



LEAP 2018 OCCUPATIONAL  
ANALYSIS

CENTER FOR ECONOMIC RESEARCH IN TENNESSEE (CERT)  
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# INTRODUCTION

Under the leadership of Governor Bill Haslam and the Department of Economic and Community Development Commissioner Bob Rolfe, Tennessee continues to experience increased job growth throughout the state. Current private sector employment has increased to 2.65 million, up 20.2 percent from the beginning of the Haslam Administration.<sup>1</sup> The state's unemployment rate began to steadily decline in 2017 and has reached historic lows, landing at 3.6 percent in September 2018. Tennessee's unemployment rate has trailed below the national average since the beginning of 2016. Furthermore, the state's labor force has steadily been rising, ranking among the top 10 states for growth year-over-year.<sup>2</sup>

The 2018 Labor and Educational Alignment Program (LEAP) Report is the final one to be released under Governor Haslam's tenure. The creation of Drive to 55 has forever changed the education landscape in Tennessee and provided unprecedented access to college for all Tennesseans. Since its launch, Drive to 55 has increased the postsecondary educational attainment of Tennesseans to 40.7 percent, up from the original 32.1 percent starting point.<sup>3</sup> As of today, given the current enrollment and completion trends, Tennessee is on track to meet the Drive to 55 goal.

## *Tennessee Promise*

Tennessee Promise provides high school students two years of tuition-free community or technical college for up to five semesters. In addition to removing the financial barrier, the program also provides students with a volunteer mentor to help guide them through the college application process. In return, the student must attend mandatory meetings, meet critical deadlines, complete eight hours of community service each semester, and maintain a 2.0 GPA throughout their tenure.

## *Tennessee Reconnect*

The Drive to 55 mission cannot be attained without the participation of adults. Tennessee Reconnect uses Tennessee Reconnect communities to focus on and serve the 900,000 to 1,000,000 adults who have completed some college but have not obtained a certificate or credential. As of fall, 2018, all Tennessee residents can earn a diploma or certificate at any of the 40 Tennessee Community or Applied Technology Colleges (TCATs) completely free of tuition and fees. There are also opportunities to attend select universities.

## *Tennessee Labor and Education Alignment Grant (LEAP)*

Spearheaded by Senate Majority Leader Mark Norris, LEAP has changed the culture of how Tennesseans address and tackle workforce challenges. Governor Haslam and the Tennessee Legislature has provided \$20M in competitive grant funding to eliminate skills gaps across the state in a proactive, data-driven, and coordinated manner by encouraging collaboration across education and industry.

## *Advise TN*

Advise TN is a college advising and capacity building program driven by the belief that every student has the potential to attend and thrive in postsecondary education. Advise TN aims to increase the number of Tennesseans accessing higher education by partnering with high schools and providing college advising services to up to 10,000 junior and senior students across Tennessee. The program began in fall 2016 and will provide services at participating high schools with the intention of helping students enroll in the postsecondary option where the student will be most likely to succeed and persist to a degree or credential.

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<sup>1</sup> Source: Bureau of Labor Statistics, Current Employment Survey (January 2011 through September 2018).

<sup>2</sup> Tennessee's labor force has grown by 36,495 people between September 2017 and September 2018 (ranking 9<sup>th</sup> in the nation for growth during this time). Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

<sup>3</sup> Source: Lumina Foundation. Estimates are for Tennessee residents ages 25 to 64.

*Apprenticeships and Work-Based Learning*

As the state unemployment rate continues to decrease, the development of workforce pipelines becomes increasingly important. Governor Haslam invested \$1,000,000 into an innovative Work-Based Learning Grant program, a total of 40, \$25,000 grants have been distributed across the state to school districts.

The Tennessee Department of Labor and Workforce Development partnered with Economic and Community Development to address the need for a statewide strategic plan for apprenticeship and pre-apprenticeship programs. The work in 2018 included a statewide tour and an Apprenticeship Summit in May. A complete plan for a state strategy will be available in early 2019.

## UTILIZING LEAP REPORT 2018

Pursuant to Section 10 of Public Chapter 338, the Tennessee Department of Economic and Community Development will submit a report to partner agencies on demonstrated workforce needs within existing and prospective businesses across the state. The following report fulfills this requirement.

LEAP 2018 Occupational Analysis identifies 259 in-demand occupations based on hires, projected openings, and/or postings relative to the total number of individuals employed in each of those occupations. In addition, postsecondary programs of study linked to information technology, production, engineering, healthcare, business and financial operations, and transportation and material moving occupations are outlined regionally, showing alignment and opportunities for alignment between education and industry in Tennessee.

This report seeks to aid in local, regional and state policy decision-making by depicting in-demand occupations. The following are specific examples of how to best utilize the LEAP 2018 Occupational Analysis.

- 1) Community Education: This report can be used as a teaching resource to inform youth, adults, traditional and non-traditional students, teachers, guidance counselors, parents, chambers of commerce and economic development professionals about in-demand occupations in Tennessee.
- 2) Increase in Postsecondary Offerings: This report can be used to identify gaps in educational programming connected to in-demand occupations and depict opportunities to develop postsecondary programs aligned to the demonstrated need.
- 3) Increase in K-12 Offerings: This report can be used to identify gaps in secondary education programs alignment to in-demand opportunities. Companies can also increase partnerships with school systems through career exploration courses, guest speaker events, facilitating industry tours and work-based learning experiences for K-12 students.
- 4) Education and Industry Partnerships: This report highlights the need and opportunities for increased education and industry alignment. Both partners can proactively approach one another to explore strategies.
- 5) Expanded Education Work Experiences: The best way to learn about an occupation is to experience it firsthand. Programs such as work-based learning, internships, co-ops and apprenticeships are valuable opportunities for the company and student, as well as the educational institution. In addition, there are state and federal resources available to support the expansion of these programs.
- 6) Data Support: The data from this report and the full download can be utilized in applications to pursue local, state and federal grants attainment.

The Labor and Educational Alignment Program (LEAP) Report serves to identify occupations throughout the state which are in high demand by Tennessee's business community. This report is not meant to be an extensive list of occupations and education programs. It is intended to be a guide to start next step conversations. Tennessee is poised to continue to experience extraordinary growth. The availability of a strong workforce pipeline and the statewide alignment of education and industry are necessary for future statewide success.

## OCCUPATIONAL ANALYSIS: JOBS WITH HIGH EMPLOYER DEMAND

The Center for Economic Research in Tennessee (CERT) conducted an analysis to identify jobs for which Tennessee employers have a high demand to fill. For each of the state's nine regions, CERT analyzed occupations with high numbers of job postings, hires and/or projected job openings relative to the total number of individuals employed in an occupation.

In total, CERT identified 259 job classifications<sup>4</sup> with high employer demand in one or more Tennessee regions. Out of 775 job classifications, CERT identified for each region several in-demand job classifications ranging from 113 to 123. In total, these occupations had 5.6 million regional geography-tied unique job postings in 2017; over 940,000 hires in 2017; and over 136,000 projected average annual job openings from 2017 to 2022.

Tennessee Region	Number of Occupations with High Employer Demand	For Job Classifications in High Demand:		
		Unique Job Postings (2017)	Hires (2017)	Projected Average Annual Openings (2017 -2022)
Greater Memphis	122	555,372	176,693	22,808
Northwest	119	309,552	20,391	3,148
Southwest	113	72,000	24,673	3,687
Northern Middle	122	2,009,244	324,963	48,168
Southern Middle	119	472,044	46,139	7,088
Upper Cumberland	123	344,652	35,913	5,847
East	123	926,772	149,093	23,982
Southeast	118	582,576	114,123	14,105
Northeast	113	385,308	48,606	7,833
Total	259	5,657,520	940,594	136,666

The 259 job classifications with high employer demand range across various industries and require a wide range of skill sets and training. This report highlights those in-demand positions which fall into **priority occupation groups** and **target industry clusters** that are relevant to the department's business recruitment and expansion strategy. Positions requiring **Science Technology Engineering and Mathematics (STEM)** skills are also highlighted in blue font in Appendix A and Appendix B, as a strong STEM workforce is critical to Tennessee's continued growth of advanced industries. For a full view of all positions with high employer demand, including positions outside of these key priority areas, please see Appendix A and Appendix B. Further information is also available in an interactive dashboard format and a data download, both of which are hyper-linked on page 1.

### **Priority Occupation Groups**

The report highlights positions with high employer demand in the following occupation groups:

- Information technology occupations (see page 10),
- Production occupations (see page 13),
- Healthcare occupations (see page 19),
- Engineering and engineering-related occupations (see page 16),
- Business and financial operations occupations (see page 24), and
- Transportation and material moving occupations (see page 28).

<sup>4</sup> The 259 occupations with high employer demand in one or more Tennessee regions are provided in Appendix A on page 30.  
CERT

For each of these occupation groups, programs offered at Tennessee colleges and universities are highlighted which support and supply the workforce for occupations with high employer demand.

While six occupation groups are highlighted in this report, nearly every occupation group has positions in high demand. The table below reflects the total number of job classifications within each group, and the share of those occupations identified as in-demand.

Occupation Group	Occupations with High Employer Demand in 1 or More Regions	All Occupations in Group
Management (11-0000)	15	34
<b>Business and Financial Operations (13-0000)</b>	<b>15</b>	<b>30</b>
<b>Computer and Mathematical (15-0000)</b>	<b>13</b>	<b>18</b>
<b>Architecture and Engineering (17-0000)</b>	<b>8</b>	<b>35</b>
Life, Physical, and Social Science (19-0000)	3	43
Community and Social Service (21-0000)	8	17
Legal (23-0000)	1	9
Education, Training, and Library (25-0000)	3	27
Arts, Design, Entertainment, Sports, and Media (27-0000)	7	41
<b>Healthcare Practitioners and Technical (29-0000)</b>	<b>10</b>	<b>60</b>
<b>Healthcare Support (31-0000)</b>	<b>11</b>	<b>17</b>
Protective Service (33-0000)	5	22
Food Preparation and Serving Related (35-0000)	2	18
Building and Grounds Cleaning and Maintenance (37-0000)	6	10
Personal Care and Service (39-0000)	5	31
Sales and Related (41-0000)	16	22
Office and Administrative Support (43-0000)	33	56
Farming, Fishing, and Forestry (45-0000)	7	15
Construction and Extraction (47-0000)	22	59
Installation, Maintenance and Repair (49-0000)	21	52
<b>Production (51-0000)</b>	<b>33</b>	<b>106</b>
<b>Transportation and Material Moving (53-0000)</b>	<b>15</b>	<b>51</b>
Military (55-0000)	-	1
Unclassified (99-9999)	-	1
TOTAL	259	775

### **Target Industry Clusters**

TNECD is committed to supporting the growth of industry clusters in Tennessee through targeted business development efforts. An industry cluster is a regional concentration of related industries in a particular location, consisting of companies, suppliers, service providers, government agencies, and other institutions that provide specialized training, education, information, research and technical support. Industry clusters enhance the competitiveness of businesses by creating a strong network of local suppliers. TNECD's industry cluster strategy focuses on clusters with a strong presence and/or growth potential in Tennessee.

Cluster strategy presents opportunities for strengthened and strategic workforce development efforts. The presence of an industry cluster often coincides with a regional workforce that specializes in supporting fields of study and skill sets. Employers within a cluster may seek to fill many of the same or similar occupations--consequently creating a collective employer demand for supporting programs of study. An increase in the



number of companies operating in a cluster, or the expansion of existing companies in a cluster, further contributes to a collective employer demand for supporting programs of study. A cycle of company growth and workforce training leads to high quality employment for Tennesseans exiting an educational institute.

TNECD has identified several industry clusters in which Tennessee has demonstrated a strong competitive advantage. Tennessee has experienced significant company expansion and recruitment success in these sectors and continually develops strategies that facilitate sustained growth.

- The **chemicals** cluster includes manufacturers that produce a wide range of products such as petroleum, coal products, basic chemicals, paints, adhesives, soaps, cleaning solutions, resins, fibers, and agricultural chemicals like fertilizers and pesticides.
- The **food and beverage cluster**, which includes 42 industries, encompasses the processing and manufacture of food and beverage products. Service industries such as the restaurant sector are not included.
- The **healthcare and medical devices cluster** includes production of medical equipment, supplies, and pharmaceuticals, as well as medical research. Service industries such as hospitals and doctor's offices are not included.
- The **advanced materials cluster** involves manufacturing of heat-treated materials to produce glass, rubber, and clay products.
- The **business services cluster** includes headquarters, business support services like accounting and logistics consulting, computer services, and research and development.
- The **aerospace and defense cluster** manufactures aircraft, engines, and other parts as well as weaponry ranging in size from small arms to nuclear weapons.
- The **electrical equipment and appliances cluster** manufactures household appliances, as well as electrical components like switchboards.
- The **automotive cluster** includes industries that produce motor vehicles and vehicle parts.
- The **transportation, distribution and logistics** cluster encompasses the distribution of products across the globe and related services.
- The **film and entertainment cluster** includes production of film and television series, as well as activities in the music production and video gaming industries.

Occupations which are key to the workforce composition of TNECD's target industry clusters are indicated in a column named "Key to Industry Clusters" in the tables of this report. These key occupations represent a high share of the staffing patterns of one or more of TNECD's clusters. Appendix B on page 37 shows the industry cluster(s) which in-demand occupations support.

To learn more about Tennessee's industry clusters, please visit the research and publications section of TNECD's website.

### ***Science, Technology, Engineering and Math (STEM):***

Science, Technology, Engineering and Math (STEM) occupations are high-wage jobs with many openings in Tennessee. Around 7.5 percent of Tennessee's projected openings from 2017 to 2022 are in STEM and STEM-related fields. STEM and STEM-related jobs are projected to grow by 18 percent in Tennessee in the next ten years (2017-2027); over the same time, all occupations are projected to grow 12 percent.

Most of the regionally in-demand STEM and STEM-related occupations are within the IT, engineering and healthcare occupation groups, which are highlighted in this report.

# METHODOLOGY

To measure jobs which have “high” employer demand relative to average or low employer demand, CERT analyzed postings, hires and openings for an occupation relative to total number of individuals employed in the occupation. Occupations which meet at least two of these three requirements are identified to have high employer demand:

1. The ratio of job postings (2017) to the number of individuals employed in an occupation is greater than or equal to the median ratio for all occupations in the region.
2. The ratio of hires (2017) to the number of individuals employed in an occupation is greater than or equal to the median ratio for all occupations in the region.
3. The ratio of projected average annual job openings (averaged over 2017 to 2022) to the number of individuals employed in an occupation is greater than or equal to the median ratio for all occupations in the region.

CERT set a minimum wage threshold to encourage job creation and skill development in high quality jobs. All occupations identified have a median wage which is at least 75% of the median wage for the region.

Occupations employing less than 0.04 percent of the region’s total number of employed individuals are excluded.

## DATA DEFINITIONS:

*Unique Job Postings:* ‘Unique Job Postings’ denotes the number of de-duplicated job advertisements listed by companies on online career sites or job boards. De-duplication is a process used to count a job posting only once even if there are listings of the same job on multiple career websites or online jobs boards.

*Hires:* A hire is reported by the Census Bureau’s Quarterly Workforce Indicators (QWI) when an individual’s Social Security number appears on a company’s payroll and was not there the quarter before. The QWI program produces a comprehensive tabulation of employment and wage information for workers covered by state unemployment insurance laws, similar to the BLS QCEW program.

*Projected Average Annual Openings:* This figure estimates the projected employment change (new jobs) and turnover (replacements) for an occupation, averaged over the total years in the timeframe. ‘New Jobs’ estimates the change in the total number of workers employed in an occupation. ‘Replacement Jobs’ estimates the workers that are permanently leaving the workforce or changing occupations.

## SOURCE:

Data in this report comes from Economic Modeling Specialists, Intl. (EMSI). (2018.3 Class of Worker).

Major data sources for the 2017.3 EMSI release include: BLS Quarterly Census of Employment & Wages 2017Q4; BLS Occupational Employment Statistics 2017; BLS Employment Projections 2016-2026; BEA State Personal Income 2016; BEA Local Area Personal Income 2016; Census Bureau American Community Survey 2016; Census Bureau Quarterly Workforce Indicators (QWI) 2018Q1; BLS Industry/Occupation Employment Matrix 2016-2026; US Department of Education National Center for Education Statistics Integrated Postsecondary Education Data System (IPEDS).

**IPEDS Data:** The Integrated Postsecondary Education Data System (IPEDS) from the U.S. Department of Education is the source of postsecondary program completion data incorporated in this report. IPEDS is a comprehensive data source because institutions, public and private, that participate in federal student aid programs are required by the Higher Education Act of 1965 to report their data to IPEDS. These institutions self-report, so there is a possibility for errors and inconsistencies.

# INFORMATION TECHNOLOGY (IT) OCCUPATIONS

Information technology (IT) occupations are in high demand both in Tennessee and the nation. In-demand IT occupations are strongly concentrated in the business services cluster—occupations like software developers are crucial for the growth of computer services industries and headquarters industries. Major corporations are increasingly interested in outsourcing their IT needs to third-party providers. Computer user support specialists are often found in industries that include direct-to-consumer services, such as medical wholesaling, computer wholesaling, and e-commerce. Manufacturers utilize software for product design. Computer programmers are instrumental for research and development programs as well as the manufacture of technical products like irradiation apparatuses for medical use and electrical equipment.

The table below outlines IT occupations that have high employer demand in one or more Tennessee regions.

### Table legend:

- An “X” denotes regions in which the occupation has high employer demand;
- a “\*” denotes the occupation is key to one or more of TNECD’s target industry clusters;
- and letters in the “Related Programs” column correspond to key postsecondary programs<sup>5</sup> for IT outlined in the following pages.

## IN-DEMAND IT OCCUPATIONS

SOC Code	Occupation	Region								Number of Regions	Key to Industry Clusters	Related Programs	
		East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast				Upper Cumberland
15-1121	Computer Systems Analysts					X	X				2	*	a, c, f
15-1122	Information Security Analysts				X	X			X		3	*	b, c, d, f
15-1131	Computer Programmers		X		X	X		X		X	5	*	b, c, e, i, j
15-1132	Software Developers, Applications		X	X	X	X	X	X	X	X	8	*	b, c, h, i, j
15-1133	Software Developers, Systems Software					X		X		X	3	*	b, c, h, i, j
15-1134	Web Developers	X			X	X			X		4	*	b, g, i
15-1141	Database Administrators					X					1	*	a, d
15-1142	Network and Computer Systems Administrators		X	X	X	X	X	X	X	X	8	*	a, d
15-1143	Computer Network Architects	X			X	X			X		4	*	a, c, d, f, h
15-1151	Computer User Support Specialists	X	X	X	X	X	X	X	X	X	9	*	
15-1152	Computer Network Support Specialists			X			X	X			3	*	b, d, f, i
15-1199	Computer Occupations, All Other			X				X	X	X	4	*	a, b

<sup>5</sup> The programs of study included in this report reflect credential programs in Tennessee. Alternative training methods including apprenticeships, industry certifications and non-credential programs are not included.

## KEY TRAINING PROGRAMS FOR IT

The 2017 completions by institution are included in parenthesis after the institution name in the tables below.

### a. **Computer and Information Sciences, General (CIP 11.0101)**

In the last five years, over 2,260 Tennesseans completed a postsecondary certificate or degree in this program. There are 18 postsecondary institutions which awarded a total of 42 certificates, 214 associates degrees, 165 bachelor's degrees, and 16 master's degrees for this program in 2017.

Austin Peay State University (82)	East Tennessee State University (75)	Pellissippi State CC (60)
Volunteer State CC (36)	Northeast State CC (32)	TCAT-Shelbyville (28)
Southwest Tennessee CC (27)	Jackson State CC (19)	Chattanooga State CC (18)
Walters State CC (14)	Nashville State CC (10)	Columbia State CC (8)
Milligan College (8)	Freed-Hardeman University (5)	Roane State CC (4)
Fisk University (4)	Belmont University (4)	Maryville College (3)

### b. **Computer Science (CIP 11.0701)**

In the last five years, over 2,150 Tennesseans completed a postsecondary certificate or degree in this program. There are 18 postsecondary institutions which awarded a total of 21 certificates, 50 associates, 122 bachelor's, and 75 master's degrees for this program in 2017.

Vanderbilt University (111)	University of Tennessee-Knoxville (99)	Middle Tennessee State University (71)
University of Memphis (70)	Tennessee Technological University (63)	Tennessee State University (50)
University of Tennessee-Chattanooga (46)	University of Tennessee-Martin (20)	Rhodes College (15)
Sewanee-The University of the South (13)	Southern Adventist University (6)	Christian Brothers University (6)
Lane College (4)	Lipscomb University (3)	Le Moyne-Owen College (2)
Union University (2)	Milligan College (2)	Carson-Newman University (1)

### c. **Information Technology (CIP 11.0103)**

In the last five years, over 1,160 Tennesseans completed a postsecondary certificate or degree in this program. There are 16 postsecondary institutions which awarded a total of 1 certificate, 458 bachelor's, 100 master's, and 25 doctoral degrees for this program in 2017.

King University (85)	Middle Tennessee State University (50)	University of Memphis (24)
Fountainhead College of Technology (23)	Trevecca Nazarene University (16)	Daymar College-Clarksville (15)
Strayer University-Tennessee (11)	Pellissippi State CC (11)	TCAT-Livingston (9)
Lee University (8)	Dyersburg State CC (5)	Lipscomb University (3)
Roane State CC (3)	Bethel University (2)	Chattanooga State CC (2)
Union University (1)		

### d. **Computer and Information Systems Security/Information Assurance (CIP 11.1003)**

In the last five years, 394 Tennesseans completed a postsecondary certificate or degree in this program. There are 5 postsecondary institutions which awarded a total of 16 certificates, 29 bachelor's, and 1 master's degrees for this program in 2017.

Fountainhead College of Technology (23)	Nashville State CC (16)	Lipscomb University (3)
University of Phoenix-Tennessee (3)	Strayer University-Tennessee (1)	

**e. Management Information Systems, General (CIP 52.1201)**

In the last five years, over 1,020 Tennesseans completed a postsecondary certificate or degree in this program. There are 10 postsecondary institutions which awarded a total of 52 certificates, 195 bachelor's, and 1 master's degrees for this program in 2017.

Middle Tennessee State University (100)	TCAT Nashville (57)	University of Memphis (53)
University of Tennessee-Martin (14)	Belmont University (10)	Bethel University (7)
Christian Brothers University (5)	Martin Methodist College (5)	Carson-Newman University (1)
DeVry University-Tennessee (1)		

**f. Computer Systems Networking and Telecommunications (CIP 11.0901)**

In the last five years, 785 Tennesseans completed a postsecondary certificate or degree in this program. There are 8 postsecondary institutions which awarded a total of 38 certificates, 34 associates, and 1 bachelor's degrees for this program in 2017.

Pellissippi State CC (19)	Nashville State CC (16)	Cleveland State CC (15)
Remington College-Memphis Campus (8)	Chattanooga College Medical Dental and Technical Careers (5)	Virginia College-Knoxville (5)
Southwest Tennessee CC (4)	University of Phoenix-Tennessee (1)	

**g. Web Page, Digital/Multimedia and Information Resources Design (CIP 11.0801)**

In the last five years, 425 Tennesseans completed a postsecondary certificate or degree in this program. There are 14 postsecondary institutions which awarded a total of 50 certificates, 12 associates, and 33 bachelor's degrees for this program in 2017.

The Art Institute of Tennessee-Nashville (29)	Pellissippi State CC (26)	Volunteer State CC (21)
Union University (5)	Trevecca Nazarene University (4)	Columbia State CC (2)
Roane State CC (1)	Chattanooga State CC (1)	Lipscomb University (1)
Nashville State CC (1)	DeVry University-Tennessee (1)	Walters State CC (1)
Tennessee Technological University (1)	Motlow State CC (1)	

**h. Computer Engineering, General (CIP 14.0901)**

In the last five years, 416 Tennesseans completed a postsecondary degree in this program. There are 6 postsecondary institutions which awarded a total of 68 bachelor's, 23 master's, and 9 doctoral degrees for this program in 2017.

University of Tennessee-Knoxville (25)	Tennessee Technological University (22)	Tennessee State University (20)
University of Memphis (18)	Vanderbilt University (14)	Christian Brothers University (1)

**i. Computer Programming/Programmer, General (CIP 11.0201)**

In the last five years, 148 Tennesseans completed a postsecondary certificate or degree in this program. There are 3 postsecondary institutions, Fountainhead College of Technology, National College-Knoxville and Vatterott College-Applying Farms, which awarded a total of 9 associates and 3 bachelor's degrees for this program in 2017.

**j. Computer Programming, Specific Applications (CIP 11.0202)**

In the last five years, 125 Tennesseans completed a postsecondary certificate or degree in this program. There is only 1 postsecondary institution, Southwest Tennessee CC, which awarded a total of 13 certificates for this program in 2017.

## PRODUCTION OCCUPATIONS

Production occupations are in high demand across Tennessee’s industry clusters. Manufacturers seek assemblers, machine tool setters, tenders, and operators to successfully develop product. Workers capable of operating extruding and drawing machines are especially critical to the production of downstream chemicals, small arms, mechanical use rubber products, ceramics, and beverages. Packing and filling machine operators assist in the packaging of products like adhesives, pharmaceuticals, distilled spirits, and e-commerce goods. Computer-controlled machine tool operators are crucial for the manufacturing of high-tech products like LED lighting.

The table below outlines production occupations that have high employer demand in one or more Tennessee regions.

**Table legend:**

- An “X” denotes regions in which the occupation has high employer demand;
- a “\*” denotes the occupation is key to one or more of TNECD’s target industry clusters;
- and letters in the “Related Programs” column correspond to key postsecondary programs<sup>6</sup> for production outlined in the following pages.

### IN-DEMAND PRODUCTION OCCUPATIONS

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Key to Industry Clusters	Related Programs
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers			X		X	X		X		4	*	
51-2091	Fiberglass Laminators and Fabricators								X		1		
51-2098	Assemblers and Fabricators, All Other, Including Team Assemblers				X	X		X	X		4	*	
51-3011	Bakers	X	X				X			X	4	*	
51-3021	Butchers and Meat Cutters	X	X	X	X	X	X	X	X	X	9	*	
51-3092	Food Batchmakers		X	X	X			X		X	5	*	
51-3099	Food Processing Workers, All Other		X	X							2	*	
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	X	X		X				X		4	*	c, d, e
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic								X		1	*	
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic			X		X			X		3	*	
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic								X		1	*	c, d
51-4041	Machinists	X		X		X			X		4	*	c, d
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	X		X	X	X	X		X		6	*	
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and			X	X	X			X		4	*	c, d

<sup>6</sup> The programs of study included in this report reflect credential programs in Tennessee. Alternative training methods including apprenticeships, industry certifications and non-credential programs are not included.  
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SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Key to Industry Clusters	Related Programs
	Plastic												
51-4111	Tool and Die Makers								X		1	*	<b>g</b>
51-4121	Welders, Cutters, Solderers, and Brazers	X	X	X	X	X	X	X	X	X	9	*	<b>a, b</b>
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic									X	1		
51-6031	Sewing Machine Operators						X				1	*	
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	X							X		2		
51-6093	Upholsterers								X		1	*	
51-7011	Cabinetmakers and Bench Carpenters	X	X	X				X		X	5		
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	X	X				X	X		X	5		
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	X	X				X			X	4		
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders			X							1	*	
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	X	X	X	X	X	X		X	X	8	*	
51-9081	Dental Laboratory Technicians							X			1	*	<b>f</b>
51-9111	Packaging and Filling Machine Operators and Tenders	X	X	X	X	X	X	X	X	X	9	*	
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders		X	X						X	3	*	
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders									X	1	*	
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	X					X				2	*	
51-9197	Tire Builders			X							1	*	
51-9198	Helpers--Production Workers	X		X				X	X	X	5	*	
51-9199	Production Workers, All Other	X	X	X	X	X	X	X	X	X	9	*	
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	X									1		
51-9198	Helpers--Production Workers	X		X				X	X	X	5		
51-9199	Production Workers, All Other	X	X	X	X	X	X	X	X	X	9		

## KEY TRAINING PROGRAMS FOR PRODUCTION

The 2017 completions by institution are included in parenthesis after the institution name in the tables below.

### a. *Welding Technology/Welder (CIP 48.0508)*

In the last five years, over 2,900 Tennesseans completed a postsecondary certificate or degree in this program. There are 27 postsecondary institutions which awarded a total of 695 certificates and 1 associates degree for this program in 2017.

TCAT-Knoxville (67)	TCAT-Jackson (55)	TCAT-Morristown (55)
TCAT Nashville (45)	TCAT-Harriman (39)	William Moore College of Technology (37)
TCAT-Pulaski (37)	TCAT-Crump (36)	Miller-Motte Technical College-Madison (31)
TCAT-Newbern (30)	TCAT-Crossville (29)	TCAT-Dickson (29)
TCAT-Hartsville (21)	TCAT-McKenzie (20)	TCAT-Elizabethton (20)
TCAT-Covington (18)	TCAT-Paris (16)	Northeast State CC (16)
TCAT-Livingston (15)	TCAT-Shelbyville (14)	TCAT-Memphis (13)
TCAT-Athens (12)	TCAT-Jacksboro (11)	TCAT-Oneida-Huntsville (9)
TCAT-Whiteville (9)	TCAT-McMinnville (6)	Cleveland State CC (6)

**b. Welding Engineering Technology/Technician (CIP 15.0614)**

In the last five years, 56 Tennesseans completed a postsecondary certificate or degree in this program. There are 3 postsecondary institutions which awarded a total of 22 certificates and 6 associates degrees for this program in 2017.

TCAT-Hohenwald (16)	Chattanooga State CC (6)	Pellissippi State CC (6)
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**c. Machine Tool Technology/Machinist (CIP 48.0501)**

In the last five years, 886 Tennesseans completed a postsecondary certificate or degree in this program. There are 17 postsecondary institutions which awarded a total of 252 certificates and 7 associates degrees for this program in 2017.

TCAT-Knoxville (43)	TCAT-Hartsville (37)	TCAT-Shelbyville (25)
TCAT-Morristown (22)	William Moore College of Technology (18)	TCAT-Covington (17)
TCAT-Whiteville (12)	TCAT-Jacksboro (12)	TCAT-Livingston (11)
TCAT-Athens (11)	TCAT-McKenzie (9)	TCAT-Crossville (9)
TCAT-Jackson (9)	TCAT-McMinnville (6)	TCAT-Oneida-Huntsville (6)
TCAT-Crump (6)	TCAT-Paris (6)	

**d. Machine Shop Technology/Assistant (CIP 48.0503)**

In the last five years, over 900 Tennesseans completed a postsecondary certificate in this program. There are 8 postsecondary institutions which awarded a total of 126 certificates for this program in 2017.

TCAT Nashville (27)	TCAT-Hohenwald (20)	TCAT-Dickson (20)
TCAT-Murfreesboro (19)	TCAT-Memphis (13)	TCAT-Harriman (13)
Northeast State CC (9)	TCAT-Newbern (5)	

**e. CNC Machinist Technology/CNC Machinist (CIP 48.0510)**

In the last five years, 51 Tennesseans completed a postsecondary certificate in this program. There is one postsecondary institution, TCAT-Pulaski, which awarded a total of 13 certificates in 2017.

**f. Dental Laboratory Technology/Technician (CIP 51.0603)**

In the last five years, 116 Tennesseans completed a postsecondary certificate in this program. There are 2 postsecondary institutions which awarded a total of 25 certificates for this program in 2017.

TCAT Nashville (14)	TCAT-Memphis (11)	
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**g. Tool and Die Technology/Technician (CIP 48.0507)**

In the last five years, over 70 Tennesseans completed a postsecondary certificate in this program. During 2017, only one institution had students complete this program, TCAT-Jackson, which awarded 17 certificates in 2017.



## ENGINEERING AND RELATED OCCUPATIONS

Engineering and engineering-related occupations play an instrumental role in Tennessee's industry clusters. Engineers are crucial for product design in aerospace, automotive, defense, advanced materials, electrical equipment, and downstream chemical industries. Engineering technicians are involved in computer facilities management as well as the manufacture of aerospace parts, analytical laboratory instruments, and chemical products. The engineering services industry, an industry in the business services cluster, relies on engineering and engineering-related occupations.

The table below outlines engineering and related occupations that have high employer demand in one or more Tennessee regions.

### Table legend:

- An "X" denotes regions in which the occupation has high employer demand;
- a "\*" denotes the occupation is key to one or more of TNECD's target industry clusters;
- and letters in the "Related Programs" column correspond to key postsecondary programs<sup>7</sup> for engineering and related occupations outlined in the following pages.

## IN-DEMAND ENGINEERING AND RELATED OCCUPATIONS

SOC Code	Occupation	Regions								Number of Regions	Key to Industry Clusters	Related Programs	
		East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast				Upper Cumberland
<b>Engineers</b>													
17-2051	Civil Engineers						X	X		X	3	*	<b>b</b>
17-2081	Environmental Engineers					X					1	*	<b>f</b>
17-2141	Mechanical Engineers						X			X	2	*	<b>a</b>
17-2199	Engineers, All Other						X			X	2	*	<b>c, d, e, g, h, i, j</b>
<b>Drafters, Engineering Technicians, and Mapping Technicians</b>													
17-3013	Mechanical Drafters				X		X		X		3	*	<b>k, l</b>
17-3022	Civil Engineering Technicians		X				X				2	*	
17-3026	Industrial Engineering Technicians			X							1	*	<b>m, n, o</b>
17-3027	Mechanical Engineering Technicians						X				1	*	

## KEY TRAINING PROGRAMS FOR ENGINEERS

The 2017 completions by institution are included in parenthesis after the institution name in the tables below.

### a. *Mechanical Engineering (CIP 14.1901)*

In the last five years, nearly 2,500 Tennesseans completed a postsecondary certificate or degree in this program. There are 9 postsecondary institutions which awarded a total of 537 bachelor's degrees, 4 postbaccalaureate certificates, 54 master's, and 10 doctoral degrees for this program in 2017.

<sup>7</sup> The programs of study included in this report reflect credential programs in Tennessee. Alternative training methods including apprenticeships, industry certifications and non-credential programs are not included.

University of Tennessee-Knoxville (172)	Tennessee Technological University (154)	Vanderbilt University (105)
University of Tennessee-Chattanooga (54)	University of Memphis (51)	Tennessee State University (28)
Lipscomb University (18)	Christian Brothers University (18)	Union University (5)

**b. Civil Engineering, General (CIP 14.0801)**

In the last five years, over 1,360 Tennesseans completed a postsecondary degree in this program. There are 8 postsecondary institutions which awarded a total of 173 bachelor's degrees, 63 master's, and 10 doctoral degrees for this program in 2017.

University of Tennessee-Knoxville (92)	Tennessee Technological University (67)	Vanderbilt University (31)
University of Memphis (29)	Lipscomb University (10)	University of Tennessee-Chattanooga (8)
Tennessee State University (5)	Christian Brothers University (4)	

**c. Engineering, General (CIP 14.0101)**

In the last five years, 491 Tennesseans completed a postsecondary degree in this program. There are 6 postsecondary institutions which awarded a total of 50 bachelor's degrees, 27 master's, and 21 doctoral degrees for this program in 2017.

University of Tennessee-Chattanooga (38)	University of Tennessee-Martin (30)	Tennessee Technological University (12)
University of Memphis (9)	Southern Adventist University (8)	Maryville College (1)

**d. Engineering Science (CIP 14.1301)**

In the last five years, 189 Tennesseans completed a postsecondary degree in this program. There are 2 postsecondary institutions, Vanderbilt and the University of Tennessee-Knoxville, which awarded a total of 35 bachelor's degrees and 4 master's degrees for this program in 2017.

**e. Mechatronics, Robotics, and Automation Engineering (CIP 14.4201)**

In the last five years, 90 Tennesseans completed a postsecondary certificate or degree in this program. There are 2 postsecondary institutions, TCAT-Dickson and Middle Tennessee State University, which awarded a total of 17 certificates and 16 bachelor's degrees for this program in 2017.

**f. Environmental/Environmental Health Engineering (CIP 14.1401)**

In the last five years, 90 Tennesseans completed a postsecondary degree in this program. There are 2 postsecondary institutions, Vanderbilt and the University of Tennessee-Knoxville, which awarded a total of 11 master's and 5 doctoral degrees for this program in 2017.

**g. Engineering, Other (CIP 14.9999)**

In the last five years, 47 Tennesseans completed a postsecondary degree in this program. There is one postsecondary institution, the University of Tennessee-Knoxville, which awarded a total of 3 master's and 11 doctoral degrees for this program in 2017.

**h. Architectural Engineering (CIP 14.0401)**

In the last five years, 30 Tennesseans completed a postsecondary degree in this program. There is one postsecondary institution, the University of Tennessee-Knoxville, which awarded a total of 3 master's and 11 doctoral degrees for this program in 2017.

**i. Systems Engineering (CIP 14.2701)**

In the last five years, 18 Tennesseans completed a postsecondary degree in this program. There is one postsecondary institution, the University of Tennessee-Chattanooga, which awarded a total of 8 doctoral degrees for this program in 2017.

**j. Biochemical Engineering (CIP 14.4301)**

In the last five years, 10 Tennesseans completed a postsecondary degree in this program. There is one postsecondary institution, Christian Brothers University, which awarded a total of 4 bachelor's degrees for this program in 2017.

**KEY TRAINING PROGRAMS FOR DRAFTERS AND TECHNICIANS**

The 2017 completions by institution are included in parenthesis after the institution name in the tables below.

**k. Drafting and Design Technology/Technician, General (CIP 15.1301)**

In the last five years, 673 Tennesseans completed a postsecondary certificate in this program. There are 12 postsecondary institutions which awarded a total of 110 certificates for this program in 2017.

TCAT-Newbern (18)	Chattanooga State CC (15)	TCAT-Jackson (12)
TCAT-Morristown (12)	TCAT-Hohenwald (10)	TCAT-Murfreesboro (10)
TCAT Nashville (8)	TCAT-Shelbyville (8)	TCAT-Crossville (6)
Nashville State CC (5)	TCAT-Crump (5)	TCAT-Memphis (1)

**l. Mechanical Drafting and Mechanical Drafting CAD/CADD (CIP 15.1306)**

In the last five years, 56 Tennesseans completed a postsecondary certificate in this program. There are 2 postsecondary institutions, Cleveland State CC and Northeast State CC, which awarded 10 certificates for this program in 2017.

**m. Industrial Technology/Technician (CIP 15.0612)**

In the last five years, 729 Tennesseans completed a postsecondary certificate or degree in this program. There are 7 postsecondary institutions which awarded a total of 37 certificates, 121 associates, and 10 master's degrees for this program in 2017.

Northeast State CC (59)	Walters State CC (38)	Jackson State CC (21)
Cleveland State CC (19)	Pellissippi State CC (15)	Middle Tennessee State University (10)
Chattanooga State CC (6)		

**n. Engineering/Industrial Management (CIP 15.1501)**

In the last five years, 697 Tennesseans completed a postsecondary certificate or degree in this program. There are 5 postsecondary institutions which awarded a total of 75 bachelor's, 9 postbaccalaureate certificates, and 117 master's degrees for this program in 2017.

Christian Brothers University (99)	University of Tennessee-Chattanooga (54)	Middle Tennessee State University (42)
University of Tennessee-Knoxville (4)	Lipscomb University (2)	

**o. Manufacturing Engineering Technology/Technician (CIP 15.0613)**

In the last five years, over 180 Tennesseans completed a postsecondary certificate or degree in this program. There are 6 postsecondary institutions which awarded a total of 27 certificates and 25 associates degrees for this program in 2017.

Nashville State CC (25)	TCAT-Pulaski (8)	Pellissippi State CC (6)
TCAT Nashville (6)	TCAT-Hartsville (4)	TCAT-Jackson (3)

## HEALTHCARE OCCUPATIONS

Healthcare and support occupations are in high demand in both Tennessee and the nation. The healthcare sector will continue to grow as the baby-boomer generation continues to enter retirement and as people continue to live longer lives due to advancements in medicine and care. Most of Tennessee’s high-demand healthcare jobs are found in healthcare service industries. Although the medical device cluster<sup>8</sup> does not include the healthcare service industries, the healthcare services industries benefit from the upstream growth of the medical device cluster. An outlier in this section, occupation health and safety specialists are utilized in pharmaceutical manufacturing, logistics industries, and the production of chemical products.

The table below outlines healthcare occupations that have high employer demand in one or more Tennessee regions.

Table legend:

- An “X” denotes regions in which the occupation has high employer demand;
- a “\*” denotes the occupation is key to one or more of TNECD’s target industry clusters;
- and letters in the “Related Programs” column correspond to key postsecondary programs<sup>9</sup> for healthcare outlined in the following pages.

### IN-DEMAND HEALTHCARE OCCUPATIONS

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Key to Industry Clusters	Related Programs
<b>Healthcare Practitioners and Technical Occupations</b>													
29-1071	Physician Assistants		X		X						2		<b>a</b>
29-1122	Occupational Therapists					X					1		<b>b</b>
29-1123	Physical Therapists			X		X					2		<b>c</b>
29-1131	Veterinarians	X	X	X	X	X			X		6		<b>d</b>
29-2052	Pharmacy Technicians		X				X				2		<b>e</b>
29-2056	Veterinary Technologists and Technicians	X									1		<b>f</b>
29-2061	Licensed Practical and Licensed Vocational Nurses	X	X	X	X	X	X	X	X	X	9		<b>g</b>
29-2071	Medical Records and Health Information Technicians					X					1		<b>h, i, j</b>
29-2081	Opticians, Dispensing			X			X				2		<b>k</b>
29-9011	Occupational Health and Safety Specialists					X					1	*	<b>l</b>
<b>Healthcare-Support Occupations</b>													
31-1014	Nursing Assistants					X			X	X	3		<b>h</b>
31-2011	Occupational Therapy Assistants		X							X	2		<b>m</b>
31-2021	Physical Therapist Assistants	X	X	X	X	X	X	X	X	X	9		<b>n, o</b>
31-9011	Massage Therapists				X			X	X		3		
31-9091	Dental Assistants	X		X		X	X			X	5		<b>p</b>
31-9092	Medical Assistants	X	X	X	X	X	X	X	X	X	9		<b>j, q, r</b>

<sup>8</sup> The medical device cluster does not include healthcare services because medical care providers tend to be equally concentrated in each part of the country and do not compete across regions.

<sup>9</sup> The programs of study included in this report reflect credential programs in Tennessee. Alternative training methods including apprenticeships, industry certifications and non-credential programs are not included.

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Key to Industry Clusters	Related Programs
31-9094	Medical Transcriptionists	X				X		X	X		4		s
31-9095	Pharmacy Aides		X								1		
31-9096	Veterinary Assistants and Laboratory Animal Caretakers						X			X	2		
31-9097	Phlebotomists	X	X		X	X			X	X	6		t
31-9099	Healthcare Support Workers, All Other		X	X	X	X	X	X			6		

## KEY TRAINING PROGRAMS FOR HEALTHCARE

The 2017 completions by institution are included in parenthesis after the institution name in the tables below.

### a. *Physician Assistant (CIP 51.0912)*

In the last five years, over 1,280 Tennesseans completed a postsecondary degree in this program. There are 6 postsecondary institutions which awarded a total of 329 master's degrees for this program in 2017.

Lincoln Memorial University (85)	South College (80)	Bethel University (49)
Trevecca Nazarene University (47)	Christian Brothers University (40)	University of Tennessee-Health Science Center (28)

### b. *Occupational Therapy/Therapist (CIP 51.2306)*

In the last five years, 778 Tennesseans completed a postsecondary degree in this program. There are 5 postsecondary institutions which awarded a total of 131 master's and 44 doctoral degrees for this program in 2017.

Belmont University (63)	University of Tennessee-Health Science Center (35)	Tennessee State University (32)
Milligan College (32)	University of Tennessee-Chattanooga (13)	

### c. *Physical Therapy/Therapist (CIP 51.2308)*

In the last five years, over 1,170 Tennesseans completed a postsecondary degree in this program. There are 7 postsecondary institutions which awarded a total of 10 associates, 1 bachelor's, and 254 doctoral degrees for this program in 2017.

South College (61)	University of Tennessee-Health Science Center (58)	Belmont University (35)
University of Tennessee-Chattanooga (34)	East Tennessee State University (34)	Tennessee State University (33)
Southern Adventist University (10)		

### d. *Veterinary Medicine (CIP 51.2401)*

In the last five years, 411 Tennesseans completed a postsecondary degree in this program. There is one postsecondary institution, the University of Tennessee-Knoxville, which awarded a total of 81 doctoral degrees for this program in 2017.

### e. *Pharmacy Technician/Assistant (CIP 51.0805)*

In the last five years, 2,110 Tennesseans completed a postsecondary certificate or degree in this program. There are 26 postsecondary institutions which awarded a total of 354 certificates and 27 associates degrees for this program in 2017.

Concorde Career College-Memphis (88)	Remington College-Memphis (35)	Virginia College-Chattanooga (24)
Chattanooga State CC (19)	Southwest Tennessee CC (18)	Fortis Institute-Cookeville (18)
Daymar College-Clarksville (17)	Virginia College-Knoxville (16)	TCAT-Livingston (13)
TCAT-Oneida-Huntsville (13)	Walters State CC (12)	TCAT-Murfreesboro (12)
TCAT-Memphis (11)	National College-Nashville (11)	TCAT-Jacksboro (10)
TCAT-Athens (9)	Ross Medical Education Center-Johnson City (9)	Roane State CC (8)
TCAT-Pulaski (8)	Fortis Institute-Nashville (7)	Remington College-Nashville (5)
Nashville College of Medical Careers (5)	TCAT-Dickson (4)	Daymar College-Murfreesboro (3)
Ross Medical Education Center-Knoxville (3)	EduMed Partners (3)	

**f. *Veterinary/Animal Health Technology/Technician and Veterinary Assistant (CIP 51.0808)***

In the last five years, over 500 Tennesseans completed a postsecondary certificate or degree in this program. There are 5 postsecondary institutions which awarded a total of 14 certificates, 80 associates, and 10 bachelor's degrees for this program in 2017.

Lincoln Memorial University (28)	Columbia State CC (24)	Volunteer State CC (21)
Chattanooga State CC (17)	TCAT-Memphis (14)	

**g. *Licensed Practical/Vocational Nurse Training (CIP 51.3901)***

In the last five years, over 6,750 Tennesseans completed a postsecondary certificate in this program. There are 24 postsecondary institutions which awarded a total of 1,368 certificates for this program in 2017.

TCAT Nashville (127)	TCAT-Elizabethton (125)	TCAT-Newbern (114)
TCAT-Knoxville (108)	TCAT-Dickson (99)	TCAT-Livingston (81)
TCAT-Jackson (74)	TCAT-Morristown (71)	TCAT-Hohenwald (62)
TCAT-Paris (56)	TCAT-Ripley (50)	TCAT-Murfreesboro (49)
TCAT-Athens (38)	TCAT-Harriman (37)	TCAT-McMinnville (37)
TCAT-Crossville (33)	TCAT-Jacksboro (32)	TCAT-Memphis (31)
TCAT-Hartsville (31)	TCAT-Crump (30)	TCAT-Shelbyville (26)
TCAT-Whiteville (24)	TCAT-Covington (20)	TCAT-Oneida-Huntsville (13)

**h. *Practical Nursing, Vocational Nursing and Nursing Assistants, Other (CIP 51.3999)***

In the last five years, 199 Tennesseans completed a postsecondary certificate in this program. There are 2 postsecondary institutions, TCAT-Pulaski and Chattanooga College Medical Dental and Technical Careers, which awarded a total of 65 certificates for this program in 2017.

**i. *Health Information/Medical Records Technology/Technician (CIP 51.0707)***

In the last five years, over 1,370 Tennesseans completed a postsecondary certificate or degree in this program. There are 15 postsecondary institutions which awarded a total of 147 certificates and 80 associates degrees for this program in 2017.

Dyersburg State CC (38)	Volunteer State CC (29)	TCAT-Paris (23)
Walters State CC (22)	Pellissippi State CC (17)	Chattanooga State CC (17)
Roane State CC (14)	Nashville State CC (14)	TCAT-Jackson (13)
TCAT-Crump (11)	TCAT-Whiteville (11)	National College-Nashville (8)
Concorde Career College-Memphis (6)	Fountainhead College of Technology (3)	Miller-Motte Technical College-Chattanooga (1)

**j. Medical Insurance Coding Specialist/Coder (CIP 51.0713)**

In the last five years, over 1,300 Tennesseans completed a postsecondary certificate or degree in this program. There are 13 postsecondary institutions which awarded a total of 169 certificates and 31 associates degrees for this program in 2017.

Brightwood College-Nashville (55)	Nashville College of Medical Careers (27)	Virginia College-Chattanooga (26)
Daymar College-Clarksville (24)	Virginia College-Knoxville (14)	Pellissippi State CC (13)
Allied Health Careers Institute (10)	Daymar College-Murfreesboro (8)	Walters State CC (6)
Daymar College-Nashville (6)	Miller-Motte Technical College-Chattanooga (5)	Remington College-Memphis Campus (5)
Vatterott College-Dividend (1)		

**k. Opticianry/Ophthalmic Dispensing Optician (CIP 51.1801)**

In the last five years, 89 Tennesseans completed a postsecondary degree in this program. There is one postsecondary institution, Roane State CC, which awarded a total of 19 associates degrees for this program in 2017.

**l. Environmental Health (CIP 51.2202)**

In the last five years, over 106 Tennesseans completed a postsecondary degree in this program. There are 2 postsecondary institutions, Roane State CC and East Tennessee State University, which awarded a total of 16 associates and 9 bachelor's degrees for this program in 2017.

**m. Nursing Assistant/Aide and Patient Care Assistant/Aide (CIP 51.3902)**

In the last five years, over 870 Tennesseans completed a postsecondary certificate in this program. There are 8 postsecondary institutions which awarded a total of 33 certificates for this program in 2017.

TCAT-Knoxville (146)	Miller-Motte Technical College-Chattanooga (73)	West Tennessee Business College (28)
TCAT-Ripley (26)	TCAT-Oneida-Huntsville (25)	TCAT-Shelbyville (13)
TCAT-Jacksboro (11)	TCAT-Paris (11)	

**n. Occupational Therapist Assistant (CIP 51.0803)**

In the last five years, 422 Tennesseans completed a postsecondary degree in this program. There are 5 postsecondary institutions which awarded a total of 131 associates degrees for this program in 2017.

Concorde Career College-Memphis (41)	Roane State CC (28)	Nashville State CC (27)
South College (23)	Jackson State CC (12)	

**o. Physical Therapy Technician/Assistant (CIP 51.0806)**

In the last five years, over 990 Tennesseans completed a postsecondary degree in this program. There are 9 postsecondary institutions which awarded a total of 203 associates degrees for this program in 2017.

South College (37)	Volunteer State CC (31)	Jackson State CC (23)
Concorde Career College-Memphis (22)	Chattanooga State CC (20)	Walters State CC (19)
Roane State CC (19)	Southwest Tennessee CC (17)	Daymar College-Clarksville (15)

**p. Dental Assisting/Assistant (CIP 51.0601)**

In the last five years, over 2,540 Tennesseans completed a postsecondary certificate or degree in this program. There are 19 postsecondary institutions which awarded a total of 490 certificates and 50 associates degrees for this program in 2017.

Concorde Career College-Memphis (114)	Remington College-Nashville (56)	Chattanooga State CC (46)
Ross Medical Education Center-Johnson City (37)	Brightwood College-Nashville (32)	TCAT-Memphis (31)
Vatterott College-Dividend (30)	Miller-Motte Technical College-Chattanooga (27)	TCAT-Knoxville (22)
Daymar College-Clarksville (22)	Ross Medical Education Center-Knoxville (21)	Genesis Career College-Cookeville (20)
TCAT-Dickson (18)	Volunteer State CC (16)	Chattanooga College Medical Dental and Technical Careers (14)
TCAT Nashville (12)	TCAT-Murfreesboro (10)	Northeast State CC (8)
Daymar College-Murfreesboro (4)		

**q. Medical Office Assistant/Specialist (CIP 51.0710)**

In the last five years, 994 Tennesseans completed a postsecondary certificate or degree in this program. There are 7 postsecondary institutions which awarded a total of 144 certificates and 15 associates degrees for this program in 2017.

Concorde Career College-Memphis (68)	TCAT-Knoxville (44)	National College-Nashville (24)
Miller-Motte Technical College-Clarksville (13)	Virginia College-Knoxville (7)	Miller-Motte Technical College-Chattanooga (2)
West Tennessee Business College (1)		

**r. Medical/Clinical Assistant (CIP 51.0801)**

In the last five years, over 7,480 Tennesseans completed a postsecondary certificate or degree in this program. There are 29 postsecondary institutions which awarded a total of 1,247 certificates and 214 associates degrees for this program in 2017.

Concorde Career College-Memphis (309)	Virginia College-Knoxville (104)	EduMed Partners (104)
Ross Medical Education Center-Johnson City (104)	Brightwood College-Nashville (74)	Remington College-Memphis Campus (74)
Genesis Career College-Lebanon (60)	Fortis Institute-Nashville (57)	West Tennessee Business College (55)
Virginia College-Chattanooga (53)	Nashville College of Medical Careers (48)	Daymar College-Clarksville (41)
Miller-Motte Technical College-Clarksville (37)	Fortis Institute-Cookeville (37)	Miller-Motte Technical College-Chattanooga (33)
South College (32)	Ross Medical Education Center-Knoxville (31)	Chattanooga College Medical Dental and Technical Careers (31)
Remington College-Nashville Campus (29)	National College-Nashville (26)	Allied Health Careers Institute (24)
Miller-Motte Technical College-Madison (24)	Daymar College-Murfreesboro (19)	TCAT-Knoxville (15)
Vatterott College-Applying Farms (13)	TCAT Nashville (13)	Genesis Career College-Cookeville (11)
Daymar College-Nashville (2)	TCAT-Harriman (1)	

**s. Medical Transcription/Transcriptionist (CIP 51.0708)**

In the last five years, 37 Tennesseans completed a postsecondary certificate or degree in this program. There is one postsecondary institution, Roane State CC, which awarded a total of 5 certificates for this program in 2017.

**t. Phlebotomy Technician/Phlebotomist (CIP 51.1009)**

In the last five years, 901 Tennesseans completed a postsecondary certificate in this program. There are 6 postsecondary institutions which awarded a total of 353 certificates for this program in 2017.

Allied Health Careers Institute (100)	West Tennessee Business College (78)	National College-Nashville (58)
Miller-Motte Technical College-Chattanooga (55)	TCAT-Nashville (34)	TCAT-Elizabethton (28)



## BUSINESS AND FINANCIAL OPERATIONS OCCUPATIONS

Business and financial operations in-demand occupations are found in nearly every strategic industry cluster. Occupations like human resources specialists, training specialists, accountants, and auditors are key operations positions. Manufacturers seek market research analysts and marketing specialists for product design and advertising. Specialists and analysts are strongly concentrated in the business services cluster, especially headquarters industries and support services like consulting.

The table below outlines business and financial operations occupations that have high employer demand in one or more Tennessee regions.

### Table legend:

- An "X" denotes regions in which the occupation has high employer demand;
- a "\*" denotes the occupation is key to one or more of TNECD's target industry clusters;
- and letters in the "Related Programs" column correspond to key postsecondary programs<sup>10</sup> for business and financial operations occupations outlined in the following pages.

## IN-DEMAND BUSINESS AND FINANCIAL OPERATIONS OCCUPATIONS

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions	Key to Industry Clusters	Related Programs
13-1011	Agents and Business Managers of Artists, Performers, and Athletes				X						1	*	
13-1041	Compliance Officers		X							X	2	*	
13-1051	Cost Estimators	X	X		X	X			X	X	6		a
13-1071	Human Resources Specialists	X	X	X	X	X	X	X	X	X	9	*	b, c
13-1081	Logisticians		X	X	X	X		X		X	6	*	d
13-1111	Management Analysts	X	X	X	X	X	X	X	X	X	9	*	a, e
13-1121	Meeting, Convention, and Event Planners	X			X	X					3	*	
13-1141	Compensation, Benefits, and Job Analysis Specialists					X					1	*	b, c
13-1151	Training and Development Specialists	X	X	X	X	X	X	X	X		8	*	b, c
13-1161	Market Research Analysts and Marketing Specialists	X	X	X	X	X	X	X	X	X	9	*	f
13-1199	Business Operations Specialists, All Other		X	X			X	X		X	5	*	
13-2011	Accountants and Auditors	X	X	X		X	X	X		X	7	*	g, h, i
13-2051	Financial Analysts		X			X		X		X	4	*	h, i, j
13-2072	Loan Officers					X		X			2	*	j
13-2082	Tax Preparers			X		X		X	X		4	*	k

<sup>10</sup> The programs of study included in this report reflect credential programs in Tennessee. Alternative training methods including apprenticeships, industry certifications and non-credential programs are not included.

## KEY TRAINING PROGRAMS FOR BUSINESS AND FINANCIAL OPERATIONS

The 2017 completions by institution are included in parenthesis after the institution name in the tables below.

### a. **Business Administration and Management, General (CIP 52.0201)**

In the last five years, over 24,900 Tennesseans completed a postsecondary certificate or degree in this program. There are 60 postsecondary institutions which awarded a total of 73 certificates, 591 associates, 2,711 bachelor's, 1,768 master's, and 27 doctoral degrees for this program in 2017. Listed below are the top 21 institutions by completions.

University of Tennessee-Chattanooga (472)	King University (459)	University of Tennessee-Knoxville (345)
Middle Tennessee State University (295)	University of Memphis (267)	Tusculum College (243)
Tennessee Technological University (221)	Trevecca Nazarene University (207)	Bryan College-Dayton (162)
East Tennessee State University (157)	Tennessee State University (134)	University of Tennessee-Martin (119)
University of Phoenix-Tennessee (116)	Vanderbilt University (107)	Lipscomb University (105)
Cleveland State CC (95)	Christian Brothers University (94)	Lee University (93)
Carson-Newman University (88)	Rhodes College (87)	Union University (82)

### b. **Human Resources Management/Personnel Administration, General (CIP 52.1001)**

In the last five years, 771 Tennesseans completed a postsecondary certificate or degree in this program. There are 10 postsecondary institutions which awarded a total of 74 bachelor's, 1 postbaccalaureate certificate, and 58 master's degrees for this program in 2017.

University of Tennessee-Knoxville (53)	Lipscomb University (35)	University of Phoenix-Tennessee (14)
Strayer University-Tennessee (12)	DeVry University-Tennessee (11)	Daymar College-Clarksville (8)
Tennessee Wesleyan University (3)	Lincoln Memorial University (2)	South College (2)
Maryville College (1)		

### c. **Organizational Behavior Studies (CIP 52.1003)**

In the last five years, 268 Tennesseans completed a postsecondary degree in this program. There are 2 postsecondary institutions, Vanderbilt University and Argosy University-Nashville, which awarded a total of 47 master's degrees for this program in 2017.

### d. **Operations Management and Supervision (CIP 52.0205)**

In the last five years, 465 Tennesseans completed a postsecondary certificate or degree in this program. There are 3 postsecondary institutions which awarded a total of 57 certificates and 37 master's degrees for this program in 2017.

Pellissippi State CC (55)	Vanderbilt University (37)	Chattanooga State CC (2)
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### e. **Organizational Leadership (CIP 52.0213)**

In the last five years, 2,164 Tennesseans completed a postsecondary degree in this program. There are 10 postsecondary institutions which awarded a total of 463 bachelor's, 105 master's, and 5 doctoral degrees for this program in 2017.

Bethel University (329)	Union University (103)	Trevecca Nazarene University (68)
Lipscomb University (41)	South College (11)	Strayer University-Tennessee (10)
Johnson University (5)	Lincoln Memorial University (2)	Oxford Graduate School (2)
Carson-Newman University (2)		

**f. Marketing/Marketing Management, General (CIP 52.1401)**

In the last five years, over 3,100 Tennesseans completed a postsecondary degree in this program. There are 21 postsecondary institutions which awarded a total of 613 bachelor's and 42 master's degrees for this program in 2017.

University of Tennessee-Knoxville (158)	University of Memphis (92)	Middle Tennessee State University (82)
East Tennessee State University (57)	Belmont University (45)	Tennessee Technological University (42)
Vanderbilt University (36)	University of Tennessee-Martin (28)	Lipscomb University (27)
Freed-Hardeman University (14)	Tennessee Wesleyan University (13)	Christian Brothers University (11)
University of Phoenix-Tennessee (9)	Austin Peay State University (7)	Union University (7)
Southern Adventist University (7)	Trevecca Nazarene University (6)	Maryville College (5)
Lincoln Memorial University (4)	Cumberland University (4)	South College (1)

**g. Accounting (CIP 52.0301)**

In the last five years, over 6,050 Tennesseans completed a postsecondary certificate or degree in this program. There are 27 postsecondary institutions which awarded a total of 1 associates, 849 bachelor's, 20 postbaccalaureate certificates, and 345 master's degrees for this program in 2017. Listed below are the top 21 institutions by completions.

University of Tennessee-Knoxville (269)	University of Memphis (193)	Middle Tennessee State University (146)
East Tennessee State University (90)	Tennessee Technological University (82)	Lipscomb University (65)
Belmont University (56)	Vanderbilt University (38)	University of Tennessee-Martin (37)
Rhodes College (29)	Christian Brothers University (28)	Tennessee State University (27)
Carson-Newman University (17)	Lee University (17)	Freed-Hardeman University (16)
Southern Adventist University (15)	Union University (15)	Cumberland University (15)
University of Tennessee-Chattanooga (10)	Milligan College (10)	Tennessee Wesleyan University (10)

**h. Accounting and Finance (CIP 52.0304)**

In the last five years, 211 Tennesseans completed a postsecondary degree in this program. There are 4 postsecondary institutions which awarded a total of 21 bachelor's and 25 master's degrees for this program in 2017.

Maryville College (21)	Vanderbilt University (12)	Strayer University-Tennessee (11)
DeVry University-Tennessee (2)		

**i. Accounting and Business/Management (CIP 52.0305)**

In the last five years, 257 Tennesseans completed a postsecondary degree in this program. There are 4 postsecondary institutions which awarded a total of 4 associates and 54 bachelor's degrees for this program in 2017.

University of Phoenix-Tennessee (19)	Bethel University (15)	Strayer University-Tennessee (14)
South College (10)		

**j. Finance, General (CIP 52.0801)**

In the last five years, nearly 2,600 Tennesseans completed a postsecondary degree in this program. There are 16 postsecondary institutions which awarded a total of 488 bachelor's and 75 master's degrees for this program in 2017.

University of Tennessee-Knoxville (107)	University of Memphis (80)	Middle Tennessee State University (74)
Vanderbilt University (69)	University of Tennessee-Martin (56)	East Tennessee State University (56)
Tennessee Technological University (40)	Lipscomb University (27)	Christian Brothers University (12)
Freed-Hardeman University (12)	Belmont University (8)	Austin Peay State University (7)
Carson-Newman University (5)	Tennessee Wesleyan University (4)	Southern Adventist University (4)
University of Phoenix-Tennessee (2)		

**k. Accounting Technology/Technician and Bookkeeping (CIP 52.0302)**

In the last five years, over 670 Tennesseans completed a postsecondary certificate or degree in this program. There are 10 postsecondary institutions which awarded a total of 81 certificates and 35 associates degrees for this program in 2017.

Pellissippi State CC (35)	Southwest Tennessee CC (24)	Nashville State CC (24)
Northeast State CC (15)	Chattanooga State CC (6)	Strayer University-Tennessee (4)
West Tennessee Business College (3)	National College-Nashville (2)	Daymar College-Clarksville (2)
South College (1)		

## TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

Transportation and material moving occupations are in high-demand across Tennessee’s industry clusters, not just the transportation and logistics cluster. Companies seek material movers and truck drivers to deliver their products to buyers. Manufacturers seek packers and packagers to prepare products for sale. Conveyors and operator tenders are essential to manufacturing companies during the production process.

The table below outlines transportation and material moving occupations that have high employer demand in one or more Tennessee regions.

Table legend:

- An “X” denotes regions in which the occupation has high employer demand;
- a “\*” denotes the occupation is key to one or more of TNECD’s target industry clusters;
- and letters in the “Related Programs” column correspond to key postsecondary programs<sup>11</sup> for transportation and material moving occupations outlined in the following page.

### IN-DEMAND TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

SOC Code	Occupation	Region								Number of Regions	Key to Industry Clusters	Related Programs	
		East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast				Upper Cumberland
53-1048	First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	X	X	X	X		X	X	X	X	8	*	
53-3021	Bus Drivers, Transit and Intercity							X		X	2		a
53-3022	Bus Drivers, School or Special Client	X									1		a
53-3031	Driver/Sales Workers			X						X	2	*	
53-3032	Heavy and Tractor-Trailer Truck Drivers	X	X	X	X			X	X	X	7	*	a
53-3033	Light Truck or Delivery Services Drivers	X	X	X	X	X		X	X	X	8	*	a
53-6031	Automotive and Watercraft Service Attendants		X								1		
53-7011	Conveyor Operators and Tenders		X				X				2	*	
53-7032	Excavating and Loading Machine and Dragline Operators				X			X	X		3		
53-7051	Industrial Truck and Tractor Operators	X	X	X	X	X	X	X	X	X	9	*	
53-7061	Cleaners of Vehicles and Equipment			X							1	*	
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	X	X	X	X	X	X	X	X	X	9	*	
53-7063	Machine Feeders and Offbearers			X			X		X	X	4	*	
53-7064	Packers and Packagers, Hand			X							1	*	
53-7081	Refuse and Recyclable Material Collectors		X		X			X	X		4		

<sup>11</sup> The programs of study included in this report reflect credential programs in Tennessee. Alternative training methods including apprenticeships, industry certifications and non-credential programs are not included.

## KEY TRAINING PROGRAMS FOR TRANSPORTATION AND MATERIAL MOVEMENT

The 2017 completions by institution are included in parenthesis after the institution name in the tables below.

**a. *Truck and Bus Driver/Commercial Vehicle Operator and Instructor (CIP 49.0205)***

In the last five years, 1,940 Tennesseans completed a postsecondary certificate in this program. There are 12 postsecondary institutions which awarded a total 479 certificates for this program in 2017.

Miller-Motte Technical College- Clarksville (102)	Miller-Motte Technical College- Chattanooga (85)	Miller-Motte Technical College-Madison (83)
TCAT-Memphis (50)	TCAT-Crossville (40)	TCAT-Jackson (29)
TCAT-Newbern (21)	Fortis Institute-Cookeville (20)	TCAT-Knoxville (18)
TCAT-Shelbyville (13)	Vatterott College-Applying Farms (11)	TCAT Nashville (7)

## APPENDIX A: OCCUPATIONS WITH HIGH EMPLOYER DEMAND

The table below outlines all occupations which have high employer demand in one or more of Tennessee regions. In the table, an “X” denotes high demand for an occupation in each region of Tennessee.

STEM and STEM-related occupations are denoted by blue text.

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
<b>Management (11-0000)</b>											
11-2021	Marketing Managers					X					1
11-2022	Sales Managers			X							1
11-3021	Computer and Information Systems Managers					X					1
11-3071	Transportation, Storage, and Distribution Managers		X	X					X		3
11-3121	Human Resources Managers	X	X	X	X	X				X	6
11-3131	Training and Development Managers					X					1
11-9013	Farmers, Ranchers, and Other Agricultural Managers						X				1
11-9021	Construction Managers	X	X	X	X	X	X	X	X	X	9
11-9031	Education Administrators, Preschool and Childcare Center/Program	X									1
11-9033	Education Administrators, Postsecondary		X								1
11-9051	Food Service Managers	X	X	X	X	X	X	X	X	X	9
11-9081	Lodging Managers					X					1
11-9141	Property, Real Estate, and Community Association Managers	X	X	X	X			X		X	6
11-9151	Social and Community Service Managers	X	X	X	X	X	X	X	X	X	9
11-1021	General and Operations Managers	X	X	X	X	X	X	X	X	X	9
<b>Business and Financial Operations (13-0000)</b>											
13-1011	Agents and Business Managers of Artists, Performers, and Athletes				X						1
13-1041	Compliance Officers		X							X	2
13-1051	Cost Estimators	X	X		X	X			X	X	6
13-1071	Human Resources Specialists	X	X	X	X	X	X	X	X	X	9
13-1081	Logisticians		X	X	X	X		X		X	6
13-1111	Management Analysts	X	X	X	X	X	X	X	X	X	9
13-1121	Meeting, Convention, and Event Planners	X			X	X					3
13-1141	Compensation, Benefits, and Job Analysis Specialists					X					1
13-1151	Training and Development Specialists	X	X	X	X	X	X	X	X		8
13-1161	Market Research Analysts and Marketing Specialists	X	X	X	X	X	X	X	X	X	9
13-1199	Business Operations Specialists, All Other		X	X			X	X		X	5
13-2011	Accountants and Auditors	X	X	X		X	X	X		X	7
13-2051	Financial Analysts		X			X		X		X	4
13-2072	Loan Officers					X		X			2
13-2082	Tax Preparers			X		X		X	X		4
<b>Computer and Mathematical (15-0000)</b>											
15-1121	Computer Systems Analysts					X	X				2
15-1122	Information Security Analysts				X	X			X		3
15-1131	Computer Programmers		X		X	X		X		X	5

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
15-1132	Software Developers, Applications		X	X	X	X	X	X	X	X	8
15-1133	Software Developers, Systems Software					X		X		X	3
15-1134	Web Developers	X			X	X			X		4
15-1141	Database Administrators					X					1
15-1142	Network and Computer Systems Administrators		X	X	X	X	X	X	X	X	8
15-1143	Computer Network Architects	X			X	X			X		4
15-1151	Computer User Support Specialists	X	X	X	X	X	X	X	X	X	9
15-1152	Computer Network Support Specialists			X			X	X			3
15-1199	Computer Occupations, All Other			X				X	X	X	4
15-2031	Operations Research Analysts					X					1
<b>Architecture and Engineering (17-0000)</b>											
17-2051	Civil Engineers						X	X		X	3
17-2081	Environmental Engineers					X					1
17-2141	Mechanical Engineers						X			X	2
17-2199	Engineers, All Other						X			X	2
17-3013	Mechanical Drafters				X		X		X		3
17-3022	Civil Engineering Technicians		X				X				2
17-3026	Industrial Engineering Technicians			X							1
17-3027	Mechanical Engineering Technicians						X				1
<b>Life, Physical, and Social Science (19-0000)</b>											
19-2031	Chemists								X		1
19-2041	Environmental Scientists and Specialists, Including Health						X				1
19-4099	Life, Physical, and Social Science Technicians, All Other								X		1
<b>Community and Social Service (21-0000)</b>											
21-1012	Educational, Guidance, School, and Vocational Counselors	X				X		X	X		4
21-1018	Substance Abuse, Behavioral Disorder, and Mental Health Counselors	X	X	X	X	X	X	X	X	X	9
21-1021	Child, Family, and School Social Workers	X	X	X		X	X	X		X	7
21-1022	Healthcare Social Workers	X	X	X	X	X	X	X	X	X	9
21-1023	Mental Health and Substance Abuse Social Workers	X	X	X		X	X	X		X	7
21-1092	Probation Officers and Correctional Treatment Specialists	X	X	X		X	X	X	X	X	8
21-1093	Social and Human Service Assistants	X	X	X	X	X	X	X	X	X	9
21-1099	Community and Social Service Specialists, All Other	X						X			2
<b>Legal Occupations (23-0000)</b>											
23-2011	Paralegals and Legal Assistants	X	X		X	X		X			5
<b>Education, Training, and Library (25-0000)</b>											
25-2011	Preschool Teachers, Except Special Education	X	X					X	X		4
25-3021	Self-Enrichment Education Teachers	X			X	X	X	X		X	6
25-3097	Teachers and Instructors, All Other	X			X			X	X		4
<b>Arts, Design, Entertainment, Sports, and Media (27-0000)</b>											
27-1024	Graphic Designers	X	X		X	X		X		X	6
27-1026	Merchandise Displayers and Window Trimmers	X			X	X	X	X	X	X	7
27-2012	Producers and Directors	X			X						2



SOC Code	Occupation											Number of Regions
		East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland		
27-2022	Coaches and Scouts	X	X	X	X		X	X	X	X	X	8
27-3031	Public Relations Specialists	X	X		X	X	X	X	X	X	X	8
27-3041	Editors				X						X	2
27-4011	Audio and Video Equipment Technicians				X							1
<b>Healthcare Practitioners and Technical (29-0000)</b>												
29-1071	Physician Assistants		X		X							2
29-1122	Occupational Therapists					X						1
29-1123	Physical Therapists			X	X							2
29-1131	Veterinarians	X	X	X	X	X			X			6
29-2052	Pharmacy Technicians		X				X					2
29-2056	Veterinary Technologists and Technicians	X										1
29-2061	Licensed Practical and Licensed Vocational Nurses	X	X	X	X	X	X	X	X	X	X	9
29-2071	Medical Records and Health Information Technicians					X						1
29-2081	Opticians, Dispensing			X			X					2
29-9011	Occupational Health and Safety Specialists					X						1
<b>Healthcare Support (31-0000)</b>												
31-1014	Nursing Assistants					X			X	X	X	3
31-2011	Occupational Therapy Assistants		X								X	2
31-2021	Physical Therapist Assistants	X	X	X	X	X	X	X	X	X	X	9
31-9011	Massage Therapists				X			X	X			3
31-9091	Dental Assistants	X		X	X	X					X	5
31-9092	Medical Assistants	X	X	X	X	X	X	X	X	X	X	9
31-9094	Medical Transcriptionists	X				X		X	X			4
31-9095	Pharmacy Aides		X									1
31-9096	Veterinary Assistants and Laboratory Animal Caretakers						X				X	2
31-9097	Phlebotomists	X	X		X	X			X	X		6
31-9099	Healthcare Support Workers, All Other		X	X	X	X	X	X				6
<b>Protective Service (33-0000)</b>												
33-1099	First-Line Supervisors of Protective Service Workers, All Other				X	X						2
33-3021	Detectives and Criminal Investigators		X									1
33-9032	Security Guards	X	X				X	X	X	X	X	6
33-9091	Crossing Guards				X							1
33-9099	Protective Service Workers, All Other	X					X	X				3
<b>Food Preparation and Serving Related (35-0000)</b>												
35-1011	Chefs and Head Cooks	X	X	X	X	X	X	X	X	X	X	9
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	X	X	X	X	X	X	X	X	X	X	9
<b>Building and Grounds Cleaning and Maintenance (37-0000)</b>												
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	X	X	X	X	X	X	X	X	X	X	9
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	X			X			X	X			4
37-2021	Pest Control Workers	X	X	X	X	X	X	X			X	8
37-3011	Landscaping and Groundskeeping Workers	X		X			X		X	X	X	5
37-3013	Tree Trimmers and Pruners	X	X									2

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
37-3019	Grounds Maintenance Workers, All Other				X						1
<b>Personal Care and Service (39-0000)</b>											
39-1021	First-Line Supervisors of Personal Service Workers						X			X	2
39-5012	Hairdressers, Hairstylists, and Cosmetologists						X			X	2
39-5094	Skincare Specialists							X			1
39-9031	Fitness Trainers and Aerobics Instructors	X	X	X	X	X	X	X	X	X	9
39-9032	Recreation Workers					X	X			X	3
<b>Sales and Related (41-0000)</b>											
41-1011	First-Line Supervisors of Retail Sales Workers	X	X	X	X	X	X	X	X	X	9
41-1012	First-Line Supervisors of Non-Retail Sales Workers			X				X			2
41-2021	Counter and Rental Clerks									X	1
41-2022	Parts Salespersons	X	X	X		X	X	X	X	X	8
41-2031	Retail Salespersons									X	1
41-3011	Advertising Sales Agents	X		X	X	X	X	X	X	X	8
41-3021	Insurance Sales Agents	X	X	X	X	X		X	X		7
41-3031	Securities, Commodities, and Financial Services Sales Agents	X			X	X	X	X		X	6
41-3041	Travel Agents				X						1
41-3099	Sales Representatives, Services, All Other	X	X	X	X	X	X	X	X	X	9
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products		X	X						X	3
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products			X		X	X	X		X	5
41-9011	Demonstrators and Product Promoters	X		X					X		3
41-9022	Real Estate Sales Agents	X			X				X		3
41-9041	Telemarketers	X		X	X						3
41-9099	Sales and Related Workers, All Other	X	X	X	X	X		X	X	X	8
<b>Office and Administrative Support (43-0000)</b>											
43-1011	First-Line Supervisors of Office and Administrative Support Workers							X			1
43-2011	Switchboard Operators, Including Answering Service	X			X	X	X		X		5
43-3011	Bill and Account Collectors	X		X	X	X		X	X	X	7
43-3021	Billing and Posting Clerks				X						1
43-3031	Bookkeeping, Accounting, and Auditing Clerks	X			X	X	X		X		5
43-3051	Payroll and Timekeeping Clerks	X		X	X	X			X		5
43-3071	Tellers				X	X	X		X		4
43-4051	Customer Service Representatives	X	X	X	X	X	X	X	X	X	9
43-4061	Eligibility Interviewers, Government Programs		X	X							2
43-4071	File Clerks	X			X	X	X		X		5
43-4111	Interviewers, Except Eligibility and Loan	X		X	X	X	X				5
43-4131	Loan Interviewers and Clerks				X	X	X				3
43-4141	New Accounts Clerks					X					1
43-4151	Order Clerks							X		X	2
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	X	X	X	X	X	X	X	X	X	9
43-4171	Receptionists and Information Clerks	X	X		X			X	X	X	6

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks				X						1
43-4199	Information and Record Clerks, All Other			X			X	X			3
43-5011	Cargo and Freight Agents				X	X					2
43-5032	Dispatchers, Except Police, Fire, and Ambulance		X	X							2
43-5061	Production, Planning, and Expediting Clerks		X	X	X		X		X	X	6
43-5071	Shipping, Receiving, and Traffic Clerks	X		X			X		X	X	5
43-5081	Stock Clerks and Order Fillers	X								X	2
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping		X								1
43-6011	Executive Secretaries and Executive Administrative Assistants	X	X	X	X	X		X	X	X	8
43-6013	Medical Secretaries	X		X	X	X	X	X	X	X	8
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive				X	X				X	3
43-9021	Data Entry Keyers	X	X	X	X	X	X		X	X	8
43-9041	Insurance Claims and Policy Processing Clerks	X					X	X			3
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	X			X	X					3
43-9061	Office Clerks, General	X	X	X	X	X	X	X	X	X	9
43-9071	Office Machine Operators, Except Computer							X			1
43-9199	Office and Administrative Support Workers, All Other	X	X	X	X	X	X	X	X		8
<b>Farming, Fishing, and Forestry (45-0000)</b>											
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers		X							X	2
45-2041	Graders and Sorters, Agricultural Products		X							X	2
45-2091	Agricultural Equipment Operators		X				X			X	3
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse			X							1
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals		X								1
45-4021	Fallers			X			X			X	3
45-4022	Logging Equipment Operators		X	X			X		X	X	5
<b>Construction and Extraction (47-0000)</b>											
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	X	X	X	X	X			X		6
47-2021	Brickmasons and Blockmasons			X							1
47-2031	Carpenters	X	X	X	X				X	X	6
47-2051	Cement Masons and Concrete Finishers	X	X	X	X	X	X	X	X	X	9
47-2061	Construction Laborers	X	X		X		X		X		5
47-2071	Paving, Surfacing, and Tamping Equipment Operators	X	X	X			X				4
47-2073	Operating Engineers and Other Construction Equipment Operators	X	X	X	X	X	X	X	X	X	9
47-2111	Electricians	X	X	X	X	X		X	X		7
47-2121	Glaziers					X					1
47-2132	Insulation Workers, Mechanical					X					1
47-2141	Painters, Construction and Maintenance							X	X	X	3
47-2151	Pipelayers		X		X		X		X	X	5
47-2152	Plumbers, Pipefitters, and Steamfitters	X	X	X	X	X	X		X	X	8
47-2181	Roofers		X		X			X			3
47-2211	Sheet Metal Workers	X	X	X	X		X		X	X	7
47-2221	Structural Iron and Steel Workers	X						X	X		3

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
47-3012	Helpers--Carpenters		X								1
47-3013	Helpers--Electricians	X			X	X	X	X	X	X	7
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters			X	X	X		X		X	5
47-3019	Helpers, Construction Trades, All Other		X							X	2
47-4011	Construction and Building Inspectors							X		X	2
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners		X								1
<b>Installation, Maintenance and Repair (49-0000)</b>											
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	X		X	X						3
49-2011	Computer, Automated Teller, and Office Machine Repairers						X				1
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	X	X	X	X	X	X	X	X		8
49-2098	Security and Fire Alarm Systems Installers	X			X	X			X		4
49-3011	Aircraft Mechanics and Service Technicians	X			X						2
49-3021	Automotive Body and Related Repairers	X			X	X		X	X	X	6
49-3023	Automotive Service Technicians and Mechanics	X	X	X	X		X	X	X	X	8
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	X	X	X	X			X	X		6
49-3041	Farm Equipment Mechanics and Service Technicians		X								1
49-3042	Mobile Heavy Equipment Mechanics, Except Engines		X	X			X			X	4
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics		X				X	X		X	4
49-3092	Recreational Vehicle Service Technicians						X				1
49-3093	Tire Repairers and Changers	X		X	X		X	X	X		6
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	X	X	X	X	X	X	X		X	8
49-9044	Millwrights			X							1
49-9051	Electrical Power-Line Installers and Repairers				X						1
49-9052	Telecommunications Line Installers and Repairers		X				X				2
49-9071	Maintenance and Repair Workers, General	X	X	X	X	X	X	X	X	X	9
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers			X							1
49-9098	Helpers--Installation, Maintenance, and Repair Workers	X	X	X		X	X	X	X	X	8
49-9099	Installation, Maintenance, and Repair Workers, All Other							X		X	2
<b>Production (51-0000)</b>											
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers			X		X	X		X		4
51-2091	Fiberglass Laminators and Fabricators								X		1
51-2098	Assemblers and Fabricators, All Other, Including Team Assemblers				X	X		X	X		4
51-3011	Bakers	X	X				X			X	4
51-3021	Butchers and Meat Cutters	X	X	X	X	X	X	X	X	X	9
51-3092	Food Batchmakers		X	X	X			X		X	5
51-3099	Food Processing Workers, All Other		X	X							2
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	X	X		X				X		4
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic								X		1
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic			X		X			X		3
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic								X		1

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
51-4041	Machinists	X		X		X			X		4
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	X		X	X	X	X		X		6
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic			X	X	X			X		4
51-4111	Tool and Die Makers								X		1
51-4121	Welders, Cutters, Solderers, and Brazers	X	X	X	X	X	X	X	X	X	9
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic									X	1
51-6031	Sewing Machine Operators						X				1
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	X							X		2
51-6093	Upholsterers								X		1
51-7011	Cabinetmakers and Bench Carpenters	X	X	X				X		X	5
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	X	X				X	X		X	5
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	X	X				X			X	4
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders			X							1
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	X	X	X	X	X	X		X	X	8
51-9081	Dental Laboratory Technicians							X			1
51-9111	Packaging and Filling Machine Operators and Tenders	X	X	X	X	X	X	X	X	X	9
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders		X	X						X	3
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders									X	1
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	X					X				2
51-9197	Tire Builders			X							1
51-9198	Helpers--Production Workers	X		X				X	X	X	5
51-9199	Production Workers, All Other	X	X	X	X	X	X	X	X	X	9
<b>Transportation and Material Moving (53-0000)</b>											
53-1048	First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	X	X	X	X		X	X	X	X	8
53-3021	Bus Drivers, Transit and Intercity							X		X	2
53-3022	Bus Drivers, School or Special Client	X									1
53-3031	Driver/Sales Workers			X						X	2
53-3032	Heavy and Tractor-Trailer Truck Drivers	X	X	X	X			X	X	X	7
53-3033	Light Truck or Delivery Services Drivers	X	X	X	X	X		X	X	X	8
53-6031	Automotive and Watercraft Service Attendants		X								1
53-7011	Conveyor Operators and Tenders		X				X				2
53-7032	Excavating and Loading Machine and Dragline Operators				X			X	X		3
53-7051	Industrial Truck and Tractor Operators	X	X	X	X	X	X	X	X	X	9
53-7061	Cleaners of Vehicles and Equipment			X							1
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	X	X	X	X	X	X	X	X	X	9
53-7063	Machine Feeders and Offbearers			X			X		X	X	4
53-7064	Packers and Packagers, Hand			X							1
53-7081	Refuse and Recyclable Material Collectors		X		X			X	X		4

## APPENDIX B: IN-DEMAND OCCUPATIONS KEY TO TNECD STRATEGIC INDUSTRY CLUSTERS

The table below outlines in-demand occupations which are important to one or more of TNECD's strategic industry clusters. In the table, an "X" denotes an occupation is a key occupation to the industry cluster's workforce in Tennessee.

STEM and STEM-related occupations are denoted by blue text.

SOC Code	Occupation	Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters
<b>Management (11-0000)</b>												
11-2021	Marketing Managers		X			X	X				X	4
11-2022	Sales Managers	X	X	X	X	X	X	X		X	X	9
11-3021	Computer and Information Systems Managers		X				X		X		X	4
11-3071	Transportation, Storage, and Distribution Managers	X					X	X		X		4
11-3121	Human Resources Managers		X		X		X					3
11-3131	Training and Development Managers						X					1
11-9013	Farmers, Ranchers, and Other Agricultural Managers											
11-9021	Construction Managers											
11-9031	Education Administrators, Preschool and Childcare Center/Program											
11-9033	Education Administrators, Postsecondary											
11-9051	Food Service Managers											
11-9081	Lodging Managers											
11-9141	Property, Real Estate, and Community Association Managers											
11-9151	Social and Community Service Managers											
11-1021	General and Operations Managers	X	X	X	X	X	X	X	X	X	X	1
<b>Business and Financial Operations (13-0000)</b>												
13-1011	Agents and Business Managers of Artists, Performers, and Athletes										X	1
13-1041	Compliance Officers		X				X			X		3
13-1051	Cost Estimators											
13-1071	Human Resources Specialists	X	X	X	X	X	X	X	X	X	X	1
13-1081	Logisticians	X	X		X		X	X	X	X		7
13-1111	Management Analysts		X				X	X			X	4
13-1121	Meeting, Convention, and Event Planners										X	1
13-1141	Compensation, Benefits, and Job Analysis Specialists						X					1
13-1151	Training and Development Specialists		X		X		X					3
13-1161	Market Research Analysts and Marketing Specialists	X	X			X	X	X		X	X	7
13-1199	Business Operations Specialists, All Other		X		X	X	X		X	X	X	7
13-2011	Accountants and Auditors	X	X	X	X	X	X	X	X	X	X	1
13-2051	Financial Analysts		X			X	X		X			4

SOC Code	Occupation											
		Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters
13-2072	Loan Officers						X					1
13-2082	Tax Preparers						X					1
<b>Computer and Mathematical (15-0000)</b>												
15-1121	Computer Systems Analysts		X		X		X	X	X	X	X	7
15-1122	Information Security Analysts		X				X					2
15-1131	Computer Programmers		X				X		X		X	4
15-1132	Software Developers, Applications		X		X		X	X	X		X	6
15-1133	Software Developers, Systems Software		X		X		X	X	X		X	6
15-1134	Web Developers						X				X	2
15-1141	Database Administrators		X				X					2
15-1142	Network and Computer Systems Administrators		X	X	X		X	X	X	X	X	8
15-1143	Computer Network Architects		X				X		X		X	4
15-1151	Computer User Support Specialists		X	X	X		X	X	X		X	7
15-1152	Computer Network Support Specialists		X				X				X	3
15-1199	Computer Occupations, All Other		X				X		X		X	4
15-2031	Operations Research Analysts		X		X		X		X			4
<b>Architecture and Engineering (17-0000)</b>												
17-2051	Civil Engineers						X					1
17-2081	Environmental Engineers						X					1
17-2141	Mechanical Engineers		X	X	X	X	X		X	X		7
17-2199	Engineers, All Other			X	X	X			X			4
17-3013	Mechanical Drafters		X	X	X	X	X		X			6
17-3022	Civil Engineering Technicians						X					1
17-3026	Industrial Engineering Technicians		X	X	X	X	X		X	X		8
17-3027	Mechanical Engineering Technicians		X	X	X	X	X		X			6
<b>Life, Physical, and Social Science (19-0000)</b>												
19-2031	Chemists		X				X			X		3
19-2041	Environmental Scientists and Specialists, Including Health						X					1
19-4099	Life, Physical, and Social Science Technicians, All Other		X									1
<b>Community and Social Service (21-0000)</b>												
21-1012	Educational, Guidance, School, and Vocational Counselors											
21-1018	Substance Abuse, Behavioral Disorder, and Mental Health Counselors											
21-1021	Child, Family, and School Social Workers											
21-1022	Healthcare Social Workers											
21-1023	Mental Health and Substance Abuse Social Workers											
21-1092	Probation Officers and Correctional Treatment Specialists											
21-1093	Social and Human Service Assistants											
21-1099	Community and Social Service Specialists, All Other											

SOC Code	Occupation	Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters
<b>Legal Occupations (23-0000)</b>												
23-2011	Paralegals and Legal Assistants		X									1
<b>Education, Training, and Library (25-0000)</b>												
25-2011	Preschool Teachers, Except Special Education											
25-3021	Self-Enrichment Education Teachers										X	1
25-3097	Teachers and Instructors, All Other											
<b>Arts, Design, Entertainment, Sports, and Media (27-0000)</b>												
27-1024	Graphic Designers		X				X				X	3
27-1026	Merchandise Displayers and Window Trimmers	X										1
27-2012	Producers and Directors										X	1
27-2022	Coaches and Scouts											
27-3031	Public Relations Specialists						X				X	2
27-3041	Editors										X	1
27-4011	Audio and Video Equipment Technicians										X	1
<b>Healthcare Practitioners and Technical (29-0000)</b>												
29-1071	Physician Assistants											
29-1122	Occupational Therapists											
29-1123	Physical Therapists											
29-1131	Veterinarians											
29-2052	Pharmacy Technicians											
29-2056	Veterinary Technologists and Technicians											
29-2061	Licensed Practical and Licensed Vocational Nurses											
29-2071	Medical Records and Health Information Technicians											
29-2081	Opticians, Dispensing											
29-9011	Occupational Health and Safety Specialists	X	X	X	X				X	X		6
<b>Healthcare Support (31-0000)</b>												
31-1014	Nursing Assistants											
31-2011	Occupational Therapy Assistants											
31-2021	Physical Therapist Assistants											
31-9011	Massage Therapists											
31-9091	Dental Assistants											
31-9092	Medical Assistants											
31-9094	Medical Transcriptionists											
31-9095	Pharmacy Aides											
31-9096	Veterinary Assistants and Laboratory Animal Caretakers											
31-9097	Phlebotomists											
31-9099	Healthcare Support Workers, All Other											
<b>Protective Service (33-0000)</b>												
33-1099	First-Line Supervisors of Protective Service Workers, All Other											



SOC Code	Occupation											
		Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters
33-3021	Detectives and Criminal Investigators											
33-9032	Security Guards							X		X	2	
33-9091	Crossing Guards											
33-9099	Protective Service Workers, All Other											
<b>Food Preparation and Serving Related (35-0000)</b>												
35-1011	Chefs and Head Cooks											
35-1012	First-Line Supervisors of Food Preparation and Serving Workers											
<b>Building and Grounds Cleaning and Maintenance (37-0000)</b>												
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers											
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers											
37-2021	Pest Control Workers											
37-3011	Landscaping and Groundskeeping Workers											
37-3013	Tree Trimmers and Pruners											
37-3019	Grounds Maintenance Workers, All Other											
<b>Personal Care and Service (39-0000)</b>												
39-1021	First-Line Supervisors of Personal Service Workers											
39-5012	Hairdressers, Hairstylists, and Cosmetologists									X	1	
39-5094	Skincare Specialists											
39-9031	Fitness Trainers and Aerobics Instructors											
39-9032	Recreation Workers											
<b>Sales and Related (41-0000)</b>												
41-1011	First-Line Supervisors of Retail Sales Workers											
41-1012	First-Line Supervisors of Non-Retail Sales Workers		X				X	X		X	4	
41-2021	Counter and Rental Clerks											
41-2022	Parts Salespersons							X			1	
41-2031	Retail Salespersons							X			1	
41-3011	Advertising Sales Agents									X	1	
41-3021	Insurance Sales Agents											
41-3031	Securities, Commodities, and Financial Services Sales Agents											
41-3041	Travel Agents											
41-3099	Sales Representatives, Services, All Other						X	X		X	3	
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products		X			X	X	X		X	5	
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	X	X	X	X	X	X	X	X	X	1	
41-9011	Demonstrators and Product Promoters											
41-9022	Real Estate Sales Agents											
41-9041	Telemarketers						X				1	

SOC Code	Occupation													
		Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters		
41-9099	Sales and Related Workers, All Other													
<b>Office and Administrative Support (43-0000)</b>														
43-1011	First-Line Supervisors of Office and Administrative Support Workers	X	X	X	X	X	X	X	X	X	X	X	X	1
43-2011	Switchboard Operators, Including Answering Service							X						1
43-3011	Bill and Account Collectors		X					X	X					3
43-3021	Billing and Posting Clerks		X					X	X				X	4
43-3031	Bookkeeping, Accounting, and Auditing Clerks	X	X	X	X	X	X	X	X	X	X	X	X	1
43-3051	Payroll and Timekeeping Clerks													
43-3071	Tellers													
43-4051	Customer Service Representatives	X	X	X	X	X	X	X	X	X	X	X	X	1
43-4061	Eligibility Interviewers, Government Programs													
43-4071	File Clerks													
43-4111	Interviewers, Except Eligibility and Loan													
43-4131	Loan Interviewers and Clerks													
43-4141	New Accounts Clerks													
43-4151	Order Clerks	X	X	X		X		X					X	6
43-4161	Human Resources Assistants, Except Payroll and Timekeeping													
43-4171	Receptionists and Information Clerks		X						X				X	3
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks													
43-4199	Information and Record Clerks, All Other												X	1
43-5011	Cargo and Freight Agents								X					1
43-5032	Dispatchers, Except Police, Fire, and Ambulance								X					1
43-5061	Production, Planning, and Expediting Clerks	X	X	X	X	X	X	X	X	X	X	X	X	1
43-5071	Shipping, Receiving, and Traffic Clerks	X	X	X	X	X		X	X	X	X	X	X	9
43-5081	Stock Clerks and Order Fillers	X	X	X	X	X		X	X	X				8
43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	X		X				X						3
43-6011	Executive Secretaries and Executive Administrative Assistants		X		X			X	X	X			X	6
43-6013	Medical Secretaries													
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	X	X	X	X	X	X	X	X	X	X	X	X	1
43-9021	Data Entry Keyers							X	X					2
43-9041	Insurance Claims and Policy Processing Clerks													
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service													
43-9061	Office Clerks, General	X	X	X	X	X	X	X	X	X	X	X	X	1
43-9071	Office Machine Operators, Except Computer													
43-9199	Office and Administrative Support Workers, All Other													
<b>Farming, Fishing, and Forestry (45-0000)</b>														
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers													
45-2041	Graders and Sorters, Agricultural Products	X												1

SOC Code	Occupation											
		Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters
45-2091	Agricultural Equipment Operators											
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	X										1
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	X										1
45-4021	Fallers											
45-4022	Logging Equipment Operators											
<b>Construction and Extraction (47-0000)</b>												
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers											
47-2021	Brickmasons and Blockmasons											
47-2031	Carpenters											
47-2051	Cement Masons and Concrete Finishers											
47-2061	Construction Laborers											
47-2071	Paving, Surfacing, and Tamping Equipment Operators											
47-2073	Operating Engineers and Other Construction Equipment Operators											
47-2111	Electricians	X		X	X	X			X	X	X	7
47-2121	Glaziers			X								1
47-2132	Insulation Workers, Mechanical											
47-2141	Painters, Construction and Maintenance											
47-2151	Pipelayers											
47-2152	Plumbers, Pipefitters, and Steamfitters				X							1
47-2181	Roofers											
47-2211	Sheet Metal Workers								X			1
47-2221	Structural Iron and Steel Workers											
47-3012	Helpers--Carpenters											
47-3013	Helpers--Electricians											
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters											
47-3019	Helpers, Construction Trades, All Other											
47-4011	Construction and Building Inspectors											
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners											
<b>Installation, Maintenance and Repair (49-0000)</b>												
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	X	X	X	X	X	X	X		X		8
49-2011	Computer, Automated Teller, and Office Machine Repairers		X									1
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers						X				X	2
49-2098	Security and Fire Alarm Systems Installers											
49-3011	Aircraft Mechanics and Service Technicians								X			1
49-3021	Automotive Body and Related Repairers											
49-3023	Automotive Service Technicians and Mechanics							X				1
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	X						X				2
49-3041	Farm Equipment Mechanics and Service Technicians											

SOC Code	Occupation	Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters
49-3042	Mobile Heavy Equipment Mechanics, Except Engines							X				1
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics											
49-3092	Recreational Vehicle Service Technicians											
49-3093	Tire Repairers and Changers											
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers					X						1
49-9044	Millwrights				X							1
49-9051	Electrical Power-Line Installers and Repairers											
49-9052	Telecommunications Line Installers and Repairers										X	1
49-9071	Maintenance and Repair Workers, General	X	X	X	X	X	X	X	X	X	X	1
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers											
49-9098	Helpers--Installation, Maintenance, and Repair Workers											
49-9099	Installation, Maintenance, and Repair Workers, All Other											
<b>Production (51-0000)</b>												
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers		X		X	X			X			4
51-2091	Fiberglass Laminators and Fabricators											
51-2098	Assemblers and Fabricators, All Other, Including Team Assemblers	X	X	X	X	X		X	X	X	X	9
51-3011	Bakers	X										1
51-3021	Butchers and Meat Cutters	X										1
51-3092	Food Batchmakers	X										1
51-3099	Food Processing Workers, All Other	X										1
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic		X	X	X	X			X			5
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic			X	X	X				X		4
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic			X	X	X			X			4
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic		X	X	X	X			X			5
51-4041	Machinists		X	X	X	X			X	X		6
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic		X	X	X	X						4
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic		X	X	X	X			X			5
51-4111	Tool and Die Makers		X	X	X	X			X			5
51-4121	Welders, Cutters, Solderers, and Brazers		X	X	X	X			X			5
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic											
51-6031	Sewing Machine Operators		X		X							2
51-6062	Textile Cutting Machine Setters, Operators, and Tenders											
51-6093	Upholsterers				X							1
51-7011	Cabinetmakers and Bench Carpenters											

SOC Code	Occupation											
		Food & Beverage Production	Healthcare & Medical Devices	Advanced (Fired) Materials	Automotive	Electrical Equipment & Appliances	Business Services	Transportation, Distribution & Logistics	Aerospace & Defense	Chemical Products	Entertainment & Media	Number of Clusters
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood											
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing											
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	X	X	X	X					X		5
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	X	X	X	X	X	X	X	X	X		9
51-9081	Dental Laboratory Technicians		X									1
51-9111	Packaging and Filling Machine Operators and Tenders	X	X	X	X	X		X		X		7
51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders			X	X	X			X	X		5
51-9192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	X		X								2
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic			X								1
51-9197	Tire Builders			X								1
51-9198	Helpers--Production Workers	X	X	X	X	X			X	X		7
51-9199	Production Workers, All Other	X	X	X	X	X			X	X		7
<b>Transportation and Material Moving (53-0000)</b>												
53-1048	First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	X		X	X	X		X		X		6
53-3021	Bus Drivers, Transit and Intercity											
53-3022	Bus Drivers, School or Special Client											
53-3031	Driver/Sales Workers	X						X				2
53-3032	Heavy and Tractor-Trailer Truck Drivers	X		X	X			X		X		5
53-3033	Light Truck or Delivery Services Drivers	X	X	X	X			X				5
53-6031	Automotive and Watercraft Service Attendants											
53-7011	Conveyor Operators and Tenders	X						X				2
53-7032	Excavating and Loading Machine and Dragline Operators											
53-7051	Industrial Truck and Tractor Operators	X			X	X		X	X	X		6
53-7061	Cleaners of Vehicles and Equipment	X						X				2
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	X	X		X	X	X	X	X	X	X	9
53-7063	Machine Feeders and Offbearers	X		X		X		X		X		5
53-7064	Packers and Packagers, Hand	X	X		X	X		X	X	X		7
53-7081	Refuse and Recyclable Material Collectors											