

A man with a beard and safety glasses, wearing a blue button-down shirt with a logo, is focused on working on an electrical circuit. He is holding a multimeter and testing a component. The background shows a workshop with various tools and equipment.

LEAP 2019: IN-DEMAND OCCUPATIONS

**2019 LABOR AND EDUCATION ALIGNMENT PROGRAM (LEAP)
IN-DEMAND OCCUPATIONS REPORT**

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Interact with the data via an interactive dashboard by [clicking here](#).

Download an excel file of data by [clicking here](#).

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INTRODUCTION

"First, Tennessee must deliver a world-class education, and that education must be aligned with the needs of job creators of today and tomorrow." – Governor Bill Lee, State of the State 2019

On January 19, 2019, Bill Lee was sworn in as the 50th Governor of the State of Tennessee. Ten days later, Governor Lee released Executive Order 1, requiring a statement of rural impact and recommendations for better serving rural Tennesseans from all executive departments. The Lee Administration is focused on rural and economically distressed counties, strengthening career and technical training, expanding school choice, pursuing criminal justice reform, improving public safety and sharpening the effectiveness of government.

Companies from around the globe continue to recognize Tennessee's pro-business climate and talented workforce. The state's success in corporate expansion and recruitment activity has resulted in unprecedented job growth and a diversified business portfolio. Tennessee's private sector experienced a net gain of 42,700 jobs over the last year. In August of 2019, Business Facilities ranked Tennessee No. 1 in the nation for Best Business Climate and No. 3 in Workforce Training Leaders.

As employment opportunities expand, so has Tennessee's available workforce. The labor force of 3.35 million employed and unemployed individuals age 16 and older has increased by 3.4 percent year-over-year (August 2018 – August 2019), which was the highest rate of growth in the nation. Tennessee's labor force participation rate of 62.2 percent also had the second highest year-over-year gain in the nation, increasing by 1.3 percentage points. In addition, the state's unemployment rate has remained under the national average for thirty-two consecutive months (January 2017 through August 2019).

Education and industry must be better aligned to ensure Tennessee will be able to meet the workforce demands of current industry, as well as provide the workforce needed for continued job growth across the state. Apprenticeship, pre-apprenticeship, work-based learning, and dual enrollment are some of the workforce strategies Tennessee will continue to build upon and utilize to ensure individuals have the knowledge and skills necessary for success.

Governor Lee has made it clear that education and workforce are a priority for Tennessee. Below are a few highlighted programs that support the alignment of labor and education, thus creating the workforce needed for economic development and business success.

Governor's Investment in Vocational Education (GIVE)

The GIVE program is a \$25 million investment designed to foster long-term regional partnerships between companies, workforce entities, and education. Programs developed include partnerships with Tennessee Colleges of Applied Technology (TCATs), community colleges, industry, economic development, workforce agencies, and K-12 schools to identify and address skills gaps in local workforce pools.

GIVE also focuses on regional partnerships to develop work-based learning and apprenticeship opportunities. Additionally, GIVE expands funding for high school juniors and seniors to utilize four, fully-funded dual enrollment credits for trade and technical programs. This is an increase from the previous allowance of two credits.

The Rural Initiative Funding Opportunity Announcement (RIFOA)

Housed in the Tennessee Department of Labor and Workforce Development, this program is a \$3 million investment available to local workforce development boards to support workforce expansion efforts in the targeted counties. The state's 15 distressed counties will split \$2.1 million of the \$3 million in grant money, with the remaining \$900,000 divided among 23 counties deemed at-risk by the state.

Future Workforce Initiative

This \$4 million investment is designed to increase access to career and technical education for K-12 students, with a special emphasis on STEM training. The Future Workforce Initiative aims to put Tennessee in the top 25 states for job creation in the technology sector by 2022 through three areas of emphasis including:

1. Launching new CTE programs focused in STEM fields with 100 new middle school programs and tripling the number of STEM-designated public schools by 2022.
2. Growing the number of teachers qualified to teach work-based learning and advanced computer science courses through STEM teacher training and implementation of K-8 computer science standards.
3. Expanding postsecondary STEM opportunities in high school through increased access to dual credit, AP courses and dual-enrollment.

Tennessee Pathways

Tennessee Pathways is the K-12 initiative created to support regionally and locally led approaches to address gaps in job skills. The program is structured around high-quality college and career advisement throughout K-12, rigorous early postsecondary and work-based learning opportunities in high school, and seamless vertical alignment between secondary and postsecondary programs. The effective partnerships include school districts, higher education institutions, employers, and community organizations. Students, with their certificate, degree or credential, can transition seamlessly into the workforce and contribute to the success of Tennessee's economy.

Tennessee Pathways Certifications

Beginning in the spring of 2019, schools were provided the opportunity to apply for the Tennessee Pathways Certification, which is designed to identify strong alignment between high school programs of study, postsecondary partners, and high-quality employment opportunities. Through the certification process, schools qualify for statewide recognition and additional grants to support their programs. This recognition program ensures students, families, and the community know high-quality pathways exist for students to transition seamlessly from K-12 education into higher education and high-quality employment.

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. There are also opportunities for students to attend select programs at 4-year universities.

Tennessee Reconnect

Tennessee Reconnect utilizes 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 post-secondary degree, 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 for students to attend select programs at 4-year universities.

UT Promise

UT Promise is a new undergraduate scholarship program guaranteeing free tuition and mandatory fees for qualifying Tennessee residents attending UT's campuses in Knoxville, Chattanooga, Martin and Memphis. UT Promise is a student-success oriented scholarship program that requires students to complete volunteer service hours and meet with a volunteer mentor each semester to ensure a successful student experience.

Launching in fall 2020, this innovative scholarship will cover a student's last-dollar amount of tuition and mandatory fees after other financial aid is applied (such as Pell grants, HOPE Scholarship or other institutional scholarships) to students who qualify for HOPE and whose family household income is under \$50,000 a year.

Apprenticeship TN

Housed in the Tennessee Department of Labor and Workforce Development, Apprenticeship TN is designed to increase the use of apprenticeship and pre-apprenticeship programs as a dependable workforce strategy for companies located in Tennessee. The program is focused on expansion and creation of traditional and non-traditional occupations, as well as increasing the diversity of the participants.

Work-Based Learning

Housed in the Tennessee Department of Education, Work-Based Learning (WBL) is a proactive approach to bridging the gap between high school and high-demand, high-skill careers in Tennessee. Students build on classroom-based instruction to develop employability skills that prepare them for success in postsecondary education and future careers. Through experiences like internships, apprenticeships, and paid work experience, juniors and seniors (16 years or older) may earn high school credit for capstone WBL experiences.

TN Broadband Accessibility

Housed in the Tennessee Department of Economic and Community Development, the Broadband Accessibility Grant Program is a critical part of Tennessee's plan to address our broadband gaps. The Program is designed to offset the capital expenses in the deployment of broadband in unserved areas. The goal of this program is to facilitate broadband access to all Tennesseans while promoting practices that increase deployment and encourage adoption. Funds are targeted to areas that are unlikely to receive broadband service without grant funding. Grants totaling more than \$24.6 million were awarded through the program's first two rounds. The grantees for the current round of funding will be announced in March 2020.

UTILIZING THE LEAP 2019: IN-DEMAND OCCUPATIONS REPORT

Pursuant to Section 49 of Public Chapter 7, 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.

This report identifies 289 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 is meant to be used as a tool in the toolbox 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 report.

- 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 report serves to identify occupations throughout the state that are in high demand by Tennessee's business community. This report is not an extensive list of occupations and education programs. It is intended to be a guide to start next step conversations.

OCCUPATIONAL ANALYSIS: JOBS WITH HIGH EMPLOYER DEMAND

The Center for Economic Research in Tennessee (CERT) conducted an analysis to identify high demand jobs in Tennessee. For each of the state’s nine regions (Job Base Camps), 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 to show a supply/demand relationship.

In total, CERT identified 289 job classifications¹ with high employer demand in one or more Tennessee regions. Out of 775 occupations, regions varied from 131 occupations to 169 occupations. In total, these occupations had over 8.3 million regional geography-tied unique job postings in 2018, over 958,000 hires in 2018, and over 224,000 projected job openings from 2016 to 2026.

Tennessee Region	Number of Occupations with High Employer Demand	For Job Classifications in High Demand:		
		Unique Job Postings (2018)	Hires (2018)	Openings (2016 - 2026 Employment Change)
Greater Memphis	146	1,205,640	185,020	31,410
Northwest	143	349,848	22,412	4,400
Southwest	145	303,552	26,241	5,170
Northern Middle	169	2,924,484	318,993	99,880
Southern Middle	140	540,756	46,508	10,270
Upper Cumberland	141	395,208	36,272	7,020
East	157	1,298,688	156,975	34,040
Southeast	152	826,200	114,505	23,430
Northeast	131	527,124	52,041	8,870
Total	289	8,371,500	958,967	224,490

The 289 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 that fall into **priority occupation groups** and **target industry clusters** that are relevant to Tennessee’s business recruitment and expansion strategy. Positions requiring **Science Technology Engineering and Mathematics (STEM)** skills are highlighted in blue font in Appendix A and Appendix B, because a robust STEM workforce is critical to Tennessee’s continued growth of advanced industries.²

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.

¹ The 289 occupations with high employer demand in one or more Tennessee regions are provided in Appendix A on page 33.

² The Advanced Industries Sector is a group of 50 industries characterized by research and development (R&D) and STEM workers. The list of industries can be found on page 3 of the Brookings *America’s Advanced Industries* report.

(<https://www.brookings.edu/research/americas-advanced-industries-what-they-are-where-they-are-and-why-they-matter/>)

Priority Occupation Groups

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

- Information technology occupations (page 11),
- Production occupations (page 15),
- Engineering and engineering-related occupations (page 19),
- Healthcare occupations (page 23),
- Business and financial operations occupations (page 28)
- Transportation and material moving occupations (page 31).

Correlating training and education programs offered at Tennessee colleges and universities are highlighted for each of these occupation groups.

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 occupations within each group, and the share of those occupations identified as in-demand.

Occupation Group	Occupations with High Employer Demand in One or More Regions	All Occupations in Group
Management (11-0000)	23	34
Business and Financial Operations (13-0000)	16	30
Computer and Mathematical (15-0000)	14	18
Architecture and Engineering (17-0000)	14	35
Life, Physical, and Social Science (19-0000)	7	43
Community and Social Service (21-0000)	11	17
Legal (23-0000)	2	9
Education, Training, and Library (25-0000)	7	27
Arts, Design, Entertainment, Sports, and Media (27-0000)	9	41
Healthcare Practitioners and Technical (29-0000)	31	60
Healthcare Support (31-0000)	11	17
Protective Service (33-0000)	4	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)	15	22
Office and Administrative Support (43-0000)	29	56
Farming, Fishing, and Forestry (45-0000)	4	15
Construction and Extraction (47-0000)	21	59
Installation, Maintenance and Repair (49-0000)	23	52
Production (51-0000)	22	106
Transportation and Material Moving (53-0000)	13	51
Military (55-0000)	-	1
Unclassified (99-9999)	-	1
TOTAL	289	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, 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. Recruitment of new companies into the cluster or expansion of existing companies 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 local graduates.

TNECD has identified several industry clusters that Tennessee has demonstrated a strong competitive advantage. Tennessee has experienced significant company expansion and recruitment in the 9 sectors listed below and continually develops strategies that facilitate sustained growth.

- **FOOD AND AGRICULTURE** focuses on the processing and manufacture of food and beverage products. Service industries such as the restaurant sector are not included.
- **HEALTHCARE AND LIFE SCIENCES** includes production of medical equipment, supplies, and pharmaceuticals, as well as medical research. Locally-traded healthcare services such as hospitals and doctors' offices are not included.
- **RUBBER, CERAMICS, AND GLASS** involves manufacturing of heat-treated materials, sometimes called vulcanized or fired materials.
- **AUTOMOTIVE** includes industries that produce motor vehicles and vehicle parts.
- **APPLIANCES AND ELECTRICAL** manufactures household appliances as well as electrical components like switchboards.
- **HEADQUARTERS, FINANCE, AND TECH** includes headquarters, business support services like accounting and logistics consulting, computer services, and research and development.
- **DISTRIBUTION AND LOGISTICS** involves product distribution and transportation services.
- **AEROSPACE AND DEFENSE** manufactures aircraft, aircraft parts such as engines, and weaponry ranging in size from small arms to nuclear weapons.
- **CHEMICALS** 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.

Occupations that 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 42 shows the industry cluster(s) that in-demand occupations support.

To learn more about Tennessee's industry clusters, please visit the industries and publications sections 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. Most of the regionally in-demand STEM occupations are IT, engineering, and healthcare occupations, which are highlighted in this report.

The Tennessee Department of Labor and Workforce Development published *The Demand for STEM Occupations in Tennessee*³ in July of 2019. This report suggests that Tennessee will experience significant growth in STEM occupations over the next decade. Most of these jobs will be computer and engineering occupations.

³ *The Demand for STEM Occupations in Tennessee can be found at:*

<https://www.jobs4tn.gov/admin/gsipub/htmlarea/uploads/LMI/Publications/STEMReport2019Updated.pdf>

INFORMATION TECHNOLOGY (IT) OCCUPATIONS

Information technology (IT) occupations are in high demand in both Tennessee and the nation. In-demand IT occupations are strongly concentrated in the headquarters, finance, and tech cluster. Industries in the headquarters, finance, and tech cluster are not only a significant source of employment in Tennessee, they also provide high average wages and generate substantial earnings, even during periods of economic decline. Below are a few highlights of the findings:

- Computer services is an industry category that is emerging in Tennessee and includes industries like data processing, hosting and related services, computer programming and systems design services, computer facilities management services, and other computer related services.
- Software developers are crucial for the growth of computer services industries and headquarters industries. Software developers are in high-demand across the state and will be increasingly important to the workforce pipeline to regions across the state.
- Computer user support specialists are in-demand in all nine Tennessee regions and are often found in industries that include direct-to-consumer services, such as medical wholesaling, computer wholesaling, and e-commerce.
- 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 that 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 programs⁴ for IT outlined in the following pages.

IN-DEMAND IT 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
11-3021	Computer and Information Systems Managers	X	X		X	X	X	X	X	X	8	*	a, b, c, d, e
15-1121	Computer Systems Analysts	X	X		X	X	X			X	6	*	b, c, f
15-1122	Information Security Analysts	X		X	X	X			X	X	6	*	a, c, d, f
15-1131	Computer Programmers	X				X	X	X		X	5	*	a, e, i, j
15-1132	Software Developers, Applications	X	X	X	X	X	X	X	X	X	9	*	a, c, h, i, j
15-1133	Software Developers, Systems Software		X		X	X	X	X	X	X	7	*	a, c, h, i, j
15-1134	Web Developers	X		X	X	X			X		5	*	a, g, i
15-1141	Database Administrators	X				X					2	*	b, d
15-1142	Network and Computer Systems Administrators	X	X	X	X	X	X	X		X	8	*	b, d

⁴ 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
15-1143	Computer Network Architects	X	X	X	X	X			X		6	*	b, c, d, f, h
15-1151	Computer User Support Specialists	X	X	X	X	X	X	X	X	X	9	*	k
15-1152	Computer Network Support Specialists							X	X		2	*	a, d, f, i
15-1199	Computer Occupations, All Other		X	X		X	X			X	6	*	a, b

KEY TRAINING PROGRAMS FOR IT

The 2018 completions by institution are included in parenthesis after the institution name in the tables below.

a. *Computer Science (CIP 11.0701)*

In the last five years, 2,515 Tennesseans completed a postsecondary certificate or degree in this program. Twenty postsecondary institutions awarded a total of three certificates, 526 bachelor's, 113 master's, and 15 doctoral degrees for this program in 2018.

Vanderbilt University (136)	University of Tennessee-Knoxville (106)	Middle Tennessee State University (86)
Tennessee Technological University (75)	Tennessee State University (61)	University of Tennessee-Chattanooga (55)
University of Memphis (53)	Rhodes College (21)	University of Tennessee-Martin (17)
Southern Adventist University (10)	Lipscomb University (7)	Lane College (7)
Sewanee-University of the South (6)	Christian Brothers University (5)	Union University (3)
Austin Peay State University (3)	Carson-Newman University (2)	Milligan College (2)
Tusculum College (1)	Le Moyne-Owen College (1)	

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

In the last five years, 2,059 Tennesseans completed a postsecondary certificate or degree in this program. Thirteen postsecondary institutions awarded a total of 29 certificates, 38 associates, 173 bachelor's, and 14 master's degrees for this program in 2018.

East Tennessee State University (83)	Austin Peay State University (72)	Jackson State CC (30)
TCAT-Shelbyville (29)	Belmont University (10)	Milligan College (9)
Freed-Hardeman University (6)	Nashville State CC (5)	Fisk University (4)
Maryville College (2)	Southwest Tennessee CC (2)	Chattanooga State CC (1)
Tennessee Wesleyan University (1)		

c. Information Technology (CIP 11.0103)

In the last five years, 1,485 Tennesseans completed a postsecondary certificate or degree in this program. Twenty-four postsecondary institutions awarded a total of 67 certificates, 293 associates, 105 bachelor's, and 98 master's degrees for this program in 2018.

Pellissippi State CC (84)	King University (63)	Middle Tennessee State University (59)
Volunteer State CC (59)	Northeast State CC (43)	University of Memphis (39)
Southwest Tennessee CC (30)	Walters State CC (25)	Fountainhead College of Technology (23)
Chattanooga State CC (23)	Columbia State CC (16)	Nashville State CC (16)
Lee University (15)	TCAT-Livingston (13)	Daymar College-Clarksville (10)
Trevecca Nazarene University (9)	Dyersburg State CC (8)	Strayer University-Tennessee (8)
Lipscomb University (5)	Motlow State CC (4)	Roane State CC (4)
Austin Peay State University (3)	Union University (2)	Cleveland State CC (2)

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

In the last five years, 328 Tennesseans completed a postsecondary certificate or degree in this program. Seven postsecondary institutions awarded a total of 15 certificates, 19 bachelor's, and one master's degree for this program in 2018.

Fountainhead College of Technology (15)	Nashville State CC (12)	University of Phoenix-Tennessee (3)
TCAT-Crump (2)	Lipscomb University (1)	University of Memphis (1)
Strayer University-Tennessee (1)		

e. Management Information Systems, General (CIP 52.1201)

In the last five years, 1,105 Tennesseans completed a postsecondary certificate or degree in this program. Eight postsecondary institutions awarded a total of 58 certificates and 190 bachelor's degrees for this program in 2018.

Middle Tennessee State University (99)	TCAT Nashville (58)	University of Memphis (55)
University of Tennessee-Martin (12)	Belmont University (11)	Bethel University (6)
Christian Brothers University (6)	Carson-Newman University (1)	

f. Computer Systems Networking and Telecommunications (CIP 11.0901)

In the last five years, 640 Tennesseans completed a postsecondary certificate or degree in this program. Ten postsecondary institutions awarded a total of 124 certificates, 25 associates, and six bachelor's degrees for this program in 2018.

Pellissippi State CC (78)	TCAT-McKenzie (23)	Southwest Tennessee CC (15)
Nashville State CC (12)	Cleveland State CC (8)	Remington College-Memphis Campus (8)
University of Phoenix-Tennessee (4)	Chattanooga College Medical Dental and Technical Careers (3)	Virginia College-Knoxville (2)
DeVry University-Tennessee (2)		

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

In the last five years, 408 Tennesseans completed a postsecondary certificate or degree in this program. Twelve postsecondary institutions awarded a total of 54 certificates, five associates, and 13 bachelor's degrees for this program in 2018.

Pellissippi State CC (54)	Art Institute of Tennessee-Nashville (6)	Belmont University (2)
Trevecca Nazarene University (2)	Lipscomb University (1)	Motlow State CC (1)
Nashville State CC (1)	Roane State CC (1)	Tennessee Technological University (1)
Union University (1)	Walters State CC (1)	University of Phoenix-Tennessee (1)

h. Computer Engineering, General (CIP 14.0901)

In the last five years, 443 Tennesseans completed a postsecondary degree in this program. Six postsecondary institutions awarded a total of 77 bachelor's, 14 master's, and eight doctoral degrees for this program in 2018.

University of Tennessee-Knoxville (38)	University of Memphis (21)	Tennessee Technological University (18)
Vanderbilt University (12)	Tennessee State University (6)	Christian Brothers University (4)

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

In the last five years, 97 Tennesseans completed a postsecondary certificate or degree in this program. Four postsecondary institutions awarded a total of 18 associates and two bachelor's degrees for this program in 2018.

j. Computer Programming, Specific Applications (CIP 11.0202)

In the last five years, 81 Tennesseans completed a postsecondary certificate or degree in this program.

k. Computer Support Specialist (CIP 11.1006)

In the last five years, 85 Tennesseans completed a postsecondary certificate or degree in this program. Five postsecondary institutions awarded a total of 33 certificates and three associates degrees for this program in 2018.

PRODUCTION OCCUPATIONS

Production occupations are in high demand across Tennessee. Manufacturers seek assemblers and machine setters, operators, and tenders to successfully develop product. 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 automotive industry drives much of the production demand. Tennessee is home to approximately 900 automotive suppliers and three major assembly plants, Nissan in Smyrna, General Motors in Spring Hill, and Volkswagen in Chattanooga. Nissan’s Smyrna location is the most productive automotive plant in North America, producing approximately 640,000 vehicles annually.

Tennessee is within a day’s drive of nine other OEM plants.⁵ Completion of the Toyota-Mazda plant in Huntsville, AL will create new revenue opportunities for automotive suppliers in Tennessee. Automotive industries are significantly more concentrated in Tennessee’s rural counties (4.1 percent of total employment) than urban counties (1.7 percent). Occupations like assemblers, tool and die, CNC, machinists, welders and first-line supervisors of production and operating workers are key to the automotive industry’s success in Tennessee.

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

Table legend:

- An “X” denotes regions that 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 programs⁶ 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
11-1021	General and Operations Managers	X	X	X	X	X	X	X	X	X	9	*	
11-3051	Industrial Production Managers			X	X	X				X	4	*	c, g, h, i
51-1011	First-Line Supervisors of Production and Operating Workers	X		X	X				X	X	5	*	h
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers		X				X				2	*	
51-2098	Assemblers and Fabricators, All Other, Including Team Assemblers			X							1	*	
51-3011	Bakers		X				X				2	*	
51-3021	Butchers and Meat Cutters	X	X	X	X	X	X	X	X		8	*	

⁵ The regional assemblers are the Ford Motor Company (KY); General Motors (KY; TN), Toyota (MS; KY), Honda (AL), Nissan (TN; MS), Volvo (SC), Kia (GA), Daimler AG (AL; SC), BMW (SC), Hino (WV), and Volkswagen (TN). Plants within an eight-hour drive are General Motors (IN; OH; MO), Toyota (IN), Chrysler (OH), Honda (OH; OH; IN), and Subaru (IN).

⁶ 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
51-3092	Food Batchmakers					X					1	*	
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic		X						X		2	*	e
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic						X				1	*	
51-4041	Machinists			X	X	X			X		4	*	d, e, f
51-4111	Tool and Die Makers		X								1	*	j
51-4121	Welders, Cutters, Solderers, and Brazers		X	X	X	X	X	X	X	X	8	*	a, b
51-5112	Printing Press Operators	X								X	2		
51-6031	Sewing Machine Operators			X							1	*	
51-6093	Upholsterers		X								1	*	
51-6099	Textile, Apparel, and Furnishings Workers, All Other		X								1		
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing		X							X	2		
51-7099	Woodworkers, All Other		X				X				2		
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	X	X	X	X	X	X		X	X	8	*	k
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			2	*	
51-9198	Helpers--Production Workers	X	X	X	X		X	X	X	X	8	*	
51-9199	Production Workers, All Other	X	X	X			X	X	X	X	7	*	

KEY TRAINING PROGRAMS FOR PRODUCTION

The 2018 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, 3,286 Tennesseans completed a postsecondary certificate or degree in this program. Twenty-eight postsecondary institutions awarded a total of 862 certificates and two associates degrees for this program in 2018. Welding completions have significantly grown from five years ago—there were 330 more completions in 2018 than in 2014, a 61 percent increase in the number of completions in the last five years.

Lincoln College of Technology-Nashville (78)	TCAT-Knoxville (76)	TCAT-Crump (71)
TCAT-Jackson (61)	TCAT Nashville (56)	TCAT-Newbern (46)
TCAT-Morristown (44)	Northeast State CC (40)	William Moore College of Technology (36)
TCAT-McKenzie (31)	TCAT-Pulaski (31)	TCAT-Elizabethton (29)
TCAT-Harriman (29)	TCAT-Hartsville (25)	TCAT-Crossville (22)
TCAT-Livingston (20)	TCAT-Shelbyville (19)	TCAT-Dickson (19)
TCAT-Covington (18)	TCAT-Athens (18)	TCAT-Murfreesboro (15)
TCAT-Paris (14)	TCAT-Memphis (14)	TCAT-Jacksboro (13)
TCAT-McMinnville (11)	TCAT-Oneida-Huntsville (10)	Cleveland State CC (9)
TCAT-Whiteville (9)		

b. Welding Engineering Technology/Technician (CIP 15.0614)

In the last three years, 91 Tennesseans completed a postsecondary certificate or degree in this program. Three postsecondary institutions awarded a total of 25 certificates and 10 associates degrees for this program in 2018.

TCAT-Hohenwald (17)	Pellissippi State CC (10)	Chattanooga State CC (8)
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c. Logistics, Materials and Supply Chain Management (CIP 52.0203)

In the last five years, 1,970 Tennesseans completed a postsecondary certificate or degree in this program. Five postsecondary institutions awarded a total of 27 certificates and 443 bachelor's degrees for this program in 2018.

University of Tennessee-Knoxville (405)	University of Memphis (36)	Nashville State CC (15)
Volunteer State CC (11)	Lipscomb University (3)	

d. Machine Tool Technology/Machinist (CIP 48.0501)

In the last five years, 1,088 Tennesseans completed a postsecondary certificate or degree in this program. Nineteen postsecondary institutions awarded a total of 277 certificates and seven associates degrees for this program in 2018.

TCAT-Hartsville (35)	TCAT-Athens (26)	TCAT-Knoxville (25)
TCAT-McMinnville (21)	William Moore College of Technology (21)	TCAT-Crossville (19)
TCAT-Shelbyville (15)	TCAT-Covington (15)	TCAT-Morristown (14)
TCAT-Livingston (14)	TCAT-McKenzie (12)	TCAT-Elizabethton (12)
TCAT-Crump (11)	TCAT-Murfreesboro (10)	TCAT-Jackson (8)
TCAT-Paris (8)	TCAT-Jacksboro (7)	TCAT-Whiteville (6)
TCAT-Oneida-Huntsville (5)		

e. Machine Shop Technology/Assistant (CIP 48.0503)

In the last five years, 765 Tennesseans completed a postsecondary certificate in this program. Six postsecondary institutions awarded a total of 119 certificates for this program in 2018.

TCAT Nashville (31)	TCAT-Dickson (24)	TCAT-Memphis (15)
TCAT-Hohenwald (14)	TCAT-Harriman (13)	Northeast State Community College (13)

f. CNC Machinist Technology/CNC Machinist (CIP 48.0510)

In the last five years, 60 Tennesseans completed a postsecondary certificate in this program.

g. Engineering/Industrial Management (CIP 15.1501)

In the last five years, 761 Tennesseans completed a postsecondary certificate or degree in this program. Four postsecondary institutions awarded a total of four certificates, 69 bachelor's, and 123 master's degrees for this program in 2018.

Christian Brothers University (95)	University of Tennessee-Chattanooga (64)	Middle Tennessee State University (35)
University of Tennessee-Knoxville (2)		

h. Operations Management and Supervision (CIP 52.0205)

In the last five years, 512 Tennesseans completed a postsecondary certificate or degree in this program.

i. Industrial Engineering (CIP 14.3501)

In the last five years, 348 Tennesseans completed a postsecondary certificate or degree in this program.

j. Tool and Die Technology/Technician (CIP 48.0507)

In the last five years, 77 Tennesseans completed a postsecondary certificate or degree in this program.

k. Quality Control Technology/Technician (CIP 15.0702)

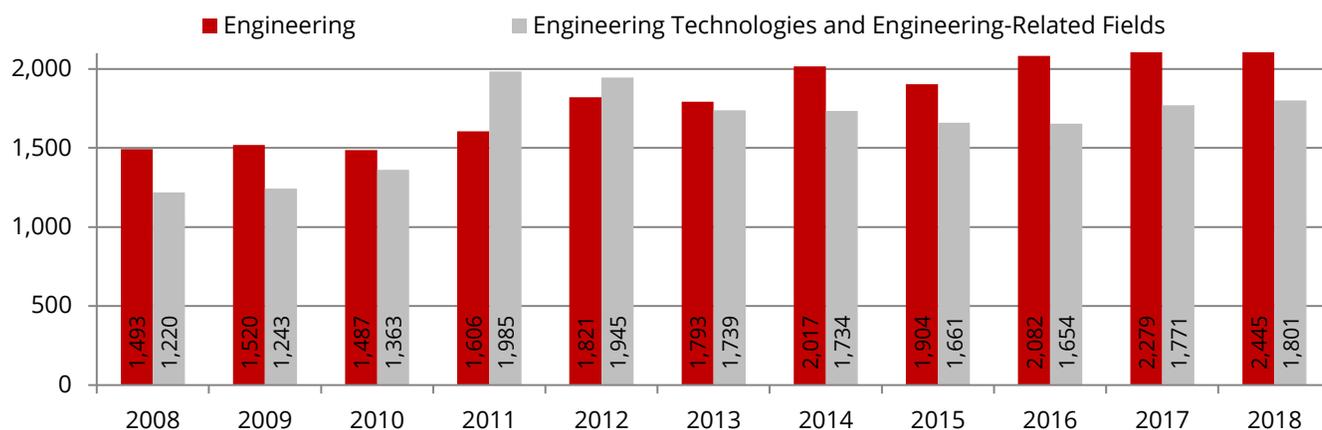
In the last five years, four Tennesseans completed a postsecondary certificate or degree in this program.

ENGINEERING AND RELATED OCCUPATIONS

Engineering and engineering-related occupations play an instrumental role in Tennessee's businesses. Engineers are crucial for product design in aerospace, automotive, defense, electrical equipment, and downstream chemical industries. Engineering technicians are involved in computer facilities management, as well as the manufacturing of aerospace parts, analytical laboratory instruments, and chemical products. The engineering services industry, which depends on engineering and engineering-related occupations, is a key industry in the headquarters, finance, and tech cluster.

Tennessee businesses employ more than 27,600 engineers and more than 15,800 engineering technicians, drafters and mapping technicians. Job growth in these occupation groups continues to rise in Tennessee, with engineers growing by 14% and engineering technicians, drafters and mapping technicians growing by 9% over the last five years. This job growth is fueled by approximately 50 postsecondary institutions in Tennessee that graduated students in these fields of study during the last five years. The top five schools producing engineering graduates in Tennessee in 2018 were the University of Tennessee-Knoxville, Tennessee Technological University, Vanderbilt University, University of Tennessee-Chattanooga, and the University of Memphis. Tennessee postsecondary institutions are graduating **64% more engineers** and **48% more engineering technologies and engineering related-fields** than they were ten years ago.

Engineering and Engineering-Related Postsecondary Completions in Tennessee



The Tennessee Department of Labor and Workforce Development highlighted the growing need for engineering completions in their 2019 STEM report—industrial engineers, civil engineers, industrial engineering technicians, mechanical engineers, architectural and engineering managers, electrical and electronics engineering technicians, electrical engineers, and civil engineering technicians were all listed as STEM occupations with more than 1,400 projected job openings from 2016 to 2026.⁷ The STEM occupations with the greatest candidate shortages were electrical engineers and mechanical engineers. The report ranked several engineering occupations among the top twenty STEM occupations to face talent shortages: civil engineers, electrical and electronics engineering technicians, health and safety engineers, architectural and engineering managers, industrial engineers, and computer hardware engineers. The authors also noted that engineering occupations have some of the highest wages for Tennessee's STEM jobs.

⁷ Source: Tennessee Department of Labor and Workforce Development (<https://www.jobs4tn.gov/admin/gsipub/htmlarea/uploads/LMI/Publications/STEMReport2019Updated.pdf>)

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 that 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 programs⁸ 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
Engineers													
17-2051	Civil Engineers	X			X		X			X	4	*	c
17-2071	Electrical Engineers	X					X				2	*	b
17-2072	Electronics Engineers, Except Computer		X				X			X	3	*	b
17-2081	Environmental Engineers	X				X	X				3	*	i
17-2112	Industrial Engineers	X		X	X	X	X		X	X	7	*	f
17-2141	Mechanical Engineers	X	X	X	X	X		X		X	7	*	a
17-2161	Nuclear Engineers	X					X				2	*	e
17-2199	Engineers, All Other					X	X				2	*	d, g, h, j, k, l, m
Drafters, Engineering Technicians, and Mapping Technicians													
17-3013	Mechanical Drafters		X		X				X		3	*	q, r
17-3023	Electrical and Electronics Engineering Technicians			X							1	*	n, v, w
17-3026	Industrial Engineering Technicians	X		X	X	X		X			5	*	o, p, t
17-3027	Mechanical Engineering Technicians						X				1	*	s
17-3029	Engineering Technicians, Except Drafters, All Other							X			1	*	u

KEY TRAINING PROGRAMS FOR ENGINEERS

The 2018 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, 2,727 Tennesseans completed a postsecondary certificate or degree in this program. Nine postsecondary institutions awarded a total of 597 bachelor’s degrees, 59 master’s, and 17 doctoral degrees for this program in 2018.

Tennessee Technological University (199)	University of Tennessee-Knoxville (198)	Vanderbilt University (86)
University of Tennessee-Chattanooga (66)	University of Memphis (45)	Tennessee State University (34)
Christian Brothers University (24)	Lipscomb University (18)	Union University (3)

⁸ 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.

b. Electrical and Electronics Engineering (CIP 14.1001)

In the last five years, 1,532 Tennesseans completed a postsecondary certificate or degree in this program. Nine postsecondary institutions awarded a total of 247 bachelor's degrees, two postbaccalaureate certificates, 56 master's, and 39 doctoral degrees for this program in 2018.

University of Tennessee-Knoxville (104)	Tennessee Technological University (76)	Vanderbilt University (51)
University of Tennessee-Chattanooga (36)	University of Memphis (33)	Tennessee State University (22)
Christian Brothers University (11)	Lipscomb University (10)	Union University (1)

c. Civil Engineering, General (CIP 14.0801)

In the last five years, 1,401 Tennesseans completed a postsecondary degree in this program. Eight postsecondary institutions awarded a total of 223 bachelor's degrees, 60 master's, and 23 doctoral degrees for this program in 2018.

University of Tennessee-Knoxville (110)	Tennessee Technological University (79)	Vanderbilt University (41)
University of Memphis (25)	University of Tennessee-Chattanooga (22)	Christian Brothers University (10)
Tennessee State University (10)	Lipscomb University (9)	

d. Engineering, General (CIP 14.0101)

In the last five years, 500 Tennesseans completed a postsecondary degree in this program. Seven postsecondary institutions awarded a total of two associates, 62 bachelor's degrees, 16 master's, and 16 doctoral degrees for this program in 2018.

University of Tennessee-Martin (43)	University of Tennessee-Chattanooga (29)	University of Memphis (8)
Tennessee Technological University (8)	Tennessee State University (5)	Southern Adventist University (2)
Maryville College (1)		

e. Nuclear Engineering (CIP 14.2301)

In the last five years, 469 Tennesseans completed a postsecondary certificate or degree in this program.

f. Industrial Engineering (CIP 14.3501)

In the last five years, 348 Tennesseans completed a postsecondary certificate or degree in this program.

g. Engineering Science (CIP 14.1301)

In the last five years, 197 Tennesseans completed a postsecondary degree in this program.

h. Mechatronics, Robotics, and Automation Engineering (CIP 14.4201)

In the last five years, 131 Tennesseans completed a postsecondary certificate or degree in this program.

i. Environmental/Environmental Health Engineering (CIP 14.1401)

In the last five years, 96 Tennesseans completed a postsecondary degree in this program.

j. Engineering, Other (CIP 14.9999)

In the last five years, 58 Tennesseans completed a postsecondary degree in this program.

k. Architectural Engineering (CIP 14.0401)

In the last five years, 33 Tennesseans completed a postsecondary degree in this program.

l. Systems Engineering (CIP 14.2701)

In the last five years, 22 Tennesseans completed a postsecondary degree in this program.

m. Biochemical Engineering (CIP 14.4301)

In the last five years, 12 Tennesseans completed a postsecondary degree in this program.

KEY TRAINING PROGRAMS FOR DRAFTERS AND TECHNICIANS

The 2018 completions by institution are included in parenthesis after the institution name in the tables below.

n. Electrical, Electronic and Communications Engineering Technology/Technician (CIP 15.0303)

In the last five years, 1,117 Tennesseans completed a postsecondary certificate or degree in this program. Nine postsecondary institutions awarded a total of 25 certificates, 107 associates, and 14 master’s degrees for this program in 2018.

Northeast State CC (59)	Southwest Tennessee CC (25)	Chattanooga State CC (14)
Nashville State CC (14)	Middle Tennessee State University (11)	Fountainhead College of Technology (10)
Cleveland State CC (8)	Walters State CC (3)	Pellissippi State CC (2)

o. Industrial Technology/Technician (CIP 15.0612)

In the last five years, 765 Tennesseans completed a postsecondary certificate or degree in this program. Seven postsecondary institutions awarded a total of 28 certificates, 121 associates, and eight master’s degrees for this program in 2018.

Northeast State CC (71)	Walters State CC (26)	Jackson State CC (22)
Cleveland State CC (15)	Pellissippi State CC (13)	Middle Tennessee State University (8)
Chattanooga State CC (2)		

p. Engineering/Industrial Management (CIP 15.1501)

In the last five years, 761 Tennesseans completed a postsecondary certificate or degree in this program. Four postsecondary institutions awarded a total of four certificates, 69 bachelor’s, and 123 master’s degrees for this program in 2018.

Christian Brothers University (95)	University of Tennessee-Chattanooga (64)	Middle Tennessee State University (35)
University of Tennessee-Knoxville (2)		

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

In the last five years, 624 Tennesseans completed a postsecondary certificate in this program. Eleven postsecondary institutions awarded a total of 93 certificates for this program in 2018.

TCAT-Murfreesboro (14)	Chattanooga State CC (13)	TCAT-Morristown (13)
TCAT Nashville (13)	TCAT-Memphis (7)	TCAT-Shelbyville (7)
TCAT-Newbern (6)	TCAT-Jackson (6)	Nashville State CC (5)
TCAT-Crump (5)	TCAT-Hohenwald (4)	

r. Mechanical Drafting and Mechanical Drafting CAD/CADD (CIP 15.1306)

In the last five years, 62 Tennesseans completed a postsecondary certificate in this program.

s. Mechanical Engineering/Mechanical Technology/Technician (CIP 15.0805)

In the last five years, 92 Tennesseans completed a postsecondary certificate or degree in this program. Three postsecondary institutions awarded a total of six certificates and 12 associates degrees for this program in 2018.

Southwest Tennessee CC (12)	Cleveland State CC (5)	Pellissippi State CC (1)
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t. Manufacturing Engineering Technology/Technician (CIP 15.0613)

In the last five years, 237 Tennesseans completed a postsecondary certificate or degree in this program. Seven postsecondary institutions awarded a total of 41 certificates and 26 associates degrees for this program in 2018.

Nashville State CC (25)	TCAT-Pulaski (12)	TCAT Nashville (11)
Pellissippi State CC (8)	TCAT-Hartsville (7)	Chattanooga State CC (3)
Southwest Tennessee CC (1)		

u. Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician (CIP 15.0501)

In the last five years, 342 Tennesseans completed a postsecondary degree in this program.

v. Computer Engineering Technology/Technician (CIP 15.1201)

In the last five years, 166 Tennesseans completed a postsecondary certificate or degree in this program.

w. Computer Technology/Computer Systems Technology (CIP 15.1202)

In the last five years, 85 Tennesseans completed a postsecondary certificate or degree in this program.

HEALTHCARE OCCUPATIONS

Healthcare occupations are in high demand in both Tennessee and the nation. Demand for healthcare will continue to grow due to retirement of the baby-boomer generation and an increase in average life expectancy brought on by medical advancements.

Most of Tennessee’s high-demand healthcare jobs are found in local health service industries, such as hospitals, nursing homes, and ambulatory services. Although not included in the healthcare and life sciences industry cluster⁹, the health services industries benefit from the upstream growth of these clusters. Occupation health and safety specialists are key occupations in pharmaceutical manufacturing, logistics, and chemical product manufacturing.

Growing expertise in healthcare supports research and development in physical, engineering and life sciences, which encompasses nearly all types of life sciences research except for nanotechnology and biotechnology. Life sciences research includes various branches of medical research, such as genetics, human biology, dental, bacteriological, and veterinary, and it includes fields unrelated to medicine, such as forestry, space vehicles, and photonics.

⁹ The healthcare and life sciences cluster does not include locally-traded healthcare services because medical care providers tend to be equally concentrated in each part of the country and do not compete across regions.

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

Table legend:

- An “X” denotes regions that 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 programs¹⁰ for healthcare outlined in the following pages.

IN-DEMAND HEALTHCARE 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			
11-9111	Medical and Health Services Managers	X	X	X	X	X	X	X	X	X	9	*	a, c, f
Healthcare Practitioners and Technical Occupations													
29-1021	Dentists, General	X		X	X	X		X	X		6		
29-1031	Dietitians and Nutritionists						X				1		
29-1051	Pharmacists		X		X						2		
29-1061	Anesthesiologists					X					1		
29-1062	Family and General Practitioners				X		X				2		
29-1065	Pediatricians, General	X									1		
29-1069	Physicians and Surgeons, All Other					X		X	X	X	4		
29-1071	Physician Assistants	X	X	X	X		X	X	X	X	8		b
29-1122	Occupational Therapists	X	X	X	X	X	X	X	X	X	9		k
29-1123	Physical Therapists	X	X	X	X	X	X		X	X	8		j
29-1126	Respiratory Therapists	X	X	X	X	X		X	X	X	8		b
29-1127	Speech-Language Pathologists		X		X	X	X	X	X		6		
29-1131	Veterinarians	X	X	X	X	X		X	X		7		m
29-1141	Registered Nurses	X	X	X		X	X	X	X	X	8		a
29-1171	Nurse Practitioners	X	X	X	X	X	X	X	X	X	9		a
29-2018	Clinical Laboratory Technologists and Technicians	X		X	X	X			X	X	6		d
29-2021	Dental Hygienists	X								X	2		
29-2031	Cardiovascular Technologists and Technicians					X		X	X		3		b
29-2032	Diagnostic Medical Sonographers	X			X		X	X	X	X	6		b
29-2034	Radiologic Technologists		X	X	X	X	X	X	X	X	8		b
29-2035	Magnetic Resonance Imaging Technologists					X	X				2		
29-2041	Emergency Medical Technicians and Paramedics	X	X		X	X	X		X	X	7		b
29-2052	Pharmacy Technicians	X	X	X	X	X	X	X	X	X	9		g
29-2055	Surgical Technologists			X		X			X		3		b, d
29-2056	Veterinary Technologists and Technicians				X			X	X		3		
29-2061	Licensed Practical and Licensed Vocational Nurses	X	X	X	X	X	X	X	X	X	9		e
29-2071	Medical Records and Health Information Technicians	X	X	X	X	X	X	X	X	X	9		c
29-2081	Opticians, Dispensing	X			X		X	X			4		
29-2099	Health Technologists and Technicians, All Other						X			X	2		b
29-9011	Occupational Health and Safety Specialists	X		X	X	X			X	X	6	*	f

¹⁰ 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
29-9091	Athletic Trainers						X				1		b
Healthcare Support Occupations													
31-1013	Psychiatric Aides						X				1		
31-1014	Nursing Assistants	X		X				X	X	X	5		e
31-2011	Occupational Therapy Assistants		X						X	X	3		
31-2021	Physical Therapist Assistants	X	X	X	X	X	X		X	X	8		i
31-9011	Massage Therapists	X			X			X	X		4		
31-9091	Dental Assistants	X		X	X	X	X	X		X	7		l
31-9092	Medical Assistants	X	X	X	X	X			X	X	7		c, h
31-9093	Medical Equipment Preparers							X	X		2		d
31-9094	Medical Transcriptionists					X					1		c
31-9097	Phlebotomists				X	X	X		X	X	5		d
31-9099	Healthcare Support Workers, All Other		X			X	X				3		

KEY TRAINING PROGRAMS FOR HEALTHCARE

The 2018 completions by institution are included in parenthesis after the institution name in the tables below.

a. *Registered Nursing, Nursing Administration, Nursing Research and Clinical Nursing (CIP 51.38)*

In the last five years, over 29,400 Tennesseans completed a postsecondary certificate or degree in this program. This includes more than 23,800 completions in registered nursing, nearly 1,500 completions in family practice nursing, more than 1,300 completions in adult health nursing, and more than 2,000 completions in other types of nursing.

Forty-five postsecondary institutions awarded a total of 1,333 associates, 2,895 bachelor's, 18 postbaccalaureate certificates, 1,206 master's, 54 post-masters certificates, and 284 doctoral degrees for this program in 2018. Vanderbilt awarded the most completions in 2018 with 436, followed by East Tennessee State University (436 completions), University of Memphis (427), Lincoln Memorial University (367), and King University (329).

b. *Allied Health Diagnostic, Intervention, and Treatment Professions (CIP 51.09)*

In the last five years, more than 11,800 Tennesseans completed a postsecondary certificate or degree in this program. This includes more than 4,400 completions in emergency medical technology, more than 2,400 completions in surgical technology, 1,300 completions for physician assistant, 880 to become a radiation therapist, over 800 in respiratory therapy, and nearly 650 to become a radiographer.

Forty-six postsecondary institutions awarded a total of 1,559 certificates, 586 associates, 220 bachelor's, and 313 master's degrees for this program in 2018.

c. *Health and Medical Administrative Services (CIP 51.07)*

In the last five years, over 5,800 Tennesseans completed a postsecondary certificate or degree in this program. This includes more than 1,200 completions in health information/medical records technology, more than 1,200 completions for medical insurance coding specialist, more than 990 completions for medical office assistant/specialist, and approximately 960 health administration/management.

Forty-seven postsecondary institutions awarded 500 certificates, 165 associates, 185 bachelor's, 17 postbaccalaureate certificates, and 122 master's degrees for this program in 2018.

d. Clinical/Medical Laboratory Science/Research and Allied Professions (CIP 51.10)

In the last five years, over 2,100 Tennesseans completed a postsecondary certificate or degree in this program. This includes programs such as phlebotomy, clinical laboratory science and medical technology, blood bank technology, sterile processing technology and cytotechnology.

Twenty-one postsecondary institutions awarded 289 certificates, 92 associates, 112 bachelor's, and five master's degrees for this program in 2018.

e. Practical Nursing, Vocational Nursing and Nursing Assistants (CIP 51.39)

In the last five years, over 7,900 Tennesseans completed a postsecondary certificate or degree in this program. This includes more than 6,600 licensed practical/vocational nurse training completions, over 1,000 nursing assistant/aide and patient care assistant/aide completions, and 250 completions for practical and vocational nursing assistant.

Twenty-seven postsecondary institutions, 25 of which are TCATs, awarded 1,582 certificates in 2018.

f. Public Health (CIP 51.22)

In the last five years, over 1,600 Tennesseans completed a postsecondary certificate or degree in this program. This includes programs such as public health, health services administration, environmental health, and community health and preventative medicine. Ten postsecondary institutions awarded eight associates, 121 bachelor's, 10 postbaccalaureate certificates, 246 master's, and 12 doctoral degrees in 2018.

East Tennessee State University (153)	Vanderbilt University (71)	Middle Tennessee State University (52)
University of Memphis (46)	University of Tennessee-Knoxville (27)	Meharry Medical College (19)
Tennessee State University (17)	Roane State Community College (8)	Argosy University-Nashville (3)
Christian Brothers University (1)		

g. Pharmacy Technician/Assistant (CIP 51.0805)

In the last five years, 1,995 Tennesseans completed a postsecondary certificate or degree in this program. Twenty-five postsecondary institutions awarded a total of 354 certificates and 40 associates degrees for this program in 2018.

Concorde Career College-Memphis (86)	Remington College-Memphis (54)	Virginia College-Chattanooga (26)
Daymar College-Clarksville (20)	TCAT-Athens (18)	TCAT-Memphis (18)
TCAT-Jacksboro (17)	Fortis Institute-Cookeville (17)	Southwest Tennessee CC (16)
Chattanooga State CC (16)	Walters State CC (15)	Ross Medical Education Center-Johnson City (12)
TCAT-Oneida-Huntsville (12)	TCAT-Livingston (11)	TCAT-Murfreesboro (10)
Nashville College of Medical Careers (9)	Roane State CC (7)	TCAT-Dickson (7)
Remington College-Nashville (6)	TCAT-Pulaski (4)	Virginia College-Knoxville (4)
National College-Nashville (3)	Daymar College-Murfreesboro (2)	Daymar College-Nashville (2)
Fortis Institute-Nashville (2)		

h. Medical/Clinical Assistant (CIP 51.0801)

In the last five years, 7,015 Tennesseans completed a postsecondary certificate or degree in this program. Twenty-nine postsecondary institutions awarded a total of 1,142 certificates and 189 associates degrees for this program in 2018.

i. Physical Therapy Technician/Assistant (CIP 51.0806)

In the last five years, 1,010 Tennesseans completed a postsecondary degree in this program. Nine postsecondary institutions awarded a combined 211 associates and one bachelor's degree for this program in 2018.

South College (46)	Volunteer State CC (34)	Chattanooga State CC (24)
Concorde Career College-Memphis (20)	Roane State CC (19)	Daymar College-Clarksville (19)
Walters State CC (18)	Jackson State CC (17)	Southwest Tennessee CC (15)

j. Physical Therapy/Therapist (CIP 51.2308)

In the last five years, 1,262 Tennesseans completed a postsecondary degree in this program. Seven postsecondary institutions awarded a total of 12 associates, one bachelor's, and 294 doctoral degrees for this program in 2018.

South College (88)	University of Tennessee-Health Science Center (53)	Belmont University (43)
East Tennessee State University (38)	University of Tennessee-Chattanooga (38)	Tennessee State University (35)
Southern Adventist University (12)		

k. Occupational Therapy/Therapist (CIP 51.2306)

In the last five years, 831 Tennesseans completed a postsecondary degree in this program. Five postsecondary institutions awarded a total of 124 master's and 55 doctoral degrees for this program in 2018.

Belmont University (67)	University of Tennessee-Health Science Center (35)	Tennessee State University (28)
Milligan College (28)	University of Tennessee-Chattanooga (12)	

l. Dental Assisting/Assistant (CIP 51.0601)

In the last five years, 2,592 Tennesseans completed a postsecondary certificate or degree in this program. Nineteen postsecondary institutions awarded a total of 473 certificates and 50 associates degrees for this program in 2018.

m. Veterinary Medicine (CIP 51.2401)

In the last five years, 503 Tennesseans completed a postsecondary degree in this program.

BUSINESS AND FINANCIAL OPERATIONS OCCUPATIONS

Over 430 companies are headquartered in Tennessee, including nearly a dozen Fortune 500 companies.¹¹ Major businesses that call the state home include FedEx, HCA, Nissan North America, Bridgestone Americas, International Paper, and Eastman Chemical. In-demand occupations for business and financial operations are found all across Tennessee. Human resources specialists, training specialists, accountants, and auditors are necessary for business success. Market research analysts and marketing specialists are important to manufacturing product design and advertising. Specialists and analysts are strongly concentrated in the headquarters, financial and technology companies, especially those specializing in consulting.

Tennessee's business services cluster has undergone remarkable growth in the last two years. In 2018, Amazon announced the location of a logistics hub in Nashville, which will create 5,000 high-wage jobs. Alliance Bernstein also announced the move of its corporate headquarters to Nashville from New York City. Since Governor Lee took office in January 2019, several major businesses have announced relocation or expansions of their corporate headquarters. These announcements include, the ICEE Company in La Vergne, Mitsubishi Motors North America in Franklin, FedEx Logistics and DEVCON in Memphis, and Pilot.com, in Nashville.

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 that 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 programs¹² 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
11-3031	Financial Managers	X	X	X	X	X	X	X	X	X	9	*	c, d
13-1031	Claims Adjusters, Examiners, and Investigators					X	X				2		
13-1041	Compliance Officers				X	X			X		3	*	
13-1051	Cost Estimators	X	X	X	X	X	X		X	X	8		a, b
13-1071	Human Resources Specialists	X	X	X	X	X	X	X	X	X	9	*	g, h
13-1081	Logisticians		X	X	X	X		X	X		6	*	i
13-1111	Management Analysts	X		X	X	X	X	X	X		7	*	a, b, j
13-1121	Meeting, Convention, and Event Planners	X			X	X		X			4	*	
13-1141	Compensation, Benefits, and Job Analysis Specialists				X	X			X		3	*	g
13-1151	Training and Development Specialists	X	X	X	X	X	X	X	X	X	9	*	g
13-1161	Market Research Analysts and Marketing Specialists	X	X	X	X	X	X	X	X	X	9	*	f

¹¹ This includes some U.S. headquarters of multinational corporations.

¹² 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
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	X	X	9	*	c
13-2051	Financial Analysts	X		X	X	X		X	X		6	*	c, d, e
13-2052	Personal Financial Advisors	X			X	X			X		4		d
13-2072	Loan Officers	X	X		X	X	X			X	6	*	d
13-2082	Tax Preparers	X		X		X		X	X	X	6	*	c

KEY TRAINING PROGRAMS FOR BUSINESS AND FINANCIAL OPERATIONS

The 2018 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, 24,851 Tennesseans completed a postsecondary certificate or degree in this program. Sixty postsecondary institutions awarded a total of 158 certificates, 578 associates, 2,513 bachelor's, 12 postbaccalaureate certificates, 1,547 master's, and 24 doctoral degrees for this program in 2018. Listed below are the top 21 institutions by completions.

University of Tennessee-Chattanooga (502)	University of Tennessee-Knoxville (322)	King University (317)
Middle Tennessee State University (272)	University of Memphis (252)	Tennessee Technological University (234)
Trevecca Nazarene University (201)	Tusculum College (171)	East Tennessee State University (165)
Cleveland State CC (141)	Bryan College-Dayton (131)	Tennessee State University (128)
University of Tennessee-Martin (122)	Lee University (109)	Lipscomb University (108)
Christian Brothers University (103)	Carson-Newman University (101)	Austin Peay State University (76)
Union University (73)	Pellissippi State CC (70)	Strayer University-Tennessee (70)

b. Business/Commerce, General (CIP 52.0101)

In the last five years, 4,088 Tennesseans completed a postsecondary certificate or degree in this program. Twelve postsecondary institutions awarded a total of 120 certificates, 66 associates, 248 bachelor's, and 250 master's degrees for this program in 2018.

Bethel University (186)	Pellissippi State CC (120)	Strayer University-Tennessee (119)
Belmont University (105)	Austin Peay State University (57)	Fisk University (32)
Christian Brothers University (22)	Cumberland University (20)	Lincoln Memorial University (11)
Argosy University-Nashville (6)	South College (4)	DeVry University-Tennessee (2)

c. Accounting and Related Services (CIP 52.03)

In the last five years, 7,093 Tennesseans completed a postsecondary certificate or degree in this program. This includes more than 6,000 completions in accounting, more than 620 completions in accounting technology and bookkeeping, more than 250 completions in accounting and business management, and more than 200 completions in accounting and finance.

Thirty-eight postsecondary institutions awarded 80 certificates, 40 associates, 897 bachelor's, one postbaccalaureate certificate, and 341 master's degrees for this program in 2018.

d. Finance, General (CIP 52.0801)

In the last five years, 2,726 Tennesseans completed a postsecondary degree in this program. Seventeen postsecondary institutions awarded a total of 567 bachelor's and 67 master's degrees for this program in 2018.

University of Tennessee-Knoxville (143)	Middle Tennessee State University (98)	East Tennessee State University (83)
University of Memphis (74)	University of Tennessee-Martin (54)	Vanderbilt University (52)
Tennessee Technological University (44)	Belmont University (16)	Austin Peay State University (15)
Christian Brothers University (13)	Lipscomb University (12)	Freed-Hardeman University (9)
Southern Adventist University (9)	Carson-Newman University (4)	Lincoln Memorial University (3)
Tennessee Wesleyan University (3)	University of Phoenix-Tennessee (2)	

e. Financial Mathematics (CIP 27.0305)

In the last five years, 106 Tennesseans completed a postsecondary degree in this program.

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

In the last five years, 3,202 Tennesseans completed a postsecondary degree in this program. Twenty postsecondary institutions awarded a total of 695 bachelor's and 46 master's degrees for this program in 2018.

University of Tennessee-Knoxville (178)	East Tennessee State University (85)	Middle Tennessee State University (82)
University of Memphis (79)	Tennessee Technological University (55)	Belmont University (47)
Vanderbilt University (42)	University of Tennessee-Martin (28)	Lipscomb University (22)
Austin Peay State University (21)	Freed-Hardeman University (19)	Tennessee Wesleyan University (16)
Lincoln Memorial University (14)	Christian Brothers University (14)	Southern Adventist University (14)
Union University (10)	Cumberland University (6)	Trevecca Nazarene University (5)
Maryville College (3)	University of Phoenix-Tennessee (1)	

g. Human Resources Management/Personnel Administration, General (CIP 52.1001)

In the last five years, 761 Tennesseans completed a postsecondary certificate or degree in this program. Nine postsecondary institutions awarded a total of four associates, 81 bachelor's, and 34 master's degrees for this program in 2018.

University of Tennessee-Knoxville (45)	Lipscomb University (39)	Strayer University-Tennessee (14)
University of Phoenix-Tennessee (7)	Maryville College (5)	Daymar College-Clarksville (4)
Tennessee Wesleyan University (3)	Lincoln Memorial University (1)	DeVry University-Tennessee (1)

h. Organizational Behavior Studies (CIP 52.1003)

In the last five years, 281 Tennesseans completed a postsecondary degree in this program. Postsecondary institutions awarded a total of 53 master's degrees for this program in 2018.

i. Operations Management and Supervision (CIP 52.0205)

In the last five years, 512 Tennesseans completed a postsecondary certificate or degree in this program.

j. Organizational Leadership (CIP 52.0213)

In the last five years, approximately 2,350 Tennesseans completed a postsecondary degree in this program. Eleven postsecondary institutions awarded a total of 430 bachelor's degrees, 24 postbaccalaureate certificates, more than 101 master's degrees, and 19 doctoral degrees for this program in 2018.

Bethel University (295)	Union University (96)	Lipscomb University (90)
Trevecca Nazarene University (51)	East Tennessee State University (12)	Strayer University-Tennessee (11)
South College (9)	Johnson University (7)	Austin Peay State University (1)
Carson-Newman University (1)	Oxford Graduate School (1)	

TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

Transportation and material moving occupations are in high-demand across Tennessee. Companies seek material movers and truck drivers to deliver their products to buyers. Manufacturers seek packers to prepare and move products and goods, and packagers to prepare products for sale. However, the long-term roles and skills of occupations in this group are quickly evolving to include additional skill sets.

Technological advancements have had substantial and irreversible impacts on the logistics workforce. The rise of automation and digital connectivity is changing occupation types and skills required by logistics companies.¹³ Robots have begun to replace pallet drivers within warehouses and may eventually replace long-distance drivers. Today's logistics companies require workers with technological expertise and other advanced skill sets. Logistics operations may eventually require more workers with the ability to create or manage automated processes. Even traditional logistics occupations will require new skills because of sensing systems, like smart glasses and other wearable devices that will be used in warehousing operations for tracking fleet. The continued success of logistics companies in Tennessee will depend on adapting to new technologies to upskill the workforce, as well as increasing STEM completions at postsecondary institutions in the state.

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 that 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 programs¹⁴ for transportation and material moving occupations outlined in the following page.

IN-DEMAND TRANSPORTATION AND MATERIAL MOVING 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
11-3071	Transportation, Storage, and Distribution Managers		X		X	X	X		X	X	6	*	b, c, d, e
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			1		a
53-3031	Driver/Sales Workers		X	X			X		X		4	*	

¹³ Burke, A., Mussomeli, A., Laaper, S., Hartigan, M., & Sniderman, B. (2017). *The smart factory*.

¹⁴ 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											Number of Regions	Key to Industry Clusters	Related Programs
		East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland				
53-3032	Heavy and Tractor-Trailer Truck Drivers	X	X	X	X	X	X	X	X	X	X	9	*	a
53-3033	Light Truck or Delivery Services Drivers	X	X	X	X		X	X	X	X	X	8	*	a
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	X	9	*	
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	5	*	
53-7063	Machine Feeders and Offbearers										X	1	*	
53-7064	Packers and Packagers, Hand			X								1	*	
53-7081	Refuse and Recyclable Material Collectors			X	X			X				3		
53-7199	Material Moving Workers, All Other					X						1		

KEY TRAINING PROGRAMS FOR TRANSPORTATION AND MATERIAL MOVEMENT

The 2018 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, 2,224 Tennesseans completed a postsecondary certificate in this program. Nine postsecondary institutions awarded a total 462 certificates for this program in 2018.

TCAT-Knoxville (162)	Miller-Motte Technical College- Chattanooga (91)	TCAT-Memphis (54)
TCAT-Jackson (43)	TCAT-Crossville (39)	Fortis Institute-Cookeville (33)
TCAT-Newbern (28)	TCAT-Shelbyville (6)	Vatterott College-Applying Farms (6)

b. *Logistics, Materials, and Supply Chain Management (CIP 52.0203)*

In the last five years, 1,970 Tennesseans completed a postsecondary certificate or degree in this program. Five postsecondary institutions awarded a total 26 certificates, 443 bachelor's degrees, and 1 postbaccalaureate certificate for this program in 2018.

University of Tennessee-Knoxville (405)	University of Memphis (36)	Nashville State Community College (15)
Volunteer State Community College (11)	Lipscomb University (3)	

c. *Aeronautics/Aviation/Aerospace Science and Technology, General (CIP 49.0101)*

In the last five years, 606 Tennesseans completed a postsecondary certificate in this program.

d. *Aviation/Airway Management and Operations (CIP 49.0104)*

In the last five years, 42 Tennesseans completed a postsecondary certificate in this program.

e. *Transportation/Mobility Management (CIP 52.0209)*

In the last five years, 113 Tennesseans completed a postsecondary certificate in this program.

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 (2018) 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 (2018) 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 job openings from 2016 to 2026 to employment for 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 Openings: A projected opening is the employment change from 2016 to 2026 from the Tennessee Department of Labor and Workforce Development’s Long-Term Occupational Projections.

SOURCES:

Data in this report comes from Economic Modeling Specialists, Intl. (EMSI). (2019.3 Class of Worker), and the Tennessee Department of Labor and Workforce Development.

Major data sources for the 2019.3 EMSI release include: BLS Quarterly Census of Employment & Wages 2018Q4; Census Bureau Quarterly Workforce Indicators (QWI) 2019Q1; Census Bureau American Community Survey 2017; BLS Industry/Occupation Employment Matrix 2016-2026; US Department of Education National Center for Education Statistics Integrated Postsecondary Education Data System (IPEDS).

The Tennessee Department of Labor and Workforce Development’s Long-Term Occupational Projections can be found at www.jobs4TN.gov by following the path: Labor Market Information > LMI Home > Data Trends > Employment and Wage Data > Occupation Data > Occupation Employment and Projections (Long-Term). Data is available for the State and for the Local Workforce Development Areas, considered in this report.

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.

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 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
Management (11-0000)											
11-1011	Chief Executives		X			X					2
11-1021	General and Operations Managers	X	X	X	X	X	X	X	X	X	9
11-2021	Marketing Managers	X	X		X	X			X		5
11-2022	Sales Managers	X	X	X	X	X		X	X	X	8
11-2031	Public Relations and Fundraising Managers			X	X						2
11-3011	Administrative Services Managers					X					1
11-3021	Computer and Information Systems Managers	X	X		X	X	X	X	X	X	8
11-3031	Financial Managers	X	X	X	X	X	X	X	X	X	9
11-3051	Industrial Production Managers			X	X	X				X	4
11-3061	Purchasing Managers	X			X	X		X		X	5
11-3071	Transportation, Storage, and Distribution Managers		X		X	X	X		X	X	6
11-3121	Human Resources Managers	X	X	X	X	X	X	X	X	X	9
11-3131	Training and Development Managers				X	X					2
11-9013	Farmers, Ranchers, and Other Agricultural Managers		X	X			X			X	4
11-9021	Construction Managers	X	X	X	X	X	X	X	X	X	9
11-9033	Education Administrators, Postsecondary	X	X	X	X		X	X	X		7
11-9041	Architectural and Engineering Managers	X		X	X	X			X		5
11-9051	Food Service Managers	X	X	X	X	X	X	X	X	X	9
11-9081	Lodging Managers					X		X			2
11-9111	Medical and Health Services Managers	X	X	X	X	X	X	X	X	X	9
11-9141	Property, Real Estate, and Community Association Managers	X	X	X	X	X	X	X	X	X	9
11-9151	Social and Community Service Managers	X	X	X	X	X	X	X	X	X	9
11-9199	Managers, All Other	X	X	X	X		X	X	X	X	8
Business and Financial Operations (13-0000)											
13-1031	Claims Adjusters, Examiners, and Investigators					X	X				2
13-1041	Compliance Officers				X	X			X		3
13-1051	Cost Estimators	X	X	X	X	X	X		X	X	8
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		7
13-1121	Meeting, Convention, and Event Planners	X			X	X		X			4
13-1141	Compensation, Benefits, and Job Analysis Specialists				X	X			X		3
13-1151	Training and Development Specialists	X	X	X	X	X	X	X	X	X	9
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

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
13-2011	Accountants and Auditors	X	X	X	X	X	X	X	X	X	9
13-2051	Financial Analysts	X		X	X	X		X	X		6
13-2052	Personal Financial Advisors	X			X	X			X		4
13-2072	Loan Officers	X	X		X	X	X			X	6
13-2082	Tax Preparers	X		X		X		X	X	X	6
Computer and Mathematical (15-0000)											
15-1121	Computer Systems Analysts	X	X		X	X	X			X	6
15-1122	Information Security Analysts	X		X	X	X			X	X	6
15-1131	Computer Programmers	X				X	X	X		X	5
15-1132	Software Developers, Applications	X	X	X	X	X	X	X	X	X	9
15-1133	Software Developers, Systems Software		X		X	X	X	X	X	X	7
15-1134	Web Developers	X		X	X	X			X		5
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	X			X		6
15-1151	Computer User Support Specialists	X	X	X	X	X	X	X	X	X	9
15-1152	Computer Network Support Specialists							X	X		2
15-1199	Computer Occupations, All Other		X	X		X	X	X		X	6
15-2031	Operations Research Analysts				X						1
15-2041	Statisticians				X						1
Architecture and Engineering (17-0000)											
17-1022	Surveyors						X				1
17-2051	Civil Engineers	X			X		X			X	4
17-2071	Electrical Engineers	X					X				2
17-2072	Electronics Engineers, Except Computer		X				X			X	3
17-2081	Environmental Engineers	X				X	X				3
17-2112	Industrial Engineers	X		X	X	X	X		X	X	7
17-2141	Mechanical Engineers	X	X	X	X	X		X		X	7
17-2161	Nuclear Engineers	X					X				2
17-2199	Engineers, All Other					X	X				2
17-3013	Mechanical Drafters		X		X				X		3
17-3023	Electrical and Electronics Engineering Technicians			X							1
17-3026	Industrial Engineering Technicians	X		X	X	X		X			5
17-3027	Mechanical Engineering Technicians						X				1
17-3029	Engineering Technicians, Except Drafters, All Other							X			1
Life, Physical, and Social Science (19-0000)											
19-1042	Medical Scientists, Except Epidemiologists				X						1
19-2031	Chemists	X									1
19-2041	Environmental Scientists and Specialists, Including Health	X									1
19-3031	Clinical, Counseling, and School Psychologists	X					X				2
19-4031	Chemical Technicians		X								1
19-4091	Environmental Science and Protection Technicians, Including Health					X	X				2

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
19-4099	Life, Physical, and Social Science Technicians, All Other								X		1
Community and Social Service (21-0000)											
21-1012	Educational, Guidance, School, and Vocational Counselors	X		X					X		3
21-1013	Marriage and Family Therapists								X		1
21-1015	Rehabilitation Counselors	X				X		X			3
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	5
21-1022	Healthcare Social Workers	X	X	X	X	X	X		X	X	8
21-1023	Mental Health and Substance Abuse Social Workers	X	X	X		X	X	X	X	X	8
21-1091	Health Educators						X				1
21-1092	Probation Officers and Correctional Treatment Specialists	X	X	X							3
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
Legal Occupations (23-0000)											
23-1011	Lawyers		X	X	X	X		X	X		6
23-2011	Paralegals and Legal Assistants	X			X	X		X	X		5
Education, Training, and Library (25-0000)											
25-1099	Postsecondary Teachers	X			X		X		X		4
25-2011	Preschool Teachers, Except Special Education	X	X	X	X	X			X		6
25-2021	Elementary School Teachers, Except Special Education		X								1
25-2031	Secondary School Teachers, Except Special and Career/Technical Education		X	X							2
25-2052	Special Education Teachers, Kindergarten and Elementary School		X								1
25-3021	Self-Enrichment Education Teachers	X	X		X		X	X	X		6
25-3097	Teachers and Instructors, All Other	X	X	X				X		X	5
Arts, Design, Entertainment, Sports, and Media (27-0000)											
27-1024	Graphic Designers	X			X	X		X		X	5
27-1026	Merchandise Displayers and Window Trimmers			X	X	X	X	X	X	X	7
27-2012	Producers and Directors	X			X	X					3
27-2022	Coaches and Scouts		X	X	X			X	X	X	6
27-3031	Public Relations Specialists	X		X	X	X	X	X		X	7
27-3041	Editors	X			X						2
27-3043	Writers and Authors								X		1
27-4011	Audio and Video Equipment Technicians				X						1
27-4021	Photographers								X		1
Healthcare Practitioners and Technical (29-0000)											
29-1021	Dentists, General	X		X	X	X		X	X		6
29-1031	Dietitians and Nutritionists						X				1
29-1051	Pharmacists		X		X						2
29-1061	Anesthesiologists					X					1
29-1062	Family and General Practitioners				X		X				2
29-1065	Pediatricians, General	X									1
29-1069	Physicians and Surgeons, All Other					X		X	X	X	4

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
29-1071	Physician Assistants	X	X	X	X		X	X	X	X	8
29-1122	Occupational Therapists	X	X	X	X	X	X	X	X	X	9
29-1123	Physical Therapists	X	X	X	X	X	X		X	X	8
29-1126	Respiratory Therapists	X	X	X	X	X		X	X	X	8
29-1127	Speech-Language Pathologists		X		X	X	X	X	X		6
29-1131	Veterinarians	X	X	X	X	X		X	X		7
29-1141	Registered Nurses	X	X	X		X	X	X	X	X	8
29-1171	Nurse Practitioners	X	X	X	X	X	X	X	X	X	9
29-2018	Clinical Laboratory Technologists and Technicians	X		X	X	X			X	X	6
29-2021	Dental Hygienists	X								X	2
29-2031	Cardiovascular Technologists and Technicians					X		X	X		3
29-2032	Diagnostic Medical Sonographers	X			X		X	X	X	X	6
29-2034	Radiologic Technologists		X	X	X	X	X	X	X	X	8
29-2035	Magnetic Resonance Imaging Technologists					X	X				2
29-2041	Emergency Medical Technicians and Paramedics	X	X		X	X	X		X	X	7
29-2052	Pharmacy Technicians	X	X	X	X	X	X	X	X	X	9
29-2055	Surgical Technologists			X		X			X		3
29-2056	Veterinary Technologists and Technicians				X			X	X		3
29-2061	Licensed Practical and Licensed Vocational Nurses	X	X	X	X	X	X	X	X	X	9
29-2071	Medical Records and Health Information Technicians	X	X	X	X	X	X	X	X	X	9
29-2081	Opticians, Dispensing	X			X		X	X			4
29-2099	Health Technologists and Technicians, All Other						X			X	2
29-9011	Occupational Health and Safety Specialists	X		X	X	X			X	X	6
29-9091	Athletic Trainers						X				1
Healthcare Support (31-0000)											
31-1013	Psychiatric Aides						X				1
31-1014	Nursing Assistants	X		X				X	X	X	5
31-2011	Occupational Therapy Assistants		X						X	X	3
31-2021	Physical Therapist Assistants	X	X	X	X	X	X		X	X	8
31-9011	Massage Therapists	X			X			X	X		4
31-9091	Dental Assistants	X		X	X	X	X	X		X	7
31-9092	Medical Assistants	X	X	X	X	X			X	X	7
31-9093	Medical Equipment Preparers							X	X		2
31-9094	Medical Transcriptionists					X					1
31-9097	Phlebotomists				X	X	X		X	X	5
31-9099	Healthcare Support Workers, All Other		X			X	X				3
Protective Service (33-0000)											
33-1099	First-Line Supervisors of Protective Service Workers, All Other				X	X					2
33-3021	Detectives and Criminal Investigators						X			X	2
33-3051	Police and Sheriff's Patrol Officers						X				1
33-9032	Security Guards	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
Food Preparation and Serving Related (35-0000)											
35-1011	Chefs and Head Cooks	X		X	X	X	X				5
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	X	X	X	X	X	X	X	X	X	9
Building and Grounds Cleaning and Maintenance (37-0000)											
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	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	X	X	X	X	8
37-2021	Pest Control Workers	X	X	X	X	X	X	X	X	X	9
37-3011	Landscaping and Groundskeeping Workers	X	X	X		X	X			X	6
37-3013	Tree Trimmers and Pruners		X				X		X		3
37-3019	Grounds Maintenance Workers, All Other	X			X	X					3
Personal Care and Service (39-0000)											
39-1021	First-Line Supervisors of Personal Service Workers	X	X	X	X	X	X	X	X	X	9
39-5012	Hairdressers, Hairstylists, and Cosmetologists	X					X		X		3
39-5094	Skincare Specialists				X						1
39-9031	Fitness Trainers and Aerobics Instructors	X		X		X		X	X	X	6
39-9032	Recreation Workers									X	1
Sales and Related (41-0000)											
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		X			X	X		5
41-2021	Counter and Rental Clerks						X		X	X	3
41-2022	Parts Salespersons	X	X	X				X	X	X	6
41-2031	Retail Salespersons								X	X	2
41-3011	Advertising Sales Agents			X	X	X					3
41-3021	Insurance Sales Agents	X	X	X	X	X	X	X	X	X	9
41-3031	Securities, Commodities, and Financial Services Sales 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						2
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products		X		X		X	X			4
41-9011	Demonstrators and Product Promoters		X	X		X			X	X	5
41-9022	Real Estate Sales Agents	X			X	X		X			4
41-9041	Telemarketers			X	X						2
41-9099	Sales and Related Workers, All Other		X		X		X	X		X	5
Office and Administrative Support (43-0000)											
43-1011	First-Line Supervisors of Office and Administrative Support Workers	X	X	X	X			X	X	X	7
43-2011	Switchboard Operators, Including Answering Service			X	X		X		X		4
43-3011	Bill and Account Collectors	X	X		X	X			X	X	6
43-3021	Billing and Posting Clerks			X	X			X			3
43-3031	Bookkeeping, Accounting, and Auditing Clerks	X		X	X	X		X	X		6
43-3051	Payroll and Timekeeping Clerks	X			X	X	X	X	X	X	7
43-4051	Customer Service Representatives	X	X	X	X	X	X	X	X	X	9
43-4111	Interviewers, Except Eligibility and Loan				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
43-4131	Loan Interviewers and Clerks		X			X	X				3
43-4151	Order Clerks			X			X	X	X	X	5
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	X	7
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	X			X						2
43-4199	Information and Record Clerks, All Other						X				1
43-5011	Cargo and Freight Agents					X					1
43-5021	Couriers and Messengers								X		1
43-5032	Dispatchers, Except Police, Fire, and Ambulance						X	X			2
43-5061	Production, Planning, and Expediting Clerks		X	X	X	X	X		X	X	7
43-5071	Shipping, Receiving, and Traffic Clerks	X	X	X	X	X	X		X		7
43-5081	Stock Clerks and Order Fillers		X				X			X	3
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	X	X	X	9
43-6013	Medical Secretaries	X	X	X	X	X	X	X	X	X	9
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	X	X	X	X	X			X		6
43-9021	Data Entry Keyers	X	X	X	X	X	X	X	X	X	9
43-9041	Insurance Claims and Policy Processing Clerks					X					1
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	X			X	X					3
43-9071	Office Machine Operators, Except Computer				X						1
43-9199	Office and Administrative Support Workers, All Other	X	X	X		X		X			5
Farming, Fishing, and Forestry (45-0000)											
45-2091	Agricultural Equipment Operators		X							X	2
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals		X				X				2
45-2099	Agricultural Workers, All Other			X						X	2
45-4022	Logging Equipment Operators		X						X		2
Construction and Extraction (47-0000)											
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	X	X	X	X	X	X	X	X	X	9
47-2021	Brickmasons and Blockmasons				X				X	X	3
47-2031	Carpenters	X	X	X	X	X	X	X	X	X	9
47-2051	Cement Masons and Concrete Finishers	X	X	X	X		X	X	X	X	8
47-2061	Construction Laborers	X	X	X	X		X	X	X	X	8
47-2071	Paving, Surfacing, and Tamping Equipment Operators	X	X	X				X	X	X	6
47-2073	Operating Engineers and Other Construction Equipment Operators	X	X	X	X	X	X		X	X	8
47-2081	Drywall and Ceiling Tile Installers				X						1
47-2111	Electricians		X	X	X	X	X	X	X	X	8
47-2121	Glaziers									X	1
47-2141	Painters, Construction and Maintenance	X	X	X	X		X	X	X	X	8
47-2151	Pipelayers						X			X	2
47-2152	Plumbers, Pipefitters, and Steamfitters	X	X	X	X	X	X	X	X	X	9
47-2181	Roofers	X	X	X	X			X	X	X	7
47-2211	Sheet Metal Workers	X	X	X	X		X	X	X	X	8

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
47-2221	Structural Iron and Steel Workers								X		1
47-3012	Helpers--Carpenters		X								1
47-3013	Helpers--Electricians	X			X	X		X	X		5
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters		X		X		X	X			4
47-4011	Construction and Building Inspectors			X	X		X			X	4
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners		X								1
Installation, Maintenance and Repair (49-0000)											
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	X	X	X	X			X	X	X	7
49-2011	Computer, Automated Teller, and Office Machine Repairers				X			X			2
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers						X	X		X	3
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment									X	1
49-2098	Security and Fire Alarm Systems Installers	X			X	X	X				4
49-3011	Aircraft Mechanics and Service Technicians	X			X	X					3
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	X		7
49-3041	Farm Equipment Mechanics and Service Technicians			X			X				2
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	X		X	X	X	X		X	X	7
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics						X			X	2
49-3092	Recreational Vehicle Service Technicians				X						1
49-3093	Tire Repairers and Changers	X	X	X	X				X		5
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	X	X	X	X	X	X	X	X	X	9
49-9041	Industrial Machinery Mechanics	X									1
49-9044	Millwrights		X	X							2
49-9051	Electrical Power-Line Installers and Repairers				X						1
49-9052	Telecommunications Line Installers and Repairers		X		X					X	3
49-9062	Medical Equipment Repairers				X						1
49-9071	Maintenance and Repair Workers, General	X	X	X	X	X	X	X	X	X	9
49-9098	Helpers--Installation, Maintenance, and Repair Workers	X				X	X	X	X	X	6
49-9099	Installation, Maintenance, and Repair Workers, All Other	X						X			2
Production (51-0000)											
51-1011	First-Line Supervisors of Production and Operating Workers	X		X	X				X	X	5
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers		X				X				2
51-2098	Assemblers and Fabricators, All Other, Including Team Assemblers			X							1
51-3011	Bakers		X				X				2
51-3021	Butchers and Meat Cutters	X	X	X	X	X	X	X	X		8
51-3092	Food Batchmakers					X					1
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic		X						X		2
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic						X				1
51-4041	Machinists			X	X	X			X		4
51-4111	Tool and Die Makers		X								1

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
51-4121	Welders, Cutters, Solderers, and Brazers		X	X	X	X	X	X	X	X	8
51-5112	Printing Press Operators	X								X	2
51-6031	Sewing Machine Operators			X							1
51-6093	Upholsterers		X								1
51-6099	Textile, Apparel, and Furnishings Workers, All Other		X								1
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing		X							X	2
51-7099	Woodworkers, All Other		X				X				2
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	X	X	X	X	X	X		X	X	8
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			2
51-9198	Helpers--Production Workers	X	X	X	X		X	X	X	X	8
51-9199	Production Workers, All Other	X	X	X			X	X	X	X	7
Transportation and Material Moving (53-0000)											
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			1
53-3031	Driver/Sales Workers		X	X			X		X		4
53-3032	Heavy and Tractor-Trailer Truck Drivers	X	X	X	X	X	X	X	X	X	9
53-3033	Light Truck or Delivery Services Drivers	X	X	X	X		X	X	X	X	8
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	X							2
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	X				X		X	X	X	5
53-7063	Machine Feeders and Offbearers									X	1
53-7064	Packers and Packagers, Hand			X							1
53-7081	Refuse and Recyclable Material Collectors			X	X			X			3
53-7199	Material Moving Workers, All Other					X					1

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 occupations are denoted by blue text.

SOC Code	Occupation										
		Food & Agriculture	Healthcare & Life Sciences	Rubber, Ceramics & Glass	Automotive	Appliances & Electrical	HQ, Finance & Tech	Distribution & Logistics	Aerospace & Defense	Chemicals	Number of Clusters
Management (11-0000)											
11-1011	Chief Executives		X				X				2
11-1021	General and Operations Managers	X	X	X	X	X	X	X	X	X	9
11-2021	Marketing Managers		X			X	X				3
11-2022	Sales Managers	X	X	X	X	X	X	X		X	8
11-2031	Public Relations and Fundraising Managers						X				1
11-3011	Administrative Services Managers	X	X				X	X			4
11-3021	Computer and Information Systems Managers		X				X		X		3
11-3031	Financial Managers	X	X	X	X	X	X	X	X	X	9
11-3051	Industrial Production Managers	X	X	X	X	X	X		X	X	8
11-3061	Purchasing Managers		X		X	X	X		X		5
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
11-9041	Architectural and Engineering Managers		X	X	X	X	X		X	X	7
11-9111	Medical and Health Services Managers		X								1
11-9199	Managers, All Other		X				X		X		3
Business and Financial Operations (13-0000)											
13-1041	Compliance Officers		X				X			X	3
13-1071	Human Resources Specialists	X	X	X	X	X	X	X	X	X	9
13-1081	Logisticians	X	X		X		X	X	X	X	7
13-1111	Management Analysts		X				X	X			3
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	6
13-1199	Business Operations Specialists, All Other		X		X	X	X		X	X	6
13-2011	Accountants and Auditors	X	X	X	X	X	X	X	X	X	9
13-2051	Financial Analysts		X			X	X		X		4
13-2072	Loan Officers						X				1
13-2082	Tax Preparers						X				1
Computer and Mathematical (15-0000)											
15-1121	Computer Systems Analysts		X		X		X	X	X	X	6
15-1122	Information Security Analysts		X				X				2

SOC Code	Occupation											Number of Clusters
		Food & Agriculture	Healthcare & Life Sciences	Rubber, Ceramics & Glass	Automotive	Appliances & Electrical	HQ, Finance & Tech	Distribution & Logistics	Aerospace & Defense	Chemicals		
15-1131	Computer Programmers		X					X		X		3
15-1132	Software Developers, Applications		X		X			X	X	X		5
15-1133	Software Developers, Systems Software		X		X			X	X	X		5
15-1134	Web Developers							X				1
15-1141	Database Administrators		X					X				2
15-1142	Network and Computer Systems Administrators		X	X	X			X	X	X	X	7
15-1143	Computer Network Architects		X					X		X		3
15-1151	Computer User Support Specialists		X	X	X			X	X	X		6
15-1152	Computer Network Support Specialists		X					X				2
15-1199	Computer Occupations, All Other		X					X		X		3
15-2031	Operations Research Analysts		X		X			X		X		4
15-2041	Statisticians		X					X				2
Architecture and Engineering (17-0000)												
17-2051	Civil Engineers							X				1
17-2071	Electrical Engineers		X		X	X	X	X		X		5
17-2072	Electronics Engineers, Except Computer		X		X	X				X		4
17-2081	Environmental Engineers							X				1
17-2112	Industrial Engineers	X	X	X	X	X	X	X		X	X	8
17-2141	Mechanical Engineers		X	X	X	X	X	X		X	X	7
17-2161	Nuclear Engineers		X							X		2
17-2199	Engineers, All Other			X	X	X	X	X		X		5
17-3013	Mechanical Drafters		X	X	X	X	X	X		X		6
17-3023	Electrical and Electronics Engineering Technicians		X	X	X	X	X	X		X		6
17-3026	Industrial Engineering Technicians	X	X	X	X	X	X	X		X	X	8
17-3027	Mechanical Engineering Technicians		X	X	X	X	X	X		X		6
17-3029	Engineering Technicians, Except Drafters, All Other		X	X	X					X		4
Life, Physical, and Social Science (19-0000)												
19-1042	Medical Scientists, Except Epidemiologists		X					X				2
19-2031	Chemists		X					X			X	3
19-2041	Environmental Scientists and Specialists, Including Health							X				1
19-4031	Chemical Technicians		X	X				X			X	4
19-4091	Environmental Science and Protection Technicians, Including Health		X					X				2
19-4099	Life, Physical, and Social Science Technicians, All Other		X									1
Legal Occupations (23-0000)												
23-1011	Lawyers		X					X				2
23-2011	Paralegals and Legal Assistants		X									1
Arts, Design, Entertainment, Sports, and Media (27-0000)												
27-1024	Graphic Designers		X					X				2
27-1026	Merchandise Displayers and Window Trimmers	X										1
27-3031	Public Relations Specialists							X				1
Healthcare Practitioners and Technical (29-0000)												
29-9011	Occupational Health and Safety Specialists	X	X	X	X					X	X	6

SOC Code	Occupation											Number of Clusters
		Food & Agriculture	Healthcare & Life Sciences	Rubber, Ceramics & Glass	Automotive	Appliances & Electrical	HQ, Finance & Tech	Distribution & Logistics	Aerospace & Defense	Chemicals		
Protective Service (33-0000)												
33-9032	Security Guards										X	1
Sales and Related (41-0000)												
41-1012	First-Line Supervisors of Non-Retail Sales Workers		X					X	X			3
41-2022	Parts Salespersons								X			1
41-2031	Retail Salespersons								X			1
41-3099	Sales Representatives, Services, All Other							X	X			2
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	X	9
41-9041	Telemarketers							X				1
Office and Administrative Support (43-0000)												
43-1011	First-Line Supervisors of Office and Administrative Support Workers	X	X	X	X	X	X	X	X	X	X	9
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			3
43-3031	Bookkeeping, Accounting, and Auditing Clerks	X	X	X	X	X	X	X	X	X	X	9
43-4051	Customer Service Representatives	X	X	X	X	X	X	X	X	X	X	9
43-4151	Order Clerks	X	X	X		X		X				5
43-4171	Receptionists and Information Clerks		X						X			2
43-5011	Cargo and Freight Agents								X			1
43-5021	Couriers and Messengers								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	9
43-5071	Shipping, Receiving, and Traffic Clerks	X	X	X	X	X		X	X	X	X	8
43-5081	Stock Clerks and Order Fillers	X	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		5
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	X	X	X	X	X	X	X	X	X	X	9
43-9021	Data Entry Keyers							X	X			2
Farming, Fishing, and Forestry (45-0000)												
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	X										1
Construction and Extraction (47-0000)												
47-2111	Electricians	X		X	X	X				X	X	6
47-2121	Glaziers			X								1
47-2152	Plumbers, Pipefitters, and Steamfitters				X							1
47-2211	Sheet Metal Workers									X		1
Installation, Maintenance and Repair (49-0000)												
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	X	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				1

SOC Code	Occupation										
		Food & Agriculture	Healthcare & Life Sciences	Rubber, Ceramics & Glass	Automotive	Appliances & Electrical	HQ, Finance & Tech	Distribution & Logistics	Aerospace & Defense	Chemicals	Number of Clusters
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment		X		X	X				X	4
49-3011	Aircraft Mechanics and Service Technicians								X		1
49-3023	Automotive Service Technicians and Mechanics							X			1
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	X						X			2
49-3042	Mobile Heavy Equipment Mechanics, Except Engines							X			1
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers					X					1
49-9041	Industrial Machinery Mechanics	X	X	X	X	X		X	X	X	8
49-9044	Millwrights				X						1
49-9062	Medical Equipment Repairers		X								1
49-9071	Maintenance and Repair Workers, General	X	X	X	X	X	X	X	X	X	9
Production (51-0000)											
51-1011	First-Line Supervisors of Production and Operating Workers	X	X	X	X	X		X	X	X	8
51-2028	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers		X		X	X			X		4
51-2098	Assemblers and Fabricators, All Other, Including Team Assemblers	X	X	X	X	X		X	X	X	8
51-3011	Bakers	X									1
51-3021	Butchers and Meat Cutters	X									1
51-3092	Food Batchmakers	X									1
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic		X	X	X	X			X		5
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic				X				X		2
51-4041	Machinists		X	X	X	X			X	X	6
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
51-6031	Sewing Machine Operators		X		X						2
51-6093	Upholsterers				X						1
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	X	X	X	X	X	X	X	X	X	9
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
51-9198	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
Transportation and Material Moving (53-0000)											
53-1048	First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	X		X	X	X		X		X	6
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
53-7051	Industrial Truck and Tractor Operators	X		X	X	X		X	X	X	7
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	X	8