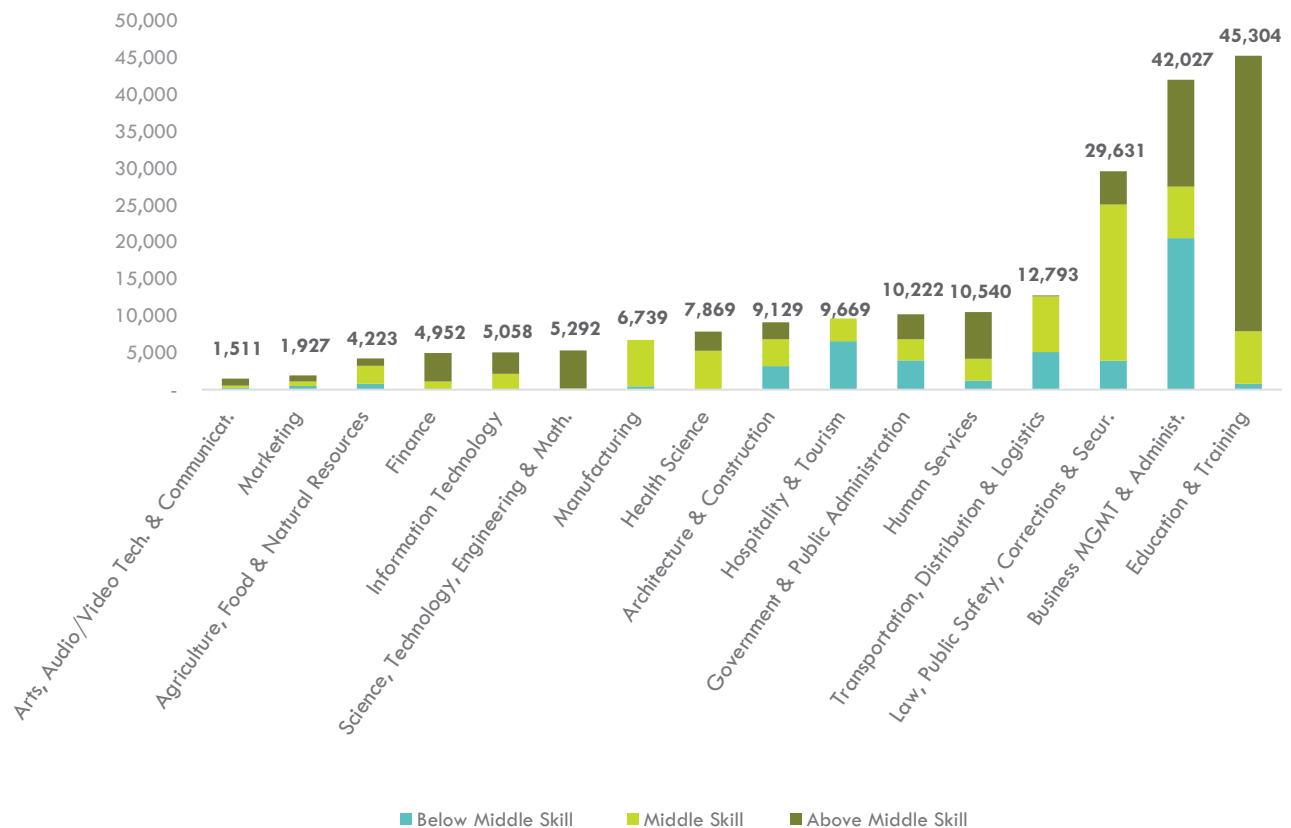
Using this report for career pathway investigation

Career clusters and industry sectors with balanced skill-level shares that are below middle skill, middle skill, and above middle skill indicate opportunities for worker advancement with additional training and education.

Detailed appendices for the seven public industry sectors and the career clusters can be used to identify areas for further investigation.



Exhibit 23: Occupational employment in the 16 career clusters, by skill level, Sacramento region, 2017³¹



³¹ O*NET, QCEW, 2017, OES, COE Crosswalk.

INTERVIEW FINDINGS AND LITERATURE REVIEW

A literature review of national and statewide reports and studies focusing on public sector workforce was compiled and 12 executive interviews were conducted for this study. The interviews revealed consternation over the systems in place and existing capacity to recruit candidates and upskill the existing workforce. Labor market demand exists for all types of positions—from maintenance technicians to entry-level payroll clerks, speech and language pathologists, cybersecurity technologists, and assistant directors of city departments. Based on interview findings and the literature review, recruitment and advancement is likely to get more challenging as aging workers retire.

Interviewees report a contradictory picture for hiring and recruitment that challenges easy explanation. Simultaneously, hiring is robust, but recruitment challenges exist. Budgets to backfill or add capacity are constrained in some areas, adding to overworked staff and delayed projects.³² Applicant pools are large, but are non-specific; many interviewees reported that hiring managers frequently must choose less-than-ideal candidates. Diversifying the workforce was cited as necessary, but strategies and policies are uneven or absent in some cases. Recruiting young talent was cited as a significant priority, but school relationships sometimes do not extend beyond hiring fairs and recruitment events.

To address current and future workforce shortfalls, the consensus view focused on internal human resources systems and recruitment mechanisms, and staff capacity to develop meaningful partnerships with schools and other community partners. Several agencies reported that they have researched specific challenges and are developing strategies, policies, and staff capacity to address the issues. The literature review and interviews show public sector recruitment, hiring, and retention challenges have been well documented and best practices and toolkits have been disseminated through statewide and national organizations, such as the International Public Management Association for Human Resources, Cal-ICMA, and the Center for State and Local Government Excellence. (See Appendix F for a list of relevant studies, reports, and articles.)

This section of the report summarizes the major themes and findings from the literature review and interviews with human resources and labor relations managers, city managers, a school district superintendent, and a community outreach manager. (Appendix G contains a list of interview participants.)



³² Katherine Barrett and Richard Greene, “Can government hiring get out of the Stone Age?” *Governing*, February 2016, accessed July 15, 2019, <https://www.governing.com/topics/mgmt/gov-government-hiring-best-practices.html>.

Reports of hard-to-fill positions include many positions in various categories. Several categories of entry-level shortages are noteworthy.

Interviewees and the literature commonly cite several areas where entry-level and rank-and-file shortages exist.³³ These include the following areas:

- **Professional:** Hard-to-fill professional positions include engineering, accounting, business and financial services, such as accounting, and specialist teaching positions, including speech language pathologists.
- **Entry-level office and administrative:** Entry-level positions for general office administrative staff, especially clerical positions and business services represent pain points. Some of these positions have severe turnover. Several human resources managers interviewed report having continuous job postings for some positions.
- **Information technology (IT):** IT technical roles and customer service positions were mentioned as hard-to-fill. Interviewees said it is a challenge to find workers with skills and expertise in cybersecurity.
- **Public safety:** Public safety positions are hard to fill. The interviewees mentioned police, sheriff's deputies, and correctional positions like probation officers and assistants. Dispatchers pose a severe hiring challenge due to job requirements and high rates of turnover from stressful working conditions.
- **Health care and social assistance:** Social services and health care roles including nurses, psychiatric technicians, and social workers were identified in the interviews and the literature review. Social workers are particularly hard to find in the Lake Tahoe region.
- **Paraprofessional education:** Hiring teacher assistants poses somewhat of a challenge at the paraprofessional level in education.

Retirements pose a threat across agencies and organizations. Retirements will have cascading impacts at every level, requiring recruitment improvements and the creation of pathways to backfill positions and move existing workers into more senior roles.

Interviewees and literature summaries of professional association meetings and surveys show impending retirements as a major threat to the government workforce.³⁴ Many interviewees said all areas of the organizational chart will be impacted, at all levels. They described a cascading effect as senior managers (assistant and deputy directors) and agency heads retire, creating a vacuum that will require internal promotion.³⁵ Some of these positions will be filled through internal recruitment. But those promotions will create vacancies in other positions. Many interviewees emphasized the need for improved internal talent development that would prepare mid-level workers to advance into senior management roles, and for entry-level workers to backfill frontline and mid-level supervisory positions.

Many interviewees report competition for workers and a tight labor market, and constrained budgets that sometimes prevent filling positions or approving new positions.

Interviewees report competition for qualified applicants from regional agencies, which was substantiated in the literature review. The sources attribute worker competition to low unemployment, higher wage differentials in neighboring public sector agencies and offices, and competition from the private sector.³⁶ Competition for candidates appears especially acute for rural agencies and small towns, with larger, better-paying employers in metro areas as competitors for candidates and existing staff. Some sources said constrained budgets prevent backfilling positions or

³³ "Survey Findings: State and Local Government Workforce 2015 Trends," Center for State and Local Government Excellence, June 2015, accessed July 15, 2019, https://slge.org/assets/uploads/2015/06/15-06-State-Local-Gov-Workforce-2015-Trends_final-web-new1.pdf.

³⁴ "State and Local Government Workforce: 2018 Data and 10 Year Trends," Center for State and Local Government Excellence, May 2018, accessed July 15, 2019, <https://slge.org/assets/uploads/2018/07/SLGE2018Workforce.pdf>.

³⁵ "Talent 2.0: A Modern Approach to Attracting and Retaining Top Talent in Local Government," Cal-ICMA, Spring 2018, accessed July 15, 2019, <https://icma.org/sites/default/files/2018/07/20REPORT%20-%20FINAL%20050718.pdf>.

³⁶ Howard Risher, "Unlocking the Talent in Government's Workforce," International Public Management Association for Human Resources, 2017-2018.

creating new positions in areas of need.

Agency growth and department expansion was noticeably absent from the rationale for workforce shortages. Regional educational supply from high schools and postsecondary institutions was not mentioned as a pain point in the interviews.

Except for a few specific cases, interviewees and the literature review did not show that agency or department growth was a factor in workforce shortages. Interview participants did not mention regional secondary school, community college, or university education and training programs as a regional weakness.

Public sector careers suffer from a lack of branding identity and marketing promotion that leaves the public and students generally unaware of government career opportunities.

There is general consensus in the interviews that there is a lack of public awareness about public sector careers. Many articulate this in terms of brand identity. The literature shows that professional organizations and cross-agency associations have developed guidelines for branding and marketing. One organization has drawn up guidelines for marketing “meaning and purpose” in public sector work.³⁷ Some public safety departments and utilities have a better track record and may be able to share best practices.

Recruitment and hiring requirements and processes often present a barrier to entry. There is a lack of strategic planning to improve, diversify, and expand recruitment practices.

A number of mechanisms in the recruitment and hiring process function as a barrier to entry, according to the literature review and many interviewees. Sources commonly report that entry-level requirements are too rigid. The problem extends to supervisory positions for some organizations where otherwise qualified candidates do not qualify due to the lack of a bachelor’s degree. Lengthy hiring processes and testing requirements deter many candidates and applicants from applying or staying the course.³⁸ Job postings are seen as out of date, not having clear descriptions, and having job titles that prospective applicants do not understand.³⁹

Three leading clearinghouse services—CalOpps, NEOGOV, and Careers in Government—were the most frequently cited method for recruitment, and are used more often than direct outreach, school partnerships, or other community-based means. Some interviewees regarded the emphasis on these online services as wholly inadequate as a strategy for recruitment. Interviews and the literature review indicate that many human resources departments likely over-rely on these services. Amid staffing shortages of their own, the literature shows that human resources departments simply don’t have bandwidth to plan and develop comprehensive recruitment practices. In some cases, human resources departments and the agencies they represent do not have systems and strategies in place to expand staffing and diversify recruitment.⁴⁰

Interviewees acknowledge diversity gaps in hiring. Some agencies have prioritized diversity while others have not.

Some agencies have conducted research into intra-agency diversity and have found significant gaps; these organizations have taken a multi-pronged approach to increase diversity (gender, ethnicity, etc.), and have adopted policies and allocated staff time to implement stated objectives. Other interviewees indicate that their agencies have not adopted policies or made diversity a priority.

³⁷ “Ten Ideas to Better Recruit, Attract and Grow Talent,” The Talent Initiative, Cal-ICMA, February 2018, accessed July 15, 2019, <https://icma.org/sites/default/files/Talent%20Initiative--Ten%20Ideas%20To%20Implement%202018-02-12.pdf>.

³⁸ Katherine Barrett and Richard Greene, “Can government hiring get out of the Stone Age?” *Governing*, February 2016, accessed July 15, 2019, <https://www.governing.com/topics/mgmt/gov-government-hiring-best-practices.html>.

³⁹ Ten Ideas to Better Recruit, Attract and Grow Talent,” The Talent Initiative, Cal-ICMA, February 2018, accessed July 15, 2019, <https://icma.org/sites/default/files/Talent%20Initiative--Ten%20Ideas%20To%20Implement%202018-02-12.pdf>.

⁴⁰ “HR2020 Shifting Perspectives: A Vision for Public Sector PR,” International Public Management Association for Human Resources, <http://ipma-hr.org/hr2020>.

Wages are generally strong, but not all positions pay middle-income wages.

Interviewees generally regarded the stability and benefits of public sector jobs as attractive to many applicants, and potentially good recruitment incentives that much of the public may not be aware of. Interviewees said that most work is full time across many areas of the organizational chart, but they do employ part-time temporary positions in certain cases.

On the whole, most rank-and-file positions pay a middle-income hourly wage, but some entry-level clerical or maintenance positions pay just \$14-\$15 per hour. Skilled trades and police and other public safety positions earn higher wages. Not all trades are well paid, depending on the role and the agency. Some mechanic and maintenance positions do not pay as well as skilled labor trades. Positions in utilities generally pay very well, but rural areas pay less than urban areas. Wages are highest for management and supervisory positions, public safety, and professional health care, engineering, and financial services positions.

Career pathways that incorporate specific policies and practices to encourage promotion appear underdeveloped. Career pathways with a focus on supervisory and management skills are needed.

Career pathways were discussed in the interviews as a means to encourage advancement in various settings in the organizational chart. Some interviewees specifically called out the need to increase effectiveness for advancement pathways with planning, training, or other measures. Several interviewees said more needs to be done to create policies and programs to encourage employee advancement. A couple of interviewees cited an underutilization of tuition reimbursement for community college and university training.

Some interviewees presented similar messages regarding advancement of employees into supervisory roles. Third party and internal training partly addresses the challenges, but many indicate that more needs to be done to support the transition.

Some agencies and departments have comprehensive research, strategic planning, and policies in place for outreach and recruitment activities and partnerships. These organizations cite several common approaches and practices.

State agencies, urban metropolitan city and county governments, utilities, and public safety departments have the widest ranging partnerships, programs, and activities for developing a talent pipeline in the region. Interviewees from these organizations cited a range of practices and programs for talent development and recruitment.

Some professional associations and agency consortia have created initiatives and strategic guidelines and templates for addressing recruitment challenges.⁴¹ Some recommendations have included offering flexible workplace and hours and stipends for cost of living adjustments. Some agencies offer training incentives based around individualized training plans.

⁴¹ "Ten Ideas to Better Recruit, Attract and Grow Talent," The Talent Initiative, Cal-ICMA, February 2018, accessed July 15, 2019, <https://icma.org/sites/default/files/Talent%20Initiative--Ten%20Ideas%20To%20Implement%202018-02-12.pdf>.

Rural agencies experience hiring challenges in the region, due to competition for workers with agencies based in higher-paying areas.

Rural agencies face special recruitment challenges for many positions, especially regarding nearby recruitment competition from higher-paying employers.⁴² Interviewees noted these challenges with public safety and water/wastewater jobs. They also noted a smaller hiring pool and hiring barriers, especially for supervisory positions that may require a bachelor's degree or other positions requiring specialized training. Interviewees did not specifically cite community college partnerships, but they did note a need to develop homegrown talent because recruiting candidates from higher-paying areas is unlikely. Rural areas and small towns cited less developed diversity programs.

School and community-based organization engagement often involves one-off recruitment events or internships. Fewer organizations have formalized partnerships and programs that extend and deepen pipeline creation.

The interviews show that much school engagement activity involves job fairs or other one-off recruitment events on school campuses, although the frequency of these activities seems to vary between organizations. Internships are common, but few organizations cited formalized, structured programs that involve alignment with coursework. Some regarded internships as costly, requiring dedication of staff time.

Training and education pathways appear confined to traditional relationships for public safety academies, health care internships, teacher training, or skilled trade apprenticeships. Only one interviewee mentioned sending employees to programs at area community colleges or universities. Another interviewee said that agencies underutilize tuition reimbursements; contract education is common with the Los Rios Community College Government Training Program and the California State University, Sacramento College of Continuing Education. Only two interviewees mentioned participation on curriculum or program advisory committees to design pipeline programs.

Automation and new technology impacts maintenance and repair technicians and office positions.

Many technical maintenance, repair, and skilled trades experience skills impacts from new electronics and digital controls technology. Technology trends include increased levels of telecommunications, centralized digital controls, and automated equipment. The adoption of new centralized digital controls in transit vehicles, utilities, and buildings were cited in the interviews.

Many positions are impacted by software that have service improvement as a goal. Workers' tasks increasingly involve new software that automate tasks they used to perform. Observers predict redundancies for the most routinized positions, such as in entry-level clerical, customer service, and other administrative roles.⁴³

⁴² Katherine Barrett and Richard Greene, "Can government hiring get out of the Stone Age?" *Governing*, February 2016, accessed July 15, 2019, <https://www.governing.com/topics/mgmt/gov-government-hiring-best-practices.html>.

⁴³ "State and Local Workforce Trends: 2016-2026," Kronos and Center for State and Local Government Excellence, October 2018, accessed July 15, 2019, <https://slge.org/assets/uploads/2018/10/infographic-workforcetrends2026.pdf>.

DATA ANALYSIS FINDINGS

The research resulted in these key findings:

Regional public sector jobs make up a quarter of the Sacramento region's jobs.

- The six-county Sacramento region has 245,000 public sector jobs, representing 24% of all jobs in the economy. Almost half of these public sector jobs are state government jobs, nearly 120,000 jobs.

The Sacramento region has a 10% larger share of public sector jobs than California.

- The Sacramento region has about a 10% larger share of public sector jobs than California, mostly due to the presence of state government jobs in the capital region. California's share of public sector jobs is 14.5%.

Public sector jobs are concentrated in the urban core.

- The report provides a detailed county-by-county employment breakdown for government jobs in local, state, and federal government, showing large shares of state jobs in Sacramento and Yolo counties. Most of these public sector jobs, approximately 160,000, are in Sacramento County. Nearly 90,000 of Sacramento county's public sector jobs are state government jobs.
- Surrounding counties have fewer public sector jobs.
- Large shares of federal government jobs are in Sacramento, Yolo, and Yuba counties.

The seven sectors analyzed for this study contain a significant share or number of public sector jobs.

- The industry sectors with the most public sector jobs are utilities; transportation and warehousing; information; professional, scientific, and consulting services; health care and social assistance; educational services; and public administration.
- The largest number of public sector jobs in the Sacramento region are in educational services (schools, colleges, and universities) and public administration (an array of government agency offices). Large shares of government jobs are in utilities (nearly 70%), and transportation and warehousing (nearly 40%).

There are more than 6,000 public sector business establishments in the Sacramento region.

- Of the nearly 50,000 business establishments (offices or facilities) in the region, 6,300 of them are in the public sector.
- The report offers detailed industry and establishment-level data to assist with interpreting the data and locating strategic partners.

The public sector pays much higher wages on average than the private sector.

- The seven public sectors pay, on average annually, \$25,000 more than private sector jobs (for all sectors and industries) in the Sacramento region. The regional average annual public sector wage is \$76,700 compared to \$51,400 for the private sector. (The regional living wage for a one-adult, one-child household is \$55,000.)
- This finding is even more staggering given that the average annual wage in California for the seven public sectors is \$69,000 compared to \$65,500 for the private sector.
- This indicates the regional economy is highly dependent on the public sector for the wealth circulating in the economy.
- The highest average annual public sector wages are in utilities (\$96,600), public administration (\$84,200), and professional, scientific and technical services (\$83,900). The lowest annual wages are in educational services (\$56,600), and information (\$46,500).

Public sector workers are generally older than the private sector. One out of four workers in the public sector is age 55 or over. Gender disparities in the public sector are fewer than the private sector.

- The public sector workforce is generally older and has more workers who are near retirement age. Eight out of 10 workers in the region are age 35 or over, compared to seven out of 10 in the private sector. One in four public sector workers is age 55 or older.
- Overall, the findings indicate the public sector does better with diversity between men and women than the private sector. The seven public sectors have higher percentages of women, particularly in health care and social assistance (63% are women) and educational services (70% are women). Men dominate the utilities sector, but there is a higher share of women in the public sector, 33%, compared to the private sector, 28%. In health care and social assistance, the public sector has a higher percentage of men, 37% versus 26%.

The region's public sector is less racially diverse than the private sector. The public sector has 6%-11% fewer non-white workers than the private sector.

- Three out of four public sector workers identify as "white alone." The largest percentage of non-white workers in the public sector and private sector is in one of the lowest wage industries, transportation and warehousing.
- The public and private sectors have roughly the same percentages of Hispanic workers. Private sector transportation and warehousing has a much higher share of Hispanic workers, 26%, than the public sector, 18%.

The public sector workforce displays high levels of education and training. It also shows an evenly-distributed share of jobs across skills levels, indicating opportunities for entry-level employment, upskilling with additional education and training, and placement opportunities for students exiting postsecondary education and training programs.

- Eight out of 10 public sector jobs require at least some postsecondary education, training, or experience.
- More than a third of the public sector workforce is middle skill, indicating there are placement opportunities for students coming from community college and other postsecondary training providers, and upskilling opportunities for entry-level workers who receive additional education and training.
- About 40% of the public sector workforce requires a bachelor's degree or higher, a number that is influenced by the large number of teachers in the region. The research indicates that the educational path to most higher paying, management positions is often a bachelor's degree.

The tens of thousands of jobs across 16 career clusters reveal numerous opportunities for pipeline and pathway development.

- The data analysis shows there are scores of opportunities for pipeline and pathway development across public industry sectors.
- Three career clusters have high job numbers. The educational services sector leads the group with 45,000 jobs, followed by business management and administration, 42,000 jobs, and public safety, corrections, and security, 29,600 jobs.

CONCLUSION AND RECOMMENDATIONS

This study set out to describe the overall size and characteristics of the public sector workforce in the six-county Sacramento region. The report identifies the major industries, employers, career clusters, and occupations that comprise the public sector. The interviews and literature review highlight specific challenges and organizational capacity to meet workforce demand, especially as retirements continue to impact regional public sector employment. The IPPS has a clear and present opportunity to support the region's public sector workforce by developing and executing a well-thought out strategy that incorporates the findings and recommendations in this report.

This section includes recommendations for developing and focusing coordination among IPPS members and partners. The recommendations emphasize a few general principles for planning and capacity-building activities. These include:

- Creating and supporting committees to focus on key strategic priorities
- Identifying best practices, resources, and technical assistance for key project areas
- Disseminating resources and practices to regional agency offices through workshops and other capacity-building activities
- Advocating for additional resources and coordinating multi-agency efforts
- Continuing to engage regional stakeholders for strategic planning, project development, and progress evaluation

The report makes the following recommendations to improve systems to connect qualified applicants with job opportunities in a more efficient and inclusive manner. The recommendations address the major challenges outlined in the findings from the literature review, interviews, and data analysis.

IPPS should support regional agencies, schools, and other training organizations to build governance systems and capacity to better inform students, faculty, and student services about public sector career opportunities.

The research shows that regional schools, community colleges, and universities are not well connected to public sector employers. The IPPS should support building governance systems and capacity to improve connections between schools and employers. Expanding capacity likely means adding staff to engage community partners and conduct direct outreach.

The IPPS should create resources and engagement opportunities to support scaling best practices for internships and other work-based learning opportunities.

The research indicates that internship offerings are not a standard practice among agency departments and offices. The IPPS can support best practices by increasing internships and other work-based learning opportunities by identifying case studies and producing and sharing resources that outline case studies and best practices for agencies and departments to develop work-based learning opportunities with schools, and other education and training providers.

Several of the interviewees have created youth summer programs and academies to provide a pipeline into public sector jobs. The IPPS should identify effective practices that are candidates for scaling.

The IPPS should identify best practices for supporting advancement along career pathways, especially for supervisory and management positions. The IPPS should use the career cluster and occupational analysis to identify specific career pathways for program development.

The research shows that in many cases, agency departments do not have well developed policies and practices for supporting staff to advance into better paying, more senior positions, especially for supervisory and management positions.

The research identified numerous career pathway possibilities using skill-level analysis and career clusters that warrant additional investigation. The IPPS should use the career cluster and skill-level research as a starting point for career pathway program development.

In addition, the IPPS should leverage its member network to identify best practices for pathway programs. The groups should document member practices and engage in capacity-building activities to disseminate the resources.

Interviewees highlighted several practices for pipeline development and upskilling for staff development. These include:

- Internal staff rotations between departments
- Partnerships with community colleges and universities for staff training programs
- Apprenticeships and academies for entry-level skilled trades and public safety job candidates
- Pipeline training programs to meet entry-level industrial, fleet, and building maintenance technician hiring needs

The IPPS should identify and promote best practices for branding and marketing to promote public sector career opportunities to new entrants and experienced workers. Develop resources and forums to disseminate and scale these practices in the region.

Many existing partners in the IPPS have identified successful practices for branding and marketing that support engagement and recruitment efforts. The IPPS should convene representatives from human resources departments, and communications and public information offices to identify, document, and disseminate these practices through professional development and summits. Partner leads could include public safety departments, state agencies, and utilities, as well as professional associations and other policy groups.

The IPPS should identify best practices to streamline recruitment and hiring policies and processes, drawing on state and professional association reports and other expertise and technical assistance resources.

An IPPS committee should identify best practices to identify processes and policies for streamlining application requirements like testing and minimum qualifications. The committee should also focus on sharing best practices for streamlining position classifications and readability of job postings. The committee should identify and disseminate information about successful deployment of technology solutions that resulted in improved alignment between applicant pools and openings.

The IPPS should identify opportunities to increase and share capacity for direct outreach and recruitment.

The interviews reveal that direct outreach and recruitment is lacking in many organizations, often due to staffing resource constraints. Interviewees indicated that onsite career expos and expansive community and school partnerships for direct outreach were vital practices that supported pipelines for recruiting. The IPPS should engage stakeholders to share resources on conducting outreach programs and expanding community partnerships on behalf of multiple agencies.

Prioritize diversity in creating practice-and-process improvements in outreach, recruitment, hiring, and professional development.

The data analysis and interviews make clear that there is more work to do with respect to hiring more diverse workers. The IPPS can leverage diversity policies and practices from leading regional agencies to develop resources and forums for disseminating the most successful approaches.

In those organizations that have made diversity a priority, interviewees cited the following practices:

- Internal diversity studies for existing workforce and applicant pool
- Internal diversity training for existing staff on sensitivity and adjusted hiring policies
- Updated diversity policies and updating hiring manuals
- Exit interviews for applicants from underrepresented groups for research to reduce barriers
- Leveraging employees of underrepresented groups for community partnerships
- Fostering resource groups among existing employees from underrepresented groups
- Leveraging specific community groups and professional associations for recruitment of underrepresented groups
- Adoption of differential preference for hiring of certain roles that require cultural competence or language skills
- Wide-ranging community partnerships and outreach for diversity programs

The IPPS should investigate these practices further and create recruitment and hiring practice resources and models to build capacity among participating members.

The IPPS should develop a rural committee to ensure that under-resourced agencies and offices have access to the resources and technical assistance the partners develop.

The research indicates that many rural agencies and offices in surrounding areas have a lower-paid labor market and staffing capacity challenges. The IPPS should create an organizational structure to support these entities and to connect them to best practices and resources created by the IPPS.

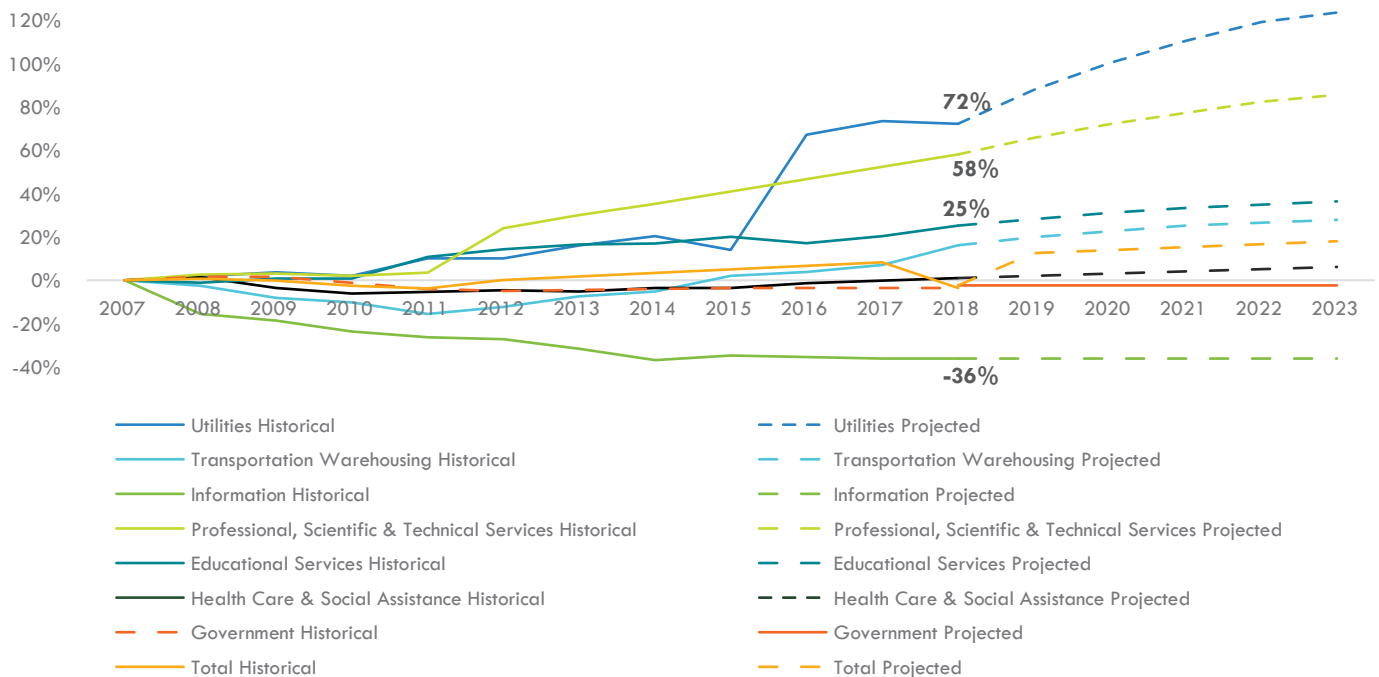


APPENDIX A: HISTORICAL AND PROJECTED GROWTH FOR THE SEVEN INDUSTRY SECTORS

The research employs EMSI, a software vendor for modeled historical and projected employment in related sectors. Exhibit A1 shows employment trends and occupational projections for the seven industry sectors in the private and public sectors.⁴⁴ The trend line uses 2007 as a baseline and shows the percentage change for each year from the baseline. Each sector is compared to local, state, and federal government jobs (“Government” line) and the total across the seven categories (“Total” line).

The utilities sector has undergone the most robust job growth, followed by health care and social assistance, and educational services. Overall government employment has remained flat, losing a few percentage points during the recession, and without regaining the jobs post-recession, according to EMSI.

Exhibit A1: EMSI historical and projected jobs 2007-2023 for the seven industry sectors⁴⁵



Data available from CalHR contradicts the data available from EMSI for state government jobs (Exhibits A2 and A3). EMSI’s model shows a 10-year decline of 6% in state government jobs, compared to a 2007 baseline. The model includes state universities and colleges, hospitals, and government offices. The jobs losses shown are not due to state colleges, universities, or hospitals. The CalHR data comes from the Annual Census of Employees in State Civil Service conducted by the state controller. The report does not cover executive, judicial, constitutional officers, gubernatorial appointees, colleges, universities, or coast guard. Additional research should explore public sector industry trends to evaluate which areas of the sector are expanding and contracting for workforce development planning purposes.

⁴⁴ EMSI, 2019.3 QCEW, Non-QCEW, Self-employed. Note, the sectors are roughly equivalent to QCEW categories, but it is not clear if the categories separate or include public sector jobs in some of the counts, like utilities or information, for example. EMSI employs a model to calculate public sector jobs, but the model is not transparent and so was not used as the primary method for counting public sector jobs.

⁴⁵ The EMSI government definition includes local, state, and federal government jobs, including public administration, education, and health care.

Exhibit A2: Percent change in federal, state, and local jobs, 2007-2023, Sacramento region⁴⁶

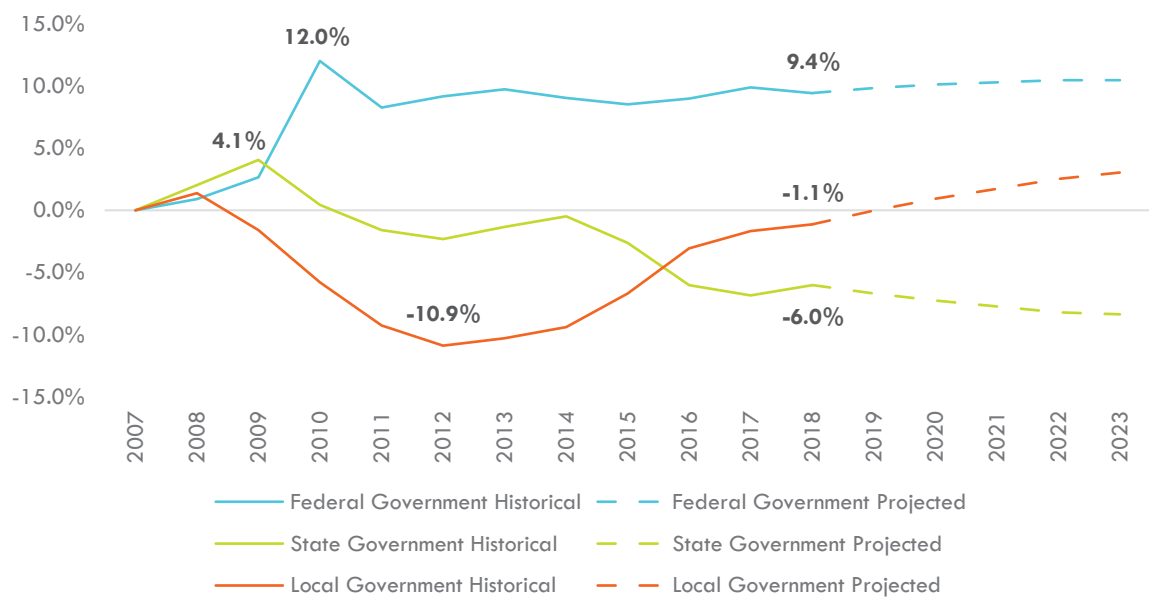
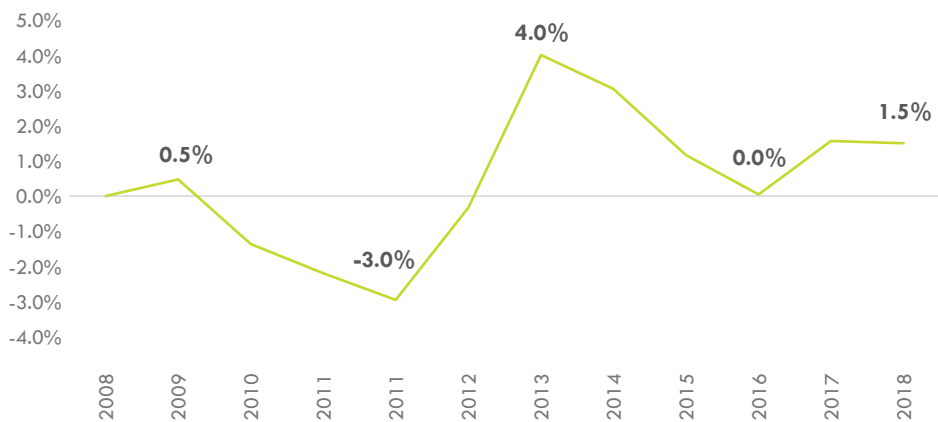


Exhibit A3: Percent change in state civil service jobs, 2008-2018⁴⁷



⁴⁶ EMSI, 2019.3.

⁴⁷ CalHR/California State Controller.

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APPENDIX B: TOP 30 PUBLIC SECTOR EMPLOYERS IN THE SIX-COUNTY SACRAMENTO REGION

The sector profiles and description of the public sector's seven industry sectors includes establishment-level data from Dun & Bradstreet via Econovue, a data vendor. The research identified a sample of top public sector employers by priority sector, county, and region. Exhibit B1 shows the top 30 employers in the region based on the total employment given in the Dun & Bradstreet analysis. Employers in the NAICS code 92-Public Administration were grouped since the entities often have numerous scattered offices and facilities. The analysis omitted Beale Air Force Base since the QCEW data in the research does not include military job counts.

It is possible these estimates do not reflect actual totals due to the methods for collecting and cleaning the data. The intention of the lists is to illustrate the actual types of businesses included in the counts and to indicate potential key partners for workforce development initiatives.

Exhibit B1: Top 30 public sectors employers in the region by number of jobs, Q3 2019⁴⁸

Industry Sector	Registered Company Name	NAICS	NAICS Description	County	Employment
92-Public Admin.	County of Sacramento	Multiple	Multiple	Sacramento	13,557
62-Health Care & Social Assistance	University of California, Davis	622110	General Medical and Surgical Hospitals	Sacramento	11,004
92-Public Admin.	Department of Health Care Services	923120	Administration of Public Health Programs	Sacramento	10,161
61-Educational Svcs	University of California, Davis	611310	Colleges, Universities, and Professional Schools	Yolo	7,830
61-Educational Svcs	Grove Elk Unified School District	611110	Elementary and Secondary Schools	Sacramento	7,710
92-Public Admin.	California Department of Corrections & Rehabilitation	Multiple	Multiple	Sacramento	7,629
92-Public Admin.	California Dept of Transportation	Multiple	Multiple	Sacramento	7,121
92-Public Admin.	California Department of General Services	921190	Other General Government Support	Yolo	3,474
92-Public Admin.	County of Placer	Multiple	Multiple	Placer	3,113
92-Public Admin.	County of El Dorado	Multiple	Multiple	El Dorado	2,940
48-49-Trans. & Warehousing	United States Postal Service	491110	Postal Service	Sacramento	2,566
61-Educational Svcs	Sierra Joint Community College District	611210	Junior Colleges	Placer	1,951
48-49-Trans. & Warehousing	United States Postal Service	491110	Postal Service	Yolo	1,400
61-Educational Svcs	Marysville Joint Unified School District	611110	Elementary and Secondary Schools	Yuba	1,347
61-Educational Svcs	Yuba City Unified School District	611110	Elementary and Secondary Schools	Sutter	1,137
48-49-Trans. & Warehousing	Sacramento Regional Transit District	485113 & 488490	Bus and Other Motor Vehicle Transit Systems & Other Support Activities for Road Transportation	Sacramento	1,052

continued

⁴⁸ Dun & Bradstreet, Econovue, 2019.3. Employment counts were not verified. Challenges to site-specific employment data include especially firm-to-establishment branch counting, and misreporting.

Exhibit B1: Top 30 public sectors employers in the region by number of jobs, Q3 2019, continued

Industry Sector	Registered Company Name	NAICS	NAICS Description	County	Employment
51-Information	California State Library	519120	Libraries and Archives	Sacramento	1,042
61-Educational Svcs	Buckeye Union School District	611110	Elementary and Secondary Schools	El Dorado	1,005
54-Prof.&Tech. Svcs	US Army Corps of Engineers	541330	Engineering Services	Sacramento	982
92-Public Admin.	County of Sutter	Multiple	Multiple	Sutter	557
22-Utilities	Sacramento Regional County Sanitation District	221320	Sewage Treatment Facilities	Sacramento	500
54-Prof.&Tech. Svcs	California Department of General Services	541330	Engineering Services	Sacramento	500
48-49-Trans. & Warehousing	United States Postal Service	491110	Postal Service	Placer	338
22-Utilities	El Dorado Irrigation District	221310	Water Supply and Irrigation Systems	El Dorado	300
48-49-Trans. & Warehousing	United States Postal Service	491110	Postal Service	El Dorado	279
62-Health Care & Social Assistance	County of Placer	624120	Services for the Elderly and Persons with Disabilities	Placer	191
54-Prof.&Tech. Svcs	County of Placer	541330	Engineering Services	Placer	150
48-49-Trans. & Warehousing	United States Postal Service	491110	Postal Service	Yuba	130
22-Utilities	South Tahoe Public Utility District	221320	Sewage Treatment Facilities	El Dorado	113
51-Information	County of Placer	519120	Libraries and Archives	Placer	101



APPENDIX C: SUPPLEMENTAL DATA ON THE SEVEN INDUSTRY SECTORS, INCLUDING CAREER CLUSTERS, EMPLOYERS, INDUSTRIES, AND TRENDS

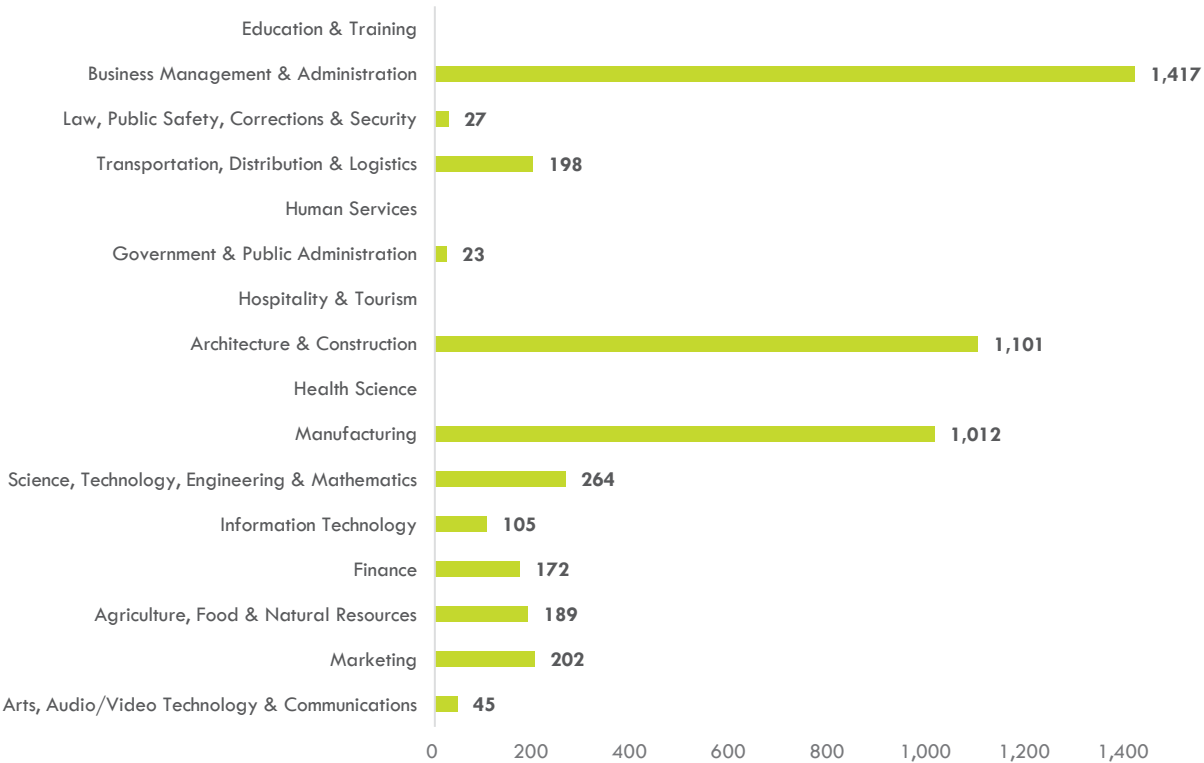
The research yielded detailed data findings for public sector jobs that add to the main findings outlined in the body of the report. These additional topics include:

- Career clusters job counts for the public sector jobs in the major industry sectors
- Establishment-level employers in the public and private sector (including business name and associated detailed industry, estimated employment count)
- Prominent detailed industries according to establishment counts
- Industry job trends and projections (2007-2023)

Utilities

- Most public sector utilities establishments are water supply and irrigation systems.
- EMSI historical trend data shows a marked increase in utilities jobs since 2015, especially in natural gas.
- The career clusters data shows that the utilities sector has a significant blue collar workforce (manufacturing and architecture and construction career clusters). The sector has a number of professional technical jobs construction and engineering, and administration and business managers.

Exhibit C1: Career clusters in utilities, by number of jobs, 2017⁴⁹



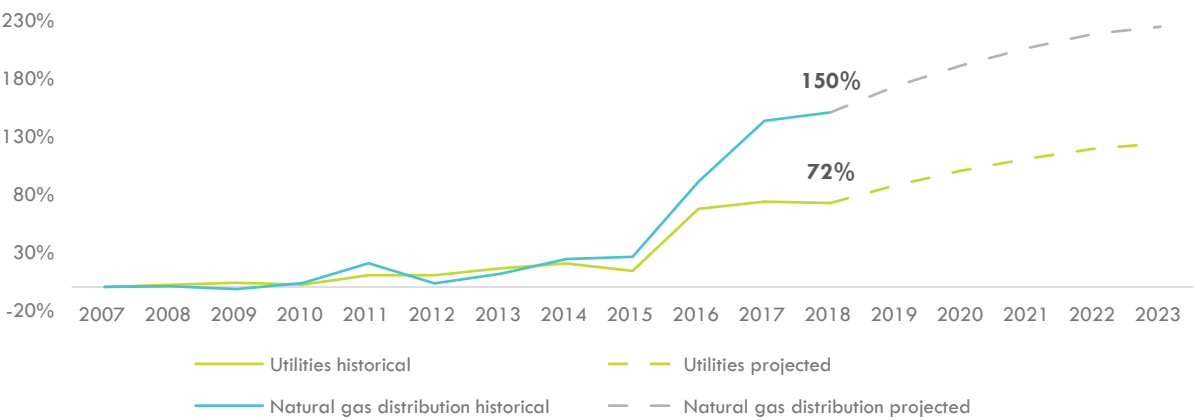
Fifty out of the 58 utilities establishments in the region are in the public sector. The majority, 44, are water supply and irrigation systems, followed by sewage treatment facilities, four establishments. According to QCEW data, other single employers include hydroelectric power generation, and electric power distribution.

Exhibit C2: Top public sector utilities establishments, Sacramento region⁵⁰

Organization Name	NAICS	NAICS Description	County	Employment
Sacramento Regional County Sanitation District	221320	Sewage Treatment Facilities	Sacramento	500
El Dorado Irrigation District	221310	Water Supply and Irrigation Systems	El Dorado	300
South Tahoe Public Utility District	221320	Sewage Treatment Facilities	El Dorado	113
Sacramento Suburban Water District	221310	Water Supply and Irrigation Systems	Sacramento	112
Sacramento County Water Agency	221310	Water Supply and Irrigation Systems	Sacramento	99
El Dorado Hills County Water District	221310	Water Supply and Irrigation Systems	El Dorado	51
North Tahoe Public Utility District	221320	Sewage Treatment Facilities	Placer	48
San Juan Water District	221310	Water Supply and Irrigation Systems	Placer	44
Fair Oaks Water District	221310	Water Supply and Irrigation Systems	Sacramento	40
Tahoe City Public Utility District Public Facilities Financing	221320	Sewage Treatment Facilities	Placer	40
Nevada Irrigation District	221310	Water Supply and Irrigation Systems	Placer	36
Rancho Murieta Community Services District	221310	Water Supply and Irrigation Systems	Sacramento	35
Yolo County Flood Control & Water Conservation District	221310	Water Supply and Irrigation Systems	Yolo	25
Olivehurst Public Utility District	221310	Water Supply and Irrigation Systems	Yuba	23
Reclamation District 1500	221310	Water Supply and Irrigation Systems	Sutter	13

⁵⁰ Econovue, Dun & Bradstreet, 2019.3.

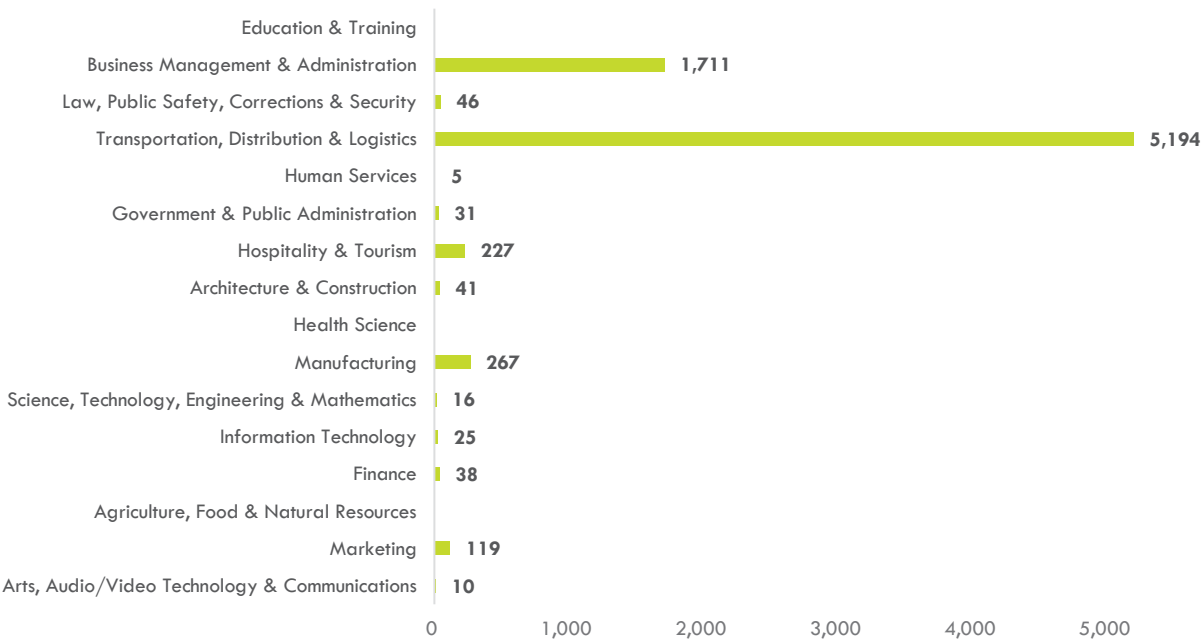
Exhibit C3: All utilities, historical and projected job change through 2023, benchmark 2007⁵¹



Transportation and warehousing

- Most public sector transportation and warehousing establishments are U.S. Postal Service.
- EMSI historical trend data shows an increase of 16% over the 2007 baseline. Jobs only recovered from the recession after 2014. General warehousing and storage was most impacted.
- The career clusters data shows that transportation and warehousing has a significant blue collar workforce (transportation, distribution, and logistics career clusters), including drivers, logistics specialists, and other goods movement occupations. Business management and administration has the other main job concentration

Exhibit C4: Career clusters in public sector transportation and warehousing by number of jobs, 2017⁵²



⁵¹ EMSI, 2019.3.

⁵² QCEW, 2017, OES, O*NET.

SACRAMENTO REGION INNOVATIVE PATHWAYS TO PUBLIC SERVICE (IPPS) WORKFORCE NEEDS ASSESSMENT

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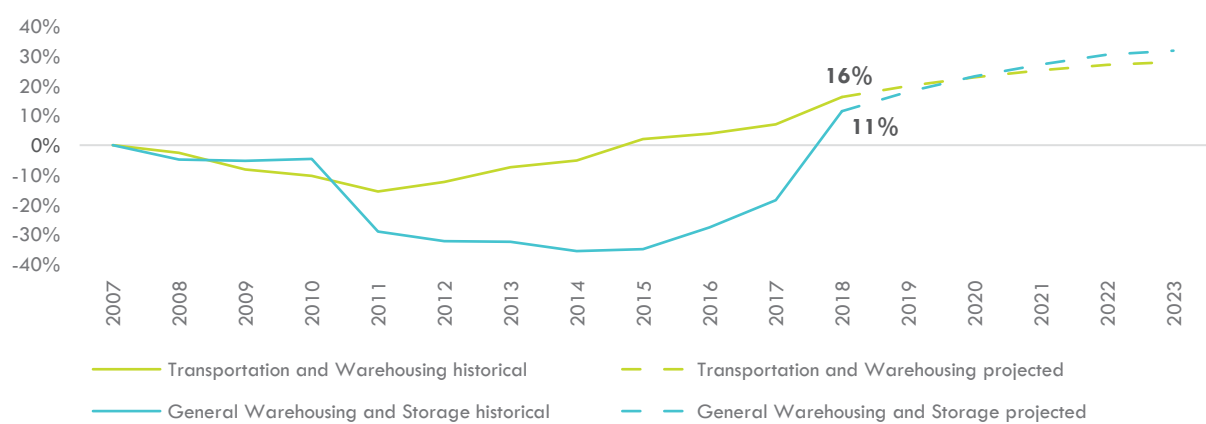
Of the more than 1,100 transportation and warehousing establishments in the region, 140 are in the public sector. The vast majority, 116, are federal postal service facilities. According to QCEW data, school and employee bus transportation, airport operations, mixed mode transit systems, and bus and other motor vehicle transit systems are also included.

Exhibit C5: Top transportation and warehousing employers, Sacramento region⁵³

Organization Name	NAICS	NAICS Description	County	Employment
United States Postal Service	491110	Postal Service	Sacramento	2,566
United States Postal Service	491110	Postal Service	Yolo	1,400
Sacramento Regional Transit District	485113 & 488490	Bus and Other Motor Vehicle Transit Systems & Other Support Activities for Road Transportation	Sacramento	1,048
United States Postal Service	491110	Postal Service	Placer	338
United States Postal Service	491110	Postal Service	El Dorado	279
County of Sacramento	488119	Other Airport Operations	Sacramento	275
Grove Elk Unified School District	485410	School and Employee Bus Transportation	Sacramento	201
United States Postal Service	491110	Postal Service	Yuba	130
Woodland Joint Unified School District	485410	School and Employee Bus Transportation	Yolo	50
School Transportation	485410	School and Employee Bus Transportation	Yuba	48
Mid-Placer Public Schools Transportation Agency	485410	School and Employee Bus Transportation	Placer	36
The City of Rio Vista	485111	Mixed Mode Transit Systems	Sacramento	35
Davis Joint Unified School District	493110	General Warehousing and Storage	Yolo	30
Food & Agriculture, California Dept	493110	General Warehousing and Storage	Sacramento	30
Yuba City Unified School District	493110	General Warehousing and Storage	Sutter	24

⁵³ Econovue, Dun & Bradstreet, 2019.3.

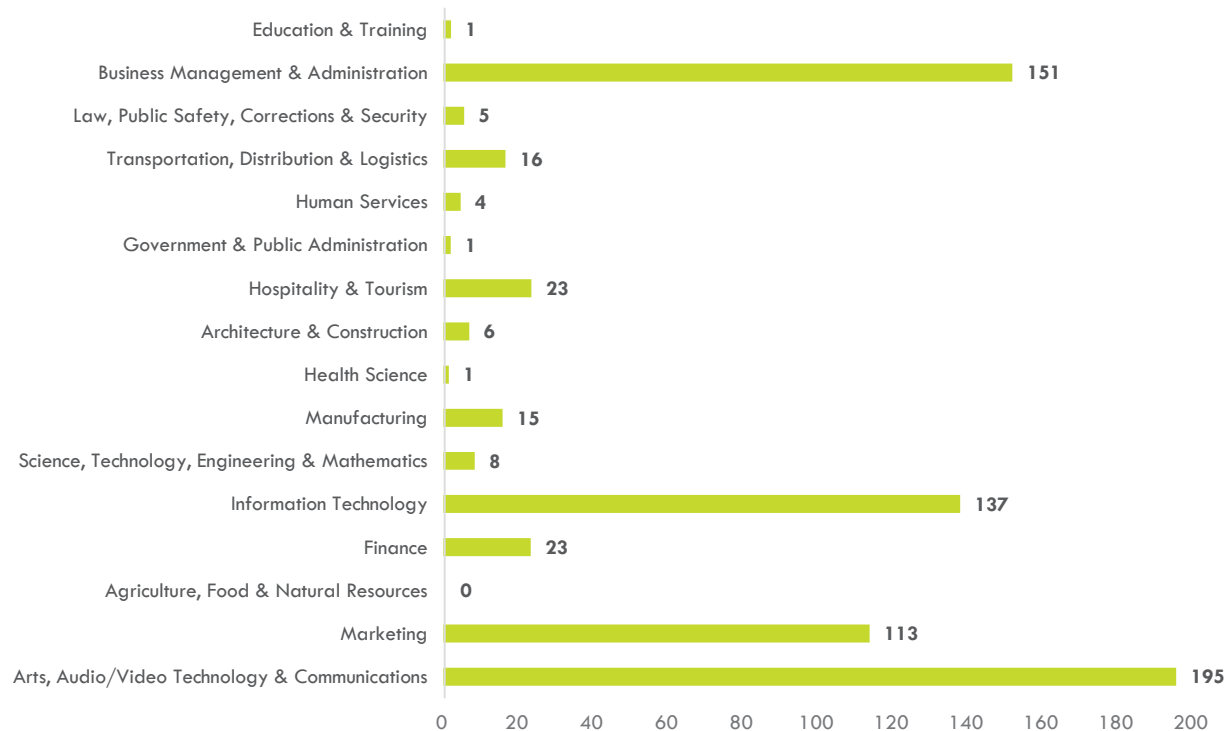
Exhibit C6: All transportation and warehousing, historical and projected job change through 2023, benchmark 2007⁵⁴



Information

- All public sector information establishments are in local libraries and the state library.
- The vast majority of information establishments are in industries that make comparison difficult, e.g., telecommunications and wireless carriers. Industry trend data is not included.
- The career clusters data reflects modest job totals, but shows that there are jobs in management, information technology and audio/video technology, and library professionals.

Exhibit C7: Career clusters in public sector information, by number of jobs, 2017⁵⁵



⁵⁴ EMSI, 2019.3.
⁵⁵ QCEW, 2017, OES, O*NET.

Of the 650 information establishments in the region, 69 are counted in the public sector. According to QCEW data, all of these are in libraries and archives.

Exhibit C8: Top public sector information employers, Sacramento region⁵⁶

Organization Name	NAICS	NAICS Description	County	Employment
California State Library	519120	Libraries and Archives	Sacramento	1,042
County of Placer	519120	Libraries and Archives	Placer	101
LDS Sacramento CA East Stake	519120	Libraries and Archives	Sacramento	80
County of Sacramento	519120	Libraries and Archives	Sacramento	78
Woodland Library Rose CLU	519120	Libraries and Archives	Yolo	70
Sacramento Public Library Foundation	519120	Libraries and Archives	Sacramento	43
County of El Dorado	519120	Libraries and Archives	El Dorado	30
County of Yolo	519120	Libraries and Archives	Yolo	30
University of California, Davis	519120	Libraries and Archives	Yolo	20
Friends of The Sacramento Library	519120	Libraries and Archives	Sacramento	20
City of Woodland	519120	Libraries and Archives	Yolo	18
Council of Chief Librarians, California Community Colleges	519120	Libraries and Archives	Sacramento	18
Yuba College Foundation Inc	519120	Libraries and Archives	Yuba	18
Yolo County Fair First Aid	519120	Libraries and Archives	Yolo	15
County of Sutter	519120	Libraries and Archives	Sutter	13

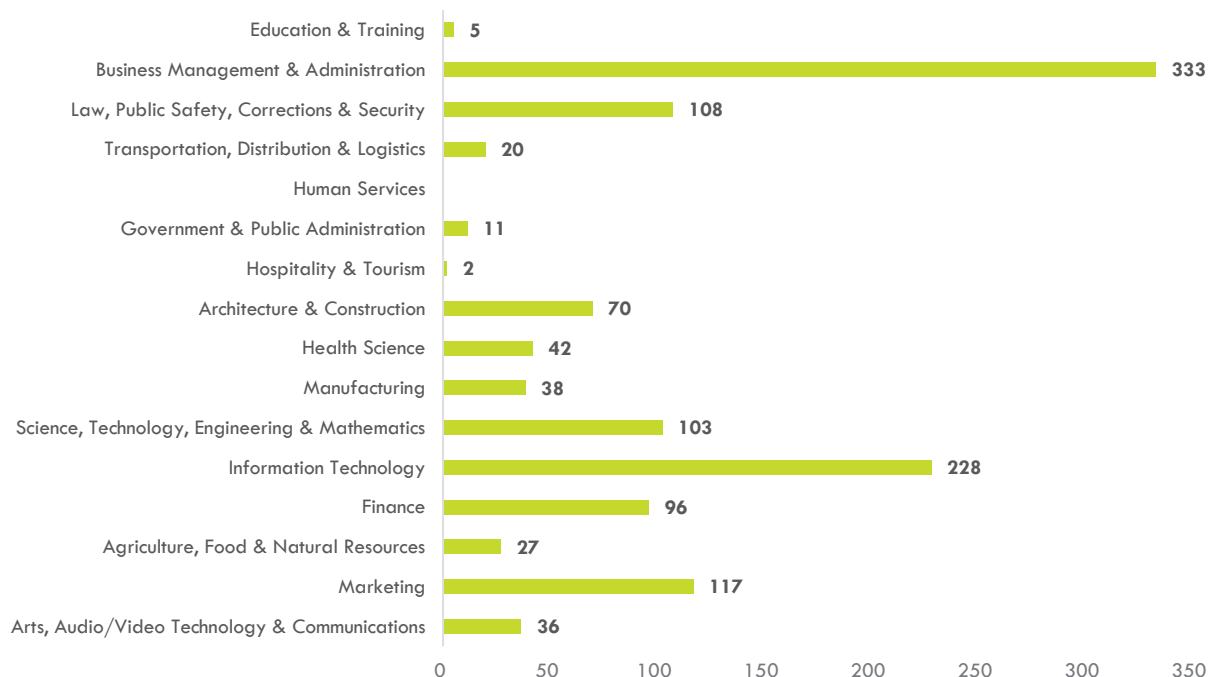
No chart is included for information historical and projected job change through 2023.

⁵⁶ Econovue, Dun & Bradstreet, 2019.3.

Professional, scientific & technical services

- Most public sector professional, scientific & technical services establishments are federal and state engineering services.
- EMSI historical trend data shows that the sector has recovered, but not grown, after the recession.
- The career clusters data shows a concentration in business management and administration, and other concentrations mostly in career clusters with professional occupations.

Exhibit C9: Career clusters in public sector professional, scientific & technical services, by number of jobs, 2017⁵⁷



⁵⁷ QCEW, 2017, OES, O*NET.

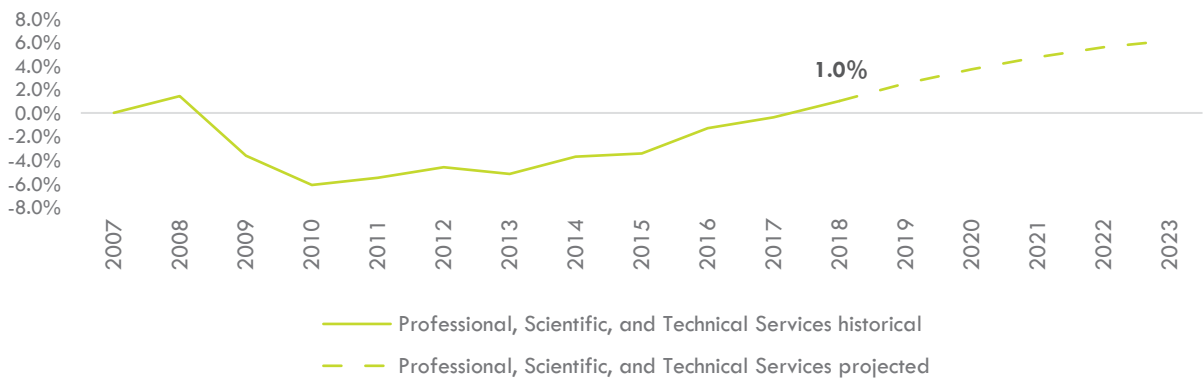
Of the more than 6,400 professional, scientific & technical services establishments in the region, 40 are counted in the public sector. The majority, 28 total, are state and federal engineering services. According to QCEW data, local government offices in human resources, management consulting, computer systems design, and public relations are also included.

Exhibit C10: Top Professional, scientific & technical services employers, Sacramento region⁵⁸

Organization Name	NAICS	NAICS Description	County	Employment
US Army Corps of Engineers	541330	Engineering Services	Sacramento	982
California Department of General Services	541330	Engineering Services	Sacramento	500
California Department of Technology Services	541512	Computer Systems Design Services	Sacramento	292
County of Placer	541330	Engineering Services	Placer	150
US Army Corps of Engineers	541330	Engineering Services	Yolo	109
California Housing Finance Agency	541690	Other Scientific and Technical Consulting Services	Sacramento	99
Sacramento Metropolitan Air Quality Management District	541620	Environmental Consulting Services	Sacramento	84
City of Woodland	541330	Engineering Services	Yolo	75
California Tahoe Conservancy	541620	Environmental Consulting Services	El Dorado	50
Capitol Area Development Authority	541690	Other Scientific and Technical Consulting Services	Sacramento	44
Sacramento-San Joaquin Delta Conservancy	541620	Environmental Consulting Services	Yolo	30
City of Roseville	541512	Computer Systems Design Services	Placer	27
Yolo-Solano Air Quality Management District	541620	Environmental Consulting Services	Yolo	26
Tahoe Resource Conservation District	541620	Environmental Consulting Services	El Dorado	18
Reclamation District 1660	541620	Environmental Consulting Services	Sutter	5

⁵⁸ Econovue, Dun & Bradstreet, 2019.3.

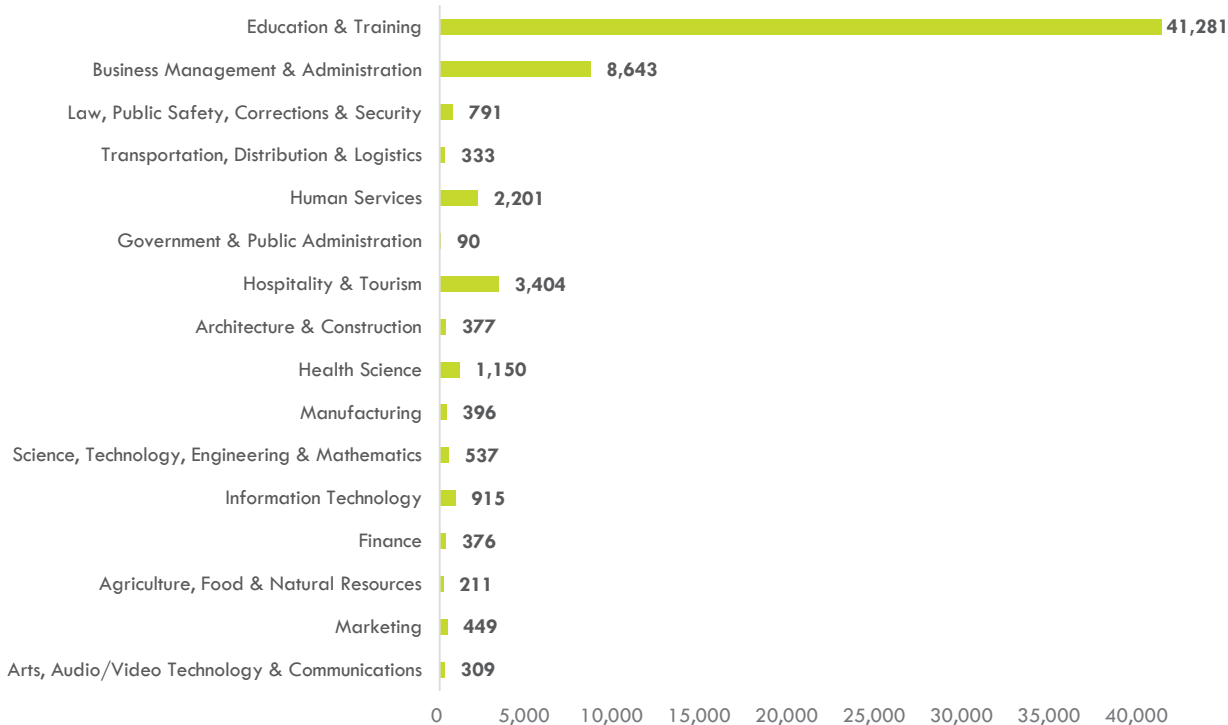
Exhibit C11: All professional, scientific & technical services, historical and projected job change through 2023, benchmark 2007⁵⁹



Educational services

- Most public educational services establishments are local elementary schools and high schools. Universities and community colleges also account for many jobs.
- EMSI historical trend data shows that the sector has grown sharply since the recession, expanding employment by 25% since 2007.
- The career clusters data shows a large concentration in education and training, due to the many categories of professional educators.

Exhibit C12: Career clusters in public sector educational services, by number of jobs, 2017⁶⁰



⁵⁹ EMSI, 2019.3.

⁶⁰ QCEW, 2017, OES, O*NET.

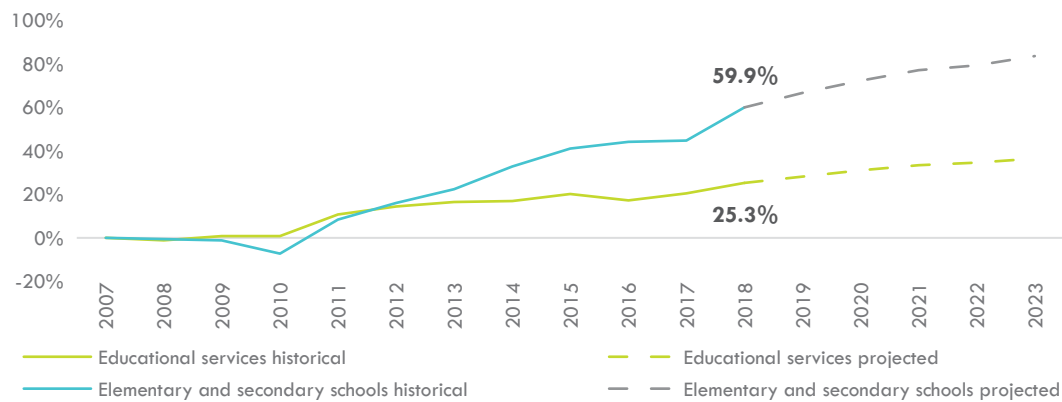
Of the 1,850 educational services establishments in the region, 1,150 are counted in the public sector. According to QCEW data, most are elementary and secondary schools (870) followed by colleges and universities (268). (The research team determined that California State University, Sacramento is counted in more than 200 separate establishments.)

Exhibit C13: Top public sector educational services employers, Sacramento region⁶¹

Organization Name	NAICS	NAICS Description	County	Employment
University of California, Davis	611310	Colleges, Universities, and Professional Schools	Yolo	7,830
Grove Elk Unified School District	611110	Elementary and Secondary Schools	Sacramento	7,710
Los Rios Community College District	611310 & 611210	Colleges, Universities, and Professional Schools & Junior Colleges	Sacramento	7,121
San Juan Unified School District	611110	Elementary and Secondary Schools	Sacramento	5,648
Sacramento City Unified School District	611110	Elementary and Secondary Schools	Sacramento	3,834
Twin Rivers Unified School District	611110	Elementary and Secondary Schools	Sacramento	3,268
Folsom-Cordova Unified School District	611310	Colleges, Universities, and Professional Schools	Sacramento	2,200
Sierra Joint Community College District	611210	Junior Colleges	Placer	1,951
University of California, Davis	611310	Colleges, Universities, and Professional Schools	Sacramento	1,802
Rocklin Unified School District	611110	Elementary and Secondary Schools	Placer	1,442
Marysville Joint Unified School District	611110	Elementary and Secondary Schools	Yuba	1,347
Roseville City School District	611110	Elementary and Secondary Schools	Placer	1,339
Woodland Joint Unified School District	611110	Elementary and Secondary Schools	Yolo	1,145
Yuba City Unified School District	611110	Elementary and Secondary Schools	Sutter	1,137
Buckeye Union School District	611110	Elementary and Secondary Schools	El Dorado	1,005

⁶¹ Econovue, Dun & Bradstreet, 2019.3.

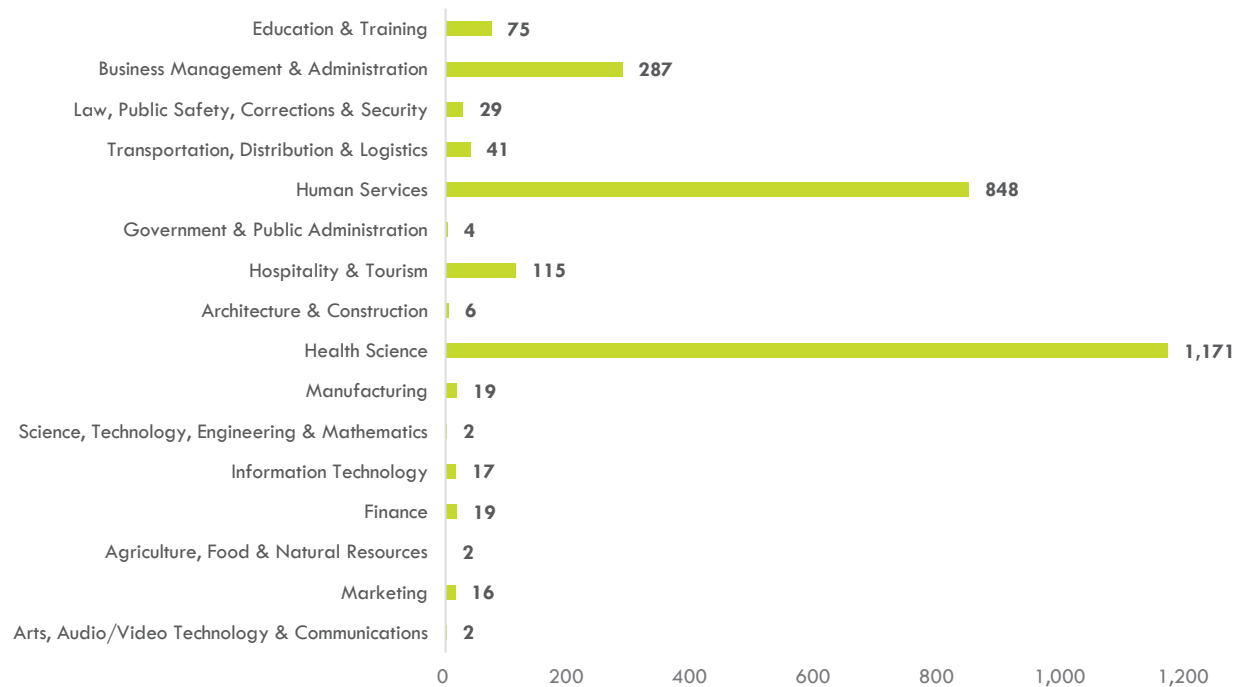
Exhibit C14: All education services, historical and projected job change through 2023, benchmark 2007⁶²



Health care and social assistance

- Most public sector health care and social assistance establishments are child daycare services and vocational rehabilitation services.
- EMSI historical trend data shows a massive increase of 58% over the 2007 baseline; the increase was unimpeded by the recession. Services for the elderly and persons with disabilities represents an outlier, with a huge job increase of more than 1,400% since 2007.
- The career clusters data shows concentrations of jobs in health science (licensed allied health and professional clinician and physician occupations), and human services (social workers, counselors, and community services occupations).

Exhibit C15: Career clusters in public sector heath care and social assistance, by number of jobs, 2017⁶³



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EMSI, 2019.3.

63

Source: QCEW, 2017, OES, O*NET.

SACRAMENTO REGION INNOVATIVE PATHWAYS TO PUBLIC SERVICE (IPPS) WORKFORCE NEEDS ASSESSMENT

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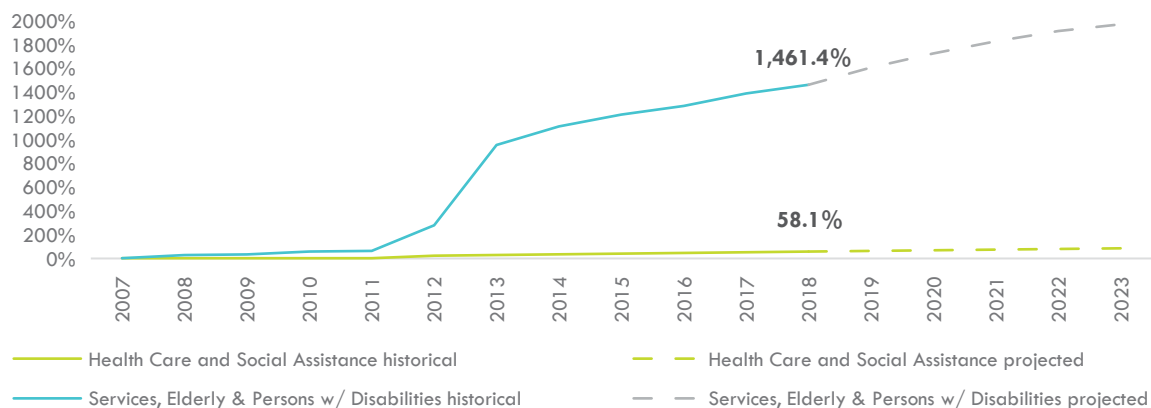
Only 70 of the more than 34,000 health care and social assistance establishments in the region are counted in the public sector. Most are child day care services, 30 total, and vocational rehabilitation services, 25. Four offices of physicians have 1,900 employees in the region. According to QCEW data, services for the elderly and disabled, medical laboratories, and ambulance services represent other public sector establishments in the region.

Exhibit C16: Top public sector health care and social assistance employers, Sacramento region⁶⁴

Organization Name	NAICS	NAICS Description	County	Employment
University of California, Davis	622110 & 621111	General Medical and Surgical Hospitals & Offices of Physicians (except Mental Health Specialists)	Sacramento	11,004
Sacramento Employment & Training Agency	624310	Vocational Rehabilitation Services	Sacramento	545
County of Sacramento	624120	Services for the Elderly and Persons with Disabilities	Sacramento	281
Veterans Health Administration	621111	Offices of Physicians (except Mental Health Specialists)	Sacramento	274
County of Placer	624120 & 621498	Services for the Elderly and Persons with Disabilities & All Other Outpatient Care Centers	Placer	191
Placer County- Adult System of Care	621498	All Other Outpatient Care Centers	Placer	99
El Dorado County Health Department	621111	Offices of Physicians (except Mental Health Specialists)	El Dorado	94
UC Med Human Resources Application Service	622110	General Medical and Surgical Hospitals	Sacramento	75
UC Davis Health System	622110	General Medical and Surgical Hospitals	Sacramento	59
University of California, Davis	621111	Offices of Physicians (except Mental Health Specialists)	Placer	54
Alcohol & Drug Program of Yolo County	621498	All Other Outpatient Care Centers	Yolo	50
Galt Joint Union School District	624410	Child Day Care Services	Sacramento	50
California Fire Fighters Apprenticeship Training Program	624310	Vocational Rehabilitation Services	Sacramento	40
University of California, Davis	621111	Offices of Physicians (except Mental Health Specialists)	Yolo	21
Davis Joint Unified School District	624410	Child Day Care Services	Yolo	13

⁶⁴ Econovue, Dun & Bradstreet, 2019.3.

Exhibit C17: All health care and social assistance, historical and projected job change through 2023, benchmark 2007⁶⁵

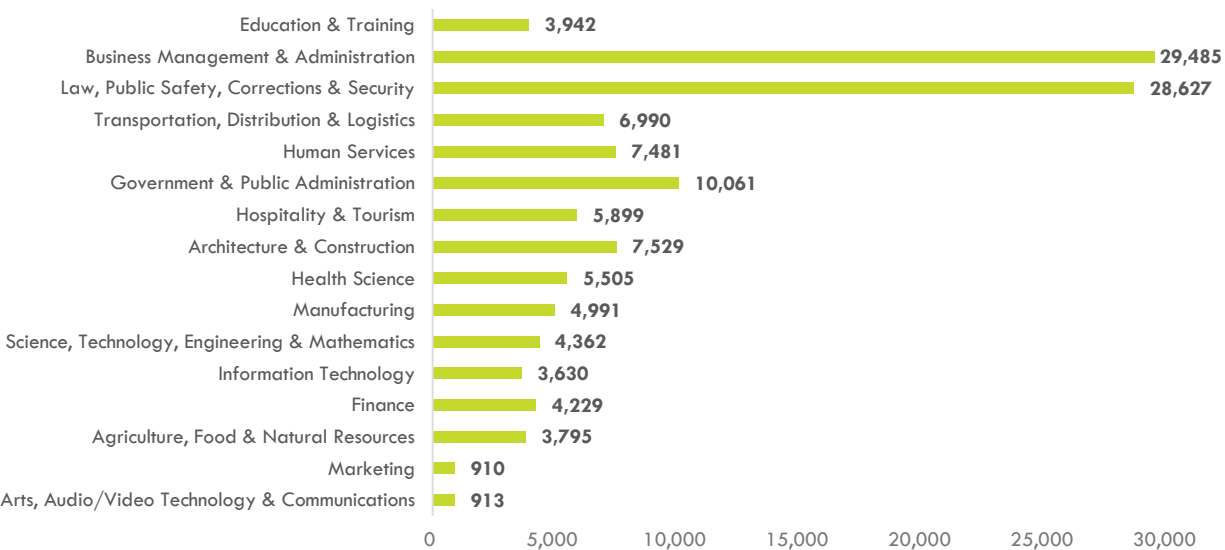


Public administration

Public administration industry and occupational employment resulted in supplemental findings for industries and establishments, and career clusters. Other trend data and top employer data is included in appendices that precede the supplemental appendix on industry sectors.

- There are more than 4,800 establishments in 29 industries in public administration in the region. Industries include general administrative offices, public finance, conservation and environment, transportation, legal, and a range of other activities.
- The career clusters data show thousands of jobs in most of the 16 career clusters. Business, management and administration, law, public safety, corrections, and security, and government and public administration are the top three career clusters.

Exhibit C18: Career clusters in public administration, by number of jobs, 2017⁶⁶



Data findings on public administration industries and establishments are included in the table below. The table describes the numerous detailed industries included in the sector. According to QCEW data, there are more than 4,800 establishments in 29 industries in public administration in the region. Employment counts of zero indicate data that is suppressed.

Exhibit C19: Top public administration industries, Sacramento region⁶⁷

NAICS 92 Public administration	Establishments	Employment
NAICS 921190 Other general government support	534	10,397
NAICS 921130 Public finance activities	523	14,058
NAICS 924120 Administration of conservation programs	447	9,598
NAICS 924110 Air, water, and waste program administration	378	7,457
NAICS 923130 Other human resource programs administration	366	6,694
NAICS 923120 Administration of public health programs	357	6,028
NAICS 926120 Transportation program administration	295	10,262
NAICS 926150 Licensing and regulating commercial sectors	267	4,366
NAICS 922130 Legal counsel and prosecution	237	3,883
NAICS 922190 Other justice and safety activities	234	8,374
NAICS 922140 Correctional institutions	227	5,357
NAICS 926140 Agricultural market and commodity regulation	224	234
NAICS 926110 Administration of general economic programs	162	2,913
NAICS 922120 Police protection	136	3,274
NAICS 923110 Administration of education programs	111	1,492
NAICS 923140 Administration of veterans' affairs	57	603
NAICS 928110 National security	43	1,333
NAICS 921110 Executive offices	37	1,817
NAICS 922160 Fire protection	37	1,850
NAICS 925120 Urban and rural development administration	36	0
NAICS 926130 Utility regulation and administration	34	0
NAICS 921140 Executive and legislative offices, combined	32	8,479
NAICS 921120 Legislative bodies	17	2,754
NAICS 922110 Courts	17	338
NAICS 925110 Administration of housing programs	16	3
NAICS 922150 Parole offices and probation offices	14	311
NAICS 921150 Tribal governments	4	0
NAICS 927110 Space research and technology	2	3
NAICS 928120 International affairs	2	82
Total	4,846	111,960

Industry trends in public administration:

Data findings for job trends in government and state civil service jobs are included in appendices preceding the supplemental data appendices. (Sources: EMSI, CalHR)

Establishment-level employers in public administration:

Data findings for the top employers in the region for public administration are included in the appendix for the top 30 public sector employers in the region, including all seven sectors. (Sources: Econovue, Dun & Bradstreet)

⁶⁷ Econovue, Dun & Bradstreet, 2019.3.

APPENDIX D: SUPPLEMENTAL CAREER CLUSTER DATA, INCLUDING INDUSTRY SECTORS, SKILL LEVEL, AND OCCUPATIONS

The research yielded detailed data findings for public sector jobs that add to the main findings outlined in the body of the report. The findings are intended to illustrate potential career pathways. The section includes:

- Job totals for 13 of the 16 career clusters in each of the seven public industry sectors.⁶⁸
- Occupational employment totals for middle-skill, above-middle-skill, and below-middle-skill occupations.
- Top occupations for each skill level, including percent change over 10 years, 5-year projections, projected annual openings, and median hourly wage.



⁶⁸ Hospitality and tourism, marketing, and arts, audio/video technology and communications were omitted from the report due to space limitations. The criteria included job totals and quality (wages and number of middle-skill and above-middle-skill jobs).



- Most of the career cluster's jobs are found in educational services sector. There is also a concentration in public administration.
- The majority of occupational employment in education and training is above middle skill, 82%, with a smaller minority of jobs at the middle-skill level.
- Detailed occupations include elementary and high school teachers and other professional staff like librarians and counselors. Teacher assistant is a prominent middle-skill occupation.

Exhibit D1: Industry sector distribution for education and training career cluster, by number of jobs, 2017⁶⁹

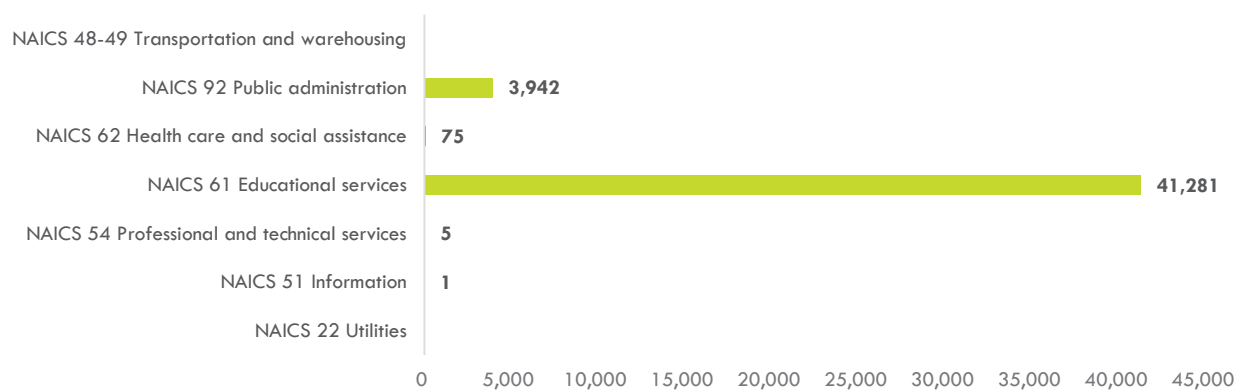
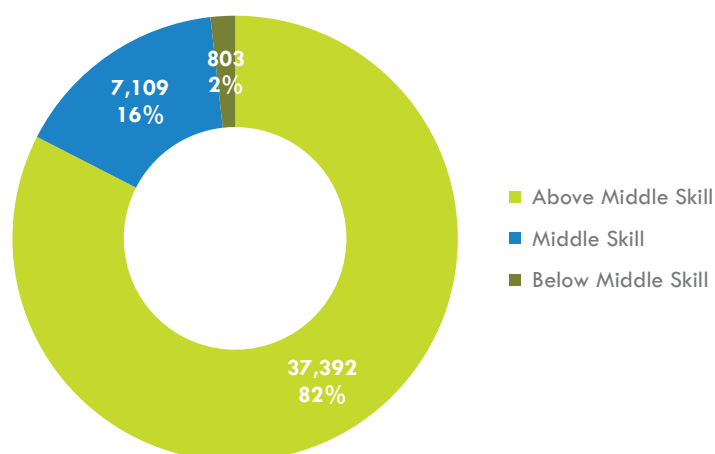


Exhibit D2: Skill-level distribution for the education and training career cluster⁷⁰



⁶⁹ QCEW, 2017, OES, O*NET.

⁷⁰ QCEW, 2017, OES, O*NET.

Exhibit D3: Detailed occupational employment for the education and training cluster⁷¹

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
25-2021	Elementary School Teachers, Except Special Education	Above Middle Skill	7,412	(2.6%)	884	\$34.29
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	Above Middle Skill	5,202	2.5%	654	\$36.03
25-3098	Substitute Teachers	Above Middle Skill	4,849	70.1%	788	\$18.28
25-3097	Teachers and Instructors, All Other, Except Substitute Teachers	Above Middle Skill	2,969	33.7%	510	\$20.73
25-2022	Middle School Teachers, Except Special and Career/Technical Education	Above Middle Skill	2,121	3.8%	330	\$35.09
21-1012	Educational, Guidance, School, and Vocational Counselors	Above Middle Skill	1,428	9.1%	261	\$28.98
25-9099	Education, Training, and Library Workers, All Other	Above Middle Skill	1,128	(2.5%)	210	\$18.86
11-9032	Education Administrators, Elementary and Secondary School	Above Middle Skill	1,061	19.0%	157	\$53.55
25-9031	Instructional Coordinators	Above Middle Skill	931	14.1%	141	\$40.00
27-2022	Coaches and Scouts	Above Middle Skill	802	38.7%	390	\$13.71
25-4031	Library Technicians	Above Middle Skill	700	(16.0%)	106	\$19.66
25-2052	Special Education Teachers, Kindergarten and Elementary School	Above Middle Skill	698	(3.8%)	102	\$33.28
25-4021	Librarians	Above Middle Skill	633	(20.2%)	62	\$34.93
11-9033	Education Administrators, Postsecondary	Above Middle Skill	559	4.7%	64	\$58.13
25-2012	Kindergarten Teachers, Except Special Education	Above Middle Skill	498	(14.6%)	125	\$36.41
25-2054	Special Education Teachers, Secondary School	Above Middle Skill	476	1.4%	68	\$35.30
25-9041	Teacher Assistants	Middle Skill	7,127	5.9%	1,383	\$14.81
25-2011	Preschool Teachers, Except Special Education	Middle Skill	642	(3.7%)	450	\$13.74
25-3021	Self-Enrichment Education Teachers	Below Middle Skill	878	14.0%	333	\$20.88



⁷¹ QCEW, 2017, OES, O*NET, EMSI, 2019.3.

Business management and administration



- Career cluster public sector occupational employment is concentrated in the public administration sector. Educational services also contains a prominent concentration. Smaller, but significant shares are in utilities, and transportation and warehousing.
- The career cluster is weighted toward above-middle-skill and below-middle-skill jobs.
- Above-middle-skill occupations include management occupations. At the below-middle-skill level, clerical occupations comprise most employment. Some middle-skill employment is found in office and administrative occupations.

Exhibit D4: Industry sector distribution for the business management and administration career cluster, by number of jobs, 2017⁷²

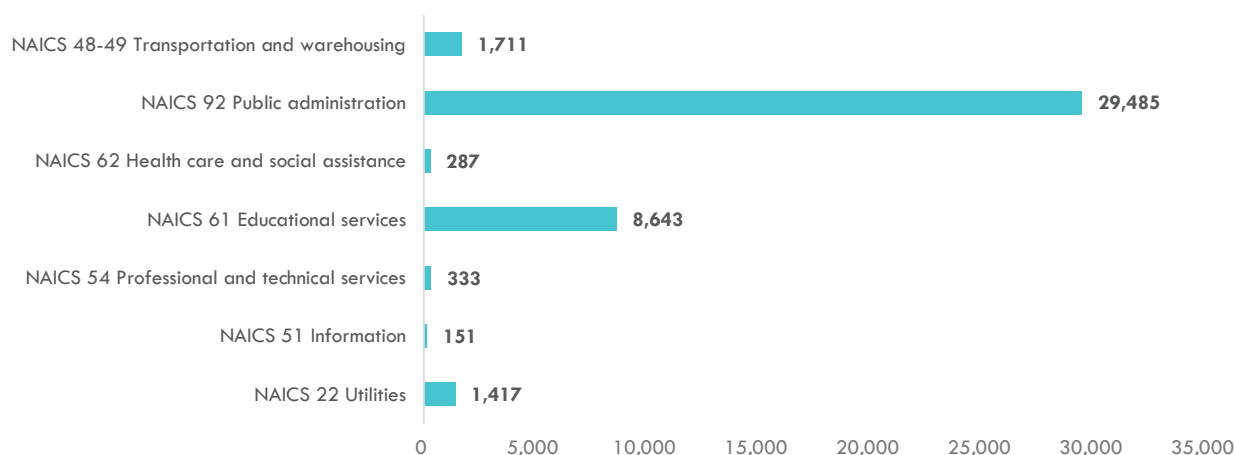
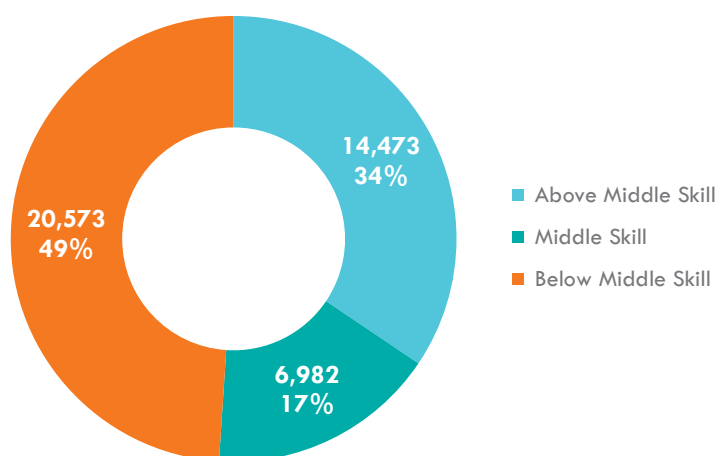


Exhibit D5: Skill-level distribution for the business management and administration career cluster⁷³



⁷² QCEW, 2017, OES, O*NET.

⁷³ QCEW, 2017, OES, O*NET.

Exhibit D6: Detailed occupational employment for the business management and administration cluster⁷⁴

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
13-1075	Labor Relations Specialists	Above Middle Skill	4,868	37.1%	95	\$37.80
13-1151	Training and Development Specialists	Above Middle Skill	3,591	11.7%	188	\$37.56
11-1021	General and Operations Managers	Above Middle Skill	1,754	31.9%	1,579	\$47.29
11-3131	Training and Development Managers	Above Middle Skill	1,476	35.8%	22	\$53.64
11-1011	Chief Executives	Above Middle Skill	559	(21.8%)	252	\$64.01
13-1141	Compensation, Benefits, and Job Analysis Specialists	Above Middle Skill	399	(17.4%)	179	\$31.44
43-6011	Executive Secretaries and Executive Administrative Assistants	Middle Skill	1,727	(51.6%)	480	\$27.92
43-9021	Data Entry Keyers	Middle Skill	1,327	(33.6%)	192	\$16.02
43-4051	Customer Service Representatives	Middle Skill	1,295	18.3%	2,001	\$16.74
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	Middle Skill	768	(19.4%)	119	\$21.14
43-3051	Payroll and Timekeeping Clerks	Middle Skill	707	(14.9%)	225	\$23.65
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	Middle Skill	490	21.4%	1,963	\$17.83
11-3011	Administrative Services Managers	Middle Skill	486	0.3%	210	\$45.45
43-5051	Postal Service Clerks	Below Middle Skill	8,956	10.9%	40	\$27.31
43-9071	Office Machine Operators, Except Computer	Below Middle Skill	3,372	(25.9%)	36	\$18.95
43-5081	Stock Clerks and Order Fillers	Below Middle Skill	1,922	14.2%	1,930	\$12.46
43-9061	Office Clerks, General	Below Middle Skill	1,314	3.0%	3,917	\$16.39
43-5071	Shipping, Receiving, and Traffic Clerks	Below Middle Skill	763	(10.8%)	429	\$16.67
43-4121	Library Assistants, Clerical	Below Middle Skill	414	(10.0%)	109	\$14.24
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	Below Middle Skill	299	(30.9%)	78	\$15.26



⁷⁴ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



Law, public safety, corrections and security

- The vast majority of career cluster occupational employment is in public administration, including public safety, corrections, and other policy-related activity.
- The career cluster is heavily weighted toward middle-skill jobs; nearly three quarters of the occupational employment is middle skill.
- Middle-skill occupations include police and sheriff’s deputies, correctional officers, and a range of other public safety occupations. Above-middle-skill jobs include lawyers and judges, and probation officers. Below-middle-skill occupations include occupations such as lifeguards, ski patrol, and security guards.

Exhibit D7: Industry sector distribution for law, public safety, corrections and security career cluster, by number of jobs, 2017⁷⁵

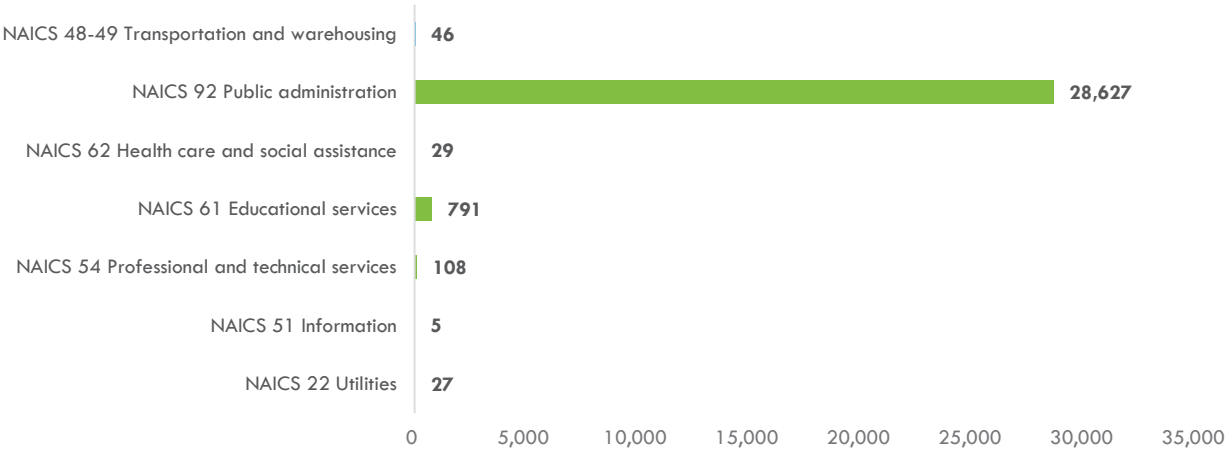
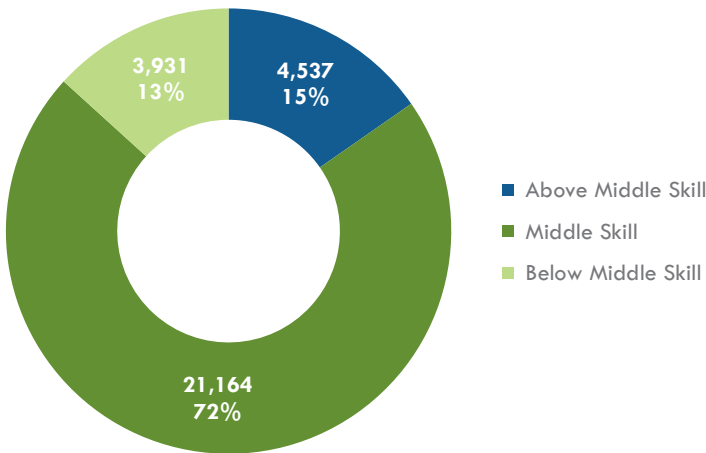


Exhibit D8: Skill-level distribution for the law, public safety, corrections and security career cluster⁷⁶



⁷⁵ QCEW, 2017, OES, O*NET.

⁷⁶ QCEW, 2017, OES, O*NET.

Exhibit D9: Detailed occupational employment for the law, public safety, corrections & security cluster⁷⁷

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
23-1011	Lawyers	Above Middle Skill	2,080	6.9%	348	\$47.27
21-1092	Probation Officers and Correctional Treatment Specialists	Above Middle Skill	1,613	(23.3%)	95	\$49.39
23-1012	Judicial Law Clerks	Above Middle Skill	409	5.9%	11	\$30.51
23-1021	Administrative Law Judges, Adjudicators, and Hearing Officers	Above Middle Skill	215	(20.8%)	13	\$63.79
33-3051	Police and Sheriff's Patrol Officers	Middle Skill	8,585	(6.2%)	355	\$46.20
33-3012	Correctional Officers and Jailers	Middle Skill	4,029	(31.9%)	191	\$37.01
33-2011	Firefighters	Middle Skill	3,871	2.4%	178	\$29.75
33-3021	Detectives and Criminal Investigators	Middle Skill	1,332	9.5%	73	\$42.55
33-1012	First-Line Supervisors of Police and Detectives	Middle Skill	566	(7.3%)	33	\$67.53
33-1011	First-Line Supervisors of Correctional Officers	Middle Skill	519	(8.0%)	52	\$42.84
23-2011	Paralegals and Legal Assistants	Middle Skill	481	19.3%	233	\$25.74
43-6012	Legal Secretaries	Middle Skill	335	(30.1%)	180	\$24.58
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	Middle Skill	333	(9.1%)	17	\$39.25
23-2099	Legal Support Workers, All Other	Middle Skill	299	(18.0%)	23	\$27.34
19-4092	Forensic Science Technicians	Middle Skill	244	(6.0%)	14	\$44.12
29-2041	Emergency Medical Technicians and Paramedics	Middle Skill	186	19.4%	113	\$21.90
23-2091	Court Reporters	Middle Skill	164	(37.8%)	16	\$30.53
33-9092	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	Below Middle Skill	1,117	30.7%	222	\$12.41
33-9099	Protective Service Workers, All Other	Below Middle Skill	957	15.2%	398	\$14.13
43-5031	Police, Fire, and Ambulance Dispatchers	Below Middle Skill	683	(5.3%)	50	\$29.81
33-9032	Security Guards	Below Middle Skill	463	28.5%	1,526	\$12.98
33-9091	Crossing Guards	Below Middle Skill	260	(7.6%)	53	\$18.06
33-1099	First-Line Supervisors of Protective Service Workers, All Other	Below Middle Skill	174	31.6%	61	\$21.90



⁷⁷ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- Career cluster occupational employment is found primarily in two public sectors: transportation and warehousing, and public administration.
- The career cluster is divided between middle-skill and below-middle-skill jobs.
- Middle-skill occupations include heavy-duty truck drivers, distribution managers and specialists, air traffic controllers, and mechanics and vehicle technicians. Below-middle-skill occupations include laborers, freight attendants, and light-duty vehicle drivers.

Exhibit D10: Industry sector distribution for transportation, distribution and logistics career cluster, by number of jobs, 2017⁷⁸

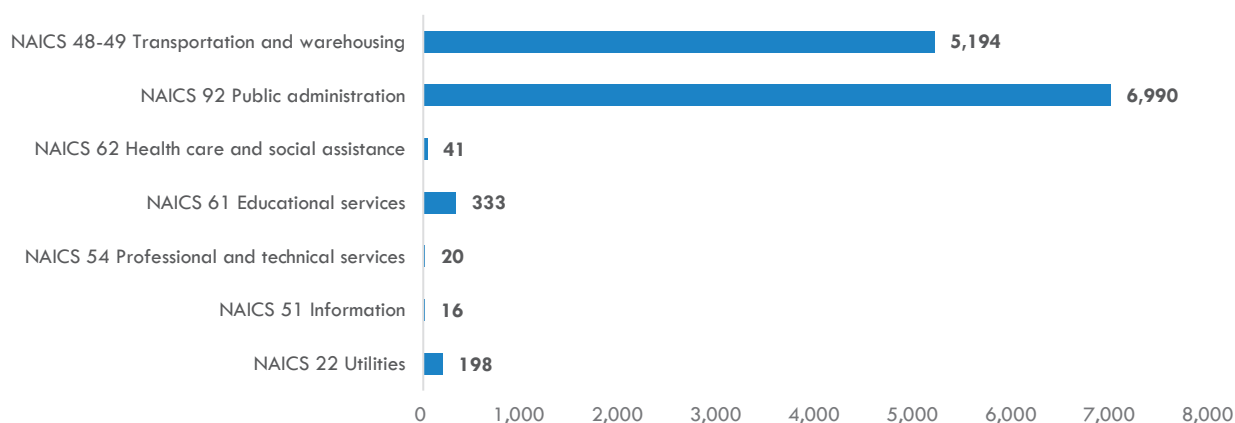
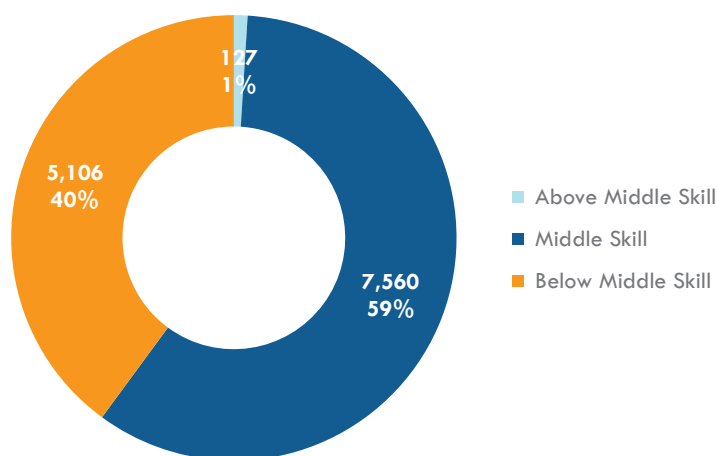


Exhibit D11: Skill-level distribution for the transportation, distribution and logistics career cluster⁷⁹



⁷⁸ QCEW, 2017, OES, O*NET.

⁷⁹ QCEW, 2017, OES, O*NET.

Exhibit D12: Detailed occupational employment for the transportation, distribution and logistics cluster⁸⁰

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
53-2011	Airline Pilots, Copilots, and Flight Engineers	Above Middle Skill	127	19.7%	108	\$75.10
53-3021	Bus Drivers, Transit and Intercity	Middle Skill	2,125	(4.7%)	186	\$24.32
53-3032	Heavy and Tractor-Trailer Truck Drivers	Middle Skill	1,169	12.3%	1,534	\$19.51
53-3022	Bus Drivers, School or Special Client	Middle Skill	1,054	24.9%	261	\$17.09
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	Middle Skill	553	5.5%	156	\$24.98
13-1081	Logisticians	Middle Skill	407	55.9%	72	\$39.77
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	Middle Skill	396	1.8%	93	\$25.99
11-3071	Transportation, Storage, and Distribution Managers	Middle Skill	326	21.7%	84	\$44.59
49-3011	Aircraft Mechanics and Service Technicians	Middle Skill	272	21.5%	75	\$31.32
53-2021	Air Traffic Controllers	Middle Skill	256	14.6%	20	\$66.48
53-2031	Flight Attendants	Middle Skill	192	55.6%	70	\$13.38
49-3023	Automotive Service Technicians and Mechanics	Middle Skill	180	3.1%	672	\$18.56
43-5011	Cargo and Freight Agents	Middle Skill	156	19.8%	36	\$23.99
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	Below Middle Skill	2,006	22.5%	3,369	\$13.43
53-3033	Light Truck or Delivery Services Drivers	Below Middle Skill	636	2.8%	811	\$15.99
53-1048	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	Below Middle Skill	546	(5.2%)	292	\$25.01
43-5032	Dispatchers, Except Police, Fire, and Ambulance	Below Middle Skill	326	6.8%	128	\$19.69
53-7051	Industrial Truck and Tractor Operators	Below Middle Skill	319	(8.5%)	425	\$16.68
53-3041	Taxi Drivers and Chauffeurs	Below Middle Skill	219	125.2%	425	\$10.58



⁸⁰ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- Career cluster occupational employment is found in three main public industry sectors: public administration, educational services, and health care and social assistance.
- Employment is concentrated in above-middle-skill occupations, with a significant share at the middle-skill level.
- The above-middle-skill concentration reflects professional occupations such as social workers, community specialists, and psychologists and counselors. Middle-skill occupations include childcare workers, community health workers, and human services assistants.

Exhibit D13: Industry sector distribution for the human services career cluster, by number of jobs, 2017⁸¹

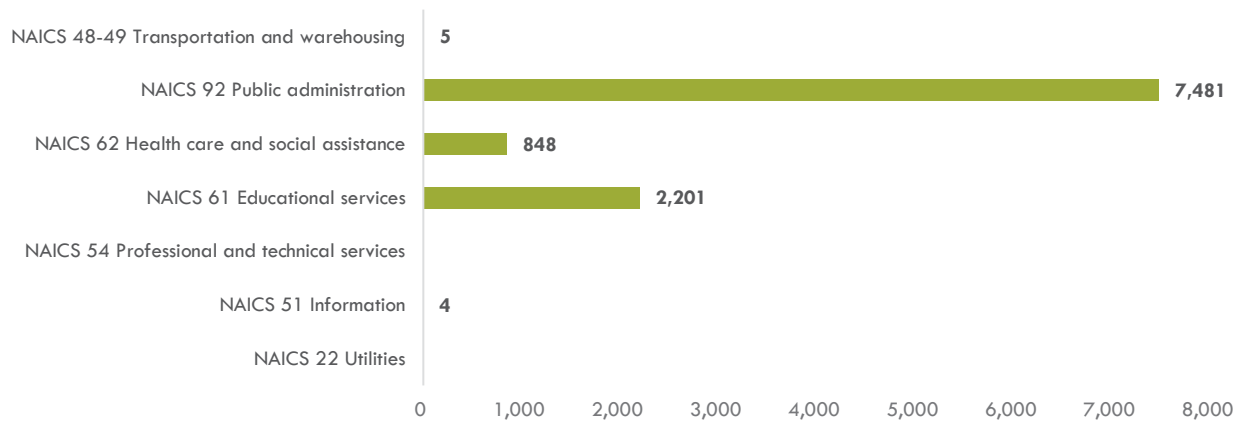
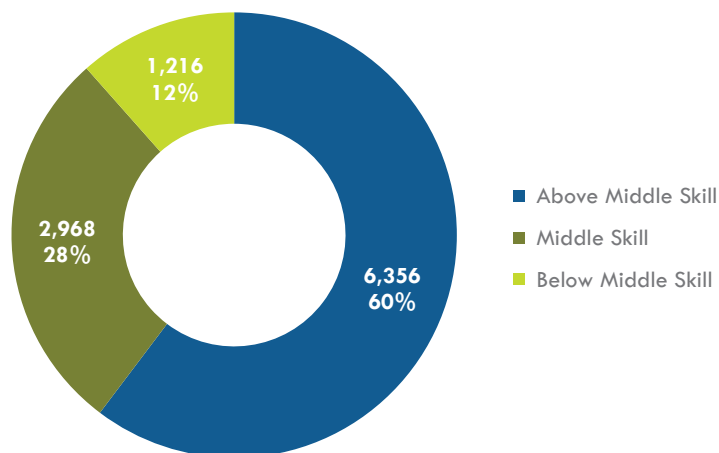


Exhibit D14: Skill-level distribution for the human services career cluster⁸²



⁸¹ QCEW, 2017, OES, O*NET.

⁸² QCEW, 2017, OES, O*NET.

Exhibit D15: Detailed occupational employment for the human services cluster⁸³

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
21-1021	Child, Family, and School Social Workers	Above Middle Skill	1,707	(5.0%)	233	\$21.45
21-1029	Social Workers, All Other	Above Middle Skill	1,084	(1.4%)	99	\$35.31
21-1099	Community and Social Service Specialists, All Other	Above Middle Skill	689	15.1%	111	\$24.58
19-3031	Clinical, Counseling, and School Psychologists	Above Middle Skill	623	24.9%	175	\$41.16
21-1018	Substance Abuse, Behavioral Disorder, and Mental Health Counselors	Above Middle Skill	564	42.5%	344	\$18.04
21-1023	Mental Health and Substance Abuse Social Workers	Above Middle Skill	486	9.0%	145	\$18.21
11-9151	Social and Community Service Managers	Above Middle Skill	468	53.2%	215	\$21.04
21-1091	Health Educators	Above Middle Skill	181	(16.9%)	75	\$24.70
21-1019	Counselors, All Other	Above Middle Skill	174	(16.8%)	21	\$20.24
21-1015	Rehabilitation Counselors	Above Middle Skill	166	(6.6%)	138	\$16.51
21-1022	Healthcare Social Workers	Above Middle Skill	148	71.9%	192	\$31.94
39-9011	Childcare Workers	Middle Skill	1,642	(46.8%)	1,138	\$10.75
21-1093	Social and Human Service Assistants	Middle Skill	1,148	14.7%	674	\$18.82
21-1094	Community Health Workers	Middle Skill	173	87.5%	102	\$14.95
39-9021	Personal Care Aides	Below Middle Skill	623	383.1%	7,469	\$11.60
39-1021	First-Line Supervisors of Personal Service Workers	Below Middle Skill	351	63.3%	345	\$13.31
39-9041	Residential Advisors	Below Middle Skill	86	72.3%	128	\$13.29



⁸³ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- Career cluster occupational employment is found almost exclusively in the public administration sector.
- Employment is evenly distributed among the three skill levels.
- Prominent above-middle-skill occupations include compliance officers, urban planners, and occupational health. Middle-skill occupations with significant employment numbers include tax examiners, transportation security, and building inspectors. Below-middle-skill occupations include eligibility interviewers.

Exhibit D16: Industry sector distribution for the government and public administration career cluster, by number of jobs, 2017⁸⁴

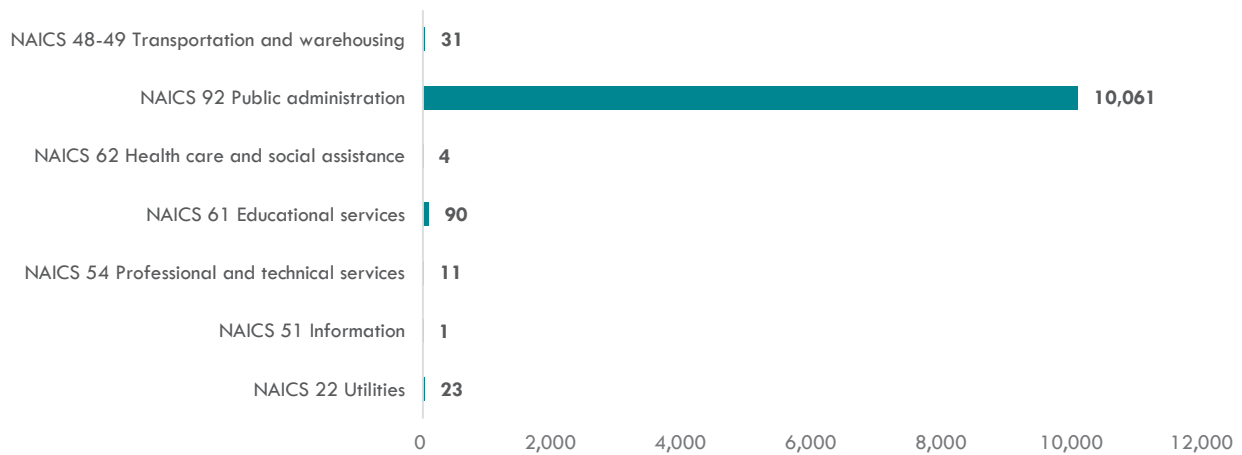
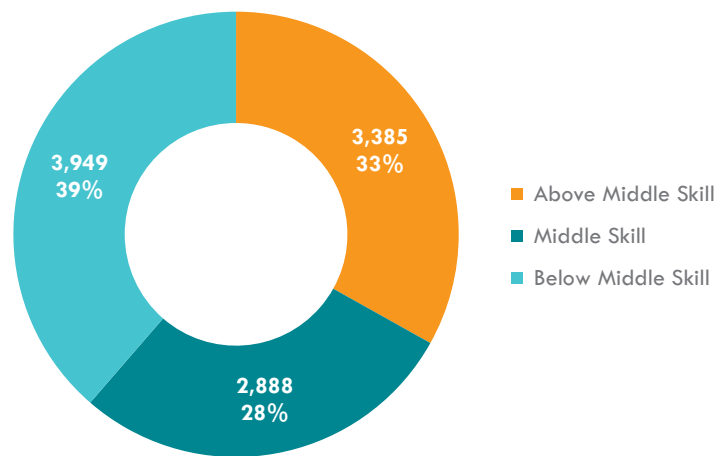


Exhibit D17: Skill-level distribution for the government and public administration career cluster⁸⁵



⁸⁴ QCEW, 2017, OES, O*NET.

⁸⁵ QCEW, 2017, OES, O*NET.

Exhibit D18: Detailed occupational employment for the government and public administration cluster⁸⁶

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
13-1041	Compliance Officers	Above Middle Skill	1,999	10.7%	191	\$34.56
19-3051	Urban and Regional Planners	Above Middle Skill	694	(2.2%)	59	\$35.88
11-1031	Legislators	Above Middle Skill	375	(7.8%)	23	\$45.75
29-9011	Occupational Health and Safety Specialists	Above Middle Skill	199	35.2%	38	\$40.82
13-2061	Financial Examiners	Above Middle Skill	124	15.4%	23	\$40.68
13-2081	Tax Examiners and Collectors, and Revenue Agents	Middle Skill	1,035	(12.5%)	259	\$24.15
33-9093	Transportation Security Screeners	Middle Skill	582	24.3%	33	\$19.55
47-4011	Construction and Building Inspectors	Middle Skill	509	(14.8%)	93	\$38.28
13-2021	Appraisers and Assessors of Real Estate	Middle Skill	288	(31.0%)	49	\$31.76
45-2011	Agricultural Inspectors	Middle Skill	198	(5.1%)	23	\$14.90
53-6051	Transportation Inspectors	Middle Skill	167	16.9%	36	\$29.55
43-4061	Eligibility Interviewers, Government Programs	Below Middle Skill	2,581	15.2%	144	\$26.23
43-4031	Court, Municipal, and License Clerks	Below Middle Skill	1,359	4.3%	160	\$21.91



⁸⁶ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



Architecture and construction

- Career cluster occupational employment is mostly in the public administration cluster. A much smaller share of career cluster jobs is in educational services.
- Employment is evenly distributed among the three skill levels.
- Prominent above-middle-skill occupations include civil engineers and construction managers. Middle-skill occupations with significant employment numbers include skilled trades and office occupations like civil engineering technicians. Laborers and other construction workers comprise the below-middle-skill occupations.

Exhibit D19: Industry sector distribution for the architecture and construction cluster, by number of jobs, 2017⁸⁷

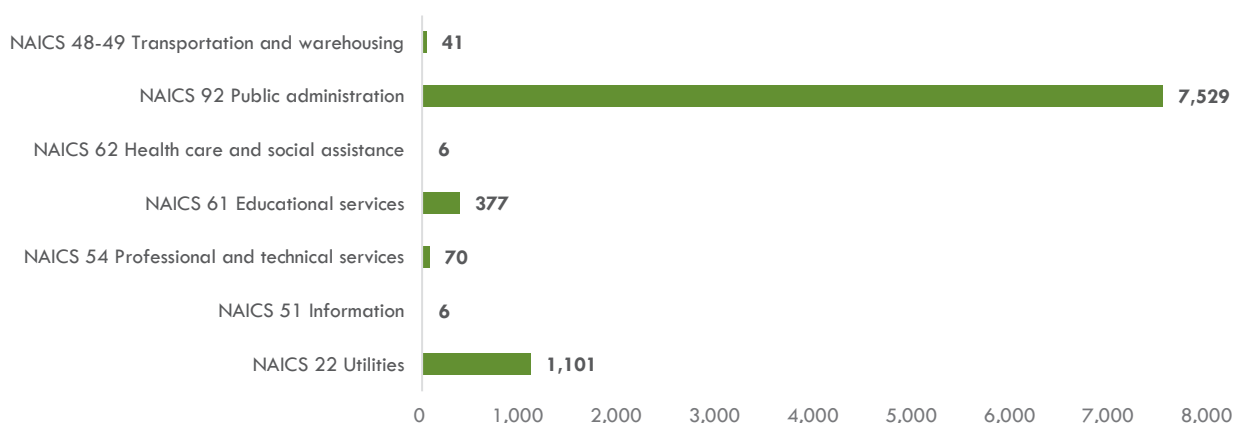
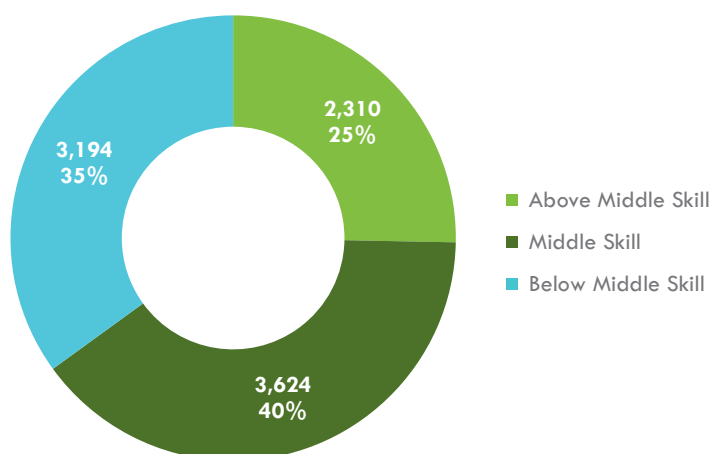


Exhibit D20: Skill-level distribution for the architecture and construction career cluster⁸⁸



⁸⁷ QCEW, 2017, OES, O*NET.

⁸⁸ QCEW, 2017, OES, O*NET.

Exhibit D21: Detailed occupational employment for the architecture and construction cluster⁸⁹

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
17-2051	Civil Engineers	Above Middle Skill	1,870	3.5%	369	\$54.50
11-9021	Construction Managers	Above Middle Skill	172	(10.6%)	314	\$30.19
17-1022	Surveyors	Above Middle Skill	115	(23.9%)	38	\$41.80
47-2073	Operating Engineers and Other Construction Equipment Operators	Middle Skill	633	(11.9%)	321	\$31.36
49-9051	Electrical Power-Line Installers and Repairers	Middle Skill	608	(8.8%)	53	\$46.95
47-2111	Electricians	Middle Skill	492	7.2%	710	\$29.11
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	Middle Skill	485	(19.0%)	568	\$30.85
17-3022	Civil Engineering Technicians	Middle Skill	342	(28.2%)	57	\$30.90
47-2152	Plumbers, Pipefitters, and Steamfitters	Middle Skill	325	0.8%	571	\$24.31
47-2031	Carpenters	Middle Skill	168	(21.9%)	1,456	\$20.40
51-8021	Stationary Engineers and Boiler Operators	Middle Skill	161	(21.8%)	39	\$35.20
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Middle Skill	130	17.1%	300	\$21.30
37-3011	Landscaping and Groundskeeping Workers	Below Middle Skill	1,183	(4.6%)	1,604	\$13.39
47-4051	Highway Maintenance Workers	Below Middle Skill	565	(19.7%)	54	\$26.64
47-2061	Construction Laborers	Below Middle Skill	398	2.5%	1,434	\$16.19
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	Below Middle Skill	283	15.3%	38	\$28.15



⁸⁹ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- Three public industry sectors comprise most of the occupational employment, especially public administration, educational services, and health care and social assistance.
- Most, nearly seven out 10 jobs, are middle skill. The remainder are above middle skill.
- Above-middle-skill jobs include professional health care workers like physicians, pharmacists, and occupational therapists. Middle-skill occupations include a range of allied health occupations like nurses, nurses' assistants, and medical assistants.

Exhibit D22: Industry sector distribution for the health science cluster, by number of jobs, 2017⁹⁰

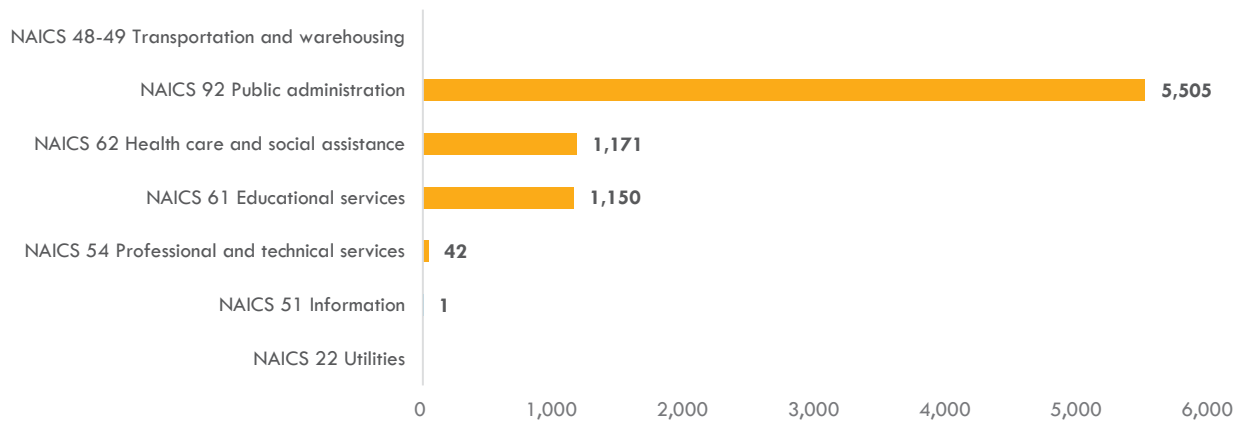
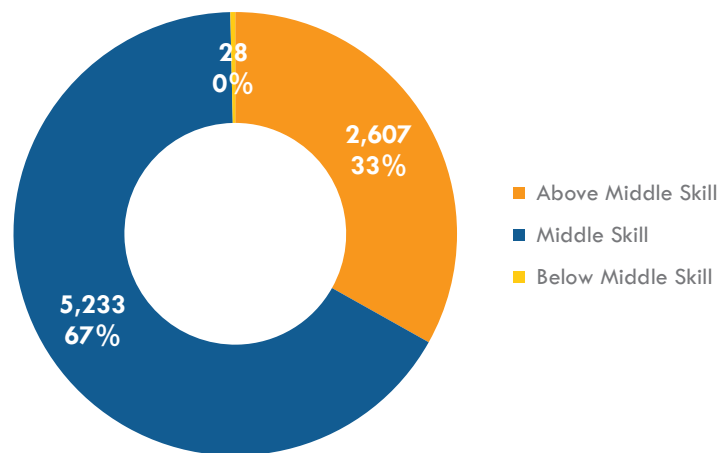


Exhibit D22: Skill-level distribution for the health science cluster⁹¹



⁹⁰ QCEW, 2017, OES, O*NET.

⁹¹ QCEW, 2017, OES, O*NET.

Exhibit D23: Detailed occupational employment for the health science cluster⁹²

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
29-1069	Physicians and Surgeons, All Other	Above Middle Skill	517	36.7%	84	\$124.77
29-1127	Speech-Language Pathologists	Above Middle Skill	345	32.2%	67	\$41.67
11-9111	Medical and Health Services Managers	Above Middle Skill	291	41.8%	284	\$58.29
19-1042	Medical Scientists, Except Epidemiologists	Above Middle Skill	187	32.9%	77	\$48.26
29-1051	Pharmacists	Above Middle Skill	161	18.5%	93	\$71.40
29-1122	Occupational Therapists	Above Middle Skill	114	19.9%	43	\$48.61
29-1031	Dietitians and Nutritionists	Above Middle Skill	112	33.2%	59	\$36.96
29-1141	Registered Nurses	Middle Skill	2,147	21.3%	1,362	\$57.82
29-2061	Licensed Practical and Licensed Vocational Nurses	Middle Skill	639	5.9%	369	\$27.07
31-1014	Nursing Assistants	Middle Skill	471	6.5%	896	\$16.74
31-9099	Healthcare Support Workers, All Other	Middle Skill	419	(8.1%)	108	\$21.73
31-9091	Dental Assistants	Middle Skill	189	27.7%	477	\$19.27
31-9092	Medical Assistants	Middle Skill	185	85.1%	944	\$16.89
29-2010	Clinical Laboratory Technologists and Technicians	Middle Skill	149	(12.0%)	23	\$27.90
29-2053	Psychiatric Technicians	Middle Skill	145	(20.0%)	39	\$31.66



⁹² QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- Most manufacturing cluster occupational employment is in public administration, with important smaller concentrations in utilities, educational services, and transportation and warehousing.
- A large majority of manufacturing occupational employment, 93%, is classified as middle skill, with the remainder below middle skill.
- Occupations include a range of technician-related activity including engineering, electrical, and maintenance and repair technicians.

Exhibit D24: Industry sector distribution for the manufacturing cluster, by number of jobs, 2017⁹³

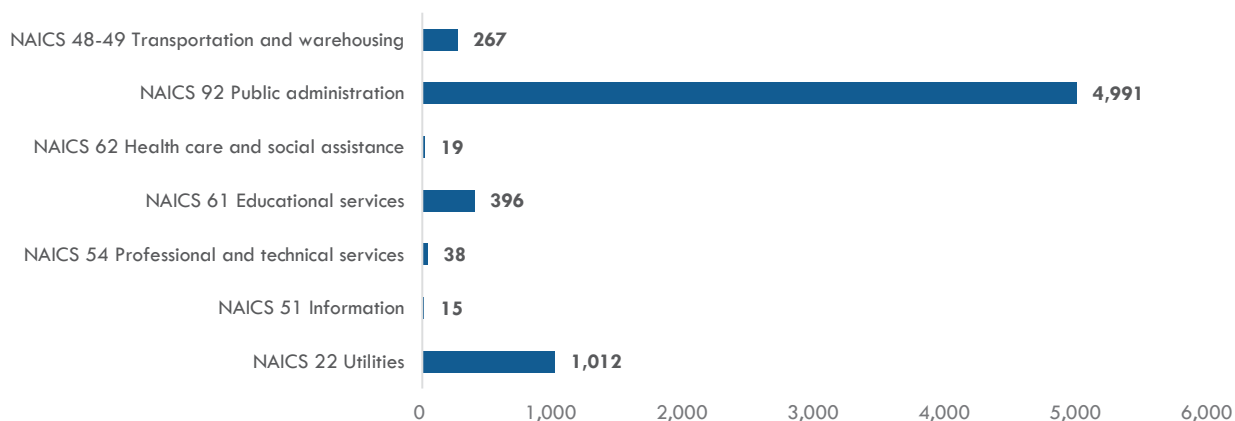
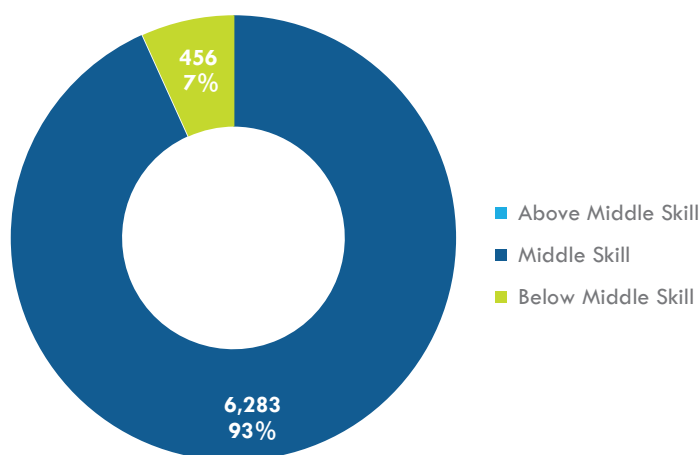


Exhibit D25: Skill-level distribution for the manufacturing cluster⁹⁴



⁹³ QCEW, 2017, OES, O*NET.

⁹⁴ QCEW, 2017, OES, O*NET.

Exhibit D26: Detailed occupational employment for the manufacturing cluster⁹⁵

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
49-9071	Maintenance and Repair Workers, General	Middle Skill	2,427	10.4%	998	\$18.95
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	Middle Skill	797	1.2%	303	\$33.94
51-8013	Power Plant Operators	Middle Skill	411	(12.0%)	33	\$54.71
51-1011	First-Line Supervisors of Production and Operating Workers	Middle Skill	411	(6.1%)	263	\$27.53
17-3029	Engineering Technicians, Except Drafters, All Other	Middle Skill	387	(8.8%)	44	\$28.25
17-3023	Electrical and Electronics Engineering Technicians	Middle Skill	301	(25.5%)	117	\$32.10
43-5061	Production, Planning, and Expediting Clerks	Middle Skill	245	30.6%	318	\$19.61
49-9041	Industrial Machinery Mechanics	Middle Skill	223	31.5%	150	\$28.34
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	Middle Skill	145	(7.3%)	10	\$39.72
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	Middle Skill	134	(13.7%)	45	\$33.33
49-9043	Maintenance Workers, Machinery	Middle Skill	129	(12.9%)	39	\$22.55
49-9099	Installation, Maintenance, and Repair Workers, All Other	Below Middle Skill	193	7.3%	162	\$17.45
51-8099	Plant and System Operators, All Other	Below Middle Skill	116	(14.8%)	11	\$34.03
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	Below Middle Skill	46	(3.8%)	53	\$14.74



⁹⁵ QCEW, 2017, OES, O*NET, EMSI, 2019.3.

Science, technology, engineering, and mathematics (STEM)



- Career cluster occupational employment is in public administration, with smaller concentrations in educational services and utilities.
- Nearly all employment in the career cluster is above middle skill, requiring at least a bachelor's degree.
- These above-middle-skill occupations include engineers, engineering managers, and research scientists.

Exhibit D27: Industry sector distribution for the STEM cluster, by number of jobs, 2017⁹⁶

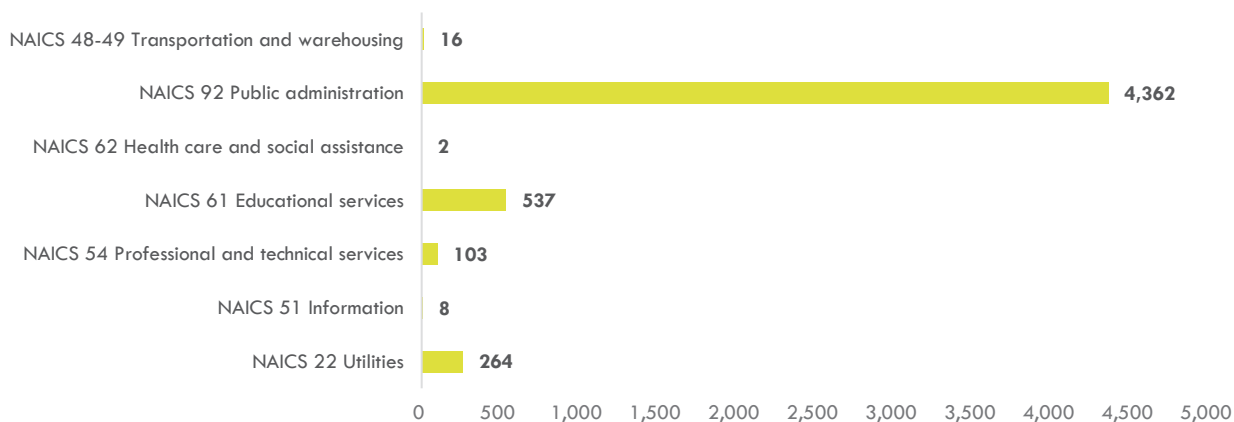
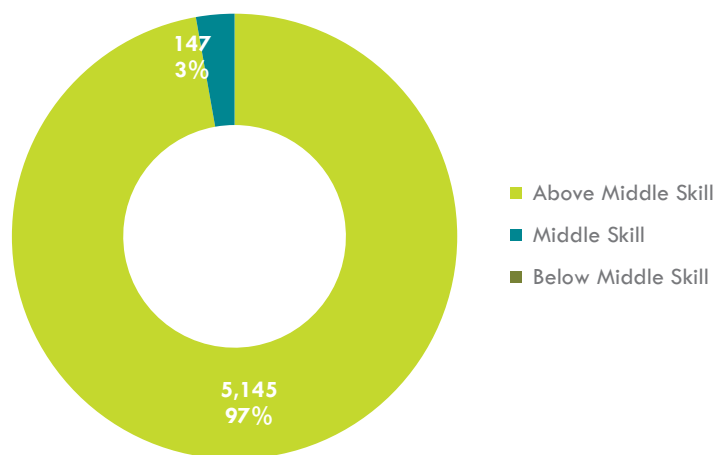


Exhibit D28: Skill-level distribution for the STEM cluster⁹⁷



⁹⁶ QCEW, 2017, OES, O*NET.

⁹⁷ QCEW, 2017, OES, O*NET.

Exhibit D29: Detailed occupational employment for the STEM cluster⁹⁸

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
19-2041	Environmental Scientists and Specialists, Including Health	Above Middle Skill	808	(8.9%)	232	\$40.39
17-2199	Engineers, All Other	Above Middle Skill	511	(24.2%)	75	\$42.05
17-2071	Electrical Engineers	Above Middle Skill	423	23.1%	106	\$54.04
17-2072	Electronics Engineers, Except Computer	Above Middle Skill	419	(14.6%)	76	\$51.09
11-9041	Architectural and Engineering Managers	Above Middle Skill	402	0.4%	118	\$70.94
19-1029	Biological Scientists, All Other	Above Middle Skill	303	34.0%	48	\$37.55
19-3099	Social Scientists and Related Workers, All Other	Above Middle Skill	274	(4.4%)	50	\$35.76
17-2141	Mechanical Engineers	Above Middle Skill	228	32.6%	103	\$45.78
19-2031	Chemists	Above Middle Skill	181	(5.5%)	50	\$35.57
15-2041	Statisticians	Above Middle Skill	177	72.2%	108	\$35.60
15-1111	Computer and Information Research Scientists	Above Middle Skill	170	(7.3%)	14	\$52.12
17-2011	Aerospace Engineers	Above Middle Skill	143	(3.9%)	13	\$52.00
19-4099	Life, Physical, and Social Science Technicians, All Other	Middle Skill	131	(8.3%)	39	\$25.34



⁹⁸ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- Career cluster occupational employment is in public administration, with smaller concentrations in educational services, information, and utilities.
- The career cluster is evenly split between above-middle-skill and middle-skill employment.
- Above-middle-skill occupations include computer systems analysts, software developers, and programmers. Middle-skill occupations include computer user support specialists, and network and computer systems administrators.

Exhibit D30: Industry sector distribution for the information technology cluster, by number of jobs, 2017⁹⁹

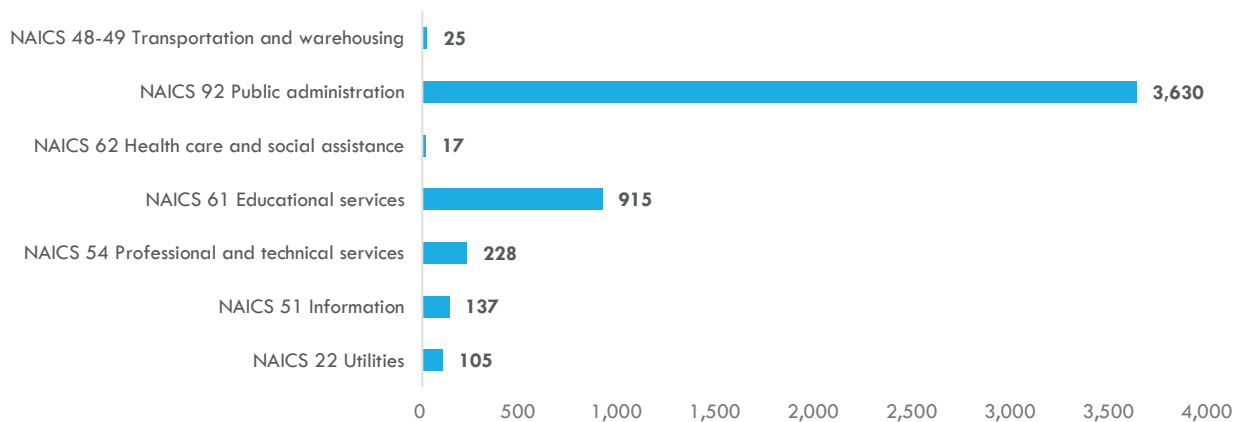
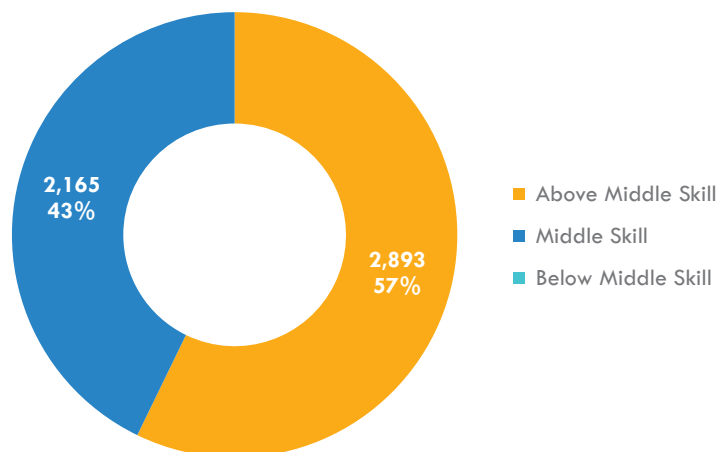


Exhibit D31: Skill-level distribution for the information technology cluster¹⁰⁰



⁹⁹ QCEW, 2017, OES, O*NET.

¹⁰⁰ QCEW, 2017, OES, O*NET.

Exhibit D32: Detailed occupational employment for the information technology cluster¹⁰¹

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
15-1121	Computer Systems Analysts	Above Middle Skill	1,556	14.3%	536	\$40.18
15-1132	Software Developers, Applications	Above Middle Skill	458	37.7%	387	\$46.44
15-1133	Software Developers, Systems Software	Above Middle Skill	452	5.2%	423	\$44.64
15-1131	Computer Programmers	Above Middle Skill	294	(40.7%)	184	\$40.03
15-1141	Database Administrators	Above Middle Skill	125	(9.1%)	56	\$40.29
15-1199	Computer Occupations, All Other	Middle Skill	758	25.9%	176	\$42.76
15-1151	Computer User Support Specialists	Middle Skill	705	40.6%	351	\$26.38
15-1142	Network and Computer Systems Administrators	Middle Skill	355	1.1%	144	\$42.54
15-1152	Computer Network Support Specialists	Middle Skill	265	18.2%	90	\$34.46



¹⁰¹ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- The largest share of finance career cluster occupational employment is in public administration. Smaller, but significant concentrations, are in educational services, utilities, and professional, scientific & technical services.
- Nearly eight out of 10 jobs are above middle skill. The remainder are mostly middle-skill occupations.
- Above-middle-skill occupations with significant jobs numbers include accountants and auditors, and financial managers. Middle-skill occupations include claims adjusters and examiners.

Exhibit D33: Industry sector distribution for the finance cluster, by number of jobs, 2017¹⁰²

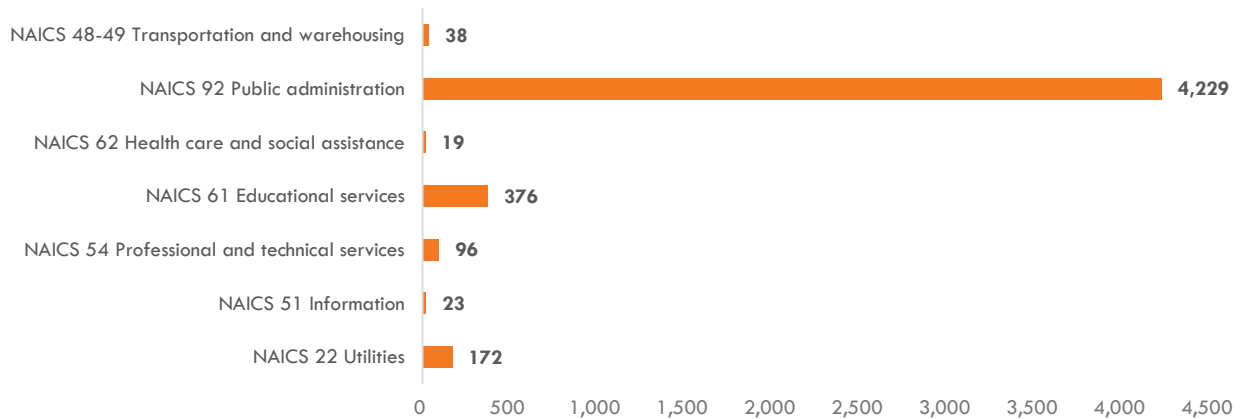
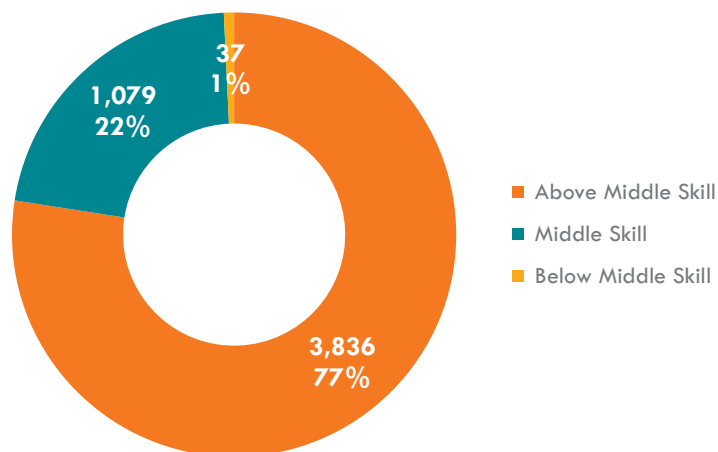


Exhibit D34: Skill-level distribution for the finance cluster¹⁰³



¹⁰² QCEW, 2017, OES, O*NET.

¹⁰³ QCEW, 2017, OES, O*NET.

Exhibit D35: Detailed occupational employment for the finance cluster¹⁰⁴

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
13-2011	Accountants and Auditors	Above Middle Skill	2,322	3.5%	1,227	\$32.39
11-3031	Financial Managers	Above Middle Skill	646	8.3%	381	\$51.56
13-2099	Financial Specialists, All Other	Above Middle Skill	334	(20.0%)	93	\$32.43
13-2031	Budget Analysts	Above Middle Skill	297	(18.2%)	60	\$33.80
13-2051	Financial Analysts	Above Middle Skill	256	1.4%	160	\$40.69
13-1031	Claims Adjusters, Examiners, and Investigators	Middle Skill	887	(9.4%)	294	\$36.61
43-3011	Bill and Account Collectors	Middle Skill	83	(27.2%)	242	\$18.84



¹⁰⁴ QCEW, 2017, OES, O*NET, EMSI, 2019.3.



- Most of the career cluster's occupational employment is in public administration. A much smaller number of jobs are in utilities and educational services.
- There is an even distribution of career cluster jobs among the three skill levels.
- Above-middle-skill occupations include environmental engineers and biological technicians. Middle-skill jobs include water and wastewater treatment plant operators, forest conservation technicians, and environmental science and protection technicians. Below-middle-skill occupations include forest conservation workers.

Exhibit D36: Industry sector distribution for the agriculture, food and natural resources cluster, by number of jobs, 2017¹⁰⁵

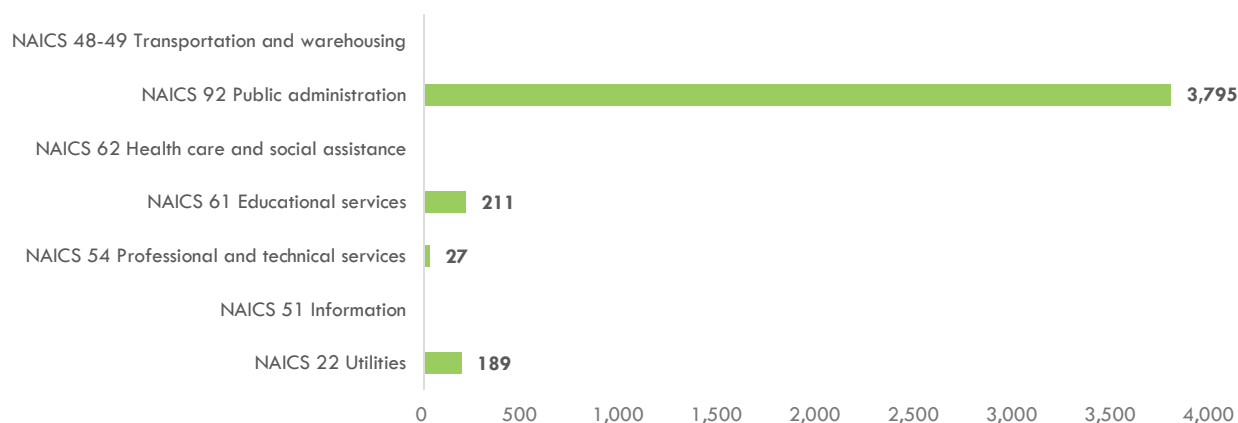
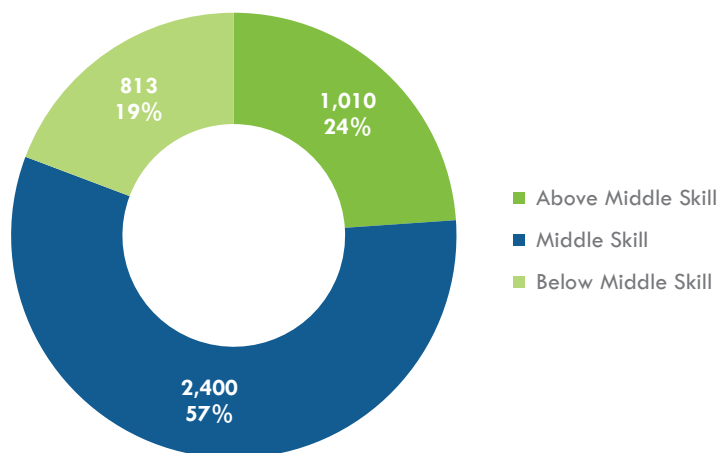


Exhibit D37: Skill-level distribution for the agriculture, food and natural resources cluster¹⁰⁶



¹⁰⁵ QCEW, 2017, OES, O*NET.

¹⁰⁶ QCEW, 2017, OES, O*NET.

Exhibit D38: Detailed occupational employment for the agriculture, food and natural resources cluster¹⁰⁷

SOC Code	SOC Title	Skill Level	Public Sector Jobs	% Change, 2007-2018	Annual Openings, 2018-2023	Median Hourly Wage
17-2081	Environmental Engineers	Above Middle Skill	371	(1.0%)	92	\$52.39
19-4021	Biological Technicians	Above Middle Skill	263	(10.0%)	55	\$21.12
51-8031	Water and Wastewater Treatment Plant and System Operators	Middle Skill	1,327	(4.8%)	68	\$33.21
19-4093	Forest and Conservation Technicians	Middle Skill	729	30.2%	84	\$15.32
19-4091	Environmental Science and Protection Technicians, Including Health	Middle Skill	224	(26.4%)	57	\$23.72
17-3025	Environmental Engineering Technicians	Middle Skill	60	(19.0%)	19	\$21.74
19-4011	Agricultural and Food Science Technicians	Middle Skill	59	(24.6%)	27	\$22.32
45-4011	Forest and Conservation Workers	Below Middle Skill	167	(38.4%)	15	\$13.35
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	Below Middle Skill	88	(6.2%)	52	\$16.40



¹⁰⁷ QCEW, 2017, OES, O*NET, EMSI, 2019.3.

APPENDIX E: NOTES ON DATA SOURCES AND METHODS

Dataset	Source	Description and method notes
Quarterly Census of Employment and Wages (QCEW)	Bureau of Labor Statistics, California Employment Development Department	The data analysis on industry sector jobs, average wages, and establishments used the 2017 annual average counts for California and the six counties in the study region. Some job counts used a method for interpolating data where there is suppression.
Dun & Bradstreet	EconoVue	The report includes establishment-level data from Dun & Bradstreet from EconoVue, a software vendor.
MIT Living Wage Calculator	MIT	The calculator is based on research of the costs for basic necessities for food, housing, transportation and childcare based on household size.
Quarterly Workforce Indicators (QWI), Longitudinal-Employer Household Dynamics (LEHD)	U.S. Census	The QWI LEHD provides a simple extraction tool that depicts regional demographics profiles by industry sector. Public sector demographics are calculated by subtracting private sector totals from the overall total.
O*NET Career clusters	U.S. Department of Labor, Employment Training Administration	The career clusters group the more than 900 occupations into 16 categories of occupations based on similar knowledge, skills, abilities, tasks, and duties.
COE occupational skill level tool	COE, OES, U.S. Census	The skill-level occupational tool scores occupations in one of three skill levels to facilitate understanding of education and training levels for workforce development planning. The report outlines the criteria based on entry-level education and training requirements in the OES, and educational attainment requirements from the BLS and U.S. Census educational attainment scores.
Occupational Employment Statistics (OES) staffing patterns	Bureau of Labor Statistics, California Employment Development Department	The BLS publishes staffing patterns from occupational surveys conducted in three-year cycles with the state EDD. The staffing patterns contain ratios of occupational employment by industry sector for most occupations. The ratio was used to calculate the occupational and career cluster employment shares for industry sectors.
QCEW, Non-QCEW, Self-employed	EMSI	EMSI software aggregates and models public sector and other sources of data. The software was used to quickly produce the industry and occupational trend data in the appendices.
State civil service jobs	CalHR, California State Controller	The state controller collects data on state civil service jobs. CalHR provided the COE with the data as a check on EMSI's data and had an opposite trend.

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