



Academic Supply and Occupational Demand in Tennessee

Workforce Needs and Award Production

Annual Report
January 15, 2018



Tennessee Higher Education Commission

Tennessee Higher Education Commission

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Executive Summary

- By academic year (AY) 2025, higher education institutions in Tennessee will award many more postsecondary credentials.
 - More associate degrees and bachelor's degrees will be awarded, while slightly fewer certificates will be awarded. The most substantial growth will be in associate degrees, with a projected increase of 22.1 percent between AY 2016 and AY 2025.
 - Public universities will continue to award the largest share of total credentials because they will award the greatest number of bachelor's degrees. By AY 2025, community colleges are projected to surpass proprietary institutions to become the second largest producer of total credentials. This is attributable to the considerable projected growth in associate degrees awarded by community colleges.
 - Total award production is expected to increase across all sectors in Tennessee, except at proprietary institutions; a 6.1 percent decrease in this sector is projected between AY 2016 and AY 2025.
 - Tennessee is projected to award 79,299 awards in AY 2025, compared to 71,143 in AY 2016, an 11.5 percent increase in statewide award production.
- There is high demand for individuals trained in a variety of career fields across the state.
 - The most in-demand career fields include Administrative and Information Support, Production, Selling and Sales Management, and Restaurants and Food Services. There is a deficit of individuals trained to work in these areas throughout Tennessee.
 - Occupations in the top 25 high-demand fields require all levels of education and training, from short-term on-the-job training through a master's or doctoral degree.
 - Conversely, a number of career paths are oversupplied; more Tennesseans are trained in these areas than there are jobs available. These fields include Cosmetology, Engineering Technology, Journalism, and Recreation and Attractions.
 - Occupational demand varies slightly by region, but regional demand is mostly aligned with statewide workforce needs.
- Many higher education institutions in Tennessee offer academic programs that can meet the workforce needs of these high-demand areas.
 - Public, private, and proprietary institutions offer programs of all levels in areas related to these in-demand fields.
 - Opportunities for postsecondary training in these areas are available across the state and are not limited to specific geographic areas.



Introduction

This report is prepared pursuant to Tennessee Code Annotated § 49-7-112(b), which directs the Tennessee Higher Education Commission (THEC) to “produce an annual report regarding state workforce need projections and credential production.”

This report is the result of collaboration between THEC and the Tennessee Department of Labor and Workforce Development (TDLWD). Using data from academic year (AY) 2006 through AY 2016, this report presents projections of awards to be produced by public, private, and proprietary¹ institutions in Tennessee through AY 2025. These estimates of award production (i.e., academic supply) are linked to the needs of Tennessee’s workforce (i.e., occupational demand) to indicate whether Tennessee’s postsecondary institutions are meeting the needs of employers across the state.

This report is divided into five sections:

- **Expected Awards** presents projections of postsecondary credentials to be awarded by public, private, and proprietary institutions in Tennessee through AY 2025.
- **State Workforce Needs** identifies Tennessee’s most immediate workforce deficits and highlights the 25 highest-demand career fields in the state through 2018, as defined by TDLWD. This section also lists the 20 most oversupplied programs of study in Tennessee, for which there are substantially more postsecondary graduates than job opportunities.
- **Institutions Offering Programs in High-Demand Areas** lists the public, private, and proprietary institutions across Tennessee that offer programs in the 25 highest-demand career areas.
- **Regional Workforce Needs** identifies occupations with high employer demand in each of the state’s nine regions defined by the Tennessee Department of Economic and Community Development (TNECD).
- **Limitations and Conclusions** outlines the limitations of supply and demand analyses and summarizes the key takeaways of the report.

¹ Proprietary institutions are also known as “for-profit” institutions.

Methodology

Projections of award production and workforce demand were developed independently by THEC and TDLWD. These projections were then linked to analyze labor supply relative to workforce demand. The narrative below explains the methodology used to develop these projections and addresses important caveats for using these estimates.

Academic Supply Projections

Postsecondary credentials are projected through academic year (AY) 2025, and these projections are based on historical data for AY 2006 through AY 2016. The institutions included in these projections are public, private, and proprietary institutions in Tennessee that award postsecondary certificates, associate degrees, or bachelor's degrees.² For public and proprietary institutions, THEC used historical data from its Student Information System, its Division of Postsecondary State Authorization, and the Integrated Postsecondary Education Data System (IPEDS).³ For private institutions, THEC used historical data from the Tennessee Independent Colleges and Universities Association (TICUA) and IPEDS.

Table 1 presents the award levels included in the projections; concentrations and minors are excluded. Past trends in award production are significantly related to future growth. For example, if a particular award shows growth between AY 2006 and AY 2016, it is likely that the number of Tennesseans earning that award will continue to increase in the future. A caveat, however, is that programs in emerging fields may be difficult to project accurately, as historical data about these programs are limited.

Table 1: Award levels included in projections

Certificates of less than 1 academic year
Certificates of at least 1 but less than 2 academic years
Associate degrees
Bachelor's degrees

Occupational Demand Projections

Projections of occupational demand were estimated by TDLWD using the Standard Occupation Classification (SOC) system. The SOC system and the Bureau of Labor Statistics provide information about the education and training required for specific occupations across the state. These education and training requirements reflect what is typically observed for an employee in a given occupation; certainly, exceptions exist. For example, an individual who holds a doctoral degree may be employed in a position that requires only a bachelor's degree.

² Only certificates, associate degrees, and bachelor's degrees (sub-baccalaureate and baccalaureate programs) are included in the analysis to better align this report with Tennessee's Drive to 55 initiative, which set the goal of increasing the percentage of Tennesseans with a postsecondary credential to 55 percent by 2025.

³ IPEDS is a federal dataset containing a breadth of information about higher education institutions, including student demographics, program offerings, and completion data.

In summary, statistical procedures based on surveys and research done at the national and state levels are used to develop the occupational projections. The average annual occupational projections are then compared to the number of people being trained in Tennessee in related programs of study to see if shortages of workers in certain occupations are expected.

It is important to note that the relationship between education requirements and occupation is most direct for highly specialized fields, such as those requiring a specific certificate or an advanced degree. Conversely, many fields requiring a bachelor's degree are less clearly defined, as those who hold a bachelor's degree often have diverse employment opportunities in a variety of fields.



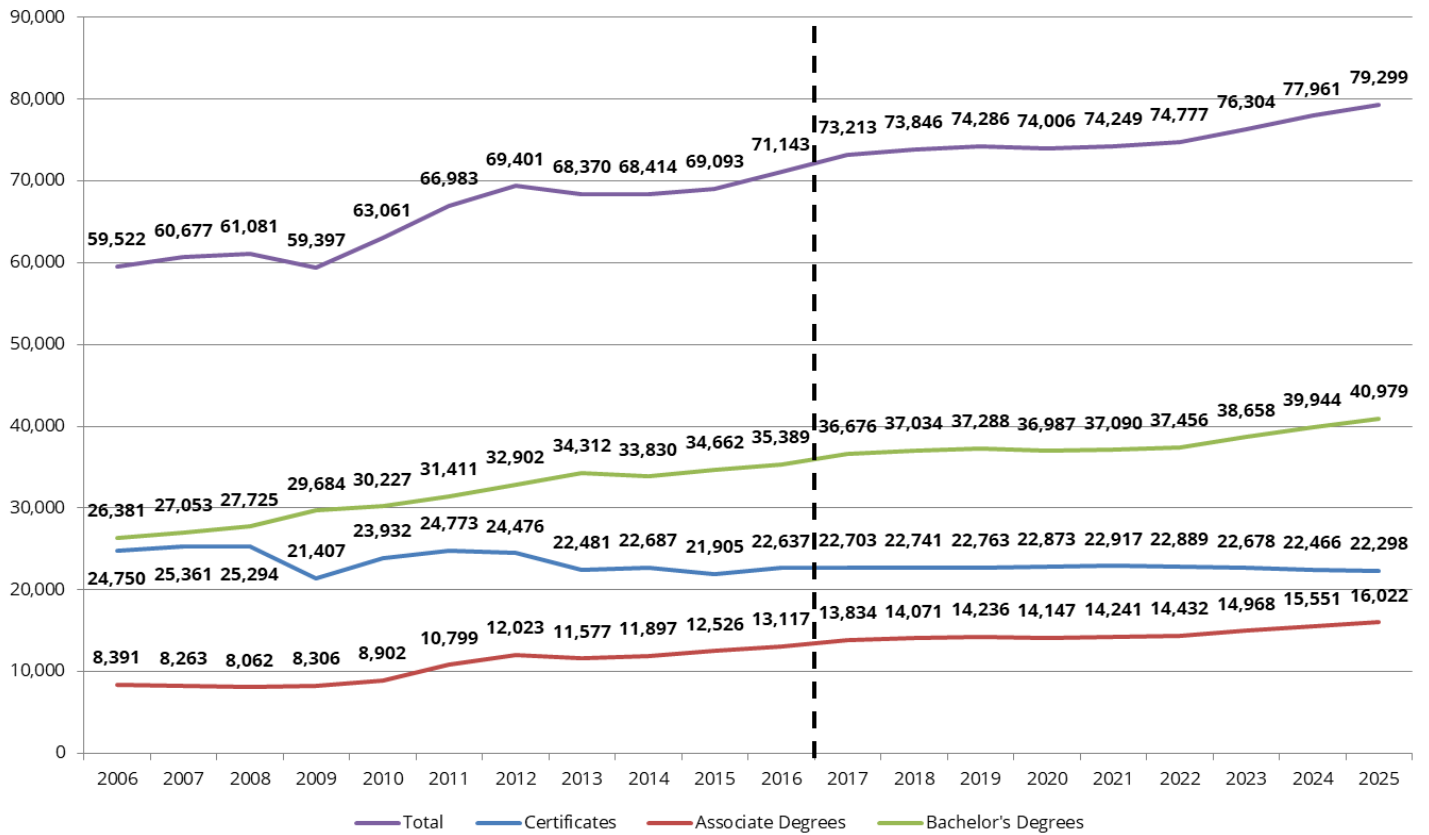
Expected Awards

This section projects the supply of postsecondary credentials to be awarded by public, private, and proprietary institutions in Tennessee. These projections forecast various award levels by institutional sector through academic year (AY) 2025. **Figures 1** through **5** below show historical award production to the left of the dashed line and projected award production to the right. These data are also available in tabular format in **Appendix A**.

Total Awards by Award Level

Figure 1 displays the projections of total awards (disaggregated by award level) to be produced by public, private, and proprietary institutions in the state. From AY 2016 to AY 2025, associate and bachelor's degrees are expected to increase (22.1 percent and 15.8 percent, respectively), while certificate production will decrease slightly (-1.5 percent). In AY 2025, Tennessee will produce 79,299 postsecondary credentials, an 11.5 percent increase from the 71,143 credentials produced in AY 2016. Although award production is expected to increase substantially during the projection period, additional growth is needed to reach the Drive to 55 attainment goal.

Figure 1: Total awards by award level



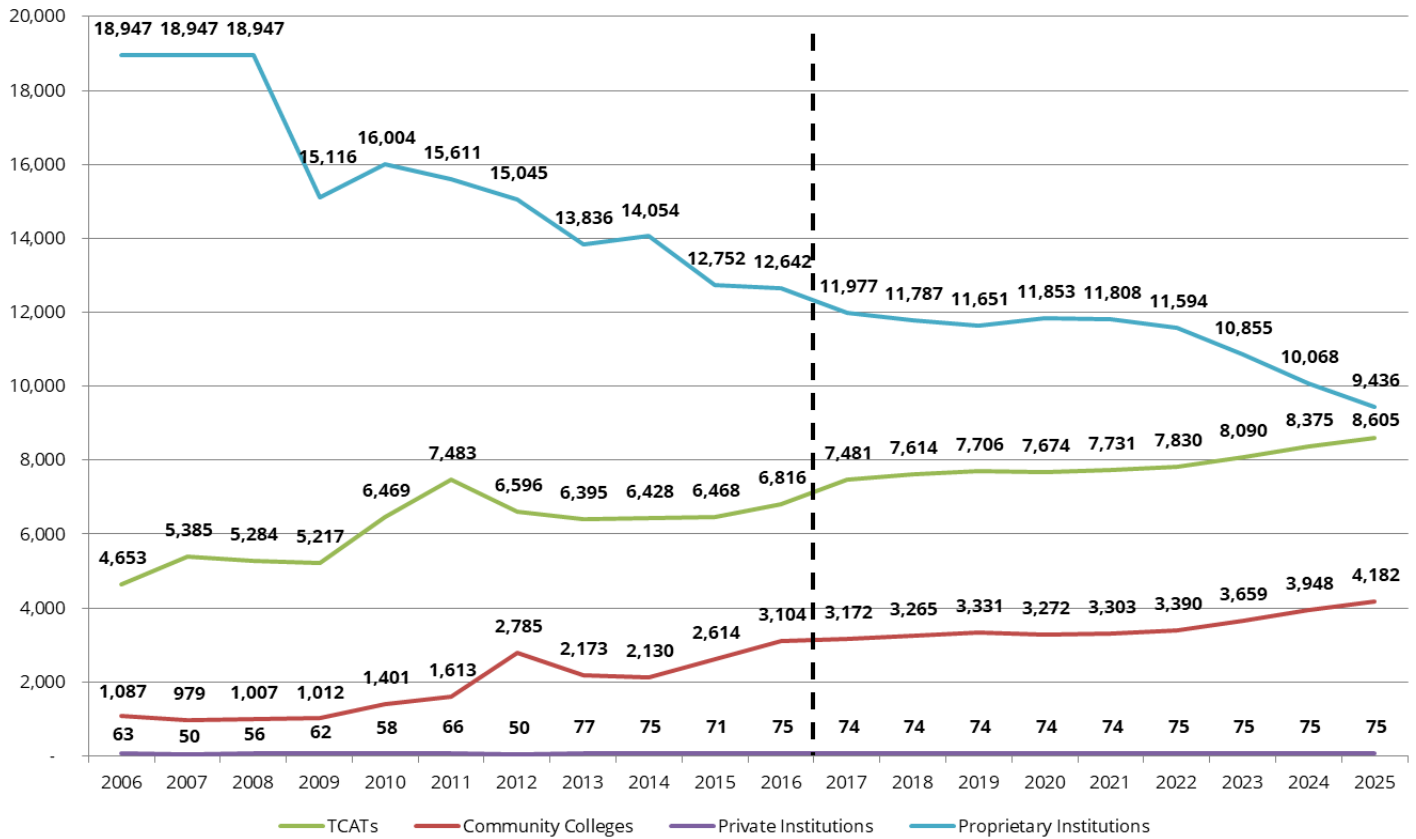
Source: THEC, 2017



Certificates

Figure 2 displays the projections of postsecondary certificates to be awarded by public, private, and proprietary institutions in the state. From AY 2016 to AY 2025, certificate production at proprietary institutions is expected to decrease substantially (-25.4 percent), while certificate production at TCATs and community colleges will continue to increase (26.2 percent and 34.7 percent, respectively). Certificate production at private institutions is projected to remain stable through AY 2025.

Figure 2: Certificates by sector



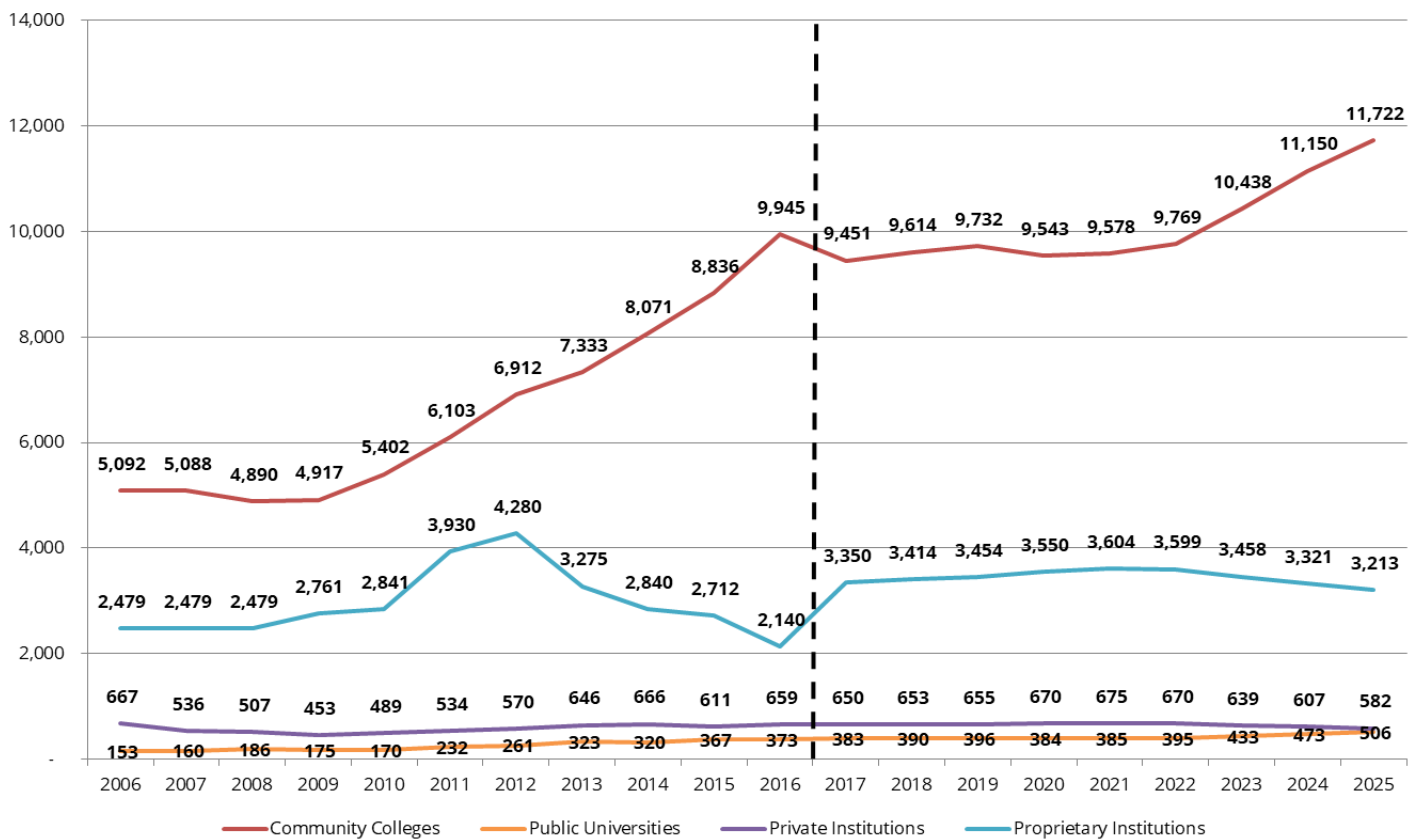
Source: THEC, 2017



Associate Degrees

Figure 3 displays the projections of associate degrees to be awarded by public, private, and proprietary institutions in the state. From AY 2016 to AY 2025, associate degree production at community colleges is expected to increase considerably (17.9 percent or 1,777 degrees). Though the percent change in associate degree production at public universities and proprietary institutions is projected to be substantial (35.7 percent and 50.1 percent, respectively), the actual number of associate degrees produced will be relatively small. Between AY 2016 and AY 2025, associate degree production is projected to increase from 373 to 506 at public universities and from 2,140 to 3,213 at proprietary institutions. Associate degree production at private institutions is projected to decrease by 11.7 percent, a loss of 77 degrees.

Figure 3: Associate degrees by sector



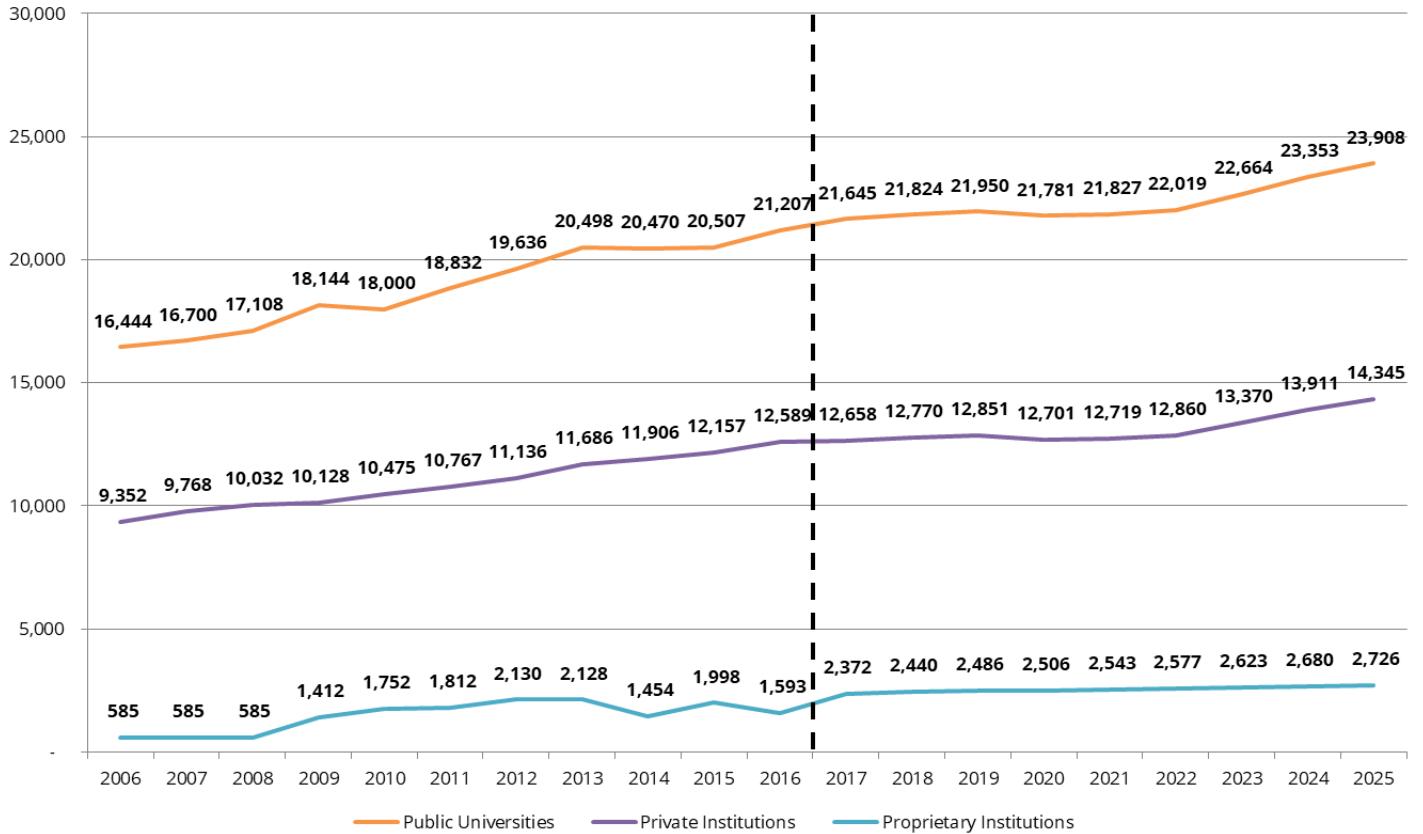
Source: THEC, 2017



Bachelor's Degrees

Figure 4 displays the projections of bachelor's degrees to be awarded by public, private, and proprietary institutions in the state. From AY 2016 to AY 2025, bachelor's degree production is expected to increase across all sectors. Proprietary institutions will see the largest percent increase (71.1 percent), followed by private institutions (13.9 percent) and public institutions (12.7 percent). This is largely due to the relative share of bachelor's degree production in each sector. In absolute terms, public universities will see the largest increase, with a projected increase of 2,701 bachelor's degrees between AY 2016 and AY 2025.

Figure 4: Bachelor's degrees by sector



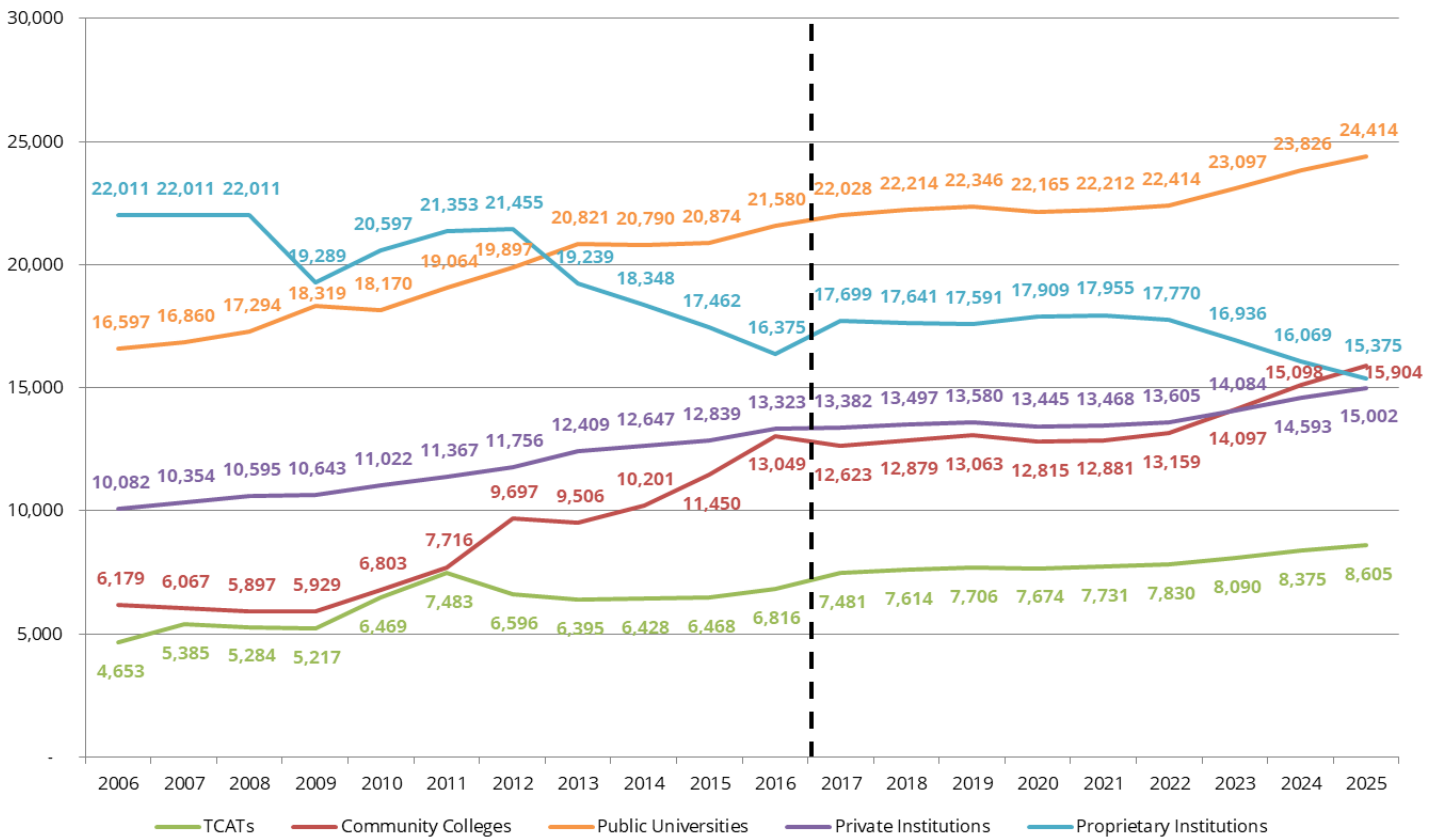
Source: THEC, 2017



Total Awards by Sector

Figure 5 displays the projections of total awards (disaggregated by sector) to be produced by public, private, and proprietary institutions in the state. From AY 2016 to AY 2025, total award production is expected to increase across all sectors except for proprietary institutions. In terms of percent increase, the largest growth in award production from AY 2016 to AY 2025 will be at TCATs, with an increase of 26.2 percent (1,789 awards), followed by community colleges, with an increase of 21.9 percent (2,855 awards). The growth in these sectors can likely be attributed to the 2015 implementation of Tennessee Promise, which allows recent high school graduates to attend a TCAT or community college free of tuition and fees for up to five semesters.

Figure 5: Total awards by sector



Source: THEC, 2017



State Workforce Needs

While Tennessee's higher education system is robust, workforce growth across numerous programs of study (career areas) has outpaced postsecondary award production. **Table 2** presents the top 25 programs of study for which employment opportunities are growing more rapidly than the supply of qualified workers. **Figure 6** displays the top 5 programs of study for which employment opportunities outpace the supply of qualified labor in a stacked bar chart format. These programs produce fewer graduates than there are jobs available, so additional Tennesseans need to be trained in these areas. These postsecondary programs are offered at public, private, and proprietary institutions across the state and yield all levels of awards, which will be described in greater detail in the next section of this report.⁴ Additional information about the supply of graduates and workforce demand in these 25 programs of study is available in **Appendix B**.

The programs of study included in **Table 2** have occupations with annual average growth rates greater than zero, more than 10 openings per year, and a ratio of completers to annual average openings of 1.55 or less. Among the programs of study that fit these criteria, those with the greatest gap between the number of openings and the number of program completers were selected. Other criteria used to select these programs of study included: 1) having 60 or more expected annual openings statewide per year; and 2) average annual wages in 2016 greater than \$22,300, the 25th percentile of the wage distribution in the state.

Administrative and Information Support constitutes the largest share of the projected deficit in Tennessee's workforce. Approximately 6,740 jobs are expected to open annually in this program of study, but only 1,952 individuals earned a credential in this field in 2016, resulting in an annual deficit of 4,788 jobs without qualified Tennesseans to fill them. Other high-demand programs of study within the Business Management and Administration career cluster⁵ are **Business Analysis** and **Human Resources**, with projected annual deficits of 848 and 709 qualified workers, respectively. As Tennessee's economy grows and more industries choose to enter and operate in the state, individuals who earn credentials in these areas will be invaluable resources to both new and existing businesses.

As the manufacturing industry continues to grow throughout the state, thousands of job opportunities are expected within the Advanced Manufacturing career cluster over the next two years. This is the case not only for those trained in **Precision Production Pathways**, but also for those specializing in **Production Operations and Maintenance**. It is projected that Tennessee will face a shortage of 6,524 qualified workers for jobs in these two programs of study in the next year. In addition, there is a projected shortage of nearly 300 industrial engineers.

Substantial deficits are also projected in the Marketing career cluster. Jobs in the **Selling and Sales Management** career area include sales managers, sales representatives, and real estate professionals. Approximately 4,330 jobs are expected to open annually in the sales industry, but only 413 individuals earned a credential in this field in 2016, resulting in an annual deficit of 3,917 qualified workers. However,

⁴ The number of completers in **Tables 2** and **3** includes students who completed a program at 107 public, private, and proprietary institutions across the state. The full list of institutions represented in this calculation is available in **Appendix C**.

⁵ Similar programs of study are grouped into 16 career clusters. For more information about each of the 16 career clusters, please visit <https://www.tn.gov/education/career-and-technical-education/career-clusters.html>

it is important to note that many jobs in this career area only require on-the-job training or related work experience, not a postsecondary credential. For the management-level jobs that do require a postsecondary award, often a bachelor's degree in any field (e.g., bachelor's degree in business administration) will fulfill the education requirement. Jobs in the **Merchandising** program of study include retail buyers, salespersons, and product promoters. Approximately 510 jobs are expected to open annually in the sales industry, but only 23 individuals earned a credential in this field in 2016, resulting in an annual deficit of 487 qualified workers.

As the tourism industry continues to grow in Tennessee,⁶ thousands of job opportunities, including food service managers and supervisors, are expected within the **Restaurants and Food and Beverage Services Pathway** program of study. Over the next two years, 4,285 jobs are expected to open annually, but only 1,573 individuals completed a credential or apprenticeship in this field in 2016, resulting in a projected annual deficit of 2,712 qualified workers.

Another area with significant demand is the Architecture and Construction career cluster, which prepares individuals for careers in designing, planning, managing, building, and maintaining the building environment. Individuals specializing in **Electrical** work, **Technical Design & Preconstruction**, **Masonry & Concrete**, and **All Other Construction** occupations are expected to be in particular demand over the next two years. In addition to the 1,350 individuals who completed a credential in this program of study in 2016, 328 individuals completed a construction-related apprenticeship in 2016. Still, there will be a projected deficit of 1,612 qualified workers over the next year.

Computer programming, systems analysis, and computer support specialist training at the associate degree level and above, as well as computer systems networking and security, are expected to have a deficit of 764 program completers as automation continues to increase in the workplace.

⁶ Tennessee Department of Tourist Development, *2017 Annual Report*:
https://www.tn.gov/content/dam/tn/tourism/documents/Annual_2017_Web.pdf

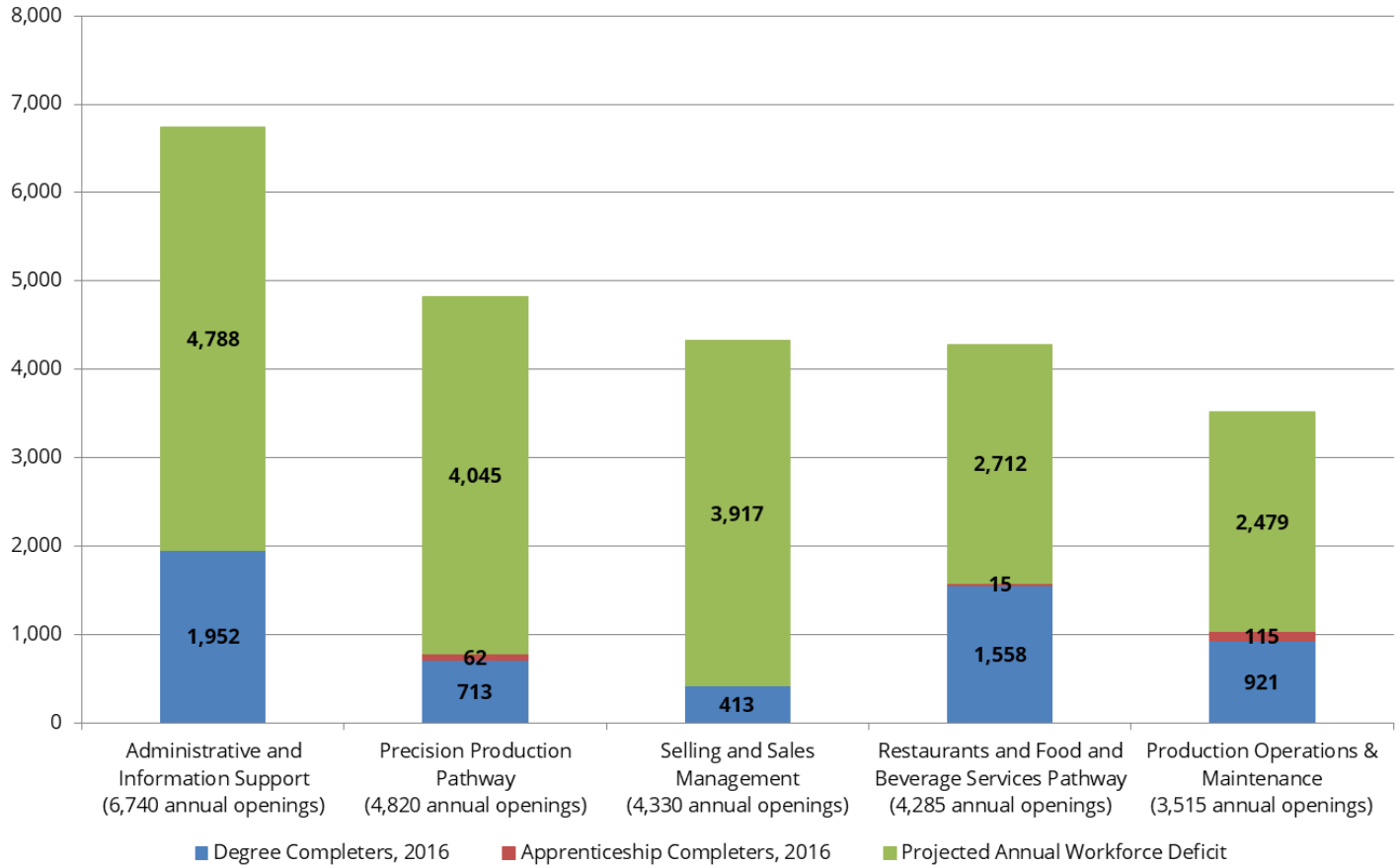
Table 2: Top 25 programs of study with largest projected workforce deficit

Program of Study Code	Program of Study Name	Median Salary	Projected Annual Openings	Degree Completers, 2016	Apprenticeship Completers, 2016	Projected Workforce Deficit
04.6000000	Administrative and Information Support	\$34,429	6,740	1,952		4,788
13.1000000	Precision Production Pathway	\$34,401	4,820	713	62	4,045
14.2000000	Selling and Sales Management	\$50,160	4,330	413		3,917
09.1000000	Restaurants and Food and Beverage Services Pathway	\$27,506	4,285	1,558	15	2,712
13.2200000	Prod. Design, Ops, and Maint. Path -- Operations & Maintenance	\$41,482	3,515	921	115	2,479
16.1300000	Truck, Bus, Rail, Water Transportation, and Heavy Equipment	\$41,314	2,145	532		1,613
06.3110000	Banking and Finance	\$64,389	2,220	728		1,492
04.4000000	Business Analysis	\$66,431	955	107		848
04.3000000	Human Resources	\$52,324	770	61		709
02.2700000	All Other Construction	\$39,278	1,640	920	39	681
01.2200000	Plant Systems Pathway - Horticulture Production	\$26,036	1,315	804		511
14.3000000	Merchandising	\$37,101	510	23		487
12.3000000	Security and Protective Services Pathway	\$32,926	495	42		453
11.1000000	Network Systems	\$70,475	570	186		384
11.3400000	Web/Multimedia Management, Programming	\$72,554	1,890	1,510		380
05.1170000	Elementary Teachers, Except Special Education	\$48,750	700	340		360
02.1220000	Technical Design & Preconstruction	\$64,461	440	85		355
02.2100000	Construction Pathway - Construction Electrical	\$49,250	955	311	289	355
12.4140000	Fire Fighting	\$43,716	405	57		348
15.1160000	Industrial Engineering	\$76,810	360	61		299
08.2220000	Medical and Clinical Laboratory Technicians	\$36,210	300	70		230
02.2200000	Construction Pathway - Construction Masonry & Concrete	\$36,232	255	34		221
07.7120000	Compliance Officers	\$55,881	200	0		200
05.1140000	Support Services- Adult and Continuing Education	\$30,291	190	1		189
05.2110000	Teacher Training Services- Pre-K- Early Childhood Education	\$29,873	430	245		185

Source: TDLWD, Projections to 2018



Figure 6: Top 5 programs of study with largest projected workforce deficit



Source: TDLWD, Projections to 2018



Conversely, Tennessee has a number of programs that are oversupplied in the workforce. **Table 3** presents the programs that graduate a larger number of students than there are jobs available, leading to a surplus of individuals trained in these areas. These programs of study include diverse fields such as **Cosmetology, Engineering Technology, Journalism, and Recreation and Attractions.**

Table 3: Programs of study with largest projected workforce surplus

Program of Study Code	Program of Study Name	Median Salary	Projected Annual Openings	Number of Completers, 2016	Projected Workforce Surplus
10.4110000	Cosmetology and Barbering	\$24,919	575	4,015	3,440
15.1240000	Engineering Technology	\$48,170	330	2,512	2,182
14.1000000	Marketing Management and Research	\$64,830	480	2,509	2,029
03.5000000	Journalism and Broadcasting Pathway	\$38,683	440	2,167	1,727
09.4000000	Recreation, Amusements and Attractions Pathway	\$30,024	570	2,123	1,553
08.1190000	Emergency Medical Tech.	\$31,840	215	1,593	1,378
06.3120000	Banking and Finance Support Services	\$36,603	330	1,680	1,350
01.3120000	Veterinary Technology	\$23,103	365	1,303	938
01.4000000	Power Structural and Technical Systems Pathway	\$32,740	25	805	780
05.1230000	Postsecondary Teachers- Teacher Education	\$56,330	85	802	717
05.1150000	Support Services- Instructional Coordinators	\$61,820	50	683	633
10.3130000	Religious Activities and Education	\$39,480	220	851	631
03.1000000	Audio and Video Technologies Pathway	\$39,860	160	731	571
16.4200000	Collision Repair Technology	\$36,789	165	728	563
15.3110000	Life Sciences	\$62,553	175	687	512
11.3100000	Interactive Media	\$49,430	35	482	447
05.1130000	Support Services- Interpreters/Translators	\$36,070	35	463	428
08.1180000	Surgical Technologist	\$39,200	60	487	427
15.3170000	Mathematics, Actuarial Science	\$60,041	100	507	407
15.3140000	Chemistry	\$62,155	50	456	406

Source: TDLWD, Projections to 2018



Institutions Offering Programs in High-Demand Areas

The following section presents the academic programs available at public, private, and proprietary postsecondary institutions in Tennessee that produce graduates who are employable in each high-demand program of study.⁷ Each table includes the institution name, the system to which the institution belongs,⁸ the grand division in which the institution is located, and the award level offered by the institution (certificate, associate degree, bachelor's degree, master's degree, or doctoral degree).

Administrative and Information Support

Careers in this area include administrative assistants, customer service representatives, legal and medical secretaries, and data entry keyers. Typical education requirements for these occupations include moderate-term on-the-job training or postsecondary vocational training.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Bethel University	TICUA	West	Associate degree
Brightwood College-Nashville	Proprietary	Middle	Certificate
Chattanooga College Medical Dental and Technical Careers	Proprietary	East	Associate degree
Chattanooga State Community College	TBR	East	Certificate
Cleveland State Community College	TBR	East	Certificate, Associate degree
Concorde Career College-Memphis	Proprietary	West	Certificate, Associate degree
Daymar College-Clarksville	Proprietary	Middle	Certificate, Associate degree
Daymar College-Murfreesboro	Proprietary	Middle	Certificate, Associate degree
Daymar College-Nashville	Proprietary	Middle	Certificate, Associate degree
Genesis Career College-Cookeville	Proprietary	Middle	Certificate
Middle Tennessee State University	LGI	Middle	Bachelor's degree
Miller-Motte Technical College-Chattanooga	Proprietary	East	Certificate
Miller-Motte Technical College-Clarksville	Proprietary	Middle	Certificate, Associate degree
Nashville College of Medical Careers	Proprietary	Middle	Certificate
Nashville State Community College	TBR	Middle	Certificate, Associate degree
National College-Nashville	Proprietary	Middle	Certificate, Associate degree
Northeast State Community College	TBR	East	Certificate, Associate degree
Pellissippi State Community College	TBR	East	Certificate, Associate degree
Remington College-Memphis Campus	Proprietary	West	Certificate
Remington College-Nashville Campus	Proprietary	Middle	Certificate

⁷ These programs were identified by TDLWD as providing the necessary award to enter a respective field. Additional institutions and programs may exist that prepare students to enter a respective field of work.

⁸ Institutions are identified as part of the Tennessee Board of Regents (TBR), University of Tennessee (UT), or TICUA system or are listed as Independent (private, non-profit) or Proprietary (private, for-profit). Public four-year institutions that were formerly governed by TBR are now identified as locally-governed institutions (LGI).

Institution Name	System	Grand Division	Award Offered
Roane State Community College	TBR	East	Certificate
Southern Adventist University	TICUA	East	Associate degree, Bachelor's degree
Southwest Tennessee Community College	TBR	West	Associate degree
TCAT Athens	TBR	East	Certificate
TCAT Covington	TBR	West	Certificate
TCAT Crossville	TBR	East	Certificate
TCAT Crump	TBR	West	Certificate
TCAT Dickson	TBR	Middle	Certificate
TCAT Elizabethton	TBR	East	Certificate
TCAT Harriman	TBR	East	Certificate
TCAT Hartsville	TBR	Middle	Certificate
TCAT Hohenwald	TBR	Middle	Certificate
TCAT Jacksboro	TBR	East	Certificate
TCAT Jackson	TBR	West	Certificate
TCAT Knoxville	TBR	East	Certificate
TCAT Livingston	TBR	Middle	Certificate
TCAT McKenzie	TBR	West	Certificate
TCAT McMinnville	TBR	Middle	Certificate
TCAT Memphis	TBR	West	Certificate
TCAT Morristown	TBR	East	Certificate
TCAT Murfreesboro	TBR	Middle	Certificate
TCAT Nashville	TBR	Middle	Certificate
TCAT Newbern	TBR	West	Certificate
TCAT Oneida-Huntsville	TBR	East	Certificate
TCAT Paris	TBR	West	Certificate
TCAT Pulaski	TBR	Middle	Certificate
TCAT Ripley	TBR	West	Certificate
TCAT Shelbyville	TBR	Middle	Certificate
TCAT Whiteville	TBR	West	Certificate
Tennessee State University	LGI	Middle	Bachelor's degree
The University of Tennessee-Health Science Center	UT	West	Master's degree
Vatterott College-Applying Farms	Proprietary	West	Associate degree
Vatterott College-Dividend	Proprietary	West	Associate degree
Virginia College-Chattanooga	Proprietary	East	Certificate, Associate degree
Virginia College-Knoxville	Proprietary	East	Certificate, Associate degree
Volunteer State Community College	TBR	Middle	Certificate
Walters State Community College	TBR	East	Certificate, Associate degree
West Tennessee Business College	Proprietary	West	Certificate, Associate degree



Precision Production Pathway

Careers in this area include various positions in manufacturing, such as machinists, team assemblers, tool and die makers, and machine tool operators. Typical education requirements for these occupations include moderate-term or long-term on-the-job training or a technical certificate.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Northeast State Community College	TBR	East	Certificate
TCAT Athens	TBR	East	Certificate
TCAT Covington	TBR	West	Certificate
TCAT Crossville	TBR	East	Certificate
TCAT Crump	TBR	West	Certificate
TCAT Dickson	TBR	Middle	Certificate
TCAT Harriman	TBR	East	Certificate
TCAT Hartsville	TBR	Middle	Certificate
TCAT Hohenwald	TBR	Middle	Certificate
TCAT Jacksboro	TBR	East	Certificate
TCAT Jackson	TBR	West	Certificate
TCAT Knoxville	TBR	East	Certificate
TCAT Livingston	TBR	Middle	Certificate
TCAT McKenzie	TBR	West	Certificate
TCAT McMinnville	TBR	Middle	Certificate
TCAT Memphis	TBR	West	Certificate
TCAT Morristown	TBR	East	Certificate
TCAT Murfreesboro	TBR	Middle	Certificate
TCAT Nashville	TBR	Middle	Certificate
TCAT Newbern	TBR	West	Certificate
TCAT Oneida-Huntsville	TBR	East	Certificate
TCAT Paris	TBR	West	Certificate
TCAT Pulaski	TBR	Middle	Certificate
TCAT Shelbyville	TBR	Middle	Certificate
TCAT Whiteville	TBR	West	Certificate
William Moore College of Technology	Independent	West	Certificate, Associate degree



Selling and Sales Management

Careers in this area include various positions in sales, sales management, and real estate. Typical education requirements for these occupations include moderate-term on-the-job training or a bachelor's degree.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Carson-Newman University	TICUA	East	Bachelor's degree
Christian Brothers University	TICUA	West	Bachelor's degree
East Tennessee State University	LGI	East	Master's degree
Northeast State Community College	TBR	East	Certificate
Southern Adventist University	TICUA	East	Bachelor's degree
Trevecca Nazarene University	TICUA	Middle	Bachelor's degree

Restaurants and Food and Beverage Services Pathway

Careers in this area include chefs, cooks, and food service managers. Typical education requirements for these occupations include long-term on-the-job training or postsecondary vocational training.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
L'Ecole Culinaire-Memphis	Proprietary	West	Certificate
Lipscomb University	TICUA	Middle	Bachelor's degree
Nashville State Community College	TBR	Middle	Certificate, Associate degree
Pellissippi State Community College	TBR	East	Certificate
Southern Adventist University	TICUA	East	Certificate, Associate degree, Bachelor's degree
Southwest Tennessee Community College	TBR	West	Certificate
The Art Institute of Tennessee-Nashville	Proprietary	Middle	Certificate, Associate degree, Bachelor's degree
Virginia College-Chattanooga	Proprietary	East	Certificate
Walters State Community College	TBR	East	Certificate



Production Operations & Maintenance

Careers in this area include various positions in mechanical, industrial, and electrical maintenance and repair. Typical education requirements for these occupations include moderate-term or long-term on-the-job training or a technical certificate.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Chattanooga State Community College	TBR	East	Certificate
Cleveland State Community College	TBR	East	Certificate
Columbia State Community College	TBR	Middle	Certificate, Associate degree
Dyersburg State Community College	TBR	West	Certificate, Associate degree
Motlow State Community College	TBR	Middle	Certificate, Associate degree
Nashville State Community College	TBR	Middle	Certificate
Northeast State Community College	TBR	East	Certificate
Pellissippi State Community College	TBR	East	Certificate
Roane State Community College	TBR	East	Certificate
Southwest Tennessee Community College	TBR	West	Certificate, Associate degree
TCAT Athens	TBR	East	Certificate
TCAT Covington	TBR	West	Certificate
TCAT Crossville	TBR	East	Certificate
TCAT Crump	TBR	West	Certificate
TCAT Dickson	TBR	Middle	Certificate
TCAT Elizabethton	TBR	East	Certificate
TCAT Harriman	TBR	East	Certificate
TCAT Hartsville	TBR	Middle	Certificate
TCAT Hohenwald	TBR	Middle	Certificate
TCAT Jackson	TBR	West	Certificate
TCAT Knoxville	TBR	East	Certificate
TCAT Livingston	TBR	Middle	Certificate
TCAT McKenzie	TBR	West	Certificate
TCAT McMinnville	TBR	Middle	Certificate
TCAT Memphis	TBR	West	Certificate
TCAT Morristown	TBR	East	Certificate
TCAT Murfreesboro	TBR	Middle	Certificate
TCAT Newbern	TBR	West	Certificate
TCAT Oneida-Huntsville	TBR	East	Certificate
TCAT Paris	TBR	West	Certificate
TCAT Pulaski	TBR	Middle	Certificate
TCAT Shelbyville	TBR	Middle	Certificate
TCAT Whiteville	TBR	West	Certificate
University of Phoenix-Tennessee	Proprietary	Middle	Bachelor's degree
Vanderbilt University	TICUA	Middle	Master's degree

Truck, Bus, Rail, Water Transportation and Heavy Equipment

Careers in this area include tractor-trailer truck drivers, bus drivers, and locomotive engineers. Typical education requirements for these occupations include moderate-term on-the-job training or work experience in a related occupation.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Fortis Institute-Cookeville	Proprietary	Middle	Certificate
Miller-Motte Technical College-Chattanooga	Proprietary	East	Certificate
Miller-Motte Technical College-Clarksville	Proprietary	Middle	Certificate
Miller-Motte Technical College-Madison	Proprietary	Middle	Certificate
TCAT Crossville	TBR	East	Certificate
TCAT Jackson	TBR	West	Certificate
TCAT Knoxville	TBR	East	Certificate
TCAT Memphis	TBR	West	Certificate
TCAT Nashville	TBR	Middle	Certificate
TCAT Newbern	TBR	West	Certificate
TCAT Shelbyville	TBR	Middle	Certificate
Vatterott College-Applying Farms	Proprietary	West	Certificate

Banking and Finance

Careers in this area include financial managers, financial analysts, loan officers, and insurance sales agents. Undergraduate and graduate degrees in accounting and finance are suitable for this occupation. Additionally, undergraduate and graduate degrees in economics and business, offered by many institutions across the state, can lead to employment in banking and finance.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Belmont University	TICUA	Middle	Bachelor's degree
Carson-Newman University	TICUA	East	Bachelor's degree
Christian Brothers University	TICUA	West	Bachelor's degree, Master's degree
East Tennessee State University	LGI	East	Certificate, Bachelor's degree
Lipscomb University	TICUA	Middle	Bachelor's degree
Maryville College	TICUA	East	Bachelor's degree
Middle Tennessee State University	LGI	Middle	Bachelor's degree, Master's degree
Milligan College	TICUA	East	Bachelor's degree
Rhodes College	TICUA	West	Bachelor's degree
Roane State Community College	TBR	East	Associate degree
Sewanee-The University of the South	TICUA	Middle	Bachelor's degree
Southern Adventist University	TICUA	East	Bachelor's degree, Master's degree

Institution Name	System	Grand Division	Award Offered
Strayer University-Tennessee	Proprietary	West	Associate degree, Bachelor's degree
Tennessee State University	LGI	Middle	Bachelor's degree
Tennessee Technological University	LGI	Middle	Bachelor's degree
The University of Tennessee-Chattanooga	UT	East	Bachelor's degree
The University of Tennessee-Knoxville	UT	East	Bachelor's degree, Master's degree
The University of Tennessee-Martin	UT	West	Bachelor's degree
Union University	TICUA	West	Bachelor's degree
University of Memphis	LGI	West	Bachelor's degree, Master's degree
Vanderbilt University	TICUA	Middle	Bachelor's degree, Master's degree

Business Analysis

Careers in this area include business operations specialists, management analysts, and budget analysts. Many of these careers require a bachelor's or master's degree, which are available at most of Tennessee's public and private universities. However, one institution in the state offers a degree program focused on business analysis:

Institution Name	System	Grand Division	Award Offered
The University of Tennessee-Knoxville	UT	East	Bachelor's degree, Master's degree

Human Resources

Careers in this area include human resource specialists and training and development specialists. Master's degree programs in Human Resources are available at the institutions listed in the table below. However, bachelor's degree programs in business administration – some of which offer a specialization in human resources – are available at a variety of institutions across the state. These degrees would also qualify individuals to work in the field of human resources.

Institution Name	System	Grand Division	Award Offered
Argosy University-Nashville	Proprietary	Middle	Master's degree
Austin Peay State University	LGI	Middle	Master's degree
Vanderbilt University	TICUA	Middle	Master's degree



Construction: Other

Careers in this area include various positions in construction, such as floor layers, painters, roofers, and highway maintenance workers. Typical education requirements for these occupations include moderate-term or long-term on-the-job training or a technical certificate.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Cleveland State Community College	TBR	East	Certificate
Southwest Tennessee Community College	TBR	West	Certificate
TCAT Crossville	TBR	East	Certificate
TCAT Harriman	TBR	East	Certificate
TCAT Livingston	TBR	Middle	Certificate
TCAT Memphis	TBR	West	Certificate
TCAT Nashville	TBR	Middle	Certificate
TCAT Pulaski	TBR	Middle	Certificate

Plant Systems Pathway – Horticulture Production

Careers in this area include farmers, landscaping workers, and groundskeepers. Typical education requirements for these careers include short-term to moderate-term on-the-job training.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Middle Tennessee State University	LGI	Middle	Bachelor's degree
Southwest Tennessee Community College	TBR	West	Associate degree
The University of Tennessee-Knoxville	UT	East	Bachelor's degree, Master's degree
Walters State Community College	TBR	East	Certificate, Associate degree

Merchandising

Careers in this area include retail buyers, salespersons, and product promoters. Typical education requirements for these careers include moderate-term on-the-job training or a bachelor's degree.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Lipscomb University	TICUA	Middle	Bachelor's degree
O'More College of Design	Independent	Middle	Bachelor's degree
The Art Institute of Tennessee-Nashville	Proprietary	Middle	Certificate, Bachelor's degree



Security and Protective Services Pathway

Careers in this area include correctional officers, private investigators, and detectives. Typical education requirements for these careers include moderate-term on-the-job training or work experience in a related occupation.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Miller-Motte Technical College-Clarksville	Proprietary	Middle	Associate degree
Roane State Community College	TBR	East	Certificate
Southwest Tennessee Community College	TBR	West	Certificate
The University of Tennessee-Knoxville	UT	East	Certificate

Network Systems

Careers in this area include network and computer systems administrators, computer network support specialists, and web developers. A bachelor's degree is typically required for a career in this field.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Chattanooga College Medical Dental and Technical Careers	Proprietary	East	Associate degree
Cleveland State Community College	TBR	East	Certificate
DeVry University-Tennessee	Proprietary	Middle	Associate degree, Bachelor's degree
Fountainhead College of Technology	Proprietary	East	Bachelor's degree
Lipscomb University	TICUA	Middle	Certificate, Bachelor's degree, Master's degree
Martin Methodist College	TICUA	Middle	Bachelor's degree
Miller-Motte Technical College-Clarksville	Proprietary	Middle	Associate degree
Nashville State Community College	TBR	Middle	Certificate, Associate degree
National College-Nashville	Proprietary	Middle	Associate degree
Pellissippi State Community College	TBR	East	Certificate
Remington College-Memphis Campus	Proprietary	West	Associate degree
South College	Proprietary	East	Associate degree
Strayer University-Tennessee	Proprietary	West	Master's degree
University of Memphis	LGI	West	Certificate
University of Phoenix-Tennessee	Proprietary	Middle	Bachelor's degree
Vatterott College-Dividend	Proprietary	West	Associate degree
Virginia College-Knoxville	Proprietary	East	Associate degree



Web/Multimedia Management, Programming

Careers in this area include computer support specialists, computer system analysts, computer and information system managers, software developers, and computer programmers. An associate or bachelor's degree is typically required for a career in this field.

Programs leading to careers in this field are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Argosy University-Nashville	Proprietary	Middle	Associate degree, Bachelor's degree
Austin Peay State University	LGI	Middle	Bachelor's degree, Master's degree
Belmont University	TICUA	Middle	Bachelor's degree
Bethel University	TICUA	West	Associate degree, Bachelor's degree
Bryan College-Dayton	TICUA	East	Bachelor's degree
Carson-Newman University	TICUA	East	Bachelor's degree
Chattanooga State Community College	TBR	East	Associate degree
Christian Brothers University	TICUA	West	Bachelor's degree
Columbia State Community College	TBR	Middle	Associate degree
Cumberland University	TICUA	Middle	Bachelor's degree
Daymar College-Clarksville	Proprietary	Middle	Associate degree
Daymar College-Murfreesboro	Proprietary	Middle	Associate degree
Daymar College-Nashville	Proprietary	Middle	Associate degree
DeVry University-Tennessee	Proprietary	Middle	Bachelor's degree, Master's degree
Dyersburg State Community College	TBR	West	Associate degree
East Tennessee State University	LGI	East	Certificate, Bachelor's degree, Master's degree
Fisk University	TICUA	Middle	Bachelor's degree
Fountainhead College of Technology	Proprietary	East	Associate degree, Bachelor's degree
Freed-Hardeman University	TICUA	West	Bachelor's degree
Jackson State Community College	TBR	West	Associate degree
King University	TICUA	East	Bachelor's degree
Lane College	TICUA	West	Bachelor's degree
Le Moyne-Owen College	TICUA	West	Bachelor's degree
Lee University	TICUA	East	Bachelor's degree
Lipscomb University	TICUA	Middle	Certificate, Bachelor's degree, Master's degree
Maryville College	TICUA	East	Bachelor's degree
Middle Tennessee State University	LGI	Middle	Bachelor's degree, Master's degree
Milligan College	TICUA	East	Bachelor's degree
Motlow State Community College	TBR	Middle	Associate degree
Nashville State Community College	TBR	Middle	Associate degree
National College-Nashville	Proprietary	Middle	Associate degree
Northeast State Community College	TBR	East	Associate degree
Pellissippi State Community College	TBR	East	Associate degree

Institution Name	System	Grand Division	Award Offered
Rhodes College	TICUA	West	Bachelor's degree
Roane State Community College	TBR	East	Associate degree
Sewanee-The University of the South	TICUA	Middle	Bachelor's degree
Southern Adventist University	TICUA	East	Bachelor's degree, Master's degree
Southwest Tennessee Community College	TBR	West	Associate degree
Strayer University-Tennessee	Proprietary	West	Certificate, Associate degree, Bachelor's degree, Master's degree
TCAT Hohenwald	TBR	Middle	Certificate
TCAT Jacksboro	TBR	East	Certificate
TCAT Shelbyville	TBR	Middle	Certificate
Tennessee State University	LGI	Middle	Bachelor's degree, Master's degree
Tennessee Technological University	LGI	Middle	Bachelor's degree, Master's degree
Tennessee Wesleyan University	TICUA	East	Bachelor's degree
The University of Tennessee-Chattanooga	UT	East	Bachelor's degree, Master's degree
The University of Tennessee-Knoxville	UT	East	Bachelor's degree, Master's degree
The University of Tennessee-Martin	UT	West	Bachelor's degree
Trevecca Nazarene University	TICUA	Middle	Certificate, Associate degree, Bachelor's degree, Master's degree
Union University	TICUA	West	Bachelor's degree
University of Memphis	LGI	West	Certificate, Bachelor's degree, Master's degree
University of Phoenix-Tennessee	Proprietary	Middle	Bachelor's degree
Vanderbilt University	TICUA	Middle	Bachelor's degree, Master's degree
Volunteer State Community College	TBR	Middle	Associate degree
Walters State Community College	TBR	East	Associate degree

Elementary Teachers

Any education program that leads to grade K-6 licensure is included in the Elementary Education career area, and there is high demand for elementary teachers in the state (except special education teachers). A bachelor's degree or higher is required for a career in this field.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Aquinas College	TICUA	Middle	Bachelor's degree, Master's degree
Belmont University	TICUA	Middle	Bachelor's degree, Master's degree
Bethel University	TICUA	West	Bachelor's degree
Bryan College-Dayton	TICUA	East	Bachelor's degree
Carson-Newman University	TICUA	East	Bachelor's degree, Master's degree
Christian Brothers University	TICUA	West	Master's degree
Cumberland University	TICUA	Middle	Bachelor's degree
East Tennessee State University	LGI	East	Master's degree
Freed-Hardeman University	TICUA	West	Bachelor's degree, Master's degree

Institution Name	System	Grand Division	Award Offered
Johnson University	TICUA	East	Certificate, Bachelor's degree, Master's degree
Lee University	TICUA	East	Bachelor's degree, Master's degree
Lincoln Memorial University	TICUA	East	Bachelor's degree
Lipscomb University	TICUA	Middle	Bachelor's degree
Martin Methodist College	TICUA	Middle	Bachelor's degree
Northeast State Community College	TBR	East	Associate degree
South College	Proprietary	East	Certificate, Bachelor's degree, Master's degree
Southern Adventist University	TICUA	East	Bachelor's degree
Tennessee State University	LGI	Middle	Master's degree
Tennessee Wesleyan University	TICUA	East	Bachelor's degree
The University of Tennessee-Chattanooga	UT	East	Master's degree
Trevecca Nazarene University	TICUA	Middle	Bachelor's degree, Master's degree
Union University	TICUA	West	Bachelor's degree
Vanderbilt University	TICUA	Middle	Bachelor's degree, Master's degree
Welch College	TICUA	Middle	Bachelor's degree

Technical Design & Preconstruction

Careers in this area include construction managers, cost estimators, and civil engineering technicians. Typical education requirements for these careers include an associate or bachelor's degree.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Middle Tennessee State University	LGI	Middle	Bachelor's degree
Southern Adventist University	TICUA	East	Bachelor's degree
Southwest Tennessee Community College	TBR	West	Certificate, Associate degree
Vatterott College-Dividend	Proprietary	West	Associate degree

Construction: Electrical

Careers in this area include electricians, electrical power-line installers and repairers, security and fire alarm installers, and telecommunication line installers. Typical education requirements for these careers include long-term on-the-job training or postsecondary vocational training.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Brightwood College-Nashville	Proprietary	Middle	Certificate
Miller-Motte Technical College-Madison	Proprietary	Middle	Certificate, Associate degree
Nashville State Community College	TBR	Middle	Certificate

Institution Name	System	Grand Division	Award Offered
Northeast State Community College	TBR	East	Certificate
Southwest Tennessee Community College	TBR	West	Certificate
TCAT Athens	TBR	East	Certificate
TCAT Jackson	TBR	West	Certificate
TCAT Knoxville	TBR	East	Certificate
TCAT McMinnville	TBR	Middle	Certificate
TCAT Morristown	TBR	East	Certificate
TCAT Oneida-Huntsville	TBR	East	Certificate
TCAT Ripley	TBR	West	Certificate

Fire Fighting

Careers in this area include fire fighters, fire inspectors, and fire investigators. Typical education requirements for these careers include on-the-job training or work experience in a related occupation.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Credential Offered
Chattanooga State Community College	TBR	East	Associate degree
Volunteer State Community College	TBR	Middle	Certificate, Associate degree
Southwest Tennessee Community College	TBR	West	Associate degree
The University of Tennessee-Knoxville	UT	East	Certificate

Industrial Engineering

Careers in this area require a minimum of a bachelor's degree in engineering. Several public and private institutions in the state offer degrees in general engineering, but only one institution offers a degree specifically in industrial engineering:

Institution Name	System	Grand Division	Award Offered
The University of Tennessee-Knoxville	UT	East	Bachelor's degree, Master's degree



Medical and Clinical Laboratory Technicians

Medical and clinical laboratory technicians perform general laboratory work. Careers in this category require an associate degree, and specialized training is available at several institutions across the state.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
Concorde Career College-Memphis	Proprietary	West	Associate degree
Fortis Institute-Cookeville	Proprietary	Middle	Associate degree
Fortis Institute-Nashville	Proprietary	Middle	Associate degree
Jackson State Community College	TBR	West	Associate degree
Southwest Tennessee Community College	TBR	West	Associate degree
TCAT Murfreesboro	TBR	Middle	Certificate
Volunteer State Community College	TBR	Middle	Associate degree

Construction: Masonry & Concrete

Careers in this area include cement masons, brickmasons, and tile and marble setters. Typical education requirements for these careers include moderate-term or long-term on-the-job training.

A program leading to careers in this field is available at the following institution:

Institution Name	System	Grand Division	Award Offered
TCAT Memphis	TBR	West	Certificate

Compliance Officers

Careers in this area include compliance officers, financial examiners, and transportation inspectors. Typical education requirements for these careers include long-term on-the-job training or a bachelor's degree.

Though the state does not have any programs specifically designed to train compliance officers, many bachelor's and master's degree programs (e.g., finance, accounting, healthcare management) would qualify individuals to work in this field.



Adult and Continuing Education

Careers in this area include self-enrichment education teachers and adult basic education teachers. Typical education requirements for these careers include a bachelor's degree or work experience in a related field.

Programs leading to careers in this area are available at the following institutions:

Institution Name	System	Grand Division	Award Offered
University of Memphis	LGI	West	Certificate
Welch College	TICUA	Middle	Bachelor's degree

Pre-K – Early Childhood Education

Preschool and Kindergarten teachers are included in the Pre-K/Early Childhood Education area. A bachelor's degree is typically required for a career in this field.

Programs leading to careers in this field are available at the following institutions:

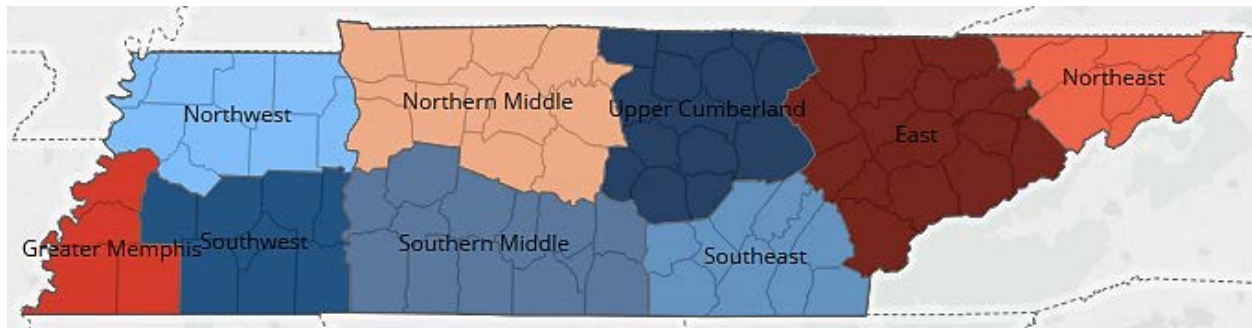
Institution Name	System	Grand Division	Award Offered
Carson-Newman University	TICUA	East	Bachelor's degree, Master's degree
Christian Brothers University	TICUA	West	Bachelor's degree, Master's degree
East Tennessee State University	LGI	East	Certificate, Master's degree
Freed-Hardeman University	TICUA	West	Bachelor's degree, Master's degree
Johnson University	TICUA	East	Bachelor's degree, Master's degree
Le Moyne-Owen College	TICUA	West	Bachelor's degree
Lee University	TICUA	East	Bachelor's degree
Middle Tennessee State University	LGI	Middle	Bachelor's degree
Southern Adventist University	TICUA	East	Associate degree
Tennessee State University	LGI	Middle	Bachelor's degree
Tennessee Technological University	LGI	Middle	Bachelor's degree
Tennessee Wesleyan University	TICUA	East	Bachelor's degree
The University of Tennessee-Chattanooga	UT	East	Bachelor's degree
Trevecca Nazarene University	TICUA	Middle	Bachelor's degree
Vanderbilt University	TICUA	Middle	Bachelor's degree
Welch College	TICUA	Middle	Associate degree, Bachelor's degree



Regional Workforce Needs

TNECD's Center for Economic Research in Tennessee (CERT) recently conducted an occupational analysis to determine workforce needs across the state's nine TNECD regions (shown in **Figure 7**).⁹ This analysis identified 255 occupations with high employer demand based on hires, job openings, and job postings relative to total employment in the region. The methodology is detailed in the following section, and **Appendix D** lists all 255 occupations with high employer demand in one or more Tennessee regions.¹⁰

Figure 7: Map of TNECD regions



Source: TNECD, LEAP Report Dashboard

Methodology

To identify occupations with high employer demand relative to average or low employer demand, CERT analyzed postings, hires, and openings for an occupation relative to total employment in the occupation. Based on 2016 data, occupations which meet at least two of the following three requirements are considered to have high employer demand:

1. The ratio of job postings (2016) to employment for an occupation is greater than or equal to the median ratio for all jobs in the region;
2. The ratio of hires (2016) to employment for an occupation is greater than or equal to the median ratio for all jobs in the region; and
3. The ratio of job openings (2011-2016) to employment for an occupation is greater than or equal to the median ratio for all jobs in the region.

To encourage job creation and skill development in high-quality jobs, CERT set a minimum wage threshold for jobs included in the analysis. All occupations identified have a median wage that is at least the median wage for the region. Occupations employing less than 0.04 percent of the region's total employment are excluded.

⁹ The full version of CERT's 2017 LEAP Report is available at <http://www.tnecd.com/research-and-data/publications/>

¹⁰ With the 2017 LEAP Report, CERT also released an interactive dashboard, available at <https://www.tn.gov/transparenttn/jobs-economic-development/openecd/tnecd-performance-metrics/workforce/leap-report.html>

Occupation Groups with High Employer Demand

CERT's 2017 LEAP Report highlights six occupation groups with high employer demand across the state:

1. Production
2. Information Technology
3. Healthcare
4. Engineering and Engineering-Related
5. Business and Financial Operations
6. Transportation and Material Moving

Though the definition of “high-demand” differs, these occupation groups are aligned with the high-demand programs of study identified by TDLWD. **Table 4** crosswalks CERT’s six high-demand occupation groups to TDLWD’s career clusters and high-demand programs of study. Additional information about CERT’s high-demand occupation groups, including regional demand for specific occupations, is available in CERT’s full report.

Table 4: Crosswalk of CERT occupation groups to TDLWD programs of study

CERT High-Demand Occupation Group	TDLWD Career Cluster	TDLWD High-Demand Program of Study
Production	Manufacturing	Precision Production Pathway
		Production Operations & Maintenance
Information Technology	Information Technology	Network Systems
		Web/Multimedia Management, Programming
Healthcare	Health	Medical and Clinical Laboratory Technicians
Engineering and Engineering-Related	Science, Technology, Engineering, and Mathematics	Industrial Engineering
Business and Financial Operations	Business Management and Administration	Administrative and Information Support
		Business Analysis
	Human Resources	
	Finance	Banking and Finance
Transportation and Material Moving	Transportation, Distribution, and Logistics	Truck, Bus, Rail, Water Transportation and Heavy Equipment

Additionally, the report identifies Science, Technology, Engineering, and Mathematics (STEM) occupations as a substantial area of growth in the coming decade. In fact, 39 of the 255 high-demand occupations (15.3 percent) listed in **Appendix D** are STEM or STEM-related occupations. Growth among STEM occupations is expected to outpace growth among all other occupations from 2016 to 2026; STEM occupations are expected to increase by 19.4 percent, while all other occupations are expected to increase by 12 percent.¹¹ Most of the STEM or STEM-related occupations identified as high-demand by both TNECD and TDLWD are in the Information Technology, Engineering, and Healthcare fields.

¹¹ CERT, 2017 LEAP Report

Limitations and Conclusions

Limitations

Supply and demand analyses are useful for educators, employers, and policymakers at all levels. However, two underlying limitations exist:

Supply and demand analyses rely on historical data and assumptions about future economic conditions, as well as industry expansion or contraction. For this reason, projections are sometimes incorrect for various occupational fields, particularly emerging fields with limited historical data and those fields with high supply-to-demand ratios (oversupplied fields).

Also, the relationship between supply and demand is most direct at the sub-baccalaureate level (certificates and associate degrees) and with specialized programs at the doctoral and professional level. For example, someone with a certificate in automotive repair or a medical specialization in Cardiology is much more likely than someone holding a bachelor's degree in English to hold a job that is specific to their field of study. As such, it is more straightforward to link individuals with specialized awards to specific employment areas. This is not true for those holding more versatile bachelor's and master's degrees, as graduates with these degrees are employable in a number of fields.

Conclusions

Projections of the supply of postsecondary awards to be produced indicate that associate and bachelor's degrees will increase through academic year (AY) 2025, while certificates will decrease slightly. The growth in associate degrees is particularly noteworthy, with a projected increase of 22.1 percent between AY 2016 and AY 2025. Given the recent implementation of Tennessee Promise, THEC is paying close attention to trends in award production at the state's community college and TCATs. THEC will update and refine these award projections as the implementation of the 2015-2025 *Master Plan for Tennessee Postsecondary Education* continues.

Administrative and Information Support, Production, Selling and Sales Management, and Restaurants and Food Services are programs of study in great demand—there are more employment opportunities in these areas than there are skilled workers to fill them. Careers in these fields require all levels of postsecondary credentials, ranging from certificates earned in less than one year to bachelor's or master's degrees. Alternatively, awards leading to jobs in Cosmetology, Engineering Technology, Journalism, and Recreation and Attractions are oversupplied, as the number of trained Tennesseans far exceeds the number of jobs available.

In 2017, Tennessee has experienced unprecedented economic growth. Current employment in the private sector has increased to 2,593,100, an increase of 17.8 percent since the beginning of Governor Haslam's administration.¹² After five consecutive months of historically low unemployment rates, the state's unemployment rate in November 2017 was 3.1 percent, two percentage points lower than it was a

¹² CERT, 2017 LEAP Report

year ago and one percentage point below the national average of 4.1 percent.¹³ To ensure the continued economic health of the state, the alignment of academic supply with occupational demand is of the utmost importance. With a strong and stable workforce pipeline, Tennessee will remain economically competitive and position itself for future statewide success.

¹³ Press Release, "Haslam Announces November Tennessee Unemployment Rate Two Percentage Points Lower than 2016": <https://www.tn.gov/governor/news/2017/12/21/haslam-announces-november-tennessee-unemployment-rate-two-percentage-points-lower-than-2016.html>

Appendix A: Award Production Tables

All tables in this section include historical data from academic year (AY) 2006 through AY 2016 and projections of award production from AY 2017 through AY 2025. (The thick horizontal line between AY 2016 and AY 2017 indicates where historical data end and projections begin.) **Table A-1** provides the projections of total awards, disaggregated by award level. **Table A-2** provides data for certificates only, **Table A-3** contains data for associate degrees only, and **Table A-4** contains data for bachelor's degrees only. **Table A-5** provides the projections of total awards, disaggregated by sector.

Table A-1: Total awards by award level

AY	Certificates	Associate Degree	Bachelor's Degree	Total
2006	24,750	8,391	26,381	59,522
2007	25,361	8,263	27,053	60,677
2008	25,294	8,062	27,725	61,081
2009	21,407	8,306	29,684	59,397
2010	23,932	8,902	30,227	63,061
2011	24,773	10,799	31,411	66,983
2012	24,476	12,023	32,902	69,401
2013	22,481	11,577	34,312	68,370
2014	22,687	11,897	33,830	68,414
2015	21,905	12,526	34,662	69,093
2016	22,637	13,117	35,389	71,143
2017	22,703	13,834	36,676	73,213
2018	22,741	14,071	37,034	73,846
2019	22,763	14,236	37,288	74,286
2020	22,873	14,147	36,987	74,006
2021	22,917	14,241	37,090	74,249
2022	22,889	14,432	37,456	74,777
2023	22,678	14,968	38,658	76,304
2024	22,466	15,551	39,944	77,961
2025	22,298	16,022	40,979	79,299

Source: THEC, 2017



Table A-2: Certificates by sector

AY	TCATs	Community Colleges	Private Institutions	Proprietary Institutions
2006	4,653	1,087	63	18,947
2007	5,385	979	50	18,947
2008	5,284	1,007	56	18,947
2009	5,217	1,012	62	15,116
2010	6,469	1,401	58	16,004
2011	7,483	1,613	66	15,611
2012	6,596	2,785	50	15,045
2013	6,395	2,173	77	13,836
2014	6,428	2,130	75	14,054
2015	6,468	2,614	71	12,752
2016	6,816	3,104	75	12,642
2017	7,481	3,172	74	11,977
2018	7,614	3,265	74	11,787
2019	7,706	3,331	74	11,651
2020	7,674	3,272	74	11,853
2021	7,731	3,303	74	11,808
2022	7,830	3,390	75	11,594
2023	8,090	3,659	75	10,855
2024	8,375	3,948	75	10,068
2025	8,605	4,182	75	9,436

Source: THEC, 2017



Table A-3: Associate degrees by sector

AY	Community Colleges	Public Universities	Private Institutions	Proprietary Institutions
2006	5,092	153	667	2,479
2007	5,088	160	536	2,479
2008	4,890	186	507	2,479
2009	4,917	175	453	2,761
2010	5,402	170	489	2,841
2011	6,103	232	534	3,930
2012	6,912	261	570	4,280
2013	7,333	323	646	3,275
2014	8,071	320	666	2,840
2015	8,836	367	611	2,712
2016	9,945	373	659	2,140
2017	9,451	383	650	3,350
2018	9,614	390	653	3,414
2019	9,732	396	655	3,454
2020	9,543	384	670	3,550
2021	9,578	385	675	3,604
2022	9,769	395	670	3,599
2023	10,438	433	639	3,458
2024	11,150	473	607	3,321
2025	11,722	506	582	3,213

Source: THEC, 2017



Table A-4: Bachelor's degrees by sector

AY	Public Universities	Private Institutions	Proprietary Institutions
2006	16,444	9,352	585
2007	16,700	9,768	585
2008	17,108	10,032	585
2009	18,144	10,128	1,412
2010	18,000	10,475	1,752
2011	18,832	10,767	1,812
2012	19,636	11,136	2,130
2013	20,498	11,686	2,128
2014	20,470	11,906	1,454
2015	20,507	12,157	1,998
2016	21,207	12,589	1,593
2017	21,645	12,658	2,372
2018	21,824	12,770	2,440
2019	21,950	12,851	2,486
2020	21,781	12,701	2,506
2021	21,827	12,719	2,543
2022	22,019	12,860	2,577
2023	22,664	13,370	2,623
2024	23,353	13,911	2,680
2025	23,908	14,345	2,726

Source: THEC, 2017



Table A-5: Total awards by sector

AY	TCATs	Community Colleges	Public Universities	Private Institutions	Proprietary Institutions
2006	4,653	6,179	16,597	10,082	22,011
2007	5,385	6,067	16,860	10,354	22,011
2008	5,284	5,897	17,294	10,595	22,011
2009	5,217	5,929	18,319	10,643	19,289
2010	6,469	6,803	18,170	11,022	20,597
2011	7,483	7,716	19,064	11,367	21,353
2012	6,596	9,697	19,897	11,756	21,455
2013	6,395	9,506	20,821	12,409	19,239
2014	6,428	10,201	20,790	12,647	18,348
2015	6,468	11,450	20,874	12,839	17,462
2016	6,816	13,049	21,580	13,323	16,375
2017	7,481	12,623	22,028	13,382	17,699
2018	7,614	12,879	22,214	13,497	17,641
2019	7,706	13,063	22,346	13,580	17,591
2020	7,674	12,815	22,165	13,445	17,909
2021	7,731	12,881	22,212	13,468	17,955
2022	7,830	13,159	22,414	13,605	17,770
2023	8,090	14,097	23,097	14,084	16,936
2024	8,375	15,098	23,826	14,593	16,069
2025	8,605	15,904	24,414	15,002	15,375

Source: THEC, 2017



Appendix B: Supply and Demand Reports for the 25 Highest-Demand Fields in Tennessee’s Workforce, Prepared by the Tennessee Department of Labor and Workforce Development¹⁴

¹⁴ Appendix B contains information on the average annual openings expected for occupations in high demand and the number of program completers in 2016 that may be qualified to fill those openings. This year’s report also contains information on the number of completers of registered apprenticeship programs in the state, as well as those who completed programs not currently authorized by THEC. If there are additional completers, this information appears on the bottom of each supply and demand report. This additional information should enhance understanding of the supply and demand relationships within these programs of study.

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area: Tennessee Statewide
 Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8
 Base Year: 2016
 Projected Year: 2018
 Cluster Code: 04.6000000
 Cluster Title: Administrative and Information Support

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
232091	Court Reporters	90	90	5	0.0	\$59,100.00	Post-secondary vocational training
319094	Medical Transcriptionists	1,520	1,530	35	0.3	\$32,550.00	Post-secondary vocational training
431011	First-Line Supervisors of Office and Administrative Support Workers	34,290	35,780	1,280	2.1	\$49,300.00	Work experience in a related occupation
434051	Customer Service Representatives	60,810	64,060	3,040	2.6	\$29,570.00	Moderate-term on-the-job training
435011	Cargo and Freight Agents	1,130	1,170	50	1.8	\$37,770.00	Moderate-term on-the-job training
435032	Dispatchers, Except Police, Fire, and Ambulance	4,630	4,780	195	1.6	\$37,440.00	Moderate-term on-the-job training
436011	Executive Secretaries and Executive Administrative Assistants	12,740	12,950	240	0.8	\$45,300.00	Moderate-term on-the-job training
436012	Legal Secretaries	2,580	2,600	35	0.4	\$37,990.00	Post-secondary vocational training
436013	Medical Secretaries	8,310	8,560	210	1.5	\$29,500.00	Post-secondary vocational training
436014	Secretaries and Administrative Assistants, Except Bookkeepers	59,570	61,270	1,485	1.4	\$30,420.00	Moderate-term on-the-job training
439011	Computer Operators	2,310	2,320	20	0.2	\$40,240.00	Moderate-term on-the-job training
439021	Data Entry Keyers	5,150	5,290	140	1.4	\$27,770.00	Moderate-term on-the-job training
439022	Word Processors and Typists	400	410	5	1.2	\$33,410.00	Moderate-term on-the-job training
Totals:		193,530	200,810	6,740	1.9		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
110301	Data Processing and Data Processing Technology/Technician.		5			
510705	Medical Office Management/Administration.		76			
510708	Medical Transcription/Transcriptionist.	7				
510710	Medical Office Assistant/Specialist.	199	13			
510713	Medical Insurance Coding Specialist/Coder.	236	31			
510716	Medical Administrative/Executive Assistant and Medical Secretaries	4	6			
510799	Health and Medical Administrative Services, Other.				12	
512211	Health Services Administration.					7
520204	Office Management and Supervision.			28		318
520401	Administrative Assistant and Secretarial Science, General.	91	120			208
520402	Executive Assistant/Executive Secretary.	312	7			
520407	Business/Office Automation/Technology/Data Entry.	103	48			
520499	Business Operations Support and Secretarial Services, Other.	121				
Totals:		1,073	306	28	12	533

TOTAL SUPPLY: 1,952
TOTAL DEMAND: 6,740
SUPPLY/DEMAND RATIO: .29

Area
Tennessee
Statewide
Cluster Code
13.100000

Projection Time (Years) = 2
Average Occupational Growth Rate = 1.8

Base Year: 2016
Projected Year
Employment: 2018

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Title
Precision Production Pathway

DEMAND DATA		Estimated	Projected	Average Annual	Average	Annual	Annual Median Salary	Usual Education Requirements
SOC CODE(S)	SOC TITLES(S)	Employment	Employment	Openings	Growth (%)	Annual		
499069	Precision Instrument and Equipment Repairers, All	220	230	10	2.2	\$51,350.00		Long-term on-the-job training
511011	First-Line Supervisors of Production and Operating	15,730	16,190	480	1.5	\$52,450.00		Work experience in a related occupation
512041	Structural Metal Fabricators and Fitters	2,270	2,300	55	0.7	\$30,830.00		Moderate-term on-the-job training
512091	Fiberglass Laminators and Fabricators	560	570	20	0.9	\$32,760.00		Moderate-term on-the-job training
512092	Team Assemblers	66,340	68,900	2,705	1.9	\$30,180.00		Moderate-term on-the-job training
513021	Butchers and Meat Cutters	2,880	2,920	70	0.7	\$28,760.00		Long-term on-the-job training
514011	Computer-Controlled Machine Tool Operators, Metal	2,130	2,250	115	2.8	\$34,970.00		Long-term on-the-job training
514012	Computer Numerically Controlled Machine Tool Progr	490	510	25	2.0	\$48,030.00		Long-term on-the-job training
514021	Extruding and Drawing Machine Setters, Operators,	1,890	1,890	45	0.0	\$32,960.00		Moderate-term on-the-job training
514022	Forging Machine Setters, Operators, and Tenders, M	660	660	15	0.0	\$52,900.00		Moderate-term on-the-job training
514023	Rolling Machine Setters, Operators, and Tenders, M	830	820	20	-0.6	\$39,180.00		Moderate-term on-the-job training
514032	Drilling and Boring Machine Tool Setters, Operator	260	260	5	0.0	\$30,900.00		Moderate-term on-the-job training
514033	Grinding, Lapping, Polishing, and Buffing Machine	1,830	1,770	75	-1.7	\$32,150.00		Moderate-term on-the-job training
514034	Lathe and Turning Machine Tool Setters, Operators,	940	940	25	0.0	\$35,040.00		Moderate-term on-the-job training
514035	Milling and Planing Machine Setters, Operators, an	440	440	10	0.0	\$36,280.00		Moderate-term on-the-job training
514041	Machinists	8,500	8,850	420	2.0	\$39,700.00		Long-term on-the-job training
514051	Metal-Refining Furnace Operators and Tenders	620	650	35	2.4	\$42,440.00		Moderate-term on-the-job training
*****	*****	720	730	20	0.7	\$30,350.00		Moderate-term on-the-job training
*****	*****	20	30		22.5	\$47,590.00		Moderate-term on-the-job training
514081	Multiple Machine Tool Setters, Operators, and Tend	1,980	2,040	65	1.5	\$31,030.00		Moderate-term on-the-job training
514111	Tool and Die Makers	2,820	2,880	40	1.1	\$45,870.00		Long-term on-the-job training
514191	Heat Treating Equipment Setters, Operators, and Te	480	480	10	0.0	\$33,980.00		Moderate-term on-the-job training
514192	Layout Workers, Metal and Plastic	240	240	5	0.0	\$40,590.00		Moderate-term on-the-job training
514194	Tool Grinders, Filers, and Sharpeners	200	200	5	0.0	\$31,830.00		Moderate-term on-the-job training
514199	Metal Workers and Plastic Workers, All Other	240	240	5	0.0	\$27,840.00		Moderate-term on-the-job training
516061	Textile Bleaching and Dyeing Machine Operators and	140	140	5	0.0	\$27,710.00		Moderate-term on-the-job training
*****	*****	110	110		0.0	\$19,420.00		Long-term on-the-job training
516093	Upholsterers	1,480	1,530	60	1.7	\$26,700.00		Long-term on-the-job training
517011	Cabinetmakers and Bench Carpenters	1,570	1,560	15	-0.3	\$29,730.00		Long-term on-the-job training
517021	Furniture Finishers	180	180	5	0.0	\$28,330.00		Long-term on-the-job training
517041	Sawing Machine Setters, Operators, and Tenders, Wo	1,610	1,660	70	1.5	\$26,130.00		Moderate-term on-the-job training
517042	Woodworking Machine Setters, Operators, and Tender	1,800	1,810	40	0.3	\$24,790.00		Moderate-term on-the-job training
517099	Woodworkers, All Other	1,100	1,120	35	0.9	\$23,950.00		Moderate-term on-the-job training
518012	Power Distributors and Dispatchers	150	160	10	3.3	\$64,210.00		Long-term on-the-job training
518013	Power Plant Operators	640	640	25	0.0	\$81,840.00		Long-term on-the-job training
518021	Stationary Engineers and Boiler Operators	650	660	20	0.8	\$55,840.00		Long-term on-the-job training
519022	Grinding and Polishing Workers, Hand	490	510	20	2.0	\$25,610.00		Moderate-term on-the-job training
519071	Jewelers and Precious Stone and Metal Workers	370	370	5	0.0	\$38,870.00		Post-secondary vocational training
*****	*****	1,920	1,980	80	1.6	\$32,090.00		Long-term on-the-job training
519083	Ophthalmic Laboratory Technicians	760	770	25	0.7	\$29,220.00		Moderate-term on-the-job training
519122	Painters, Transportation Equipment	820	850	30	1.8	\$37,410.00		Moderate-term on-the-job training
519194	Etchers and Engravers	120	120	5	0.0	\$32,510.00		Long-term on-the-job training
519195	Molders, Shapers, and Casters, Except Metal and Pl	1,690	1,720	75	0.9	\$29,730.00		Moderate-term on-the-job training
*****	*****	10	10		0.0	\$26,030.00		Short-term on-the-job training
518011	Nuclear Power Reactor Operators	350	340	15	-1.4	\$84,360.00		Long-term on-the-job training
Totals:		129,250	133,230	4,820	1.5			

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
CIP CODE(S)	CIP TITLE(S)					
480501	Machine Tool Technology/Machinist.	137	87			
480503	Machine Shop Technology/Assistant.	54	89			299
480507	Tool and Die Technology/Technician.	17				
480510	Computer Numerically Controlled (CNC) Machinist Technology/CNC N	15				
480511	Metal Fabricator.	15				
Totals:		238	176			299
TOTAL SUPPLY:		713				
TOTAL DEMAND:		4,820				
SUPPLY/DEMAND RATIO:		.15				

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year
Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code	Cluster Title
14.2000000	Selling and Sales Management

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
112022	Sales Managers	10,000	10,430	435	2.1	\$88,270.00	Work experience, plus bachelor's degree
132021	Appraisers and Assessors of Real Estate	1,120	1,190	55	3.1	\$48,940.00	Post-secondary vocational training
271023	Floral Designers	1,260	1,250	30	-0.4	\$25,080.00	Moderate-term on-the-job training
271026	Merchandise Displayers and Window Trimmers	2,420	2,480	85	1.2	\$27,270.00	Moderate-term on-the-job training
411011	First-Line Supervisors of Retail Sales Workers	36,500	37,400	1,280	1.2	\$36,760.00	Work experience in a related occupation
411012	First-Line Supervisors of Non-Retail Sales Workers	7,910	8,180	225	1.7	\$68,740.00	Work experience in a related occupation
413011	Advertising Sales Agents	2,690	2,800	130	2.0	\$39,310.00	Moderate-term on-the-job training
413099	Sales Representatives, Services, All Other	15,080	15,880	720	2.6	\$41,680.00	No category defined
414011	Sales Representatives, Wholesale and Manufacturing	8,720	9,130	380	2.3	\$66,410.00	Moderate-term on-the-job training
414012	Sales Representatives, Wholesale and Manufacturing	22,330	22,990	775	1.5	\$52,930.00	Moderate-term on-the-job training
*****	*****	10	10		0.0	\$18,740.00	Moderate-term on-the-job training
419021	Real Estate Brokers	1,100	1,160	35	2.7	\$51,520.00	Work experience in a related occupation
419022	Real Estate Sales Agents	3,280	3,510	140	3.4	\$30,820.00	Post-secondary vocational training
419031	Sales Engineers	900	940	40	2.2	\$75,470.00	Bachelor's degree
Totals:		113,320	117,350	4,330	1.8		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
520208	E-Commerce/Electronic Commerce.				3	
520799	Entrepreneurial and Small Business Operations, Other.					348
521801	Sales, Distribution, and Marketing Operations, General.			1		56
521804	Selling Skills and Sales Operations.	5				
Totals:		5		1	3	404

TOTAL SUPPLY:	413
TOTAL DEMAND:	4,330
SUPPLY/DEMAND RATIO:	.10

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area
 Tennessee
 Statewide

Projection Time (Years) = 2

Base Year: 2016
 Projected Year
 Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Code

Cluster Title

09.1000000

Restaurants and Food and Beverage Services Pathway

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
119051	Food Service Managers	16,800	17,910	870	3.3	\$39,600.00	Work experience in a related occupation
351011	Chefs and Head Cooks	3,520	3,750	165	3.2	\$28,720.00	Post-secondary vocational training
351012	First-Line Supervisors of Food Preparation and Ser	16,680	17,830	1,110	3.4	\$27,580.00	Work experience in a related occupation
352012	Cooks, Institution and Cafeteria	10,480	10,600	345	0.6	\$21,890.00	Long-term on-the-job training
352014	Cooks, Restaurant	23,710	25,810	1,690	4.3	\$22,530.00	Long-term on-the-job training
513011	Bakers	2,830	2,930	105	1.8	\$23,160.00	Long-term on-the-job training
Totals:		74,020	78,830	4,285	3.2		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
120500	Cooking and Related Culinary Arts, General.	14				
120501	Baking and Pastry Arts/Baker/Pastry Chef.	13	15			
120503	Culinary Arts/Chef Training.	81	53			857
120504	Restaurant, Culinary, and Catering Management/Manager.			21		24
120505	Food Preparation/Professional Cooking/Kitchen Assistant.					317
120599	Culinary Arts and Related Services, Other.	159				
190505	Foodservice Systems Administration/Management.	2		2		
Totals:		269	68	23		1,198

TOTAL SUPPLY: 1,558
TOTAL DEMAND: 4,285
SUPPLY/DEMAND RATIO: .36

Area
Tennessee
Statewide

Projection Time (Years) = 2
Average Occupational Growth Rate = 1.8

Base Year: 2016
Projected Year
Employment: 2018

Cluster Grade = A
The outlook for this cluster is Excellent.
The GROWTH rate is above the average for all occupations across the state.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code 13.2200000
Cluster Title Prod. Design, Ops, and Maint. Path -- Operations & Maint.

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
SOC CODE(S)	SOC TITLES(S)						
131023	Purchasing Agents, exc. Wholesale, Retail & Farm.	3,620	3,720	145	1.4	\$51,440.00	Bachelor's degree
472011	Boilermakers	290	290	5	0.0	\$67,260.00	Long-term on-the-job training
474021	Elevator Installers and Repairers	90	100	5	5.4	\$64,360.00	Long-term on-the-job training
491011	First-Line Supervisors of Mechanics, Installers, a	10,680	11,120	430	2.0	\$59,260.00	Work experience in a related occupation
499011	Mechanical Door Repairers	620	700	60	6.3	\$34,340.00	Moderate-term on-the-job training
499031	Home Appliance Repairers	930	970	45	2.1	\$30,570.00	Long-term on-the-job training
499041	Industrial Machinery Mechanics	7,980	8,520	460	3.3	\$46,460.00	Long-term on-the-job training
499043	Maintenance Workers, Machinery	3,810	3,950	145	1.8	\$45,480.00	Long-term on-the-job training
499044	Millwrights	1,100	1,140	45	1.8	\$46,190.00	Long-term on-the-job training
*****	*****	20	20		0.0	\$44,590.00	Moderate-term on-the-job training
499062	Medical Equipment Repairers	1,280	1,340	50	2.3	\$43,150.00	Moderate-term on-the-job training
499063	Musical Instrument Repairers and Tuners	220	230	5	2.2	\$31,760.00	Long-term on-the-job training
499071	Maintenance and Repair Workers, General	31,930	33,200	1,400	2.0	\$36,460.00	Post-secondary vocational training
499091	Coin, Vending, and Amusement Machine Servicers and	1,010	1,040	30	1.5	\$31,450.00	Moderate-term on-the-job training
499094	Locksmiths and Safe Repairers	340	340	15	0.0	\$29,640.00	Moderate-term on-the-job training
516063	Textile Knitting and Weaving Machine Setters, Oper	700	680	10	-1.4	\$31,850.00	Long-term on-the-job training
516064	Textile Winding, Twisting, and Drawing Out Machine	360	370	10	1.4	\$21,070.00	Moderate-term on-the-job training
516091	Extruding and Forming Machine Setters, Operators,	740	740	10	0.0	\$41,780.00	Moderate-term on-the-job training
518091	Chemical Plant and System Operators	1,210	1,230	50	0.8	\$48,020.00	Long-term on-the-job training
519011	Chemical Equipment Operators and Tenders	1,560	1,580	50	0.6	\$53,940.00	Moderate-term on-the-job training
519061	Inspectors, Testers, Sorters, Samplers, and Weighe	13,200	13,620	540	1.6	\$32,800.00	Moderate-term on-the-job training
*****	*****	170	180	5	2.9	\$44,670.00	Post-secondary vocational training
Totals:		81,860	85,080	3,515	1.9		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
CIP CODE(S)	CIP TITLE(S)					
150403	Electromechanical Technology/Electromechanical Engineering T	166	14			
150499	Electromechanical and Instrumentation and Maintenance Techno	42				63
410303	Chemical Process Technology.	26				
470000	Mechanics and Repairers, General.	9				
470303	Industrial Mechanics and Maintenance Technology.	460	30			
479999	Mechanic and Repair Technologies/Technicians, Other.	6				
520205	Operations Management and Supervision.	77			28	
Totals:		786	44		28	63
TOTAL SUPPLY:		921				
TOTAL DEMAND:		3,515				
SUPPLY/DEMAND RATIO:		.26				

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year
Employment: 2018

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Average Occupational Growth Rate = 1.8

Cluster Code
16.130000

Cluster Title
Truck, Bus, Rail, Water Transportation, and Heavy Equipment

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
474061	Rail-Track Laying and Maintenance Equipment Operat	250	250	10	0.0	\$38,200.00	Moderate-term on-the-job training
*****	*****	4,710	4,860	220	1.6	\$53,190.00	Work experience in a related occupation
533011	Ambulance Drivers and Attendants, Except Emergency	190	190	5	0.0	\$22,150.00	Moderate-term on-the-job training
533021	Bus Drivers, Transit and Intercity	2,890	2,960	70	1.2	\$36,080.00	Moderate-term on-the-job training
533032	Heavy and Tractor-Trailer Truck Drivers	59,100	60,670	1,720	1.3	\$39,430.00	Moderate-term on-the-job training
534021	Railroad Brake, Signal, and Switch Operators	500	500	20	0.0	\$51,280.00	Work experience in a related occupation
*****	*****	30	30		0.0	\$44,430.00	Moderate-term on-the-job training
535021	Captains, Mates, and Pilots of Water Vessels	990	1,000	35	0.5	\$38,270.00	Moderate-term on-the-job training
*****	*****	20	20		0.0	\$36,520.00	Moderate-term on-the-job training
*****	*****	340	350	10	1.5	\$71,400.00	Post-secondary vocational training
537121	Tank Car, Truck, and Ship Loaders	110	100	5	-4.7	\$42,060.00	Moderate-term on-the-job training
534011	Locomotive Engineers	670	670	30	0.0	\$56,250.00	Moderate-term on-the-job training
534031	Railroad Conductors and Yardmasters	590	590	20	0.0	\$55,050.00	Work experience in a related occupation
Totals:		70,390	72,190	2,145	1.3		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
490205	Truck and Bus Driver/Commercial Vehicle Operation.	532				
Totals:		532				
TOTAL SUPPLY:		532				
TOTAL DEMAND:		2,145				
SUPPLY/DEMAND RATIO:		.25				

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area
 Tennessee
 Statewide

Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8

Base Year: 2016
 Projected Year
 Employment: 2018

Cluster Code
06.3110000

Cluster Title
Banking and Finance

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
113031	Financial Managers	14,890	15,620	685	2.4	\$90,290.00	Work experience, plus bachelor's degree
131031	Claims Adjusters, Examiners, and Investigators	4,250	4,440	190	2.2	\$62,540.00	Long-term on-the-job training
131032	Insurance Appraisers, Auto Damage	160	160	10	0.0	\$61,540.00	Long-term on-the-job training
131131	Fundraisers	880	910	25	1.7	\$46,290.00	No category defined
131161	Market Research Analysts & Marketing Specialists	3,415	3,625	140	3.0	\$54,280.00	Bachelor's degree
132041	Credit Analysts	1,270	1,330	85	2.3	\$60,460.00	Bachelor's degree
132051	Financial Analysts	3,660	3,860	165	2.7	\$67,490.00	Bachelor's degree
132053	Insurance Underwriters	1,080	1,090	20	0.5	\$70,570.00	Bachelor's degree
132071	Credit Counselors	520	570	30	4.7	\$36,490.00	Bachelor's degree
132072	Loan Officers	6,720	6,870	190	1.1	\$58,590.00	Bachelor's degree
132099	Financial Specialists, All Other	1,590	1,630	30	1.3	\$59,250.00	Bachelor's degree
193011	Economists	90	90	90	0.0	\$80,860.00	Bachelor's degree
*****	*****	40	50	5	11.8	\$28,430.00	Bachelor's degree
251011	Business Teachers, Postsecondary	2,030	2,120	80	2.2	\$60,360.00	Doctor's degree
251063	Economics Teachers, Postsecondary	450	470	15	2.2	\$81,750.00	Doctor's degree
413021	Insurance Sales Agents	10,400	11,250	690	4.0	\$42,830.00	Bachelor's degree
Totals:		51,445	54,085	2,360	2.5		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
010103	Agricultural Economics.				10	
450601	Economics, General.			492	23	
450602	Applied Economics.				2	
450604	Development Economics and International Development.				38	
450605	International Economics.			8		
450699	Economics, Other.			9		
520601	Business/Managerial Economics.			132	10	
520803	Banking and Financial Support Services.		2			
520899	Finance and Financial Management Services, Other.				2	
Totals:			2	641	85	

TOTAL SUPPLY: 728
TOTAL DEMAND: 2,360
SUPPLY/DEMAND RATIO: .31

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area: Tennessee Statewide
 Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8
 Cluster Code: 04.400000
 Cluster Title: Business Analysis

Base Year: 2016
 Projected Year: 2018

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
SOC CODE(S)	SOC TITLES(S)						
131111	Management Analysts	9,220	9,920	455	3.7	\$74,720.00	Work experience, plus bachelor's degree
131199	Business Operations Specialists, All Other	11,880	12,320	345	1.8	\$56,610.00	No category defined
132031	Budget Analysts	490	500	20	1.0	\$62,340.00	Bachelor's degree
152031	Operations Research Analysts	1,860	2,070	135	5.5	\$64,200.00	Master's degree
Totals:		23,450	24,810	955	2.9		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
CIP CODE(S)	CIP TITLE(S)					
521302	Business Statistics.			67	40	
Totals:				67	40	

TOTAL SUPPLY: 107
TOTAL DEMAND: 955
SUPPLY/DEMAND RATIO: .11

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area: Tennessee Statewide
 Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8
 Base Year: 2016
 Projected Year: 2018
 Cluster Code: 04.300000
 Cluster Title: Human Resources

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
SOC CODE(S)	SOC TITLES(S)						
131071	Human Resources, Training, and Labor Relations Spe	8,940	9,290	380	1.9	\$49,930.00	Bachelor's degree
131075	Labor Relations Specialists	940	940	25	0.0	\$63,750.00	No category defined
131141	Compensation, Benefits & Job Analysis Specialists	1,740	1,900	120	4.5	\$56,860.00	Bachelor's degree
131151	Training and Development Specialists	5,160	5,410	245	2.4	\$52,650.00	Bachelor's degree
Totals:		16,780	17,540	770	2.2		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
CIP CODE(S)	CIP TITLE(S)					
422804	Industrial and Organizational Psychology.				12	
521003	Organizational Behavior Studies.				49	
Totals:					61	

TOTAL SUPPLY: 61
TOTAL DEMAND: 770
SUPPLY/DEMAND RATIO: .08

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year
Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Grade = A
The outlook for this cluster is Excellent.
The GROWTH rate is above the average for all occupations across the state.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code	Cluster Title
02.270000	All Other Construction

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
471011	Supervisors of Construction and Extraction Workers	10,990	11,450	325	2.1	\$54,160.00	Work experience in a related occupation
*****	*****	410	410	5	0.0	\$30,010.00	Moderate-term on-the-job training
472042	Floor Layers, Except Carpet, Wood, and Hard Tiles	210	220	5	2.4	\$41,160.00	Moderate-term on-the-job training
472043	Floor Sanders and Finishers	480	490	15	1.0	\$28,180.00	Moderate-term on-the-job training
*****	*****	10	10		0.0	\$31,040.00	Long-term on-the-job training
472071	Paving, Surfacing, and Tamping Equipment Operators	2,520	2,670	130	2.9	\$34,700.00	Moderate-term on-the-job training
*****	*****	40	40		0.0	\$64,740.00	Moderate-term on-the-job training
472073	Operating Engineers and Other Construction Equipme	5,140	5,430	230	2.8	\$37,390.00	Moderate-term on-the-job training
472081	Drywall and Ceiling Tile Installers	2,050	2,090	35	1.0	\$36,400.00	Moderate-term on-the-job training
472082	Tapers	220	230	5	2.2	\$39,760.00	Moderate-term on-the-job training
472121	Glaziers	930	970	35	2.1	\$33,310.00	Long-term on-the-job training
472131	Insulation Workers, Floor, Ceiling, and Wall	680	700	30	1.5	\$33,030.00	No category defined
472132	Insulation Workers, Mechanical	520	550	30	2.8	\$41,510.00	No category defined
472141	Painters, Construction and Maintenance	5,360	5,500	150	1.3	\$31,370.00	Moderate-term on-the-job training
*****	*****	60	60		0.0	\$26,170.00	Moderate-term on-the-job training
472161	Plasterers and Stucco Masons	320	340	10	3.1	\$35,650.00	Long-term on-the-job training
472171	Reinforcing Iron and Rebar Workers	240	260	10	4.1	\$35,580.00	Long-term on-the-job training
472181	Roofers	2,120	2,240	90	2.8	\$31,920.00	Moderate-term on-the-job training
472211	Sheet Metal Workers	3,890	3,960	110	0.9	\$43,240.00	Moderate-term on-the-job training
472221	Structural Iron and Steel Workers	1,250	1,290	45	1.6	\$40,910.00	Long-term on-the-job training
*****	*****	340	380	30	5.7	\$28,820.00	Moderate-term on-the-job training
474041	Hazardous Materials Removal Workers	660	680	20	1.5	\$49,770.00	Moderate-term on-the-job training
474051	Highway Maintenance Workers	2,600	2,700	115	1.9	\$29,540.00	Moderate-term on-the-job training
474071	Septic Tank Servicicers and Sewer Pipe Cleaners	580	610	30	2.6	\$33,140.00	Moderate-term on-the-job training
474099	Construction and Related Workers, All Other	580	610	25	2.6	\$33,710.00	No category defined
475021	Earth Drillers, Except Oil and Gas	350	370	20	2.8	\$40,340.00	Moderate-term on-the-job training
*****	*****	130	130	5	0.0	\$27,930.00	Moderate-term on-the-job training
537021	Crane and Tower Operators	620	650	35	2.4	\$45,010.00	Moderate-term on-the-job training
537031	Dredge Operators	120	120	5	0.0	\$38,830.00	Moderate-term on-the-job training
537032	Excavating and Loading Machine and Dragline Operat	1,800	1,940	95	3.8	\$35,290.00	Moderate-term on-the-job training
Totals:		45,220	47,100	1,640	2.1		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
460415	Building Construction Technology.	20	21			716
469999	Construction Trades, Other.	19	12			132
Totals:		39	33			848

TOTAL SUPPLY:	920
TOTAL DEMAND:	1,640
SUPPLY/DEMAND RATIO:	.56

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area: Tennessee Statewide
 Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8
 Base Year: 2016
 Projected Year: 2018
 Cluster Code: 01.2200000
 Cluster Title: Plant Systems Pathway - Horticulture Production

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
SOC CODE(S)	SOC TITLES(S)						
119013	Farmers, Ranchers & Other Ag. Managers	5,006	5,207	185	2.0	\$50,360.00	No category defined
*****	*****	430	450	15	2.3	\$42,790.00	Bachelor's degree
371012	First-Line Supervisors of Landscaping, Lawn Servic	1,905	1,975	63	1.8	\$38,860.00	Work experience in a related occupation
373011	Landscaping and Groundskeeping Workers	10,265	10,670	383	2.0	\$25,090.00	Short-term on-the-job training
373012	Pesticide Handlers, Sprayers, and Applicators, Veg	295	305	10	1.7	\$30,640.00	Moderate-term on-the-job training
373013	Tree Trimmers and Pruners	665	695	25	2.2	\$34,750.00	Short-term on-the-job training
452092	Farmworkers and Laborers, Crop, Nursery, and Green	3,785	3,915	170	1.7	\$21,160.00	Short-term on-the-job training
Totals:		22,351	23,217	850	1.9		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
CIP CODE(S)	CIP TITLE(S)					
010601	Applied Horticulture/Horticulture Operations, General.	1				
010603	Ornamental Horticulture.		7			
010801	Agricultural and Extension Education Services.			20	8	
011101	Plant Sciences, General.			49	9	
011103	Horticultural Science.					668
011105	Plant Protection and Integrated Pest Management.				8	
011202	Soil Chemistry and Physics.			30	4	
Totals:		1	7	99	29	668

TOTAL SUPPLY: 804
TOTAL DEMAND: 850
SUPPLY/DEMAND RATIO: .95

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area
 Tennessee
 Statewide

Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8

Base Year: 2016
 Projected Year Employment: 2018

Cluster Code: 14.3000000
 Cluster Title: Merchandising

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
131022	Wholesale and Retail Buyers, Except Farm Products	4,070	4,240	210	2.1	\$48,120.00	Bachelor's degree
412022	Parts Salespersons	5,560	5,790	225	2.0	\$28,780.00	Moderate-term on-the-job training
419011	Demonstrators and Product Promoters	980	1,060	75	4.0	\$31,210.00	Moderate-term on-the-job training
Totals:		10,610	11,090	510	2.2		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
190203	Consumer Merchandising/Retailing Management.					6
521902	Fashion Merchandising.			17		
Totals:				17		6

TOTAL SUPPLY: 23
TOTAL DEMAND: 510
SUPPLY/DEMAND RATIO: .05

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year: 2018

Average Occupational Growth Rate = 1.8

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code

Cluster Title

12.3000000

Security and Protective Services Pathway

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
151142	Network and Computer Systems Administrators	349	368	13	2.6	\$74,300.00	No category defined
331011	First-Line Supervisors of Correctional Officers	810	840	40	1.8	\$49,800.00	Work experience in a related occupation
333012	Correctional Officers and Jailers	9,340	9,670	420	1.8	\$30,340.00	Moderate-term on-the-job training
339021	Private Detectives and Investigators	790	820	35	1.9	\$44,680.00	Work experience in a related occupation
*****	*****	10	10		0.0	\$35,880.00	Moderate-term on-the-job training
Totals:		11,299	11,708	508	1.8		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
430102	Corrections.					41
430109	Security and Loss Prevention Services.		1			
Totals:			1			41

TOTAL SUPPLY:	42
TOTAL DEMAND:	508
SUPPLY/DEMAND RATIO:	.08

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area
 Tennessee
 Statewide

Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8

Base Year: 2016
 Projected Year
 Employment: 2018

Cluster Code
11.100000

Cluster Title
Network Systems

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
151122	Information Security Analysts, Web Developers, and	1,230	1,320	60	3.6	\$76,250.00	Bachelor's degree
151134	Web Developers	1,910	2,080	105	4.4	\$55,800.00	Bachelor's degree
151142	Network and Computer Systems Administrators	5,471	5,762	207	2.6	\$74,300.00	No category defined
151143	Computer Network Architects	850	905	38	3.2	\$93,490.00	Bachelor's degree
151152	Computer Network Support Specialists	3,000	3,150	110	2.5	\$57,990.00	No category defined
Totals:		12,461	13,217	519	3.0		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
110901	Computer Systems Networking and Telecommunications.	60	42	5		
111001	System Administration/Administrator.		25	2		
111003	Computer and Information Systems Security.	20	4	28		
Totals:		80	71	35		

TOTAL SUPPLY: 186
TOTAL DEMAND: 519
SUPPLY/DEMAND RATIO: .36

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area: Tennessee Statewide
 Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8
 Base Year: 2016
 Projected Year: 2018
 Cluster Code: 11.340000
 Cluster Title: Web/Multimedia Management, Programming

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
SOC CODE(S)	SOC TITLES(S)						
113021	Computer and Information Systems Managers	6,240	6,640	260	3.2	\$101,200.00	Work experience, plus bachelor's degree
151111	Computer and Information Research Scientists	210	230	10	4.7	\$91,520.00	Master's degree
151121	Computer Systems Analysts	7,630	8,150	345	3.4	\$72,780.00	Associate degree
151131	Computer Programmers	4,240	4,420	190	2.1	\$70,050.00	Bachelor's degree
151132	Software Developers, Applications	6,320	6,820	330	3.9	\$82,740.00	Bachelor's degree
151133	Software Developers, Systems Software	3,320	3,610	190	4.3	\$83,130.00	Bachelor's degree
151141	Database Administrators	1,390	1,470	65	2.8	\$81,470.00	Bachelor's degree
151151	Computer Support Specialists	10,290	11,030	480	3.5	\$45,500.00	Associate degree
251021	Computer Science Teachers, Postsecondary	630	650	20	1.6	\$62,350.00	Master's degree
Totals:		40,270	43,020	1,890	3.4		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
CIP CODE(S)	CIP TITLE(S)					
110101	Computer and Information Sciences, General.		194	188	18	
110103	Information Technology.		57	95	58	
110104	Informatics.				10	
110201	Computer Programming/Programmer, General.		12	6		
110401	Information Science/Studies.		3	5	4	
110501	Computer Systems Analysis/Analyst.			8		
110701	Computer Science.			381	94	
110802	Data Modeling/Warehousing and Database Administration.			3	6	
111004	Web/Multimedia Management and Webmaster.	76		1		
111005	Information Technology Project Management.			10		
111006	Computer Support Specialist.		3			
111099	Computer/Information Technology Services Administration andM			32	2	
119999	Computer and Information Sciences and Support Services, Othe		2	4	8	
140903	Computer Software Engineering.				6	
151202	Computer Technology/Computer Systems Technology.		18			
512706	Medical Informatics.		13	4		
521201	Management Information Systems, General.		2	180	4	
521206	Information Resources Management/CIO Training.				3	
Totals:		76	304	917	213	

TOTAL SUPPLY: 1,510
TOTAL DEMAND: 1,890
SUPPLY/DEMAND RATIO: .80

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year
Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code
05.1170000

Cluster Title
Elementary Teachers, Except Special Education

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
252021	Elementary School Teachers, Except Special Educati	25,950	26,200	700	0.5	\$48,750.00	Bachelor's degree
Totals:		25,950	26,200	700	0.5		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
131202	Elementary Education and Teaching.			244	96	
Totals:				244	96	

TOTAL SUPPLY:	340
TOTAL DEMAND:	700
SUPPLY/DEMAND RATIO:	.49

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year
Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code
02.1220000

Cluster Title
Technical Design & Preconstruction

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
119021	Construction Managers	8,100	8,320	230	1.3	\$74,010.00	Bachelor's degree
131051	Cost Estimators	2,160	2,257	108	2.2	\$56,460.00	Bachelor's degree
173022	Civil Engineering Technicians	830	810	20	-1.2	\$30,660.00	Associate degree
Totals:		11,090	11,387	358	1.3		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
150101	Architectural Engineering Technology/Technician.	23	4			
460499	Building/Construction Finishing, Management, and Inspection,		37			
522001	Construction Management.			21		
Totals:		23	41	21		

TOTAL SUPPLY: 85
TOTAL DEMAND: 358
SUPPLY/DEMAND RATIO: .24

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area: Tennessee Statewide
 Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8
 Base Year: 2016
 Projected Year: 2018
 Cluster Code: 02.210000
 Cluster Title: Construction Pathway - Construction Electrical

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
472111	Electricians	11,620	12,130	430	2.2	\$45,400.00	Long-term on-the-job training
473013	Helpers--Electricians	2,630	2,760	110	2.4	\$29,090.00	Short-term on-the-job training
492095	Electrical and Electronics Repairers, Powerhouse, Security and Fire Alarm Systems Installers	640	640	10	0.0	\$76,490.00	Post-secondary vocational training
492098	Security and Fire Alarm Systems Installers	1,640	1,720	75	2.4	\$43,740.00	Post-secondary vocational training
499012	Control and Valve Installers and Repairers, Except	800	820	40	1.2	\$44,150.00	Moderate-term on-the-job training
499051	Electrical Power-Line Installers and Repairers	3,720	3,900	230	2.4	\$69,620.00	Long-term on-the-job training
499052	Telecommunications Line Installers and Repairers	1,610	1,670	60	1.8	\$41,460.00	Long-term on-the-job training
Totals:		22,660	23,640	955	2.1		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
460302	Electrician.	182	8			109
460303	Lineworker.	12				
Totals:		194	8			109

TOTAL SUPPLY: 311
TOTAL DEMAND: 955
SUPPLY/DEMAND RATIO: .33

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area
 Tennessee
 Statewide

Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8

Base Year: 2016
 Projected Year Employment: 2018

Cluster Code
12.4140000

Cluster Title
Fire Fighting

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
331021	First-Line Supervisors of Fire Fighting and Preven	1,920	2,000	120	2.1	\$53,530.00	Work experience in a related occupation
332011	Firefighters	5,600	5,840	275	2.1	\$38,940.00	Long-term on-the-job training
332021	Fire Inspectors and Investigators	260	270	10	1.9	\$57,290.00	Post-secondary vocational training
332022	Forest Fire Inspectors and Prevention Specialists	10	10		0.0	\$37,640.00	Bachelor's degree
Totals:		7,790	8,120	405	2.1		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
430202	Fire Services Administration.					6
430203	Fire Science/Fire-fighting.	16	23			
430299	Fire Protection, Other.			12		
Totals:		16	23	12		6

TOTAL SUPPLY: 57
TOTAL DEMAND: 405
SUPPLY/DEMAND RATIO: .14

Area
Tennessee
Statewide

Projection Time (Years) = 2
Average Occupational Growth Rate = 1.8

Base Year: 2016
Projected Year
Employment: 2018

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code
15.1160000

Cluster Title
Industrial Engineering

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
172112	Industrial Engineers	8,130	8,390	360	1.6	\$76,810.00	Bachelor's degree
Totals:		8,130	8,390	360	1.6		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
143501	Industrial Engineering.			28	33	
Totals:				28	33	

TOTAL SUPPLY: 61
TOTAL DEMAND: 360
SUPPLY/DEMAND RATIO: .17

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year
Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code
08.2220000

Cluster Title
Medical and Clinical Laboratory Technicians

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
292012	Medical and Clinical Laboratory Technicians	7,140	7,400	300	1.8	\$36,210.00	Associate degree
Totals:		7,140	7,400	300	1.8		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
511004	Clinical/Medical Laboratory Technician.		63			
511099	Clinical/Medical Laboratory Science and Allied Professions,	7				
Totals:		7	63			

TOTAL SUPPLY:	70
TOTAL DEMAND:	300
SUPPLY/DEMAND RATIO:	.23

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area: Tennessee Statewide
 Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8
 Base Year: 2016
 Projected Year: 2018
 Cluster Code: 02.2200000
 Cluster Title: Construction Pathway - Construction Masonry & Concrete

DEMAND DATA		Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
472021	Brickmasons and Blockmasons	1,550	1,640	60	2.9	\$43,970.00	Long-term on-the-job training
472022	Stonemasons	150	160	5	3.3	\$37,460.00	Long-term on-the-job training
472044	Tile and Marble Setters	610	640	25	2.4	\$35,360.00	Long-term on-the-job training
472051	Cement Masons and Concrete Finishers	2,480	2,660	125	3.6	\$35,300.00	Long-term on-the-job training
473011	Helpers--Brickmasons, Blockmasons, Stonemasons, an	760	810	40	3.2	\$27,930.00	Short-term on-the-job training
499045	Refractory Materials Repairers, Except Brickmasons	70	80		6.9	\$36,220.00	Moderate-term on-the-job training
Totals:		5,620	5,990	255	3.2		

SUPPLY DATA		No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
460101	Mason/Masonry.	12				17
460402	Concrete Finishing/Concrete Finisher.					5
Totals:		12				22
TOTAL SUPPLY:		34				
TOTAL DEMAND:		255				
SUPPLY/DEMAND RATIO:		.13				

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area
 Tennessee
 Statewide

Projection Time (Years) = 2
 Average Occupational Growth Rate = 1.8

Base Year: 2016
 Projected Year
 Employment: 2018

Cluster Code
07.7120000
 Cluster Title
Compliance Officers

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
131041	Compliance Officers	5,100	5,330	180	2.2	\$54,030.00	Long-term on-the-job training
132061	Financial Examiners	530	520	10	-0.9	\$74,060.00	Bachelor's degree
536051	Transportation Inspectors	300	310	10	1.7	\$71,020.00	Work experience in a related occupation
Totals:		5,930	6,160	200	1.9		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
	There is no supply data available.					

Totals:

TOTAL SUPPLY:	0
TOTAL DEMAND:	200
SUPPLY/DEMAND RATIO:	.00

Cluster Grade = A
 The outlook for this cluster is Excellent.
 The GROWTH rate is above the average for all occupations across the state.
 There are more job openings expected annually than there were training completers in a recent year.

Area
 Tennessee
 Statewide

Projection Time (Years) = 2

Base Year: 2016
 Projected Year
 Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Code
 05.1140000

Cluster Title
 Support Services- Adult and Continuing Education

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
253011	Adult Basic and Secondary Education and Literacy T	800	820	20	1.2	\$45,770.00	Bachelor's degree
253021	Self-Enrichment Education Teachers	3,920	4,120	170	2.5	\$28,470.00	Work experience in a related occupation
Totals:		4,720	4,940	190	2.3		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
131502	Adult Literacy Tutor/Instructor.			1		
Totals:				1		

TOTAL SUPPLY: 1
TOTAL DEMAND: 190
SUPPLY/DEMAND RATIO: .01

Area
Tennessee
Statewide

Projection Time (Years) = 2

Base Year: 2016
Projected Year
Employment: 2018

Average Occupational Growth Rate = 1.8

Cluster Grade = B
The outlook for this cluster is Very Good.
The growth rate is positive but not above the average for all occupations.
There are more job openings expected annually than there were training completers in a recent year.

Cluster Code

Cluster Title

05.2110000

Teacher Training Services- Pre-K-Early Childhood Education

DEMAND DATA

SOC CODE(S)	SOC TITLES(S)	Estimated Employment	Projected Employment	Average Annual Openings	Average Annual Growth (%)	Annual Median Salary	Usual Education Requirements
252011	Preschool Teachers, Except Special Education	9,100	9,230	335	0.7	\$24,770.00	Bachelor's degree
252012	Kindergarten Teachers, Except Special Education	2,780	2,800	95	0.4	\$47,870.00	Bachelor's degree
Totals:		11,880	12,030	430	0.6		

SUPPLY DATA

CIP CODE(S)	CIP TITLE(S)	No of Certs	No of Assoc	No of Bach	No of Grads	No of SecCom
131210	Early Childhood Education and Teaching.			220	25	
Totals:				220	25	

TOTAL SUPPLY:	245
TOTAL DEMAND:	430
SUPPLY/DEMAND RATIO:	.57

Appendix C: Institutions Included in Completion Data

The number of completers provided by TDLWD includes students who completed a program at 107 public, private, and proprietary institutions across the state. **Table C-1** provides the full list of institutions represented in the completion data.

Table C-1: List of institutions included in TDLWD's completion data

Aquinas College	Sewanee-The University of the South
Argosy University-Nashville	South College
Austin Peay State University	Southern Adventist University
Belmont University	Southwest Tennessee Community College
Bethel University	Strayer University-Tennessee
Brightwood College-Nashville	TCAT Athens
Bryan College-Dayton	TCAT Covington
Carson-Newman University	TCAT Crossville
Chattanooga College Medical Dental and Technical Careers	TCAT Crump
Chattanooga State Community College	TCAT Dickson
Christian Brothers University	TCAT Elizabethton
Cleveland State Community College	TCAT Harriman
Columbia State Community College	TCAT Hartsville
Concorde Career College-Memphis	TCAT Hohenwald
Cumberland University	TCAT Jacksboro
Daymar College-Clarksville	TCAT Jackson
Daymar College-Murfreesboro	TCAT Knoxville
Daymar College-Nashville	TCAT Livingston
DeVry University-Tennessee	TCAT McKenzie
Dyersburg State Community College	TCAT McMinnville
East Tennessee State University	TCAT Memphis
Fisk University	TCAT Morristown
Fortis Institute-Cookeville	TCAT Murfreesboro
Fortis Institute-Nashville	TCAT Nashville
Fountainhead College of Technology	TCAT Newbern
Freed-Hardeman University	TCAT Oneida-Huntsville
Genesis Career College-Cookeville	TCAT Paris
Jackson State Community College	TCAT Pulaski
Johnson University	TCAT Ripley
King University	TCAT Shelbyville
Lane College	TCAT Whiteville
Le Moyne-Owen College	Tennessee State University

L'Ecole Culinaire-Memphis	Tennessee Technological University
Lee University	Tennessee Wesleyan University
Lincoln Memorial University	The Art Institute of Tennessee-Nashville
Lipscomb University	The University of Tennessee-Chattanooga
Martin Methodist College	The University of Tennessee-Health Science Center
Maryville College	The University of Tennessee-Knoxville
Middle Tennessee State University	The University of Tennessee-Martin
Miller-Motte Technical College-Chattanooga	Trevecca Nazarene University
Miller-Motte Technical College-Clarksville	Union University
Miller-Motte Technical College-Madison	University of Memphis
Milligan College	University of Phoenix-Tennessee
Motlow State Community College	Vanderbilt University
Nashville College of Medical Careers	Vatterott College-Applying Farms
Nashville State Community College	Vatterott College-Dividend
National College-Nashville	Virginia College-Chattanooga
Northeast State Community College	Virginia College-Knoxville
O'More College of Design	Volunteer State Community College
Pellissippi State Community College	Walters State Community College
Remington College-Memphis Campus	Welch College
Remington College-Nashville Campus	West Tennessee Business College
Rhodes College	William Moore College of Technology
Roane State Community College	



Appendix D. Occupations with High Employer Demand by Region

Table D-1 lists all 255 occupations identified by TNECD as having high employer demand in one or more Tennessee regions. In the table, an “X” indicates high demand for an occupation an individual region of Tennessee. STEM and STEM-related occupations are denoted by [blue text](#).

Table D-1: Occupations with high employer demand by region

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
Management (11-0000)											
11-1021	General and Operations Managers	X	X	X	X	X	X	X	X	X	9
11-2022	Sales Managers	X	X	X	X		X	X		X	7
11-2031	Public Relations and Fundraising Managers				X						1
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
11-9021	Construction Managers	X	X	X	X	X	X	X	X	X	9
11-9041	Architectural and Engineering Managers					X					1
11-9051	Food Service Managers	X	X	X	X	X	X	X	X	X	9
11-9081	Lodging Managers	X							X		2
11-9141	Property, Real Estate, and Community Association Managers	X	X	X	X			X		X	6
11-9151	Social and Community Service Managers	X	X	X	X	X	X	X	X		8
Business and Financial Operations (13-0000)											
13-1022	Wholesale and Retail Buyers, Except Farm Products		X		X						2
13-1051	Cost Estimators		X	X	X				X		4
13-1071	Human Resources Specialists	X	X	X	X	X	X	X	X	X	9
13-1111	Management Analysts					X	X	X			3
13-1121	Meeting, Convention, and Event Planners	X			X	X					3
13-1151	Training and Development Specialists	X	X	X	X	X	X	X		X	8
13-1161	Market Research Analysts and Marketing Specialists	X	X	X	X	X	X	X		X	8
13-1199	Business Operations Specialists, All Other						X				1

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
13-2082	Tax Preparers				X	X		X	X		4
Computer and Mathematical (15-0000)											
15-1121	Computer Systems Analysts				X	X	X				3
15-1122	Information Security Analysts				X	X			X		3
15-1131	Computer Programmers	X			X	X	X	X	X	X	7
15-1132	Software Developers, Applications	X	X		X	X	X	X	X	X	8
15-1133	Software Developers, Systems Software							X			1
15-1134	Web Developers	X			X	X			X		4
15-1141	Database Administrators				X						1
15-1142	Network and Computer Systems Administrators	X	X	X	X	X	X	X	X	X	9
15-1143	Computer Network Architects				X	X			X		3
15-1151	Computer User Support Specialists	X	X	X	X	X	X	X	X	X	9
15-1152	Computer Network Support Specialists			X							1
15-1199	Computer Occupations, All Other			X				X		X	3
Architecture and Engineering (17-0000)											
17-2051	Civil Engineers	X				X		X	X		4
17-2071	Electrical Engineers					X					1
17-2081	Environmental Engineers					X					1
17-2141	Mechanical Engineers					X				X	2
17-2199	Engineers, All Other		X			X	X				3
17-3013	Mechanical Drafters	X			X		X				3
17-3023	Electrical and Electronics Engineering Technicians					X					1
17-3026	Industrial Engineering Technicians									X	1
17-3027	Mechanical Engineering Technicians									X	1
17-3029	Engineering Technicians, Except Drafters, All Other			X							1
Life, Physical, and Social Science (19-0000)											
19-2031	Chemists					X					1
19-2041	Environmental Scientists and Specialists, Including Health	X									1
19-4021	Biological Technicians					X					1
19-4031	Chemical Technicians					X					1
19-4091	Environmental Science and Protection Technicians, Including Health	X									1
19-4099	Life, Physical, and Social Science				X				X		2

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
	Technicians, All Other										
Community and Social Service (21-0000)											
21-1011	Substance Abuse and Behavioral Disorder Counselors			X			X		X		3
21-1014	Mental Health Counselors			X	X		X	X	X	X	6
21-1021	Child, Family, and School Social Workers	X	X	X	X			X		X	6
21-1022	Healthcare Social Workers		X			X	X				3
21-1023	Mental Health and Substance Abuse Social Workers			X			X	X		X	4
21-1091	Health Educators					X					1
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	X	X			4
Education, Training, and Library (25-0000)											
25-1099	Postsecondary Teachers			X							1
25-2011	Preschool Teachers, Except Special Education	X						X		X	3
25-3021	Self-Enrichment Education Teachers	X			X			X		X	4
25-3099	Teachers and Instructors, All Other	X		X	X	X	X	X	X		7
Arts, Design, Entertainment, Sports, and Media (27-0000)											
27-1023	Floral Designers	X	X	X							3
27-1024	Graphic Designers	X	X		X	X	X	X			6
27-1025	Interior Designers				X						1
27-1026	Merchandise Displayers and Window Trimmers	X			X	X		X	X	X	6
27-2012	Producers and Directors	X			X						2
27-2022	Coaches and Scouts	X	X		X	X	X	X	X		7
27-3031	Public Relations Specialists	X	X		X	X		X	X	X	7
27-3041	Editors			X					X		2
27-4011	Audio and Video Equipment Technicians				X						1
27-4021	Photographers	X							X		2
Healthcare Practitioners and Technical (29-0000)											
29-1051	Pharmacists						X	X			2
29-1122	Occupational Therapists			X		X					2
29-1123	Physical Therapists			X		X					2
29-1131	Veterinarians	X	X	X		X			X	X	6
29-2052	Pharmacy Technicians		X				X	X			3

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
29-2056	Veterinary Technologists and Technicians	X	X		X				X		4
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			2
29-2081	Opticians, Dispensing	X			X		X	X			4
Healthcare Support (31-0000)											
31-1014	Nursing Assistants	X				X				X	3
31-2011	Occupational Therapy Assistants		X							X	2
31-2021	Physical Therapist Assistants	X	X	X	X	X	X	X	X	X	9
31-9011	Massage Therapists				X						1
31-9091	Dental Assistants				X						1
31-9092	Medical Assistants			X	X	X					3
31-9093	Medical Equipment Preparers							X			1
31-9094	Medical Transcriptionists			X							1
31-9096	Veterinary Assistants and Laboratory Animal Caretakers		X							X	2
31-9097	Phlebotomists		X	X		X	X	X	X	X	7
31-9099	Healthcare Support Workers, All Other				X	X					2
Protective Service (33-0000)											
33-1099	First-Line Supervisors of Protective Service Workers, All Other				X	X					2
33-3012	Correctional Officers and Jailers			X							1
33-9021	Private Detectives and Investigators	X									1
33-9032	Security Guards	X	X	X			X	X		X	6
33-9099	Protective Service Workers, All Other	X		X				X		X	4
Food Preparation and Serving Related (35-0000)											
35-1011	Chefs and Head Cooks	X	X	X	X	X	X	X	X	X	9
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	X	X	X	X	X	X	X	X	X	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		1
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	X	7

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation		X								1
37-3013	Tree Trimmers and Pruners					X					1
37-3019	Grounds Maintenance Workers, All Other				X						1
Personal Care and Service (39-0000)											
39-1021	First-Line Supervisors of Personal Service Workers	X	X	X	X		X	X	X	X	8
39-5012	Hairdressers, Hairstylists, and Cosmetologists					X	X		X	X	4
39-5094	Skincare Specialists	X						X			2
39-9031	Fitness Trainers and Aerobics Instructors	X			X	X	X	X	X	X	7
39-9041	Residential Advisors		X								1
39-9099	Personal Care and Service Workers, All Other									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			2
41-2021	Counter and Rental Clerks	X		X			X		X	X	5
41-2022	Parts Salespersons	X		X		X	X	X	X	X	7
41-2031	Retail Salespersons									X	1
41-3011	Advertising Sales Agents	X		X	X	X	X	X	X	X	8
41-3021	Insurance Sales Agents				X			X	X		3
41-3099	Sales Representatives, Services, All Other	X	X	X	X	X	X	X	X	X	9
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products			X	X					X	3
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products			X							1
41-9011	Demonstrators and Product Promoters			X		X			X		3
41-9022	Real Estate Sales Agents				X			X	X		3
41-9031	Sales Engineers				X						1
41-9041	Telemarketers	X		X	X			X	X	X	6
41-9099	Sales and Related Workers, All Other	X	X	X	X	X	X	X	X	X	9
Office and Administrative Support (43-0000)											
43-1011	First-Line Supervisors of Office and	X		X				X			3

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
	Administrative Support Workers										
43-2011	Switchboard Operators, Including Answering Service	X	X	X	X	X	X		X	X	8
43-3011	Bill and Account Collectors	X		X	X	X	X	X	X	X	8
43-3021	Billing and Posting Clerks				X					X	2
43-3031	Bookkeeping, Accounting, and Auditing Clerks	X		X	X	X			X		5
43-3051	Payroll and Timekeeping Clerks				X	X			X	X	4
43-3071	Tellers	X			X	X	X	X	X		6
43-4041	Credit Authorizers, Checkers, and Clerks							X			1
43-4051	Customer Service Representatives	X	X	X	X	X	X		X	X	8
43-4071	File Clerks			X	X	X		X	X		5
43-4111	Interviewers, Except Eligibility and Loan			X	X	X	X		X	X	6
43-4151	Order Clerks	X	X		X			X	X	X	6
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	X	X	9
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	X			X	X					3
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			X				3
43-5061	Production, Planning, and Expediting Clerks		X	X	X	X	X		X		6
43-5071	Shipping, Receiving, and Traffic Clerks	X	X	X			X		X	X	6
43-5081	Stock Clerks and Order Fillers	X									1
43-6011	Executive Secretaries and Executive Administrative Assistants	X	X	X	X	X	X	X	X		8
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive		X						X		2
43-9021	Data Entry Keyers	X		X	X	X	X	X	X		7
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	X				X					2
43-9061	Office Clerks, General					X					1
43-9071	Office Machine Operators, Except Computer					X		X			2
43-9199	Office and Administrative Support Workers, All Other		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
Farming, Fishing, and Forestry (45-0000)											
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers		X							X	2
45-2041	Graders and Sorters, Agricultural Products		X								1
45-2091	Agricultural Equipment Operators		X				X			X	3
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse		X				X				2
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals		X								1
45-4022	Logging Equipment Operators		X	X			X			X	4
Construction and Extraction (47-0000)											
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers		X	X	X	X	X		X	X	7
47-2021	Brickmasons and Blockmasons			X	X			X	X	X	5
47-2031	Carpenters								X	X	2
47-2051	Cement Masons and Concrete Finishers	X	X	X	X	X	X	X	X	X	9
47-2061	Construction Laborers	X			X	X			X	X	5
47-2071	Paving, Surfacing, and Tamping Equipment Operators	X	X	X	X				X		5
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			X						2
47-2111	Electricians		X	X	X		X	X	X	X	7
47-2131	Insulation Workers, Floor, Ceiling, and Wall	X						X			2
47-2141	Painters, Construction and Maintenance	X	X	X			X	X	X	X	7
47-2151	Pipelayers	X	X	X			X			X	5
47-2152	Plumbers, Pipefitters, and Steamfitters		X	X					X		3
47-2181	Roofers	X		X	X	X		X	X	X	7
47-2221	Structural Iron and Steel Workers			X	X		X		X		4
47-3012	Helpers--Carpenters		X								1
47-3013	Helpers--Electricians	X			X	X	X	X	X	X	7
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters			X	X	X	X	X		X	6
47-3019	Helpers, Construction Trades, All Other		X								1
47-4011	Construction and Building Inspectors					X					1
Installation, Maintenance and Repair (49-0000)											

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	X		X	X			X			4
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers		X					X			2
49-2098	Security and Fire Alarm Systems Installers	X			X	X	X		X		5
49-3011	Aircraft Mechanics and Service Technicians	X			X	X					3
49-3021	Automotive Body and Related Repairers	X			X	X	X				4
49-3023	Automotive Service Technicians and Mechanics	X	X	X	X	X	X	X	X	X	9
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			X				3
49-3042	Mobile Heavy Equipment Mechanics, Except Engines			X			X	X	X	X	5
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics									X	1
49-3093	Tire Repairers and Changers	X	X	X	X		X		X	X	7
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	X	X	X	X	X	X		X	X	8
49-9044	Millwrights		X				X	X			3
49-9051	Electrical Power-Line Installers and Repairers			X	X						2
49-9052	Telecommunications Line Installers and Repairers		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
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers			X						X	2
49-9098	Helpers--Installation, Maintenance, and Repair Workers	X			X	X	X	X	X	X	7
49-9099	Installation, Maintenance, and Repair Workers, All Other							X		X	2
Production (51-0000)											
51-2022	Electrical and Electronic Equipment Assemblers	X		X	X		X	X	X	X	7
51-2023	Electromechanical Equipment Assemblers									X	1
51-2031	Engine and Other Machine Assemblers									X	1
51-2092	Team Assemblers	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
51-2099	Assemblers and Fabricators, All Other	X				X		X	X		4
51-3011	Bakers	X				X					2
51-3021	Butchers and Meat Cutters	X	X	X	X	X	X	X	X	X	9
51-3023	Slaughterers and Meat Packers	X									1
51-3092	Food Batchmakers		X	X	X			X			4
51-3099	Food Processing Workers, All Other			X							1
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	X	X	X					X	X	5
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic									X	1
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic				X	X			X		3
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic		X			X			X	X	4
51-4041	Machinists			X		X	X		X	X	5
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic			X	X				X		3
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic				X				X		2
51-4111	Tool and Die Makers		X		X				X		3
51-4121	Welders, Cutters, Solderers, and Brazers		X	X	X	X	X		X	X	7
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders									X	1
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic			X							1
51-4199	Metal Workers and Plastic Workers, All Other						X			X	2
51-5112	Printing Press Operators		X	X						X	3
51-6031	Sewing Machine Operators									X	1
51-6093	Upholsterers			X			X				2
51-7011	Cabinetmakers and Bench Carpenters	X		X						X	3
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood		X				X		X	X	4
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except		X					X	X	X	4

SOC Code	Occupation	East	Northwest	Southern Middle	Northern Middle	Greater Memphis	Southwest	Northeast	Southeast	Upper Cumberland	Number of Regions
	Sawing										
51-7099	Woodworkers, All Other									X	1
51-8099	Plant and System Operators, All Other		X								1
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers		X	X	X	X			X	X	6
51-9111	Packaging and Filling Machine Operators and Tenders	X	X		X	X	X	X	X	X	8
51-9151	Photographic Process Workers and Processing Machine Operators		X				X				2
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	X									1
51-9198	Helpers--Production Workers	X		X				X	X	X	5
51-9199	Production Workers, All Other	X	X	X	X	X	X	X	X	X	9
Transportation and Material Moving (53-0000)											
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand		X		X		X	X	X	X	6
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	X	X	X	X		X	X	X		7
53-3022	Bus Drivers, School or Special Client				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
53-3041	Taxi Drivers and Chauffeurs		X								1
53-6031	Automotive and Watercraft Service Attendants		X								1
53-7011	Conveyor Operators and Tenders		X				X				2
53-7021	Crane and Tower Operators								X		1
53-7032	Excavating and Loading Machine and Dragline Operators	X	X	X			X	X	X	X	7
53-7051	Industrial Truck and Tractor Operators	X	X	X	X	X	X	X	X	X	9
53-7061	Cleaners of Vehicles and Equipment			X							1
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	X	X	X		X	X	X	X	X	8
53-7063	Machine Feeders and Offbearers						X		X	X	3
53-7064	Packers and Packagers, Hand			X							1
53-7081	Refuse and Recyclable Material Collectors								X	X	2
53-7199	Material Moving Workers, All Other								X		1

