

# State of Middle Tennessee Tech

# 2018

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# Introduction

The fact that Middle Tennessee has experienced tremendous growth in recent years is no secret, and should come as no surprise. There are a multitude of factors that make this region an attractive place to live, work, and do business. Since 2012, the number of jobs has grown by 15%, and it is projected to grow by another 9% over the next five years. When looking specifically at tech jobs, the rate of growth is even higher – 30% growth since 2012 and 16% projected growth by 2022.

Overall growth and other such high-level statistics are useful for providing a general lay of the land, but they are not detailed enough to inform a course of action. Those who are actively working to address the tech talent needs of today – and tomorrow – need the ability to “peel back the layers” and see what is going on at a more granular level. Tech jobs are as varied as they are numerous. A one-size fits-all approach simply does not adequately address Middle Tennessee’s tech talent needs. Ensuring the vitality of the regional tech workforce is going to take an informed, coordinated, and sustained effort on the part of many stakeholders if it is to be successful.

That is why Middle Tennessee State University, in partnership with the Nashville Technology Council, procured access to in-depth workforce development data and used it to produce this report. It uses a tailored definition of “tech workforce,” one that is reflective of our local tech community. This definition encompasses not only traditional tech occupations, but also analytics occupations that lie at the intersection of tech, mathematics, and business. It also captures the tech workers that fuel industries – like healthcare and entertainment – that serve as the economic backbone of our region. This ability to see the existing landscape clearly provides exciting opportunities to create workforce development strategies that leverage our regional strengths while developing thoughtful, data-driven programs that foster the ideal environment for growth.

This report provides summary data on the Middle Tennessee tech workforce as a whole, as well as for the major occupation groups identified within the tech workforce. This includes an overview of current job supply, job demand, demographic diversity, as well as the regional education pipeline. It also supplies detailed data on each of the individual occupations identified as part of the tech workforce, including the most in-demand job titles and in-demand hard skills associated for each occupation. The combination of these multiple levels of detail provides the most comprehensive picture of the local tech workforce seen to-date.

# Background

When interpreting the data presented in this report, it is first important to understand the data sources used, as well as the definitions of “tech workforce” and “Middle Tennessee” that are being used. The aim of this section is to provide that understanding. This will not only aid in interpreting the research presented here, but also improve readers’ ability to compare this research to other published reports providing similar and/or complementary analysis. Where necessary, additional information is embedded in the report to assist the reader in understanding the data as presented.

## Data Sources

This report uses data sourced from Economic Modeling Specialists Incorporated (Emsi 2018.3). The Emsi dataset is aggregated from multiple sources. Official government data is collected from entities including the U.S. Census Bureau, the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor Statistics, and state government agencies. In addition, Emsi also collects data from online social profiles, resumes, and job postings. The aggregation of data from these disparate sources allows for the creation of a holistic picture of the existing workforce, job demand, and talent supply.

## Defining “Tech”

This report uses the Standard Occupational Classification System (SOC) created by the U.S. Bureau of Labor Statistics (BLS). The “Occupation Groupings and Codes” table lists all the occupation codes and groupings used in this analysis. The groupings used here are based on the BLS’s 2010 SOC structure. Detailed data for each of the occupations listed can be found in the appendix.

## Occupation Groupings and Codes

OCCUPATION GROUP	SOC CODE	DETAILED OCCUPATION
Management Occupations	11-2021	Marketing Managers
	11-3021	Computer and Information Systems Managers
Business & Financial Operations Analysts	13-1081	Logisticians
	13-1111	Management Analysts
	13-1161	Market Research Analysts and Marketing Specialists
	13-2051	Financial Analysts
Computer & Information Research Scientists	15-1111	Computer and Information Research Scientists
Computer & Information Analysts	15-1121	Computer Systems Analysts
	15-1122	Information Security Analysts
Software Developers & Programmers	15-1131	Computer Programmers
	15-1132	Software Developers, Applications
	15-1133	Software Developers, Systems Software
	15-1134	Web Developers
Database & Systems Administrators & Network Architects	15-1141	Database Administrators
	15-1142	Network and Computer Systems Administrators
	15-1143	Computer Network Architects
Computer Support Specialists	15-1151	Computer User Support Specialists
	15-1152	Computer Network Support Specialists
Computer Occupations, All Other	15-1199	Computer Occupations, All Other
Mathematical Science Occupations	15-2031	Operations Research Analysts
	15-2041	Statisticians
Computer Hardware Engineers	17-2061	Computer Hardware Engineers
Multimedia Artists, Animators & Graphic Designers	27-1014	Multimedia Artists and Animators
	27-1024	Graphic Designers
Computer Operators	43-9011	Computer Operators
Computer, Automated Teller, and Office Machine Repairers	49-2011	Computer, Automated Teller, and Office Machine Repairers

## Defining “Middle Tennessee”

All numbers presented in this report span two Metropolitan Statistical Areas (MSA)<sup>1</sup> as defined by the federal Office of Management and Budget and applied to United States (US) Census Bureau data. The two MSA’s used to define “Middle Tennessee” are Nashville-Davidson-Murfreesboro-Franklin and Clarksville, TN-KY. The counties included in each of these MSA’s are listed in the table below.

### Metropolitan Statistical Areas

MSA	COUNTY
Nashville-Davidson-Murfreesboro-Franklin	Cannon
	Cheatham
	Davidson
	Dickson
	Hickman
	Macon
	Maury
	Robertson
	Rutherford
	Smith
	Sumner
	Trousdale
	Williamson
Clarksville, TN-KY	Wilson
	Montgomery, TN
	Christian, KY
	Trigg, KY



<sup>1</sup> According to the U.S. Census Bureau, the general concept of a metropolitan or micropolitan statistical area is that of a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core. (<https://www.census.gov/programs-surveys/metro-micro/about.html>)

# Job Supply

This section provides an overview of current tech job supply in Middle Tennessee. To put the data in context, the analysis compares local tech supply to national tech supply, as well as to overall national and regional supply for all occupations. Cross-industry comparisons are presented in order to determine which industries employ the most tech workers. The tech occupation groups are also compared to one another in terms of job volume, compensation, and growth trends. These are the key findings:<sup>2</sup>

- From 2012-2017, the number of tech jobs in Middle Tennessee grew by **30%**. This rate of job growth outpaced national tech job growth by **10%** and overall job growth in Middle Tennessee by **15%**.
- The projected growth rate for tech jobs in Middle Tennessee (2017-2022) is **16%**, compared to a **9%** projected growth rate for both national tech job growth and overall job growth in Middle Tennessee.
- The occupation group with the largest number of jobs in Middle Tennessee was **Business & Financial Operations Analysts** (11,965), followed by **Software Developers & Programmers** (7,940), and **Computer Support Specialists** (5,986).
- Median compensation for tech jobs in Middle Tennessee was **\$71,370** in 2017. This value is **13%** below the national median for tech jobs and **96%** above the median compensation across all occupations in Middle Tennessee.
- The occupation group with the highest median salary is **Management Occupations** at **\$113,961**. **Computer and Information Research Scientists** had the second-highest median salary at **\$93,209**.
- More than **260** industries employed Middle Tennessee tech workers in 2017. Employment is concentrated, though, in a much smaller number of industries, with **approximately half of tech workers (51.8%) employed in one of just 10 industries**.
- The **Computer Systems Design and Related Services industry** employed the largest number of tech workers in Middle Tennessee. Tech occupations accounted for **62.5%** of all jobs in this industry in 2017.
- Despite being the smallest occupation group in terms of job volume (57), the occupation group with the highest 5-year projected growth rate is **Computer and Information Research Scientists** at **23%**.

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<sup>2</sup> The job numbers reported here are sourced by Emsi from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW). The QCEW program publishes a quarterly count of employment and wages reported by employers. For the purposes of that program, a job is defined as a full- or part-time position that is covered by state and federal unemployment insurance laws. It does not include self-employed workers or those who perform tech work as secondary source of income.

## Middle Tennessee vs. National Comparisons (2017)

ALL OCCUPATIONS: NATIONAL	
Supply (Jobs)	150,592,851
Median Compensation	\$37,781
Supply (Jobs) Past Growth (2012-2017)	9%
Supply (Jobs) Projected Growth (2017-2022)	6%

TECH OCCUPATIONS: NATIONAL	
Supply (Jobs)	7,312,140
Median Compensation	\$82,456
Supply (Jobs) Past Growth (2012-2017)	20%
Supply (Jobs) Projected Growth (2017-2022)	9%

ALL OCCUPATIONS: MIDDLE TENNESSEE	
Supply (Jobs)	1,086,404
Median Compensation	\$36,449
Supply (Jobs) Past Growth (2012-2017)	15%
Supply (Jobs) Projected Growth (2017-2022)	9%

TECH OCCUPATIONS: MIDDLE TENNESSEE	
Supply (Jobs)	46,099
Median Compensation	\$71,370
Supply (Jobs) Past Growth (2012-2017)	30%
Supply (Jobs) Projected Growth (2017-2022)	16%

## Middle Tennessee Tech Jobs by Occupation Group

OCCUPATION GROUP	2017 JOBS	NATIONAL AVERAGE	% DIFFERENCE
Business & Financial Operations Analysts	11,965	12,874	-7.1%
Software Developers & Programmers	7,940	11,905	-33.3%
Computer Support Specialists	5,968	6,475	-7.8%
Computer & Information Analysts	4,745	5,095	-6.9%
Management Occupations	4,124	4,367	-5.6%
Database & Systems Administrators & Network Architects	4,115	4,824	-14.7%
Computer Occupations, All Other	2,155	2,437	-11.6%
Multimedia Artists, Animators & Graphic Designers	1,778	1,826	-2.6%
Mathematical Science Occupations	1,313	1,093	20.1%
Computer Operators	850	370	129.7%
Computer, Automated Teller, and Office Machine Repairers	556	770	-27.8%
Computer Hardware Engineers	531	498	6.6%
Computer & Information Research Scientists	57	219	-74.0%

## Middle Tennessee Median Tech Salary by Occupation Group

OCCUPATION GROUP	2017 MEDIAN SALARY	2017 NAT'L MEDIAN	% DIFF.
Management Occupations	\$113,961	\$136,996	-16.8%
Computer & Information Research Scientists	\$93,209	\$114,525	-18.6%
Database & Systems Administrators & Network Architects	\$87,448	\$86,935	0.6%
Computer Hardware Engineers	\$87,100	\$115,128	-24.3%
Software Developers & Programmers	\$83,593	\$97,683	-14.4%
Computer Occupations, All Other	\$76,140	\$88,525	-14.0%
Computer & Information Analysts	\$74,596	\$89,315	-16.5%
Business & Financial Operations Analysts	\$66,860	\$75,621	-11.6%
Mathematical Science Occupations	\$66,067	\$82,141	-19.6%
Computer Support Specialists	\$51,142	\$52,650	-2.9%
Multimedia Artists, Animators & Graphic Designers	\$50,062	\$50,766	-1.4%
Computer Operators	\$44,119	\$44,262	-0.3%
Computer, Automated Teller, and Office Machine Repairers	\$32,993	\$37,710	-12.5%

## Top 10 Industries Employing Middle Tennessee Tech Workers

INDUSTRY	TECH JOBS IN INDUSTRY (2016)	TECH JOBS IN INDUSTRY (2017)	CHANGE (2016 - 2017)	% CHANGE (2016 - 2017)	% OF TECH WORKERS EMPLOYED BY INDUSTRY (2017)	% OF TOTAL JOBS IN INDUSTRY (2017)
Computer Systems Design and Related Services	6,054	5,980	(74)	-1.2%	13.0%	62.5%
Management of Companies and Enterprises	4,026	4,153	127	3.2%	9.0%	20.0%
Management, Scientific, and Technical Consulting Services	3,461	3,820	359	10.4%	8.3%	27.1%
Data Processing, Hosting, and Related Services	1,650	1,849	199	12.1%	4.0%	47.0%
Insurance Carriers	1,331	1,588	257	19.3%	3.4%	14.3%
State Government, Excluding Education and Hospitals	1,353	1,394	41	3.0%	3.0%	6.8%
Federal Government, Military	1,393	1,377	(16)	-1.1%	3.0%	4.1%
Employment Services	1,370	1,368	(2)	-0.1%	3.0%	3.9%
Federal Government, Civilian	1,346	1,318	(28)	-2.1%	2.9%	6.9%
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	820	1,022	202	24.6%	2.2%	6.8%

## Growth Trends by Occupation Group

OCCUPATION GROUP	PAST GROWTH (2012-2017)	PROJECTED GROWTH (2017-2022)
Management Occupations	37%	16%
Business & Financial Operations Analysts	50%	20%
Computer & Information Research Scientists	-14%	23%
Computer & Information Analysts	33%	14%
Software Developers & Programmers	21%	19%
Database & Systems Administrators & Network Architects	13%	12%
Computer Support Specialists	25%	12%
Computer Occupations, All Other	70%	13%
Mathematical Science Occupations	73%	22%
Computer Hardware Engineers	14%	11%
Multimedia Artists, Animators & Graphic Designers	18%	9%
Computer Operators	-24%	-5%
Computer, Automated Teller, and Office Machine Repairers	-27%	6%

# Job Demand

This section provides an overview of current tech job demand in Middle Tennessee as measured by the number of unique job postings<sup>3</sup> made within a given time period. Postings were analyzed from multiple perspectives, including demand by occupation group, demand by minimum experience required, demand by job title, and demand by hard job skills. These are the key findings:

- Generally speaking, Middle Tennessee has less demand for tech occupations than would be expected of a region this size. The exceptions to this are the **Computer Support Specialists** and **Mathematical Science Occupations** groups. The average number of monthly job postings for these two occupation groups exceeds the national average by **23.6% and 15.7%, respectively**<sup>4</sup>.
- The **Software Developers and Programmers** Occupation Group has the highest demand with an average of **708** unique monthly job postings in 2017.
- Of the job postings that stated a required minimum experience level, the majority (**43.6%**) required a minimum of **2-3 years of experience**.
- The most in-demand job title is **Software Engineer**, which appeared in a **total of 1,334 postings** from July 2017 through June 2018.
- The top hard skill is **Structured Query Language (SQL)**, which appeared in a **total of 4,354 postings** from July 2017 through June 2018.

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<sup>3</sup> Jobs postings data is scraped from various career sites and jobs boards. In recognition that the same job posting can be found on multiple sites, the postings are de-duplicated in order to arrive at a number that best approximates demand.

<sup>4</sup> National average values are derived by taking the national value for the occupation set and scaling it down to account for the difference in overall workforce size between the nation and a given area. In other words, the values represent the national average adjusted for region size.

## Demand by Occupation Group (2017)

OCCUPATION GROUP	AVERAGE NEW MONTHLY JOB POSTINGS (2017)	NATIONAL AVERAGE	% DIFFERENCE
Software Developers & Programmers	708	968	-26.9%
Business & Financial Operations Analysts	479	525	-8.8%
Computer Support Specialists	366	296	23.6%
Management Occupations	339	463	-26.8%
Computer & Information Analysts	337	366	-7.9%
Computer Occupations, All Other	311	395	-21.3%
Database & Systems Administrators & Network Architects	295	296	-0.3%
Mathematical Science Occupations	59	51	15.7%
Multimedia Artists, Animators & Graphic Designers	49	65	-24.6%
Computer & Information Research Scientists	9	34	-73.5%
Computer Hardware Engineers	4	15	-73.3%
Computer Operators	2	3	-33.3%
Computer, Automated Teller, and Office Machine Repairers	1	1	0.0%

## Demand by Minimum Experience Required<sup>5</sup>

OCCUPATION GROUP	0-1 YEARS	2-3 YEARS	4-5 YEARS	>5 YEARS
Business & Financial Operations Analysts	151	367	171	51
Computer & Information Analysts	69	257	187	72
Computer & Information Research Scientists	3	5	5	2
Computer Hardware Engineers	1	1	1	1
Computer Occupations, All Other	53	210	151	87
Computer Operators	1	2	0	0
Computer Support Specialists	157	211	63	28
Computer, Automated Teller, and Office Machine Repairers	0	1	0	0
Database & Systems Administrators & Network Architects	49	207	149	51
Management Occupations	37	197	213	158
Mathematical Science Occupations	31	44	16	5
Multimedia Artists, Animators & Graphic Designers	7	27	8	3
Software Developers & Programmers	111	425	293	142
Grand Total	668	1,954	1,256	599

## Top 10 Job Titles

JOB TITLE	TOTAL UNIQUE POSTINGS (JUL 2017 - JUN 2018)
Software Engineer	1,334
Business Analyst (Business and Financial Operations)	1,332
Java Developer	857
Research Analyst (Life, Physical, and Social Science)	713
Project Manager (Computer and Mathematical)	668
Financial Analyst	626
tech Help Desk Specialist	604
.Net Developer	575
Marketing Manager	559
Systems Analyst	550

<sup>5</sup> The numbers presented in this table represent the average number of active monthly job postings across all tech occupations from July 2017-June 2018. A posting that remained online across multiple months would be included in each month's count of unique postings. Postings that contained no experience requirements are not included in the analysis.

## Top 10 Hard Job Skills

SKILL	TOTAL POSTINGS WITH SKILL (JUL 2017 - JUN 2018)
SQL (Programming Language)	4,354
Agile Software Development	3,263
JavaScript (Programming Language)	2,794
Accounting	2,731
Information Systems	2,557
Java (Programming Language)	2,469
Software Development	2,298
.NET Framework	2,171
Microsoft Access	2,150
C Sharp (Programming Language)	2,064

# Diversity

This section provides an overview of the demographic breakdown of tech workers, categorizing workers by gender, age, and race/ethnicity. To provide context, the analysis compares Middle Tennessee tech occupations to national and regional populations, as well as national and regional workers. These are the key findings:

- Across tech occupations, the gender diversity found in Middle Tennessee is roughly equivalent to national gender diversity. In aggregate, **males** occupy approximately **two-thirds** of tech roles.
- When looking at individual occupations (see Appendix: Detailed Occupation Data), **42%** of 26 occupations included in the analysis have female representation at or above **34.5%**, the overall percentage of women employed in tech roles in Middle Tennessee.
- The occupation showing the highest degree of female representation is **Marketing Research Analysts and Marketing Specialists** with females occupying **60.7%** of those roles.
- The overwhelming majority of the Middle Tennessee tech workforce (**80.1%**), falls between the ages of 25 and 54. In aggregate, there is little threat of losing workers to retirement.
- When compared to the general working population in Middle Tennessee, the tech workforce has a **higher** percentage of Asian (**+4.2%**) and White (**+3.8%**) workers.
- When compared to the general working population in Middle Tennessee, the tech workforce has a **lower** percentage of Black (**-5.7%**) and Hispanic or Latino (**-2.2%**) workers.

## National and Middle Tennessee Population Demographics

National Population Demographics		
GENDER	2017 POPULATION	2017 % POPULATION
Males	165,172,570	50.76%
Females	160,229,339	49.24%
AGE	2017 POPULATION	2017 % OF POPULATION
< 15	61,355,342	18.9%
14-18	21,143,363	6.5%
20-24	22,165,881	6.81%
25-34	45,163,458	13.9%
35-44	40,719,206	12.5%
45-54	42,259,909	13.0%
55-64	41,883,544	12.9%
65+	50,711,208	15.6%
RACE/ETHNICITY	2017 POPULATION	2017 % OF POPULATION
White	198,075,749	60.9%
Black or African American	51,482,916	15.8%
Hispanic or Latino	48,326,287	14.9%
Asian	18,206,835	5.6%
Two or More Races	6,943,070	2.1%
American Indian or Alaska Native	1,775,019	0.6%
Native Hawaiian or Other Pacific Islander	592,035	0.2%

Middle Tennessee Population Demographics		
GENDER	2017 POPULATION	2017 % POPULATION
Males	1,111,682	50.98%
Females	1,068,850	49.02%
AGE	2017 POPULATION	2017 % OF POPULATION
<15	436,280	20.0%
14-18	140,295	6.4%
20-24	155,360	7.1%
25-34	337,268	15.5%
35-44	292,074	13.4%
45-54	282,310	12.9%
55-64	259,391	11.9%
65+	277,554	12.7%
RACE/ETHNICITY	2017 POPULATION	2017 % OF POPULATION
White	1,561,565	71.6%
Black or African American	343,662	15.8%
Hispanic or Latino	161,752	7.4%
Asian	58,532	2.7%
Two or More Races	46,933	2.2%
American Indian or Alaska Native	6,066	0.3%
Native Hawaiian or Other Pacific Islander	1,080	0.1%

## National Occupation Demographics

All Occupations: National		
GENDER	2017 JOBS	2017 PERCENT
Males	76,507,789	50.8%
Females	74,085,061	49.2%
AGE	2017 JOBS	2017 PERCENT
14-18	3,311,388	2.2%
19-24	16,579,173	11.0%
25-34	33,879,514	22.5%
35-44	31,564,724	21.0%
45-54	32,142,557	21.3%
55-64	24,859,100	16.5%
65+	8,256,394	5.5%
RACE/ETHNICITY	2017 JOBS	2017 PERCENT
White	96,575,493	64.1%
Hispanic or Latino	22,632,746	15.0%
Black or African American	19,093,901	12.7%
Asian	8,892,468	5.9%
Two or More Races	2,318,935	1.5%
American Indian or Alaska Native	801,031	0.5%
Native Hawaiian or Other Pacific Islander	278,277	0.2%

Tech Occupations: National		
GENDER	2017	2017 PERCENT
Males	4,960,165	67.8%
Females	2,351,975	32.2%
AGE	2017 POPULATION	2017 PERCENT
14-18	11,749	0.2%
19-24	403,787	5.5%
25-34	2,109,006	28.8%
35-44	2,027,916	27.7%
45-54	1,638,101	22.4%
55-64	940,727	12.9%
65+	180,855	2.5%
RACE/ETHNICITY	2017 JOBS	2017 PERCENT
White	1,561,565	71.6%
Black or African American	343,662	15.8%
Hispanic or Latino	161,752	7.42%
Asian	58,532	2.68%
Two or More Races	46,933	2.15%
American Indian or Alaska Native	6,066	0.28%
Native Hawaiian or Other Pacific Islander	2,022	0.09%

## Middle Tennessee Occupation Demographics

All Occupations: Middle Tennessee

GENDER	2017 JOBS	2017 PERCENT
Males	562,728	51.8%
Females	523,676	48.2%
AGE	2017 JOBS	2017 PERCENT
14-18	27,422	2.5%
19-24	129,808	11.9%
25-34	261,233	24.0%
35-44	231,770	21.3%
45-54	223,652	20.6%
55-64	161,301	14.8%
65+	51,219	4.7%
RACE/ETHNICITY	2017 JOBS	2017 PERCENT
White	808,034	74.4%
Black or African American	182,815	16.8%
Hispanic or Latino	52,880	4.9%
Asian	26,121	2.4%
Two or More Races	12,784	1.2%
American Indian or Alaska Native	2,511	0.2%
Native Hawaiian or Other Pacific Islander	1,260	0.1%

Tech Occupations: Middle Tennessee

GENDER	2017 JOBS	2017 PERCENT
Males	30,208	65.5%
Females	15,891	34.5%
AGE	2017 JOBS	2017 PERCENT
14-18	75	0.2%
19-24	2,646	5.7%
25-34	13,761	29.9%
35-44	12,986	28.2%
45-54	10,148	22.0%
55-64	5,458	11.8%
65+	1,025	2.2%
RACE/ETHNICITY	2017 JOBS	2017 PERCENT
White	36,060	78.2%
Black or African American	5,103	11.1%
Asian	3,023	6.6%
Hispanic or Latino	1,250	2.7%
Two or More Races	547	1.2%
American Indian or Alaska Native	83	0.2%
Native Hawaiian or Other Pacific Islander	34	0.1%

# Education Pipeline

This section provides an overview of the education pipeline feeding into the Middle Tennessee tech workforce. It summarizes the number of schools and programs producing graduates relevant<sup>6</sup> to tech occupations, as well as identifies the top schools and programs in terms of the number of completions. These are the key findings:

- Over the last 5 years, **36 schools** in Middle Tennessee and the surrounding area produced graduates relevant to tech occupations.
- In 2017, students completed degrees relevant to tech work across **50 academic programs** for a total of **3,670** completions.
- **Middle Tennessee State University** had the most completions with **731 students** earning degrees in relevant programs in 2017.
- Across all schools, the program producing the most graduates in **Business Administration and Management, General**.

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<sup>6</sup> A “relevant” graduate is an individual who has completed a certificate or degree program in the region of study that trains for one of the 26 occupations included in the analysis. Programs are mapped to occupations using a “crosswalk” created by the National Center for Education Statistics.

## Top 10 Schools by Completions (2017)

SCHOOL	CERTIFICATE	ASSOCIATE'S	BACHELOR'S	MASTER'S OR HIGHER	TOTAL
Middle Tennessee State University	0	0	548	183	731
Vanderbilt University	0	0	200	351	551
Austin Peay State University	0	13	267	38	318
Trevecca Nazarene University	0	0	164	137	301
Lipscomb University	0	0	121	143	264
Belmont University	0	0	161	70	231
Tennessee State University	0	0	128	84	212
Nashville Software School	179	0	0	0	179
University of Phoenix-Tennessee	0	0	128	35	163
Volunteer State Community College	53	102	0	0	155

## Top 10 Programs by Completions (2017)

ACADEMIC PROGRAM	TOTAL COMPLETIONS (2013-2017)
Business Administration and Management, General	6,953
Business/Commerce, General	1,584
Computer and Information Sciences, General	1,124
Marketing/Marketing Management, General	1,018
Finance, General	988
Mathematics, General	945
Computer Science	795
Management Information Systems, General	577
Information Technology	441
Organizational Leadership	344

# Conclusion

This report provides evidence of the rapid growth, past and projected, of tech occupations in Middle Tennessee. The occupation groups currently employing the most tech workers include Business and Financial Operations Analysts, Software Developers and Programmers, and Computer Support Specialists. Those occupations are projected to experience continued growth, but the two occupation groups with the highest projected 5-year growth are Computer and Information Research Scientists and Mathematical Science Occupations.

The median tech salary in Middle Tennessee of \$71,370 is lower than the national median for the same tech occupations; however, it is nearly double the general median salary for Middle Tennessee workers. While this may make attracting talent from other areas more challenging, it makes a strong financial case that those already living in Middle Tennessee would do well to pursue a tech career. Of the occupation groups examined in this analysis, Management Occupations, Computer and Information Research Scientists, and Database and Systems Administrators and Network Architects were the groups with the highest median salaries.

When looking at current job demand, Computer Support Specialists and Mathematical Science Occupations show higher demand in Middle Tennessee than would be expected for a region this size. The occupation group with the highest current demand is Software Developers and Programmers with Software Engineer being the most in-demand job title. Structured Query Language (SQL) is the most in-demand hard skill, followed by knowledge of the agile software methodology.

From a diversity perspective, the gender diversity found in the Middle Tennessee tech workforce is roughly equivalent to the national diversity breakdown for the same occupations. In aggregate, males occupy approximately two-thirds of tech roles. The local tech workforce is a relatively young one, with the vast majority of the workforce falling between the ages of 25 and 54. This indicates a low risk of losing workers to retirement in the immediate future. In terms of racial diversity, White and Asian workers are over-represented when compared to the general Middle Tennessee workforce while Black and Hispanic or Latino workers are under-represented.

These results provide important insight into the current landscape; however, it is important to realize that they only capture a single snapshot in time. Tech occupations are in a state of constant flux; keeping abreast of changes requires near constant monitoring of the environment. That is why this report is not meant to be a final product, but rather the first publication in a longitudinal research program designed to keep the local tech community informed of the changes as they are occurring.

The goal is for the release of this publication to become an annual event. In addition to this, four white papers will be released throughout the year that focus on the tech sub-specialties of great importance to the local community: analytics, healthcare IT, information security, and software development. Those reports will allow for a more nuanced look at the talent supply and demand in those areas.

If you or your organization is interested in underwriting this research program, or if you would be interested in discussing opportunities to insights tailored to your organization's needs, please contact the report's author ([amy.harris@mtsu.edu](mailto:amy.harris@mtsu.edu)).

# About the Author



Dr. Amy Harris is an associate professor of information systems and analytics in the Jennings A. Jones College of Business at Middle Tennessee State University. There, she teaches undergraduate and graduate courses in business intelligence and analytics. Dr. Harris is passionate about tech workforce development, as well as diversity and inclusion. She is active in the Nashville tech community, serving on the steering committee for the Nashville Analytics Summit, as a board member for Women in Technology Tennessee, and as a member of the Nashville Technology Council's diversity committee.

Dr. Harris received her Ph.D. in Management Information Systems from the Fogelman College of Business and Economics at the University of Memphis. She earned her Master of Science in Computer Information Systems from the Jennings A. Jones College of Business at Middle Tennessee State University and her Bachelor of Arts in Music and Communications from Mississippi University for Women.

She has published research in journals including in Communications of the ACM, Journal of Computer Information Systems, Communications of the Association of Information Systems, and Computers in Human Behavior.

For more information contact: Amy Harris, Ph.D.  
Associate Professor, Department of Information Systems & Analytics  
[amy.harris@mtsu.edu](mailto:amy.harris@mtsu.edu)  
615.904.8178

## **Appendix: Detailed Occupation Data**

# MARKETING MANAGERS (11-2021)

Jobs  
(2017)

1,548

5% below  
national average\*

Median  
Salary

\$109.5K

17% below  
national median

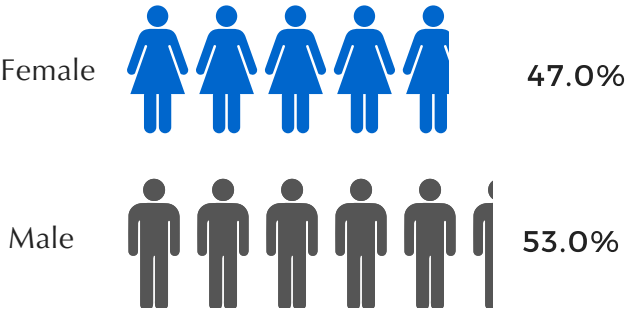
Ave. New Job  
Postings/Month (2017)

244

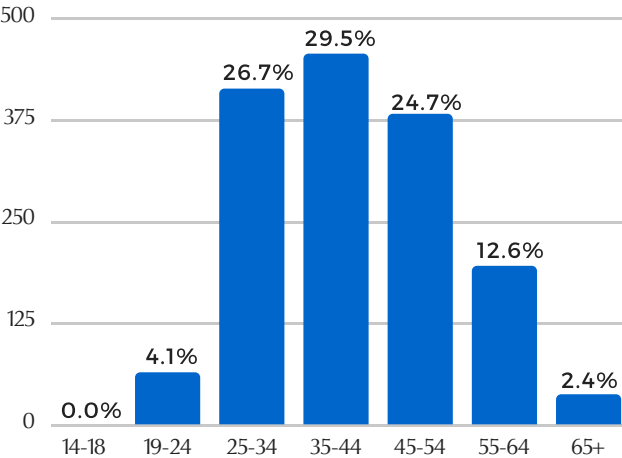
29% below  
national average\*

## DEMOGRAPHICS

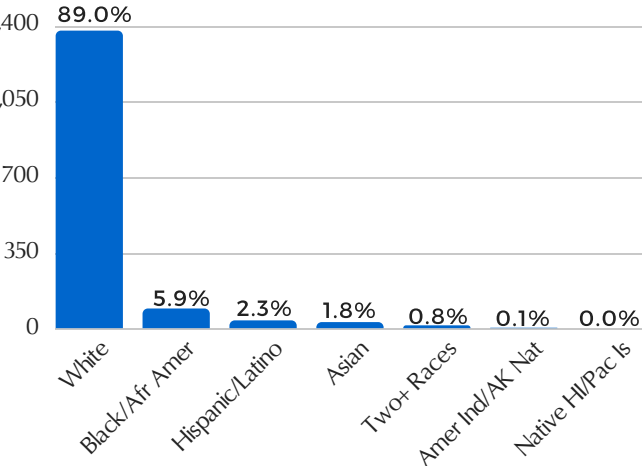
### Gender



### Age

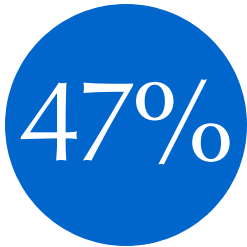


### Race/Ethnicity

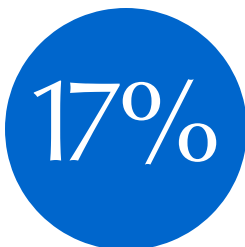


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Marketing Manager	465
Product Manager (Management)	442
Business Development Manager (Management)	198
Marketing Director	184
Account Manager (Management)	121
Sales Manager (Management)	103
Business Development Director	88
Brand Manager	76
Director of Revenue Cycle	45
Category Manager	41

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Business Development	566
Product Management	532
New Product Development	518
Marketing Strategies	507
Marketing Management	502
Selling Techniques	387
Analytics	386
Digital Marketing	372
Market Research	304
Customer Relationship Management	299

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER AND INFORMATION SYSTEMS MANAGERS (11-2021)

Jobs  
(2017)

2,575

6% below  
national average\*

Median  
Salary

\$116.1K

17% below  
national median

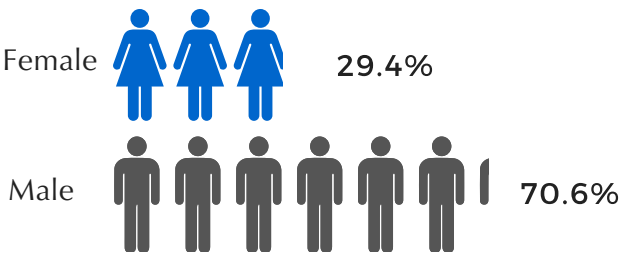
Ave. New Job  
Postings/Month

97

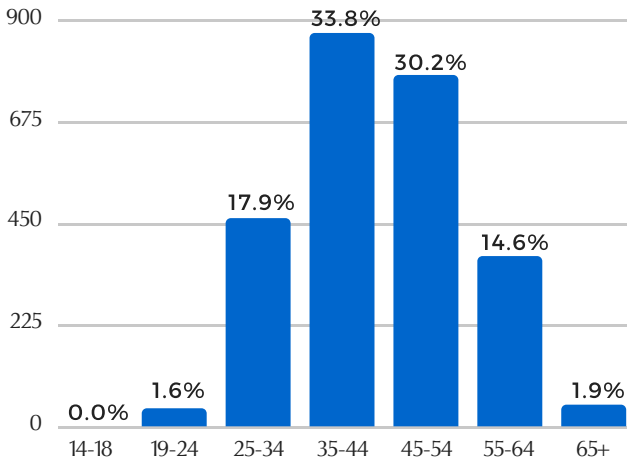
17% below  
national average\*

## DEMOGRAPHICS

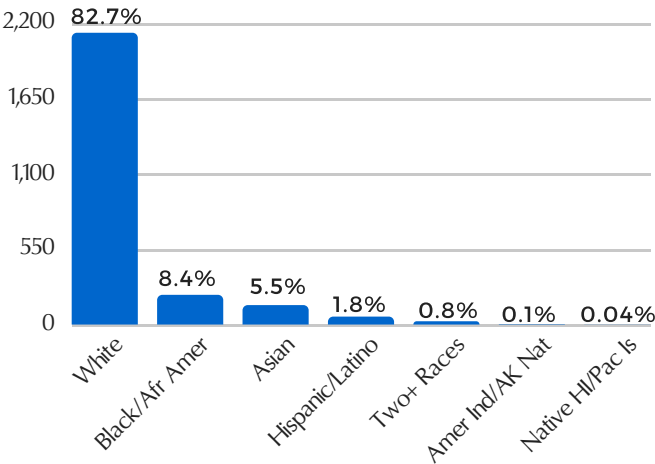
### Gender



### Age

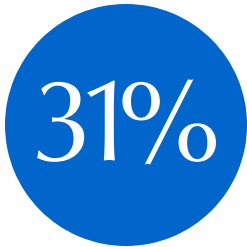


### Race/Ethnicity

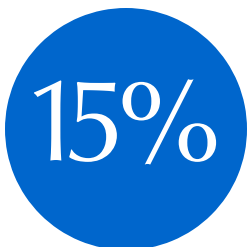


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Information Technology (IT) Manager	68
Program Manager	42
Director of Technology	39
Information Security Manager	35
Engagement Manager	27
Product Manager (Management)	25
Operations Manager	24
Project Management Office (PMO) Manager	24
Systems Manager	24
Compliance Manager (Management)	21

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Information Systems	211
Professional Services	167
Agile Software Development	153
Risk Management	147
Business Process	127
Change Management	122
Auditing	121
Software Development	111
Facility Management	96
Systems Development Life Cycle	96

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# LOGISTICIANS (13-1081)

Jobs  
(2017)

1,488

8% above  
national average\*

Median  
Salary

\$61.6K

17% below  
national median

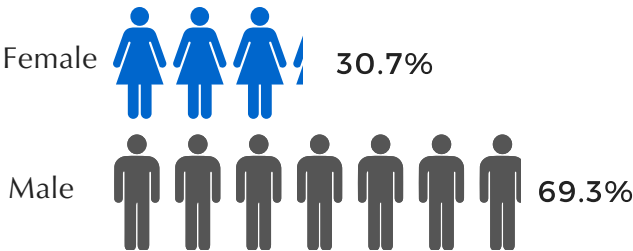
Ave. New Job  
Postings/Month

40

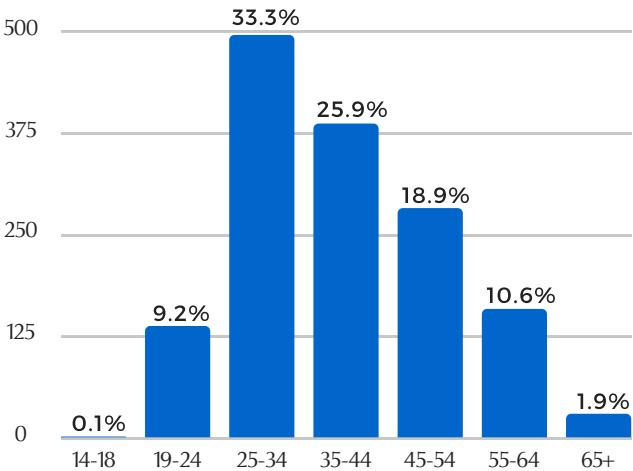
7% below  
national average\*

## DEMOGRAPHICS

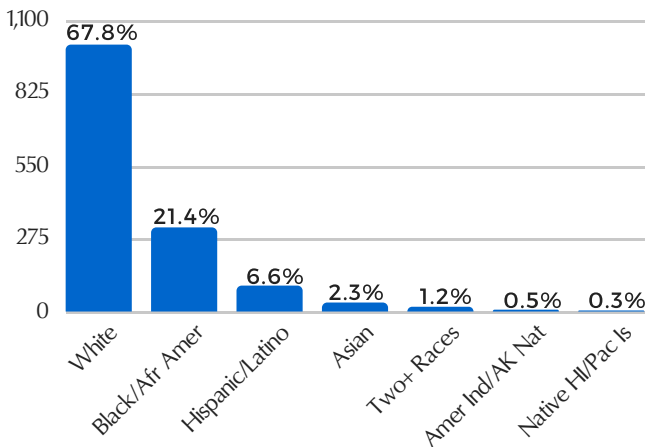
### Gender



### Age

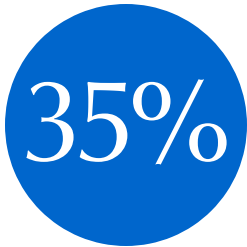


### Race/Ethnicity

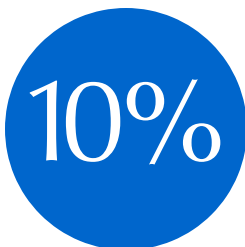


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Supply Chain Planner	63
Logistics Analyst (Business and Financial Operations)	46
Logistics Specialist	40
Logistics Coordinator	29
Team Member Trainer (Business and Financial Operations)	28
Logistics Manager (Business and Financial Operations)	14
Freight Operations Supervisor	13
Supply Chain Analyst	13
Logistics Engineer (Business and Financial Operations)	11
Delivery Driver	10

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Supply Chain Management	114
Warehousing	85
Purchasing	65
Microsoft Access	48
Forecasting	47
Transportation Management Systems	47
Procurement	46
Inventory Management	45
Customer Experience	39
Auditing	37

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# MANAGEMENT ANALYSTS (13-1111)

Jobs  
(2017)

3,959

19% below  
national average\*

Median  
Salary

\$74.5K

10% below  
national median

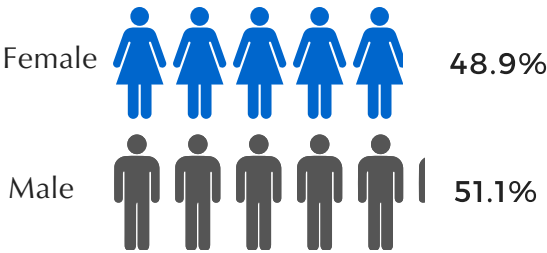
Ave. New Job  
Postings/Month

240

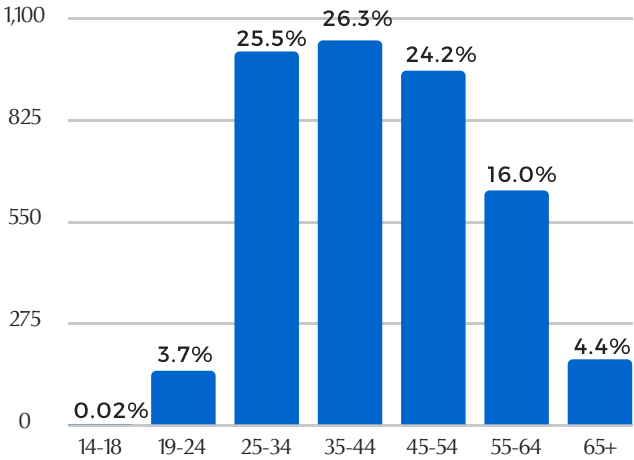
3% below  
national average\*

## DEMOGRAPHICS

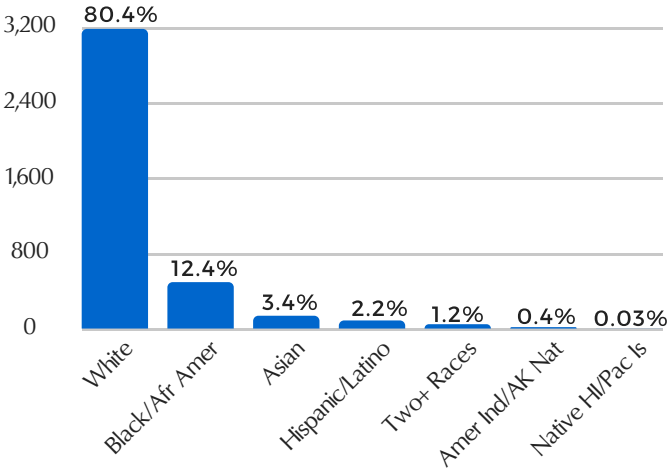
### Gender



### Age

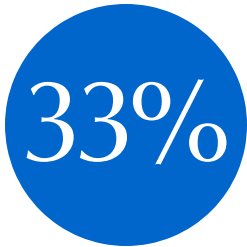


### Race/Ethnicity

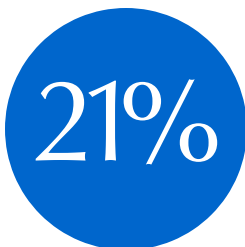


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Business Analyst (Business and Financial Operations)	1,014
Business Analyst (Computer and Mathematical)	125
Research Analyst (Life, Physical, and Social Science)	94
Project Analyst (Business and Financial Operations)	73
Business Consultant	67
Healthcare Consultant	48
Data Analyst (Computer and Mathematical)	41
Managing Consultant	40
Financial Analyst	37
Reporting Analyst	33

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Business Process	478
Microsoft Access	440
Business Requirements	324
Business Analysis	310
Accounting	302
Information Systems	223
Agile Software Development	216
Business Process Improvement	207
SQL (Programming Language)	205
Data Management	191

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# MARKETING RESEARCH ANALYSTS AND MARKETING SPECIALISTS (13-1161)

Jobs  
(2017)

3,952

10% below  
national average\*

Median  
Salary

\$56.3K

11% below  
national median

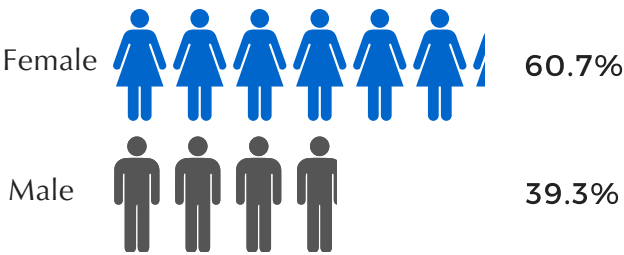
Ave. New Job  
Postings/Month

133

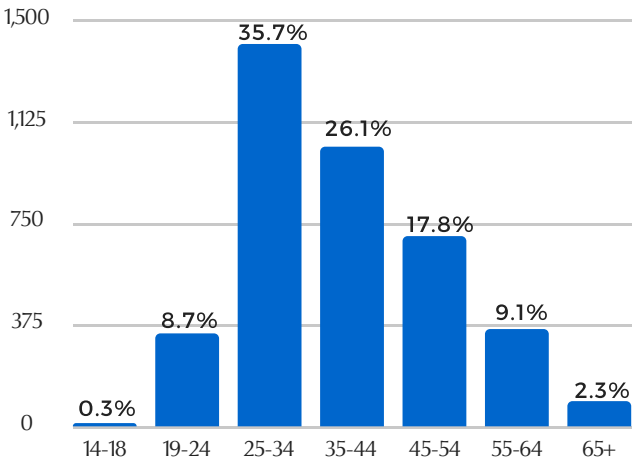
18% below  
national average\*

## DEMOGRAPHICS

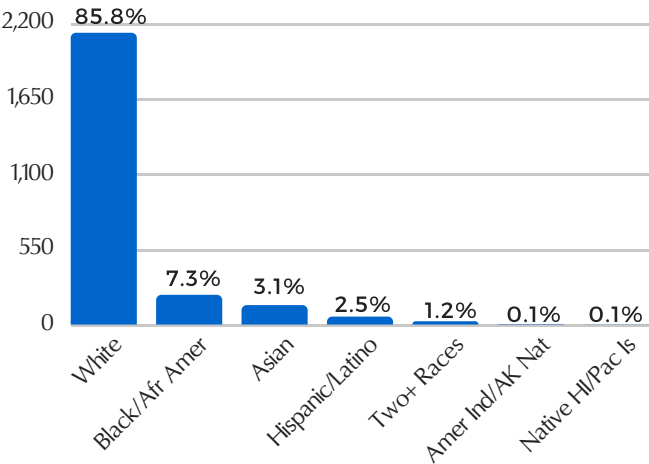
### Gender



### Age

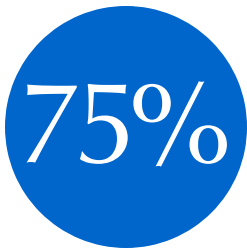


### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Research Analyst (Life, Physical, and Social Science)	452
Research Specialist	103
Marketing Manager	71
Marketing Coordinator	66
Assistant Analyst	42
Marketing Communications Associate	42
Product Development Scientist	35
Field Specialist	34
Marketing Specialist	34
Business Analyst (Business and Financial Operations)	29

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Analytics	272
Digital Marketing	187
Marketing Strategies	176
Market Research	163
Business Development	124
Microsoft Access	118
Accounting	114
Economics	113
Search Engine Optimization	98
Customer Relationship Management	97

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# FINANCIAL ANALYSTS (13-2051)

Jobs  
(2017)

2,564

17% above  
national average\*

Median  
Salary

\$73.0K

13% below  
national median

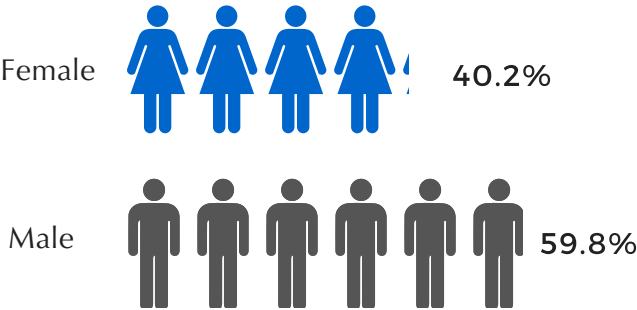
Ave. New Job  
Postings/Month (2017)

68

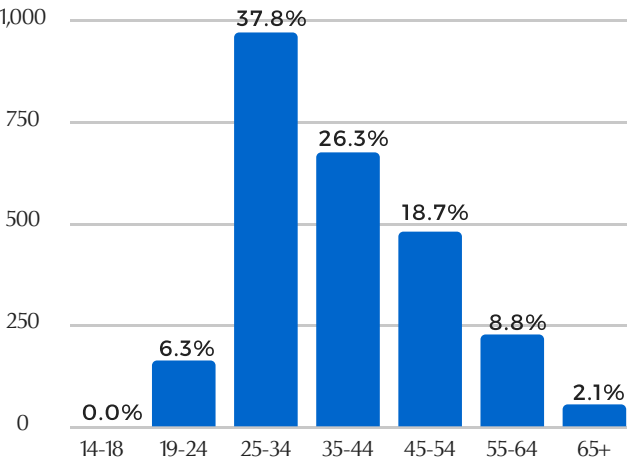
9% below  
national average\*

## DEMOGRAPHICS

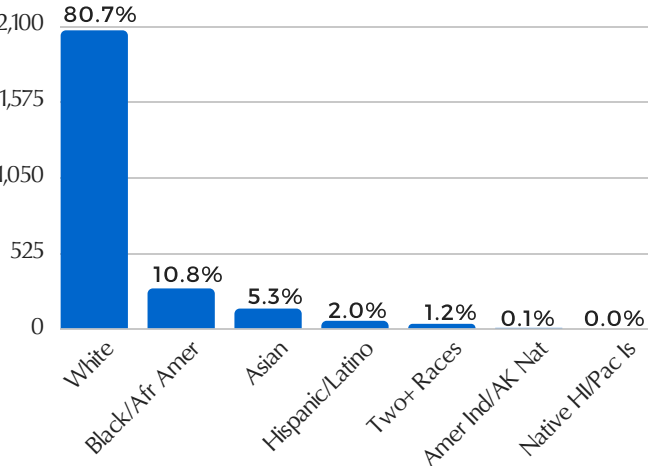
### Gender



### Age

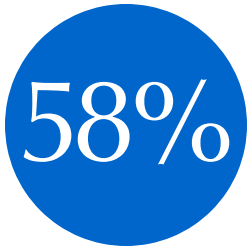


### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Financial Analyst	570
Treasury Analyst	21
Business Analyst (Business and Financial Operations)	20
Investment Analyst	19
Reporting Analyst	15
Revenue Analyst	15
Risk Analyst	14
Research Analyst (Life, Physical, and Social Science)	13
Real Estate Analyst	12
Risk Management Analyst	11

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Accounting	608
Forecasting	383
Financial Analysis	269
Budgeting	265
Financial Statements	200
Economics	178
Financial Modeling	159
Microsoft Access	157
Financial Planning	146
Investments	133

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER AND INFORMATION RESEARCH SCIENTISTS (15-1111)

Jobs  
(2017)

57

74% below  
national average\*

Median  
Salary

\$93.2K

19% below  
national median

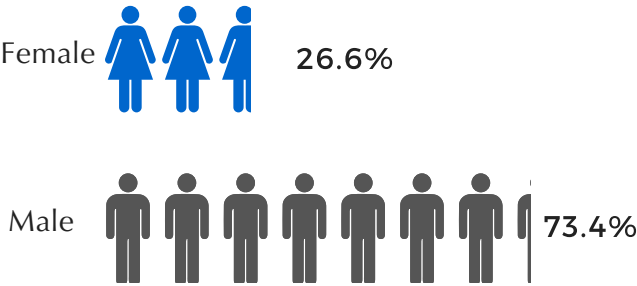
Ave. New Job  
Postings/Month (2017)

9

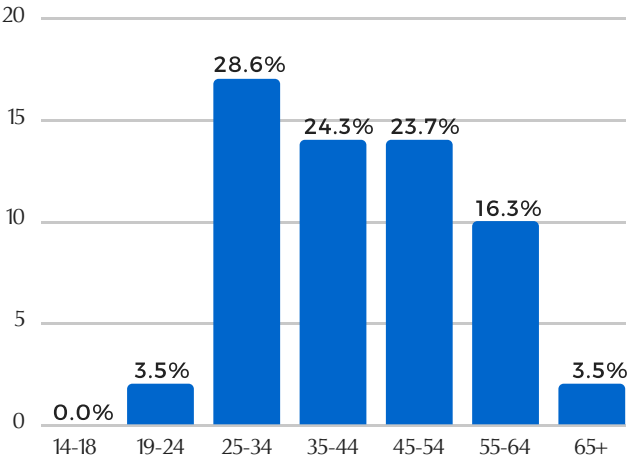
74% below  
national average\*

## DEMOGRAPHICS

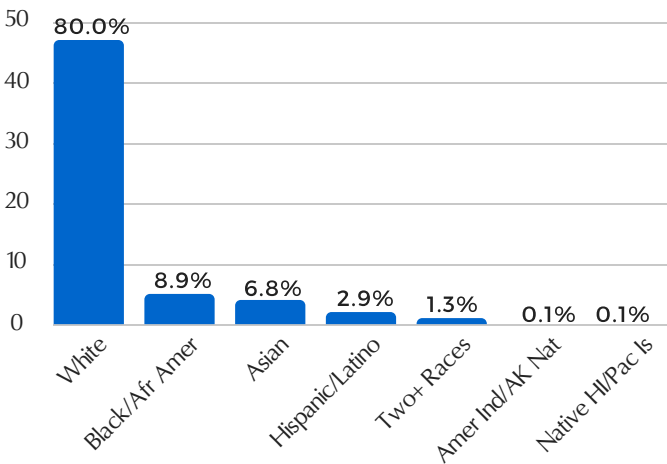
### Gender



### Age



### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)

-14%

Projected Growth  
(2017-2022)

23%

## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Data Scientist	56
Research Analyst (Life, Physical, and Social Science)	6
Senior Scientist	6
Computer Scientist	5
General Manager	5
Data Engineer	3
Research Scientist	3
Software Engineer	3
Staff Scientist	3
Development Scientist	2

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Data Science	44
Statistics	43
Machine Learning	38
Algorithms	28
Natural Language Processing	25
Apache Hadoop	23
Data Mining	22
Mathematical Optimization	22
Big Data	18
Time Series	16

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER SYSTEMS ANALYSTS (15-1121)

Jobs  
(2017)

4,067

5% below  
national average\*

Median  
Salary

\$74.0K

16% below  
national median

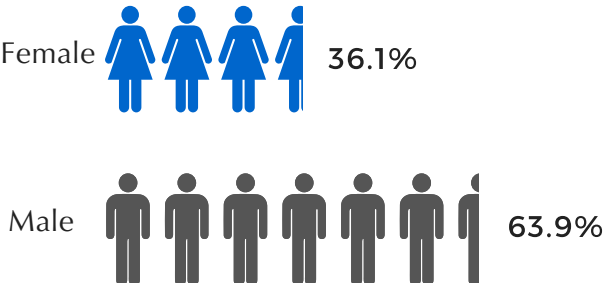
Ave. New Job  
Postings/Month (2017)

235

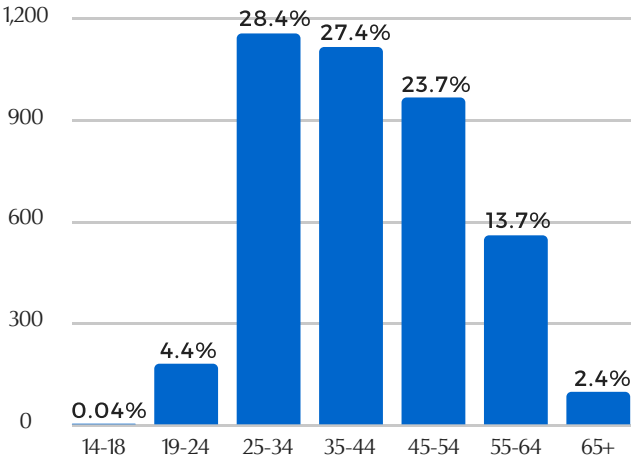
1% above  
national average\*

## DEMOGRAPHICS

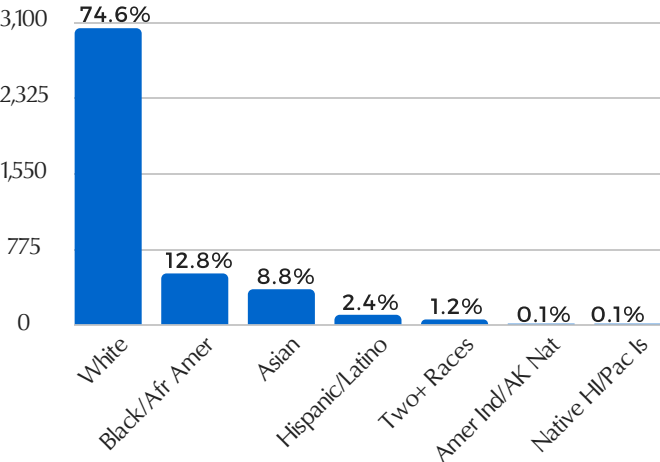
### Gender



### Age



### Race/Ethnicity

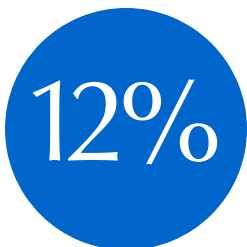


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Systems Analyst	464
Business Analyst (Computer and Mathematical)	204
Business Analyst (Business and Financial Operations)	200
Information Technology (IT) Systems Analyst	132
Data Analyst (Computer and Mathematical)	78
Epic HIM Analyst	74
Programmer Analyst	71
Clinical Systems Analyst	49
HRIS Analyst	38
Programmer	38

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Systems Analysis	671
Business Process	523
Business Requirements	474
SQL (Programming Language)	469
Information Systems	425
Business Analysis	301
Agile Software Development	300
Systems Development Life Cycle	243
Business Intelligence	220
Test Planning	213

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# INFORMATION SECURITY ANALYSTS (15-1122)

Jobs  
(2017)

677

15% below  
national average\*

Median  
Salary

\$79.1K

17% below  
national median

Ave. New Job  
Postings/Month

103

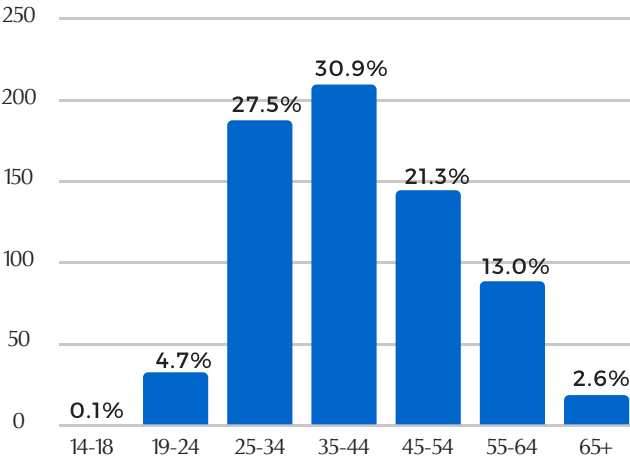
23% above  
national average\*

## DEMOGRAPHICS

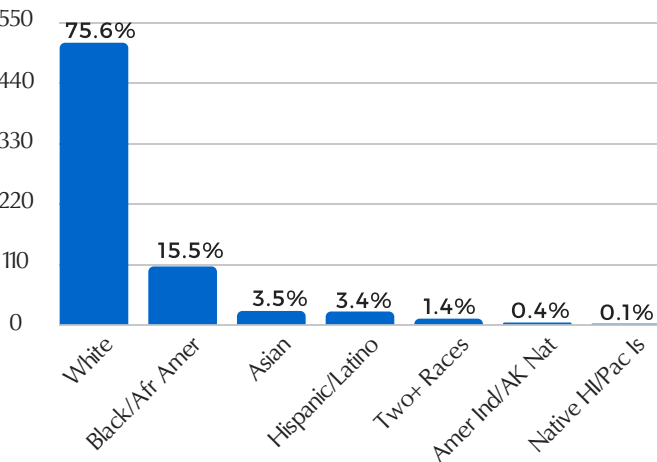
### Gender



### Age

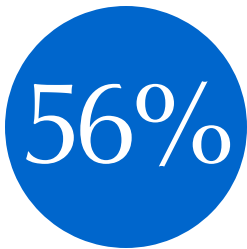


### Race/Ethnicity

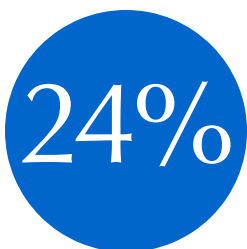


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Information Security Analyst	310
Security Engineer	188
Information Security Specialist	48
Risk Analyst	40
Identity Management Engineer	31
Information Security Architect	28
Security Manager (Computer and Mathematical)	27
Information Security Engineer	26
Cyber Security Engineer	24
Information Security Manager	23

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Vulnerability	343
Cyber Security	272
Auditing	271
Information Systems	253
Risk Analysis	253
Security Policies	250
Incident Response	229
Security Information And Event Management	201
Risk Management	191
Professional Services	190

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER PROGRAMMERS (15-1131)

Jobs  
(2017)

1,618

12% below  
national average\*

Median  
Salary

\$74.2K

10% below  
national median

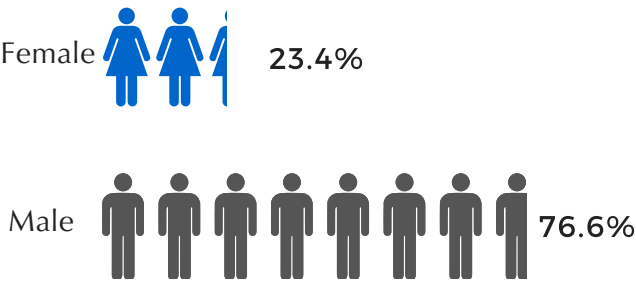
Ave. New Job  
Postings/Month

69

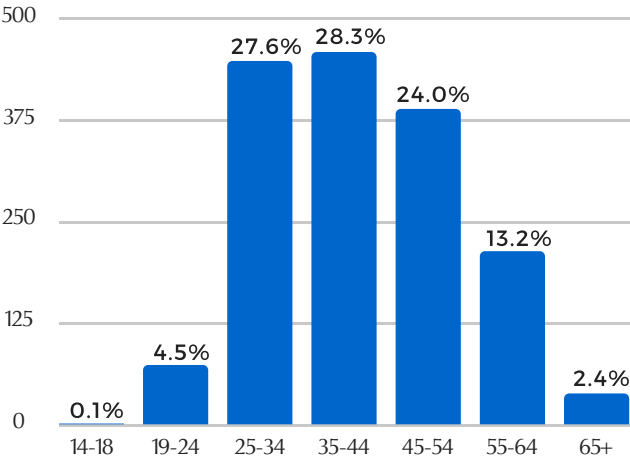
6% above  
national average\*

## DEMOGRAPHICS

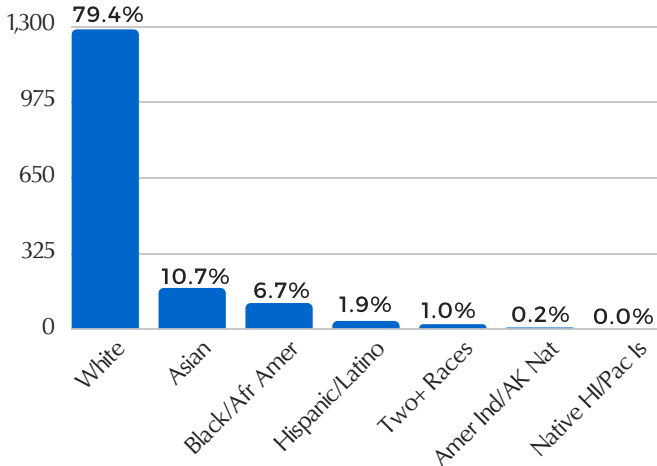
### Gender



### Age

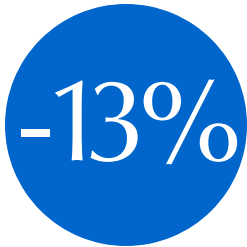


### Race/Ethnicity

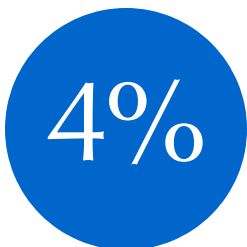


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
.Net Developer	156
Programmer	73
SQL Developer	55
Software Engineer	47
Java Developer	37
Advanced Business Application Programming (ABAP) Developer	26
Microsoft Dynamics Developer	24
Statistical Programmer	24
Oracle Developer	19
EDI Analyst	17

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
SQL (Programming Language)	334
.NET Framework	260
C Sharp (Programming Language)	251
JavaScript (Programming Language)	138
ASP.NET	98
Java (Programming Language)	78
Software Development	76
Cascading Style Sheets (CSS)	75
Agile Software Development	71
JQuery	69

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# SOFTWARE DEVELOPERS, APPLICATIONS (15-1132)

Jobs  
(2017)

3,072

51% below  
national average\*

Median  
Salary

\$92.6K

9% below  
national median

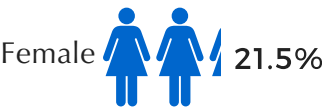
Ave. New Job  
Postings/Month

420

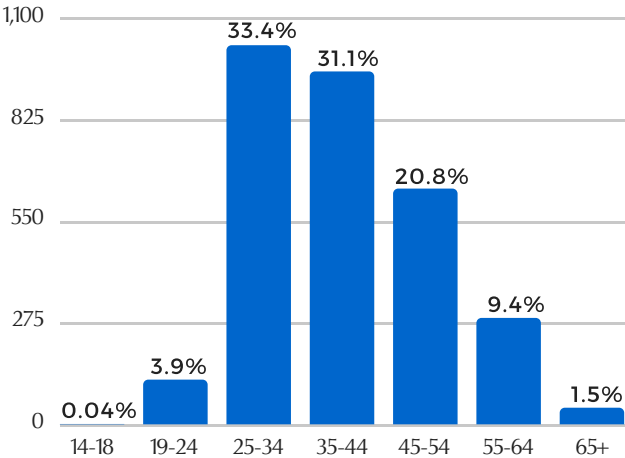
29% below  
national average\*

## DEMOGRAPHICS

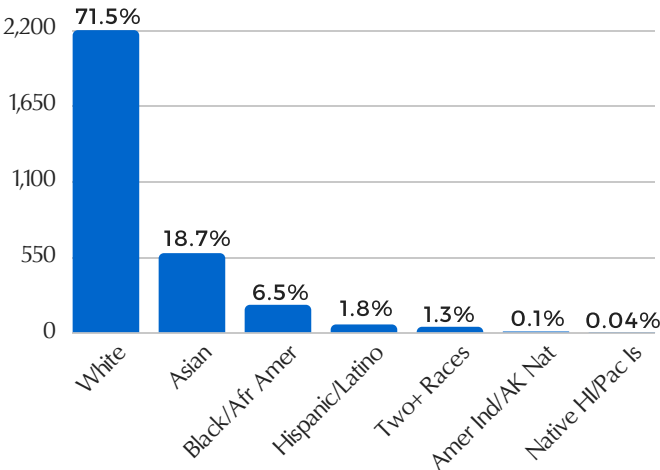
### Gender



### Age

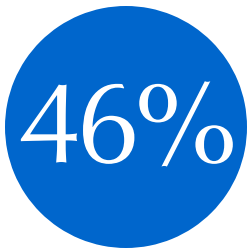


### Race/Ethnicity

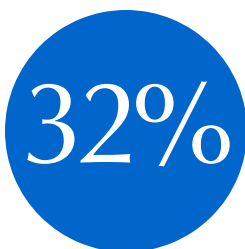


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Software Engineer	1,079
Java Developer	339
.Net Developer	296
SQL Developer	172
Cloud Engineer Architect	140
Business Intelligence Developer	126
ETL Developer	124
Application Developer	119
Software Developer	112
Data Engineer	95

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
SQL (Programming Language)	1,715
JavaScript (Programming Language)	1,290
Agile Software Development	1,130
Java (Programming Language)	1,129
C Sharp (Programming Language)	1,066
.NET Framework	1,056
Software Development	973
Software Engineering	845
Cascading Style Sheets (CSS)	689
Amazon Web Services	657

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# SOFTWARE DEVELOPERS, SYSTEMS SOFTWARE (15-1133)

Jobs  
(2017)

2,470

15% below  
national average\*

Median  
Salary

\$86.8K

19% below  
national median

Ave. New Job  
Postings/Month

25

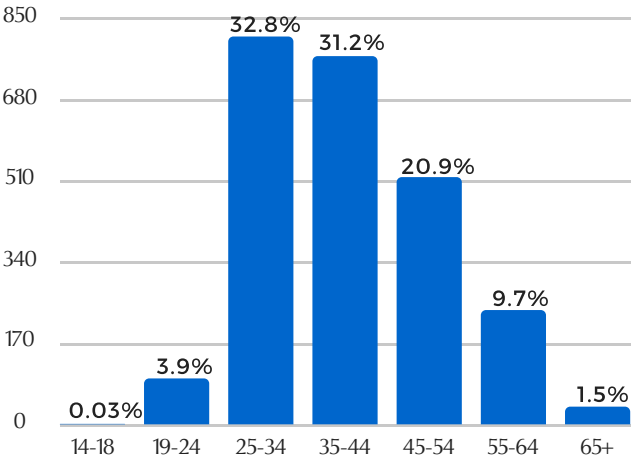
60% below  
national average\*

## DEMOGRAPHICS

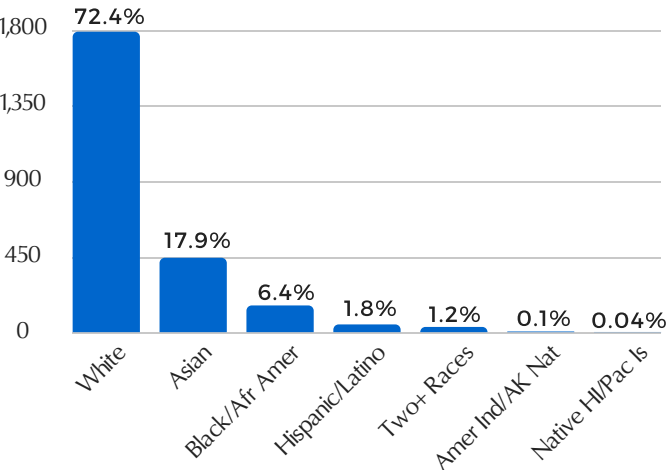
### Gender



### Age



### Race/Ethnicity

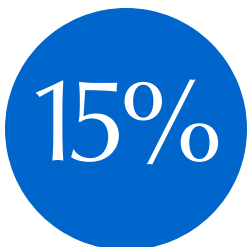


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Systems Engineer (Computer and Mathematical)	131
Software Engineer	60
Systems Engineer (Architecture and Engineering)	11
Mobile Software Engineer	8
Controls Engineer	6
Field Engineer	5
Firmware Engineer	5
Operations Engineer (Computer and Mathematical)	4
Junior Software Engineer	3
Linux Engineer	3

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Systems Engineering	98
Software Engineering	51
Software Development	39
C++ (Programming Language)	36
Linux	36
Systems Design	33
Operating Systems	31
Systems Integration	30
Computer Control Systems	28
C (Programming Language)	27

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# WEB DEVELOPERS (15-1134)

Jobs  
(2017)

777

18% below  
national average\*

Median  
Salary

\$63.9K

6% below  
national median

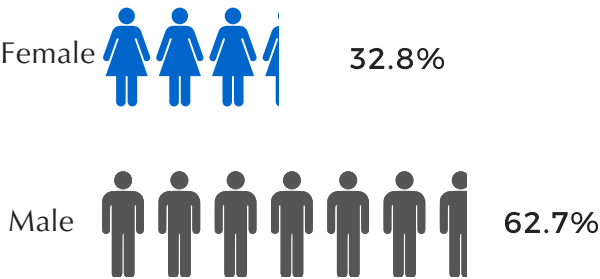
Ave. New Job  
Postings/Month

198

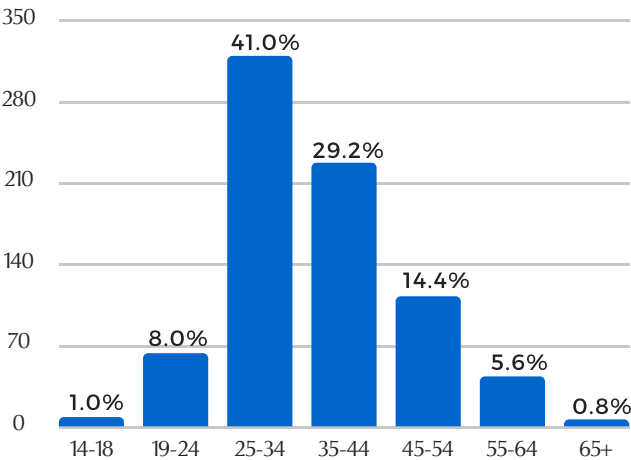
23% below  
national average\*

## DEMOGRAPHICS

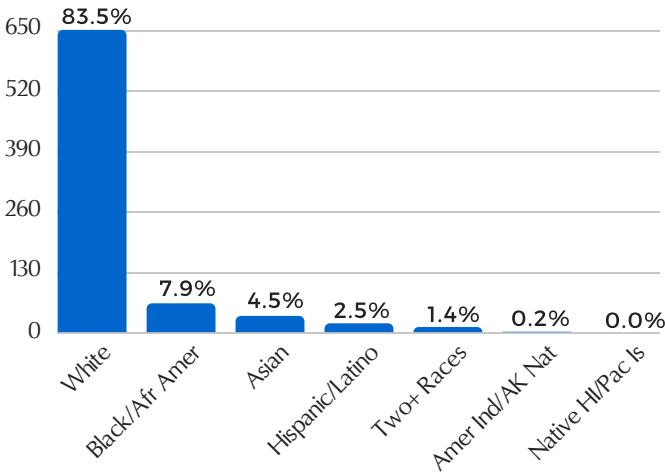
### Gender



### Age



### Race/Ethnicity

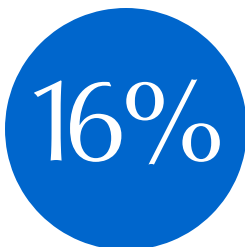


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Java Developer	406
Web Developer	306
Sales Representative	206
Front-End Developer	163
.Net Developer	114
Web Designer (Computer and Mathematical)	63
JavaScript Developer	62
Ruby on Rails Developer	57
PHP Developer	55
Mobile Software Engineer	49

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
JavaScript (Programming Language)	834
Cascading Style Sheets (CSS)	629
Accounting	601
Analytics	595
Search Engine Optimization	591
Language Translation	535
HyperText Markup Language (HTML)	524
Java (Programming Language)	498
SQL (Programming Language)	435
Front End (Software Engineering)	388

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# DATABASE ADMINISTRATORS (15-1141)

Jobs  
(2017)

750

12% below  
national average\*

Median  
Salary

\$86.9K

0% below  
national median

Ave. New Job  
Postings/Month

53

13% above  
national average\*

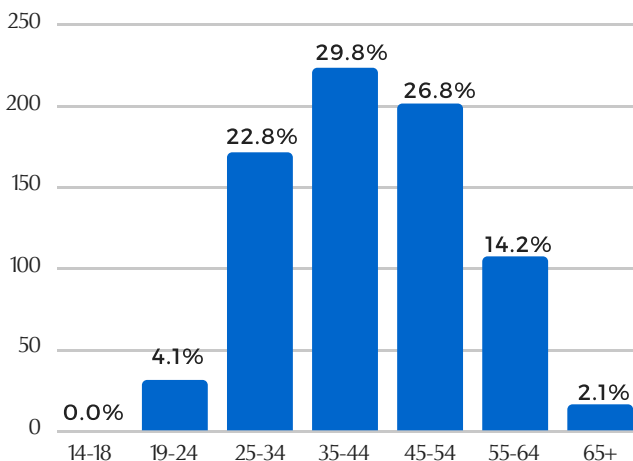
## DEMOGRAPHICS

### Gender

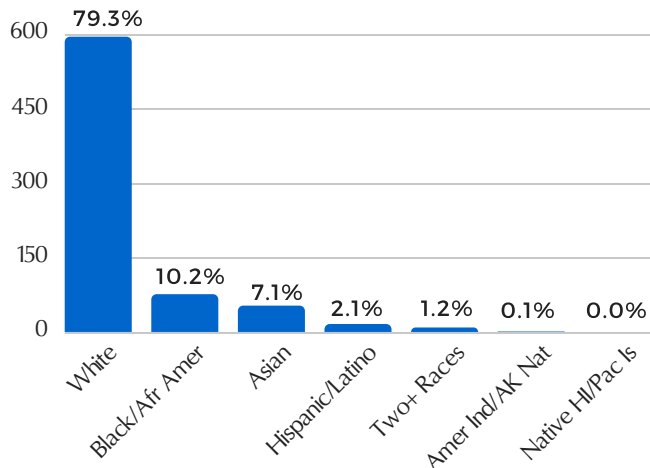
Female  37.7%

Male  62.3%

### Age



### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)

9%

Projected Growth  
(2017-2022)

14%

## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Database Administrator	422
Data Modeler	16
Data Analyst (Computer and Mathematical)	15
SQL Developer	15
Data Architect	10
Oracle Developer	8
Consulting Manager	7
Oracle Consultant	7
Teradata Engineer	6
Database Developer	5

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Database Administration	400
SQL (Programming Language)	315
Performance Tuning	181
Microsoft SQL Servers	162
SQL Server Integration Services	114
Data Warehousing	107
Disaster Recovery	105
Database Design	98
Data Modeling	91
SQL Server Reporting Services	91

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# NETWORK AND COMPUTER SYSTEMS ADMINISTRATORS (15-1142)

Jobs  
(2017)

2,345

17% below  
national average\*

Median  
Salary

\$80.7K

0% below  
national median

Ave. New Job  
Postings/Month

226

4% below  
national average\*

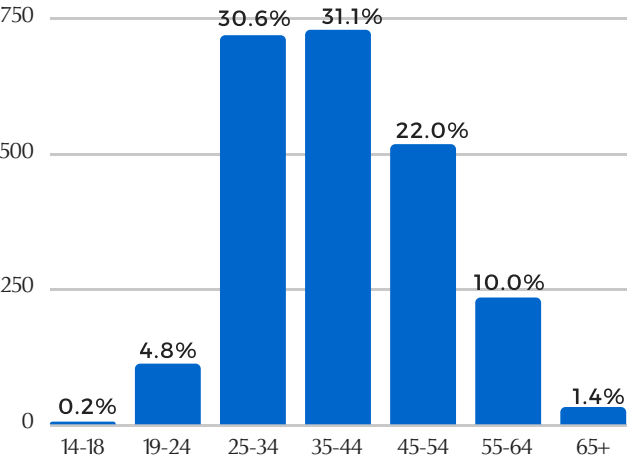
## DEMOGRAPHICS

### Gender

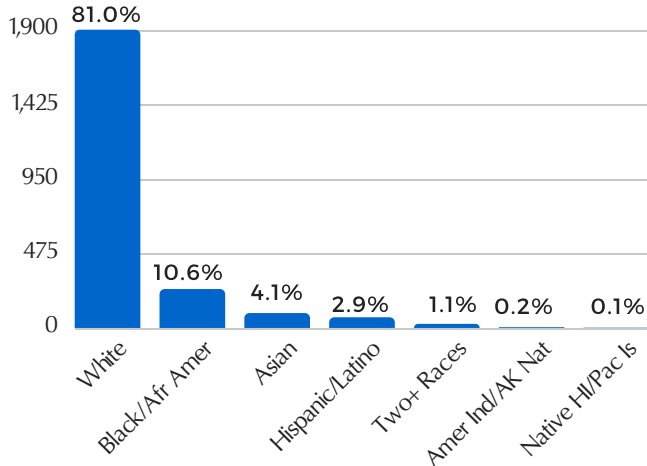
Female  19.6%

Male  80.4%

### Age



### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)

12%

Projected Growth  
(2017-2022)

12%

## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Systems Administrator	420
Network Engineer	361
Systems Engineer (Computer and Mathematical)	238
IT Network Administrator	115
IT System Administrator	82
Windows Administrator	70
IT Support Engineer	55
Linux Administrator	53
Salesforce Developer	34
Support Engineer	33

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Operating Systems	475
Network Switches	410
Wide Area Networks	379
Active Directory	375
Local Area Networks	367
Linux	334
Circuit Switches	265
Systems Engineering	258
Network Routing	257
Disaster Recovery	247

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER NETWORK ARCHITECTS (15-1143)

Jobs  
(2017)

1,020

12% below  
national average\*

Median  
Salary

\$99.4K

5% below  
national median

Ave. New Job  
Postings/Month

18

0% above  
national average\*

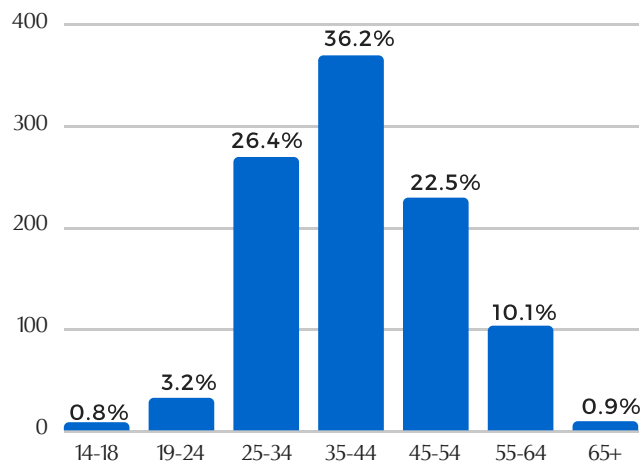
## DEMOGRAPHICS

### Gender

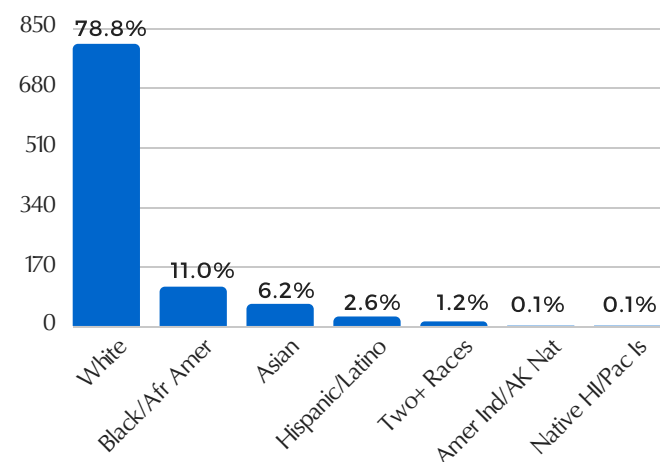
Female  15.4%

Male  84.6%

### Age



### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)

19%

Projected Growth  
(2017-2022)

11%

## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Network Analyst	34
Network Architect	26
Communications Engineer (Computer and Mathematical)	25
Network Engineer	10
Network Manager	9
Information Security Analyst	6
Telecommunications Engineer (Computer and Mathematical)	6
Telecommunications Manager (Computer and Mathematical)	6
Business Analyst (Business and Financial Operations)	5
Senior IT Consultant	5

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Wide Area Networks	75
Local Area Networks	70
Telecommunications	59
Network Routing	50
Network Switches	40
Quality Of Services	34
Border Gateway Protocol	33
Open Shortest Path First	33
Unified Communications	30
Facility Management	27

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER USER SUPPORT SPECIALISTS (15-1151)

Jobs  
(2017)

4,115

18% below  
national average\*

Median  
Salary

\$48.2K

4% below  
national median

Ave. New Job  
Postings/Month

363

22% above  
national average\*

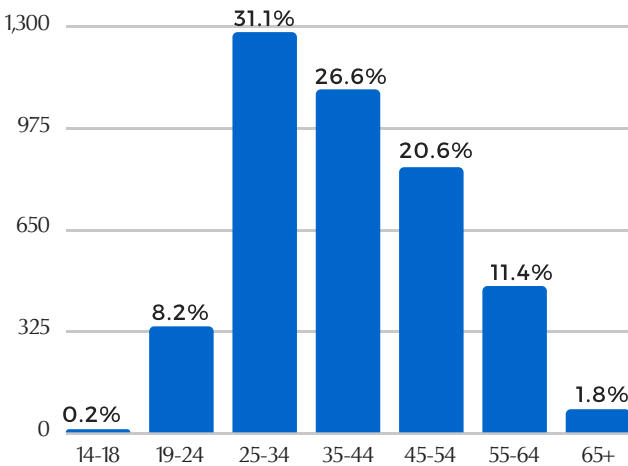
## DEMOGRAPHICS

### Gender

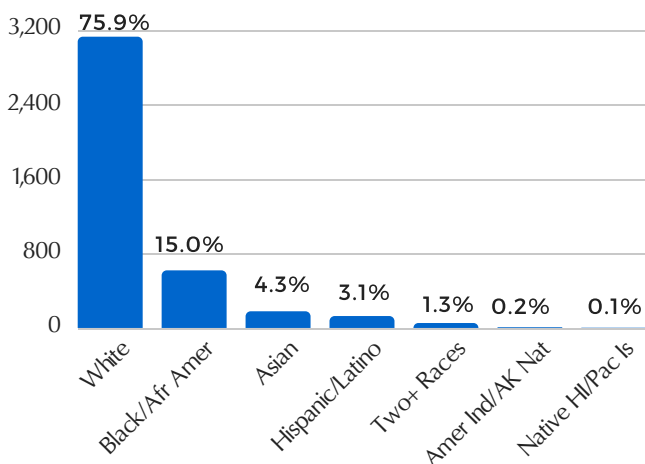
Female  27.4%

Male  72.6%

### Age



### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)

24%

Projected Growth  
(2017-2022)

14%

## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
IT Help Desk Specialist	577
IT Support Analyst	317
Desktop Support Technician	188
Client Support Specialist	187
Support Specialist	151
Technical Support Representative	122
Service Desk Analyst	107
Help Desk Technician	106
Maintenance Technician (Installation, Maintenance, and Repair)	82
PC Technician	82

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Technical Support	984
Help Desk	734
Desktop Support	472
Computer Hardware	398
Operating Systems	380
Customer Support	338
Microsoft Access	306
Service Desk	266
Information Systems	247
Active Directory	230

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER NETWORK SUPPORT SPECIALISTS (15-1152)

Jobs  
(2017)

1,852

25% above  
national average\*

Median  
Salary

\$58K

7% below  
national median

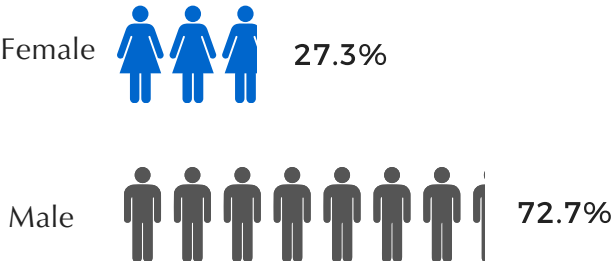
Ave. New Job  
Postings/Month

4

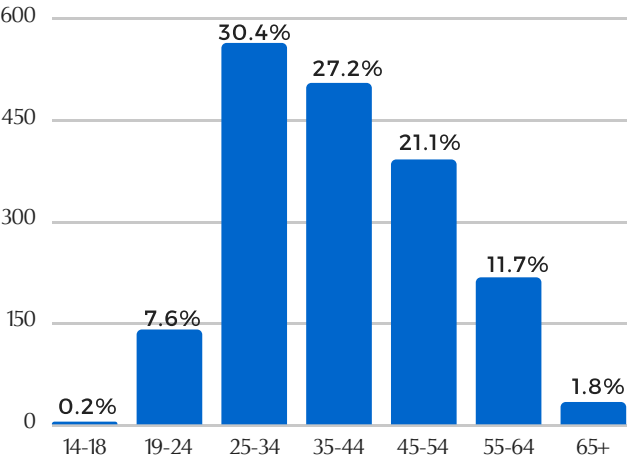
0% above  
national average\*

## DEMOGRAPHICS

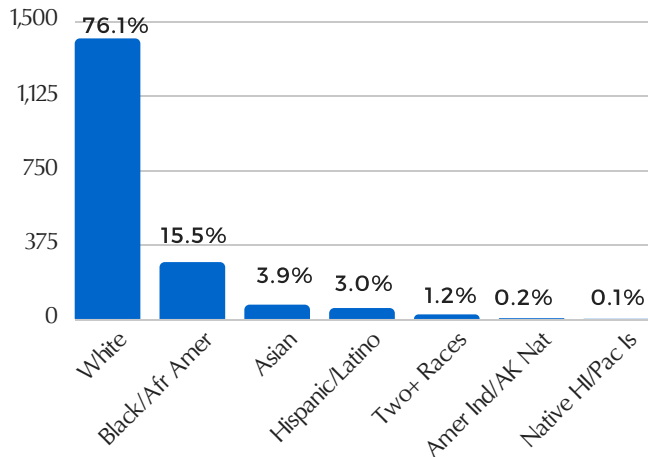
### Gender



### Age

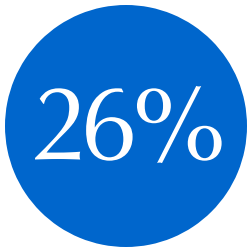


### Race/Ethnicity

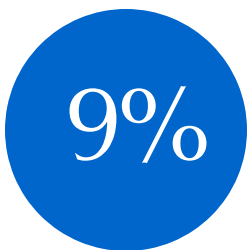


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Network Specialist	9
Operations Support	8
Support Specialist	6
Network Technician	5
Maintenance Technician (Installation, Maintenance, and Repair)	2
Security Technician	2
Clinical Documentation Specialist	1
Contract Specialist	1
IT Field Technician	1
IT Support Engineer	1

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Peripheral	9
Telecommunications	9
Business Continuity	7
Disaster Recovery	7
Network Architecture	7
Network Planning And Design	7
Software Configuration Management	7
Wide Area Networks	7
Artilleries	6
Field Artillery	6

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER OCCUPATIONS, ALL OTHER (15-1199)

Jobs  
(2017)

2,155

12% below  
national average\*

Median  
Salary

\$76.1K

14% below  
national median

Ave. New Job  
Postings/Month

311

21% below  
national average\*

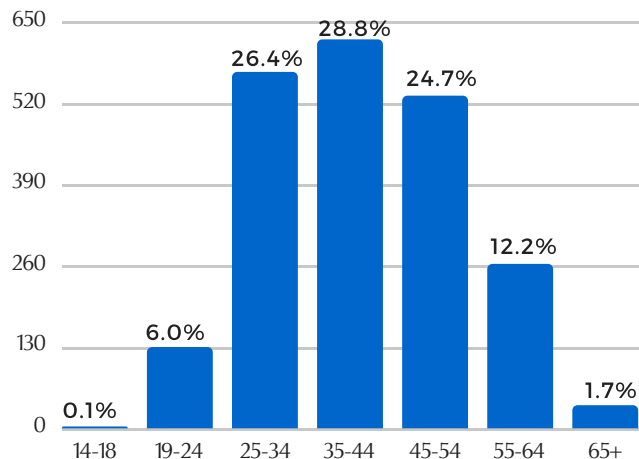
## DEMOGRAPHICS

### Gender

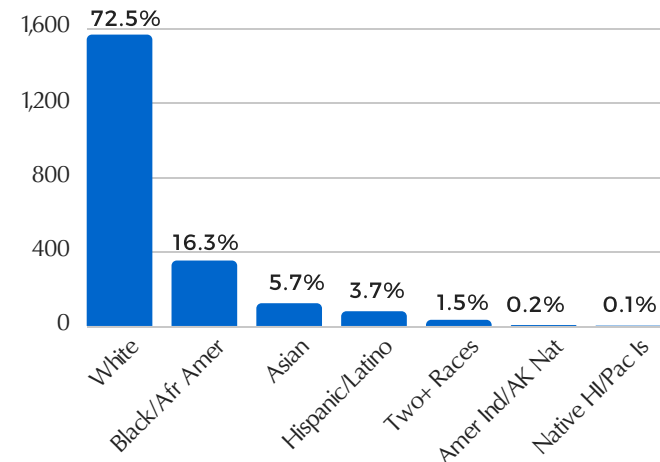
Female  25.6%

Male  74.4%

### Age



### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)

70%

Projected Growth  
(2017-2022)

13%

## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Project Manager (Computer and Mathematical)	593
IT Quality Assurance Analyst	325
Solutions Architect	232
Project Manager (Management)	225
Test Automation Engineer	115
Scrum Master	105
Enterprise Architect	102
Data Architect	98
IT Project Coordinator	66
Software Engineer	66

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Agile Software Development	831
Software Quality Assurance (SQA)	651
Product Quality Assurance	606
Scrum (Software Development)	516
Automation	497
Systems Development Life Cycle	465
Software Development	405
Test Planning	368
Information Systems	354
Test Automation	338

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# OPERATIONS RESEARCH ANALYSTS (15-2031)

Jobs  
(2017)

918

14% above  
national average\*

Median  
Salary

\$67.7K

17% below  
national median

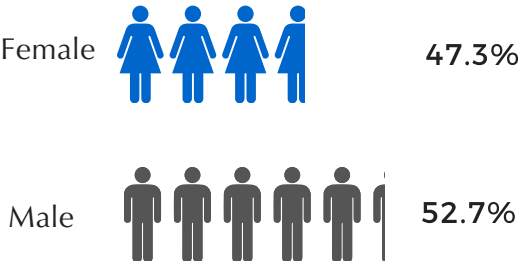
Ave. New Job  
Postings/Month

42

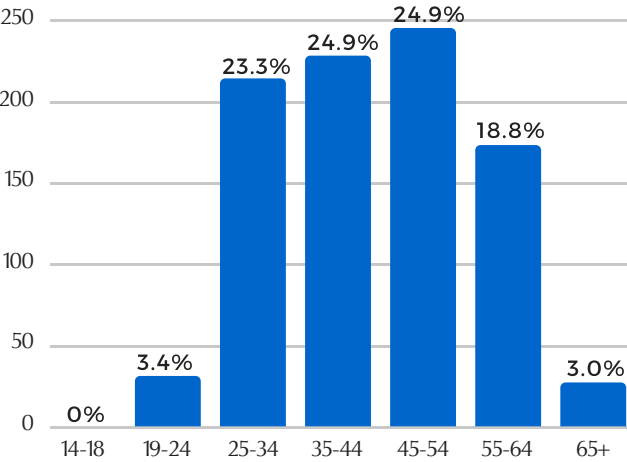
11% above  
national average\*

## DEMOGRAPHICS

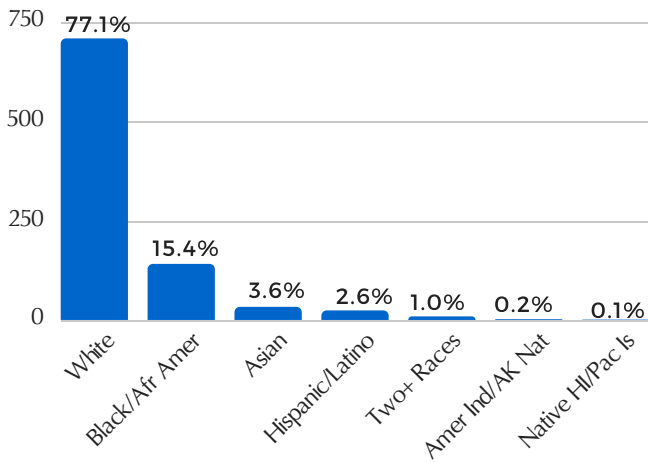
### Gender



### Age

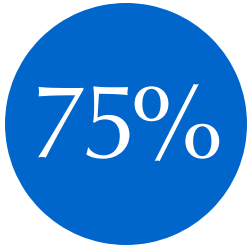


### Race/Ethnicity

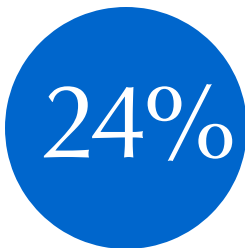


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Supply Chain Analyst	86
Operations Analyst (Computer and Mathematical)	57
Research Analyst (Life, Physical, and Social Science)	53
Operations Analyst (Business and Financial Operations)	42
Business Analyst (Business and Financial Operations)	21
Supply Chain Planner	20
Planning Analyst	12
Systems Analyst	10
Logistics Analyst (Business and Financial Operations)	9
Financial Analyst	8

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Microsoft Access	84
Supply Chain Management	80
Accounting	64
Purchasing	61
Business Process Improvement	59
Warehousing	51
Inventory Management	48
Inventory Control	44
Forecasting	42
Business Process	37

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# STATISTICIANS (15-2041)

Jobs  
(2017)

394

38% above  
national average\*

Median  
Salary

\$63.7K

24% below  
national median

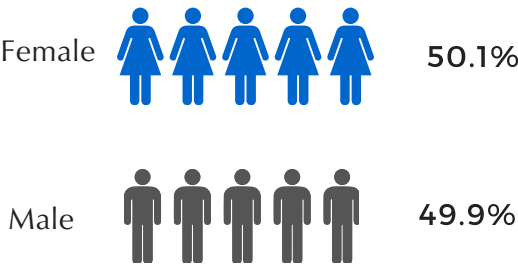
Ave. New Job  
Postings/Month

16

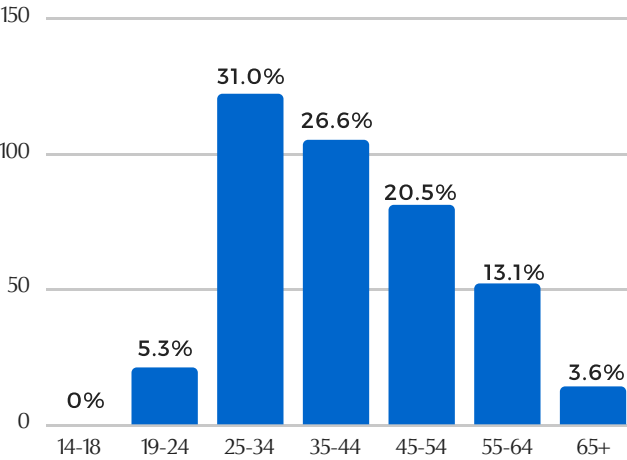
14% above  
national average\*

## DEMOGRAPHICS

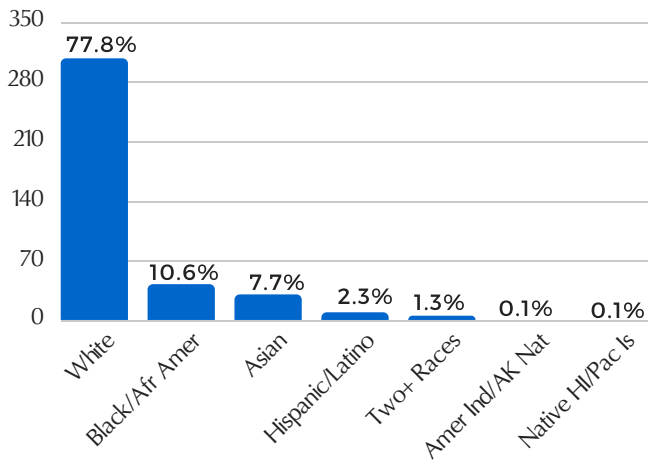
### Gender



### Age

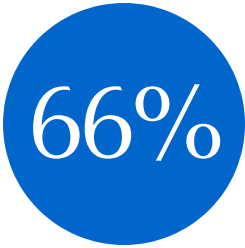


### Race/Ethnicity

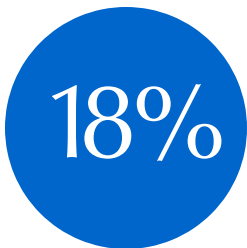


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Clinical Manager (Management)	20
Statistician	18
Biostatistician	15
Clinical Data Manager	14
Data Analyst (Computer and Mathematical)	12
Clinical Analyst	10
Project Analyst (Business and Financial Operations)	8
Statistical Programmer	7
Clinical Systems Analyst	5
Research Analyst (Life, Physical, and Social Science)	5

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Data Management	43
Clinical Trials	38
Statistics	30
Drug Development	28
Good Clinical Practices (GCP)	28
Clinical Research	26
Business Process Improvement	25
Data Collection	23
Timelines	23
Medicare	21

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER HARDWARE ENGINEERS (17-2061)

Jobs  
(2017)

531

7% above  
national average\*

Median  
Salary

\$87.1K

24% below  
national median

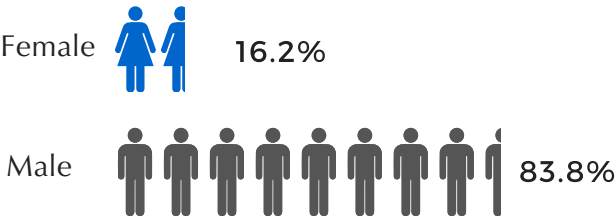
Ave. New Job  
Postings/Month

4

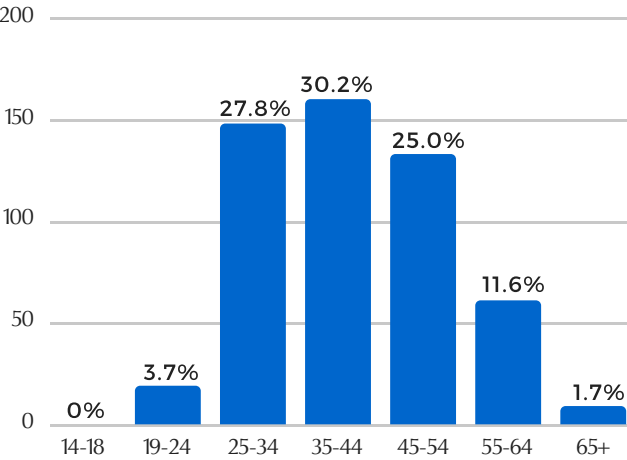
73% below  
national average\*

## DEMOGRAPHICS

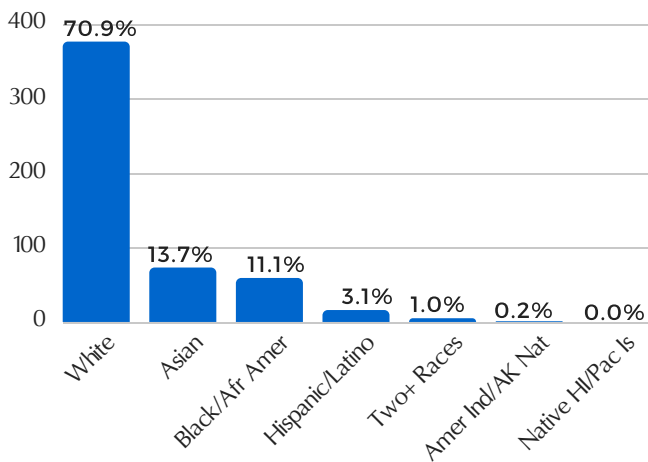
### Gender



### Age

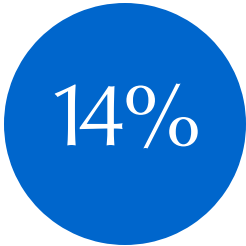


### Race/Ethnicity

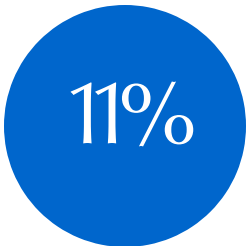


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Design Engineer (Architecture and Engineering)	4
Senior Technician	3
Tooling Engineer	3
Architect	2
Customer Service Representative	2
Design Engineer (Computer and Mathematical)	2
Hardware Engineer (Computer and Mathematical)	2
Network Engineer	2
Performance Engineer (Computer and Mathematical)	2
Project Engineer (Architecture and Engineering)	2

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Language Translation	8
Product Quality Assurance	8
Accounting	7
Analytics	5
Digital Audio Workstation	5
Information Systems	5
Search Engine Optimization	5
Sound Recording And Reproduction	5
WaveLab	5
Computer Engineering	4

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# MULTIMEDIA ARTISTS AND ANIMATORS (27-1014)

Jobs  
(2017)

187

17% below  
national average\*

Median  
Salary

\$50.3K

29% below  
national median

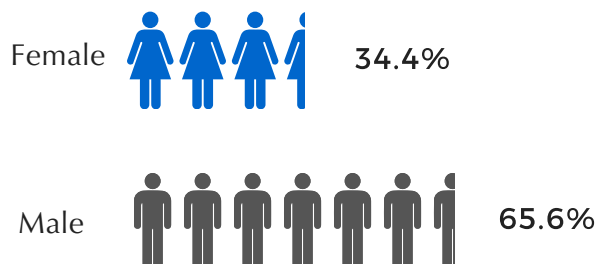
Ave. New Job  
Postings/Month

2

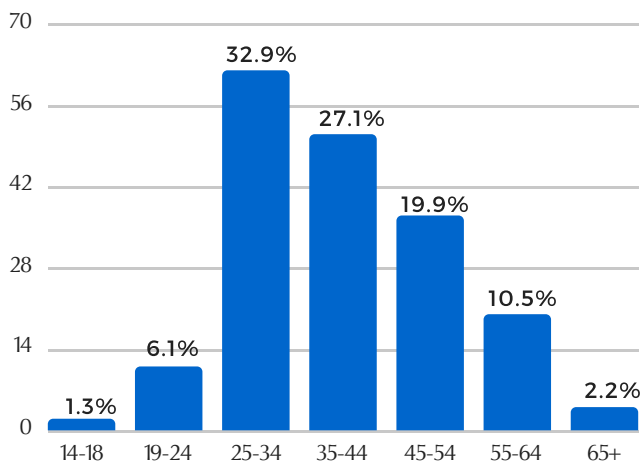
60% below  
national average\*

## DEMOGRAPHICS

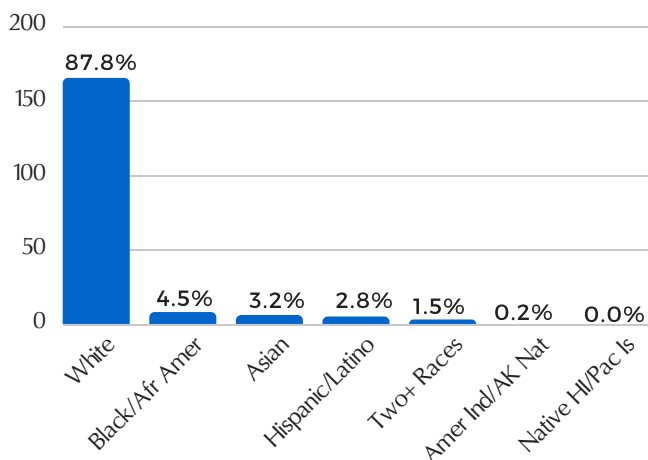
### Gender



### Age

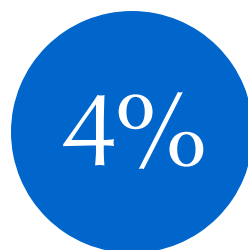


### Race/Ethnicity

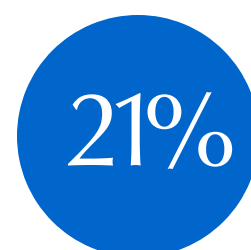


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Illustrator	4
Graphic Designer	3
Designer	2
Solutions Representative (Office and Administrative Support)	2
Animator	1
Artist	1
Graphic Artist	1
Resort Manager	1
Sales Representative	1
Social Media Manager	1

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Animations	10
Accounting	6
Analytics	5
Language Translation	5
Multimedia	5
Search Engine Optimization	5
Adobe Illustrator	4
Adobe Photoshop	4
Compositions	4
Motion Graphic Design	4

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# GRAPHIC DESIGNERS (27-1024)

Jobs  
(2017)

1,591

1% below  
national average\*

Median  
Salary

\$49.9K

2% above  
national median

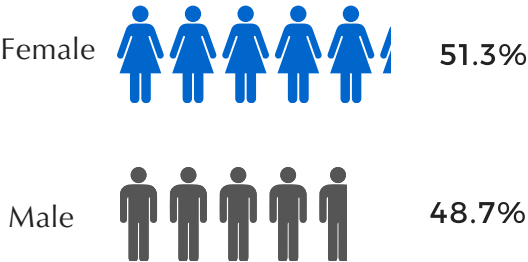
Ave. New Job  
Postings/Month

49

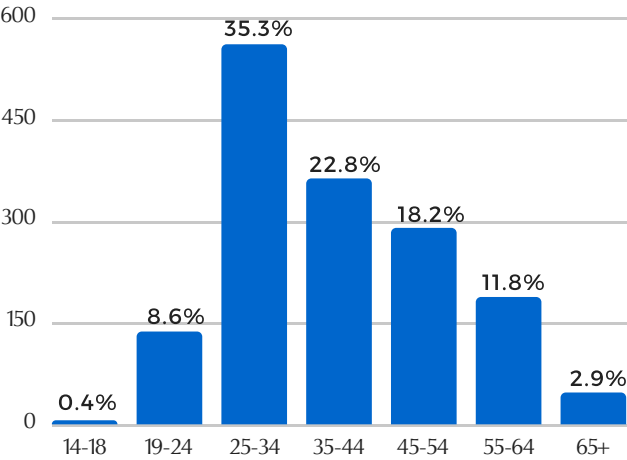
22% below  
national average\*

## DEMOGRAPHICS

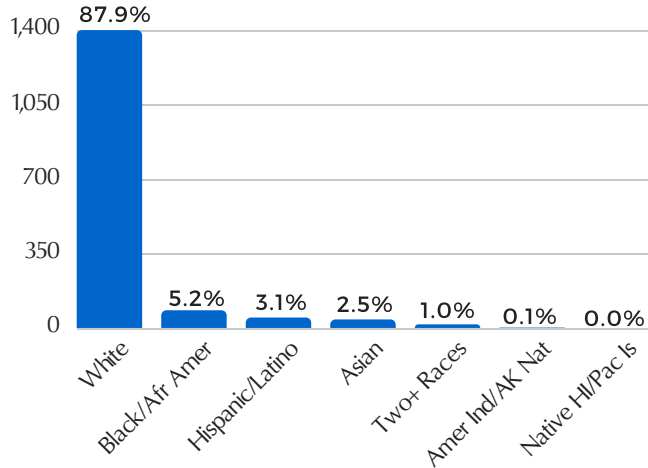
### Gender



### Age



### Race/Ethnicity

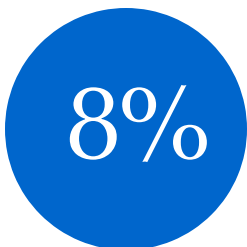


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Graphic Designer	326
Designer	27
Sales Representative	21
Production Artist	16
Artist	14
Digital Designer	13
Graphic Artist	12
Visual Designer	9
Web Designer (Arts, Design, Entertainment, Sport)	9
Package Designer	8

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Adobe Photoshop	231
Adobe Illustrator	223
Graphic Design	214
Adobe InDesign	184
QuarkXPress Design Software	132
Accounting	115
Adobe Creative Suite	115
Branding	112
Search Engine Optimization	85
Analytics	80

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER OPERATORS (43-9011)

Jobs  
(2017)

850

130% above  
national average\*

Median  
Salary

\$44.1K

0% below  
national median

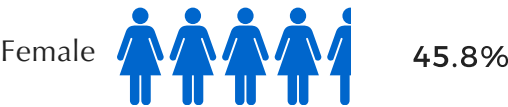
Ave. New Job  
Postings/Month

49

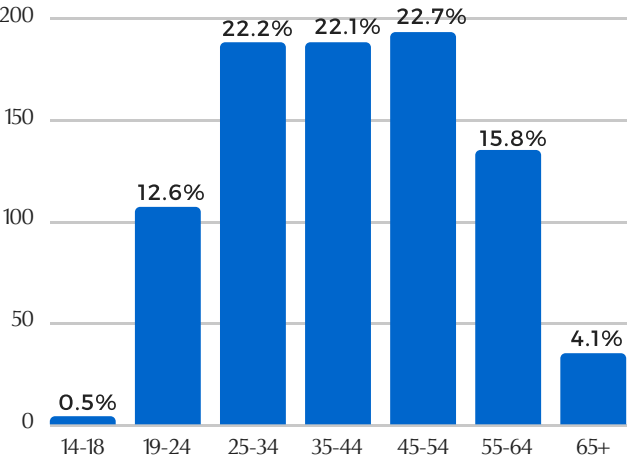
33% below  
national average\*

## DEMOGRAPHICS

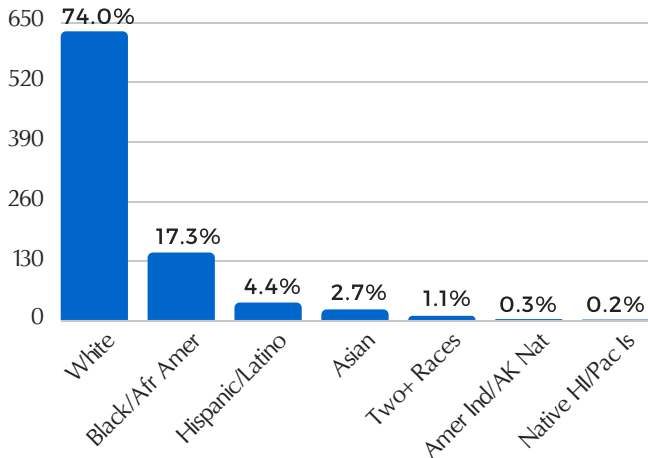
### Gender



### Age

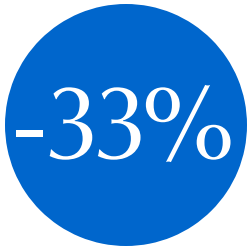


### Race/Ethnicity

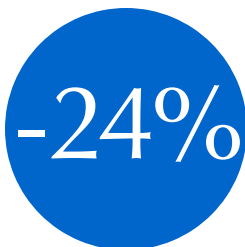


## GROWTH TRENDS

Past Growth  
(2012-2017)



Projected Growth  
(2017-2022)



## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Systems Operator (Production)	11
Computer Operator	4
Control Operator	3
Systems Operator (Computer and Mathematical)	3
IT Operations Administrator	1
Operations Analyst (Computer and Mathematical)	1
PC Technician	1

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Dry Cleaning	10
Service-Level Agreement	4
Acute Care	3
IBM System I	3
Job Scheduling (Batch Processing)	3
Nursing Homes	3
Operations Support Systems	3
Unix	3
Systems Integration	2
Annual Enrollments	1

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.

# COMPUTER, AUTOMATED TELLER, AND OFFICE MACHINE REPAIRERS (49-2011)

Jobs  
(2017)

556

28% below  
national average\*

Median  
Salary

\$32.9K

13% below  
national median

Ave. New Job  
Postings/Month

1

0% below  
national average\*

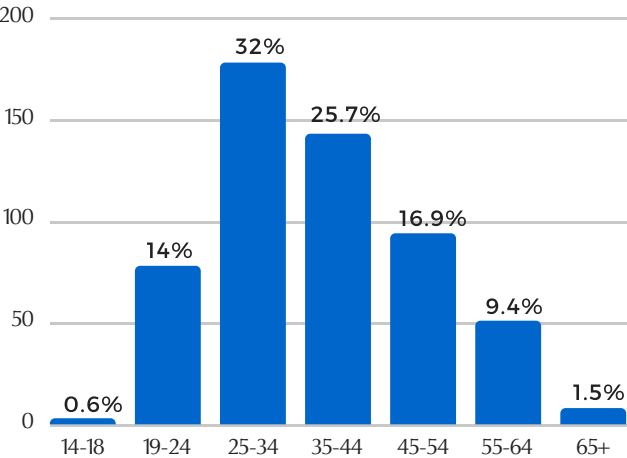
## DEMOGRAPHICS

### Gender

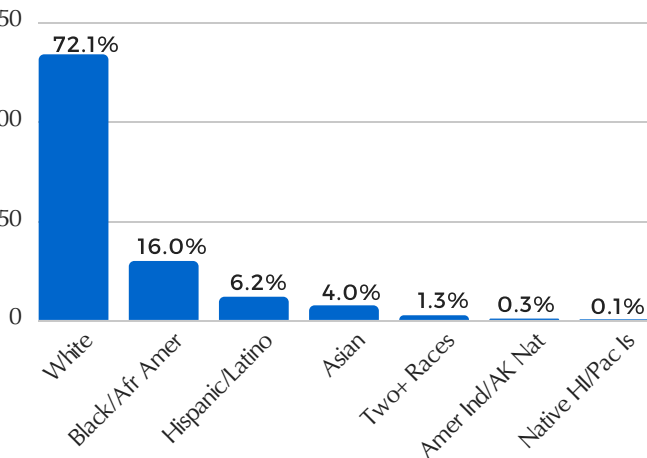
Female  11%

Male  89%

### Age



### Race/Ethnicity



## GROWTH TRENDS

Past Growth  
(2012-2017)

-27%

Projected Growth  
(2017-2022)

6%

## DEMAND

### Top 10 Job Titles

JOB TITLE	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Maintenance Technician (Installation, Maintenance)	8
Copier Technician	3
Entry Level Technical Writer	2
Field Service Engineer	1
Soldering Technician	1

### Top 10 Hard Job Skills

SKILL	UNIQUE POSTINGS (Jul 2017 - Jun 2018)
Balancing (Ledger/Billing)	4
Field Service Management	4
Data Centers	3
Project Commissioning	3
Service Delivery	3
Service-Level Agreement	3
Loyalty Programs	1
Outsourcing	1
Purchasing	1
Soldering	1

\*National average values are derived by taking the national value for the occupation and scaling it down to account for the difference in overall workforce size between the nation and your area. In other words, the values represent the national average adjusted for region size.