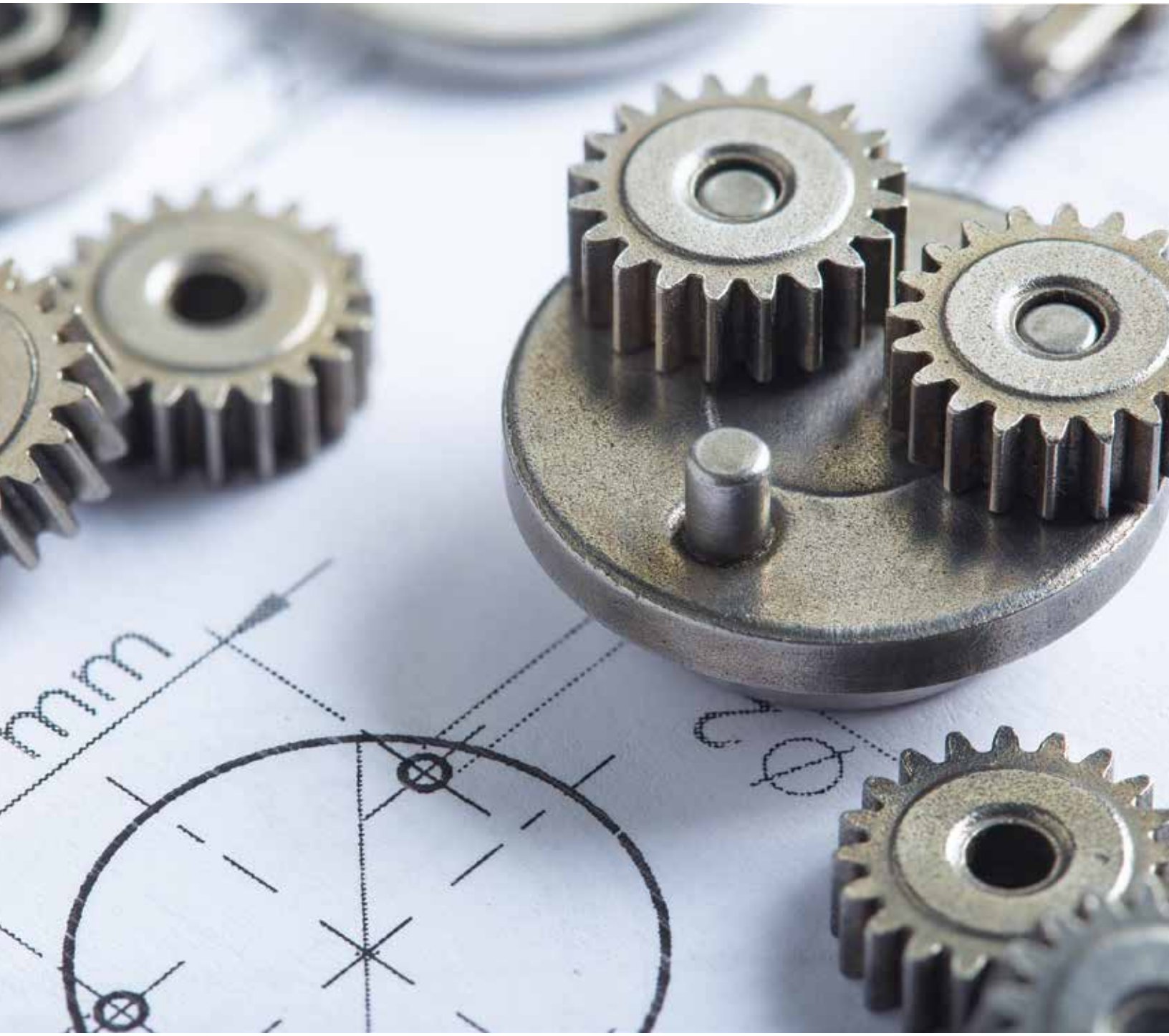
ACADEMIC SUPPLY FOR OCCUPATIONAL DEMAND REPORT



2025

TN Department of Economic & Community Development

TN Department of Education

TN Department of Labor & Workforce Development

THEC TSAC

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Introduction

The *2025 Academic Supply for Occupational Demand Report* is a joint report between the Tennessee Higher Education Commission (THEC), Tennessee Department of Labor and Workforce Development (TDLWD), Tennessee Department of Economic and Community Development (TNECD), and Tennessee Department of Education (TDOE). The Department of Finance and Administration's Office of Evidence and Impact (OEI) supports this project by linking K-12 and postsecondary graduates to employment data in Tennessee's integrated, longitudinal data system, Tennessee Data Analytics for Transparency and Accountability (TN DATA) Secure Data Hub.

This report is prepared pursuant to Tennessee Code Annotated § 49-7-112(b), which directs THEC, in partnership with TDLWD, TNECD, and TDOE, to "produce an annual report regarding state workforce need projections and credential production." While each agency has a distinct mission, all have connected goals in preparing Tennesseans for careers and building the talent pipeline of Tennessee's workforce.

This Report:

- Identifies in-demand occupations and aligned academic programs at the postsecondary and secondary levels and registered apprenticeships organized across 14 career clusters.
- Captures select agency initiatives promoting education and workforce alignment in K-12, higher education, and the workforce.
- Includes information for additional resources to further explore Tennessee's in-demand occupations and aligned academic programs.
- Identifies aligned academic programs whose graduates enjoy high employment and high wages signaling increased labor force need. Programs where Tennessee employment rates are 60% or higher and confer first-year wages exceeding the state median wage ($43,816 in 2023) have been labeled as programs that are meeting unmet needs. There are 77 programs that have been identified for this report using these thresholds developed by TDLWD.
    - These programs include 28 certificate programs, 17 associate degree programs, 7 bachelor's degree programs, and 25 advanced degree programs across 11 of the 14 career clusters. For the full list, see **Appendix A**.
    - There are 17 occupations that do not align with academic programs that meet the criteria developed by TDLWD, but are in-demand in all nine of Tennessee's local workforce development areas (LWDAs). See **Appendix B** for the list of these occupations.

The Tennessee Department of Education's (TDOE) mission is *to set all students on a path to success*. As part of this vision, TDOE seeks to increase the number of students on-track to meet their postsecondary goals. 56.4% of the class of 2024 were Ready Graduates, which are the share of graduating students who demonstrate readiness for postsecondary education and/or a career after high school. There are several criteria to be a Ready Graduate, including a qualifying ACT score, and participation in early postsecondary opportunities (EPSOs), among other criteria. Tennessee high school students earned 64,100 industry credentials in the 2023-24 school year, which is a Ready Graduate indicator. The State Board of Education's (SBOE) Master Plan outlines the goal to **increase the share of Ready Graduates by 4 percentage points annually**.

The mission of the Tennessee Higher Education Commission (THEC) and Tennessee Student Assistance Corporation (TSAC) is *to build a strong higher education landscape that provides opportunities for all individuals to pursue high-quality education and high-value credentials.* **The goal is to have 55% of Tennesseans earn a postsecondary credential by 2025**, which is informed by estimates of workforce need. To meet this goal, THEC/TSAC promotes college access, offers financial aid programs, approves academic programs offered by public colleges, funds colleges through an outcomes-based funding model, and guides local workforce alignment efforts through the Governor's Investment in Vocational Education Act (GIVE).

The mission of the Tennessee Department of Labor and Workforce Development (TDLWD) is to *work as a team to promote workforce and economic development and improve workplace safety and health throughout Tennessee*. TDLWD oversees several functions to promote training and employment for individuals to increase family-sustaining wages, meet employer demand, and enhance productivity and competitiveness in Tennessee. This is done through a high-quality workforce development system, aligning workforce investment, education, and economic development. TDLWD seeks **to increase the Labor Force Participation rate to 65% by 2027**. As of December 2024, Tennessee's Labor Force Participation rate was 59.4%.

The Tennessee Department of Economic and Community Development's (TNECD) mission is to *generate economic growth by fostering job creation and community development.* As part of this mission, TNECD seeks to **increase economic opportunity for all Tennesseans** and support the state's efforts to attract and grow business in the state for job growth and economic vitality. A core goal to their strategic plan is to support companies and education stakeholders in closing workforce gaps.

In-Demand Occupations and Aligned Academic Supply

This section details how the 2025 in-demand occupations across Tennessee and the aligned secondary and postsecondary academic programs are determined. An in-demand occupation is a job that Tennessee employers have a high demand to fill. An occupation is measured as in-demand when two of three measures of demand (job postings, projected job openings, and hires) are above the median relative to other occupations within the region.

Measures for In-Demand Occupational Analysis

An **aligned academic program**[1] is a training program preparing students for careers in an in-demand occupation. The skills and knowledge developed through completion of an aligned academic program are matched with the skills and knowledge required for success in an occupation. These matches are informed by TDOE's career clusters framework which organizes occupations and training programs providing common pathways for prospective students to occupations (and vice versa).[2,3]

The Tennessee Department of Labor and Workforce Development (TDLWD) uses a crosswalk to link 2020 Classification of Instructional Programs (CIP)[4] to the 2018 Standard Occupational

[1] This report includes registered apprenticeships, high school CTE completers, and postsecondary degree completers in data for aligned academic programs. There are other training initiatives, like industry certifications, that are not currently captured.
[2] Tennessee Department of Education's Career Cluster Framework can be found here.
[3] This year's report combines Business, Finance, Government and Support Services into one cluster and Sales and Marketing into one cluster resulting in 14 career clusters.
[4] The Classification of Instructional Programs (CIP) is a taxonomic scheme that supports the accurate tracking and reporting of fields of study and program completions activity.

Classification (SOC)[5,6] via the career cluster. The universe of CIP and SOC codes are linked to a career cluster, which TDLWD uses to identify aligned academic programs associated with in-demand occupations. The career clusters were developed in alignment with the 16 TDOE career clusters. They have been updated over the years in consultation with Tennessee educators at the secondary and postsecondary levels and to incorporate code changes in SOC and CIP codes. Tennessee's Department of Finance and Administration's Office of Evidence and Impact (OEI) analyzes the aligned academic programs for public and select private postsecondary completers[7], secondary concentrators[8], and employment outcomes captured in this report.

The in-demand occupations tables highlight occupations in TNECD's target industry clusters.[9] TNECD has nine prioritized clusters for business expansion and recruitment. TNECD configures its incentives to support specific business segments, systematically chosen to align with the state's distinctive economic competencies. This strategic alignment is designed to stimulate job creation and foster investment in industries where Tennessee exhibits a competitive advantage.[10]

TNECD Target Industry Sectors		
Aerospace & Defense	**Automotive**	**Chemicals**
Distribution & Logistics	**Electrical Equipment & Appliances**	**Food & Agriculture**
Healthcare & Life Sciences	**HQ, Finance, & Tech**	**Rubber, Ceramics, & Glass Products**

[5] The Standard Occupational Classification (SOC) is a federal statistical standard used by federal agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data.
[6] More information about BLS and NCES CIP to SOC crosswalk can be found here. This year's report reflects the updated 2020 CIP codes and 2018 SOC codes.
[7] Select Tennessee Independent Colleges and Universities Association (TICUA) institutions report to TN DATA and those completers and their associated job market outcomes are included.
[8] For purposes of this report, high school CTE concentrators reflect a student completing two course credits within a CTE program of study.
[9] More information on each target industry sector is available at https://tnecd.com/.
[10] TNECD, "OpenECD Tax Incentives", Transparent TN

Data Sources and Methodology

This section outlines the data sources and methods for identifying in-demand occupations and aligned academic programs.

In-Demand Occupations

To measure **in-demand occupations**, the Center for Economic Research in Tennessee (CERT) at ECD analyzes postings, openings, and hires for an occupation relative to the total number of individuals employed in the occupation. This analysis is completed at the statewide level and for each of the nine local workforce development areas (LWDAs). Occupations which meet at least two of these three requirements are considered in-demand:

- The ratio of job postings (2023) to the number of individuals employed in an occupation is greater than or equal to the median ratio for all occupations in the region.
- The ratio of hires (2023) to the number of individuals employed in an occupation is greater than or equal to the median ratio for all occupations in the region.
- The ratio of projected annual job openings from 2020 to 2030 to employment for an occupation is greater than or equal to the median ratio for all occupations in the region. For statewide analysis, projected annual job openings cover 2022 to 2032.

To encourage job creation and skill development in high-quality jobs, occupations must meet a minimum wage threshold. All occupations identified as in-demand have a median wage which is at least 80% of the median wage for the region. To ensure the identification of in-demand occupations across diverse regional economies, the methodology employs a minimum employment threshold of .04% of a region's total employment. This parameter is used to evaluate the significance of each occupation within the local labor market, facilitating a nuanced understanding of regional workforce needs, and supporting targeted economic development strategies.

Data Definitions and Sources:

Employment: Employment and wage data for each occupation and region are sourced primarily from the Tennessee Department of Labor and Workforce Development's May 2023 release of the Occupational Employment and Wages Survey (OEWS). OEWS publication standards require redaction for employment figures for some occupations. In cases where OEWS has redacted information, and a 2020 regional or 2022 statewide employment estimate from the TDLWD Long-Term Occupational Projections was available, the 2020 or 2022 employment estimate was used in place of the redaction to fully analyze as many occupations as possible.

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

career websites or online jobs boards. The source for this data is the Tennessee Department of Labor and Workforce Development.[11]

Projected Annual Openings: A projected annual opening for an occupation is the average annual employment change over ten years from the Tennessee Department of Labor and Workforce Development's Long-Term Occupational Projections added to the expected openings due to transfers and exits from the occupation.[12] For LWDA regional analysis, 2020-2030 projections are used; for statewide analysis, the range is 2022-2032.

Hires: A hire is reported by the Census Bureau's Quarterly Workforce Indicators (QWI) dataset when an individual's Social Security number appears on a company's payroll and was not there the quarter before. The QWI program produces a comprehensive tabulation of employment and wage information at the industry-level for workers covered by state unemployment insurance laws. The hires data in this report is sourced from Lightcast, using a combination of proprietary job data, Bureau of Labor Statistics separation rates, and Census Bureau's QWI. This method models occupational hires by matching job growth with turnover rates, transforming industry hires into detailed occupational estimates for regional employment trend analysis.[13]

Aligned Academic Programs

An **aligned academic program**[14] is a training program preparing students for careers in an in-demand occupation. The skills and knowledge developed through completion of an aligned academic program are matched with the skills and knowledge required for success in an occupation informed by the Classification of Instructional Programs (CIP) to Standard Occupation Code (SOC) crosswalk developed in partnership between the Bureau of Labor Statistics and National Center for Education Statistics.[15] The educational programs are aligned with occupational completers in programs of study for the purpose of identifying shortages and surpluses of trained personnel within the workforce system.

This report uses Tennessee's TN DATA statewide longitudinal data system. The Tennessee Department of Finance and Administration's Office of Evidence and Impact (OEI) analyzes postsecondary and high school CTE concentrators alongside unemployment insurance (UI) employment records and wages.

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[11] Advertised Job Data can be found at jobs4tnwfs.tn.gov by following the path: Labor Market Information > Supply and Demand Data > Menu (in the top left-hand corner of the webpage) > Data Trends > Advertised Job Trends.
[12] The Tennessee Department of Labor & Workforce Development's 2022 – 2032 Long-Term Occupational Projections can be found at jobs4tnwfs.tn.gov by following the path: Labor Market Information > Occupation Data > Menu (in the top left-hand corner of the webpage) > Data Trends > Employment and Wage Data > Occupation Data > Occupation Employment and Projections (Long-Term).
[13] Lightcast, Hires Methodology, https://kb.lightcast.io/en/articles/6957581-hires-methodology
[14] This report includes registered apprenticeships, high school CTE Concentrators, and postsecondary degree completers in data for aligned academic programs. There are other training initiatives, like Industry Certifications, that are not currently captured due to data limitations.
[15] More information about BLS and NCES CIP to SOC Crosswalk can be found here.

Student outcome data at the postsecondary level for the 2022-23 academic year include all public colleges: the Tennessee Colleges of Applied Technology (TCATs), TBR community colleges, six locally governed institutions, and four University of TN system colleges.[16] Twenty-two members of the Tennessee Independent Colleges and Universities Association (TICUA) are also included. All degree levels, from less than one- year certificates through doctoral and professional degrees are included and disaggregated by the six-digit CIP code. Cells with less than 10 awards are suppressed.

Student outcome data at the secondary level reflect 2022-2023 high school career and technical education concentrators. For purposes of this report, concentrators reflect a student completing at least two course credits within a CTE program of study or career cluster.[17] Cells with less than 10 awards are suppressed.

Tennessee completers of registered apprenticeships in 2023 are also included. As they are not currently in the TN DATA system, no wage or employment data are available. Registered Apprenticeship programs[18] are those approved by the U.S. Department of Labor or a State Apprenticeship Agency[19] with an employer that has an occupational objective and standards for implementation and completion of the apprenticeship.[20]

OEI matches high school and postsecondary completers to Tennessee's UI data to identify graduates who are working in Tennessee and their wages two quarters after graduation. Graduates must be found employed in Tennessee for two quarters to be included in the share employed in Tennessee and wage outcomes. In cases where a graduate was found in only one quarter, they would be included in the graduates count but dropped for the measures of employed in Tennessee and wages.[21] The sum of two quarters of wages is multiplied by two, then a median is found to estimate an annual wage for completers. This annual wage represents a first-year wage for degree completers. Individuals who remain enrolled in an education program are excluded from these wage figures.

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[16] This includes UT Health Science Center. UT Southern did not yet submit data to the THEC Student Information System for the time period of interest, so it is not part of the TN DATA postsecondary completions.
[17] CTE Concentrators have been defined by the U.S. Department of Education. As part of the Strengthening Career and Technical Education for the 21st Century Act (Perkins V), this definition changed, lessening the required course credit requirements from three to two. More detail about the changes to this definition can be found here.
[18] More information about Registered Apprenticeship Programs can be found here.
[19] More information about the Tennessee Apprenticeship program can be found here.
[20] More information about Registered Apprenticeships in Tennessee can be found here. This analysis is limited to Federal Registered Apprenticeships.
[21] This methodological improvement began with 2023 reporting. As a result, approximately 20% of graduates are not included in employment outcomes because of the more stringent employed in two terms (instead of employed in only one term).

Limitations

While this report illustrates the connection between in-demand occupations and academic supply, it is not an explicit gap analysis.[22] Reporting agencies will continue to evaluate new data sources to enhance the comprehensiveness of Tennessee's supply for in-demand occupations.

- The Bureau of Labor Statistics' Occupational Employment and Wage Statistics (OEWS), which is a semiannual survey collecting data on wage and salary workers in nonfarm establishments, excludes self-employed individuals. The exclusion of self-employed individuals may disproportionately impact select occupational areas which tend to have a high number of self-employed workers.[23]
- Teachers are an occupational area that is under-represented in the data on job postings, which is one of the three indicators used in this report to identify demand.[24] Job postings data for teachers are decentralized at the local school district level. While there is a TN Education Job Board, hosted by the Tennessee Department of Education, this is not a required space to post teacher jobs and is not a comprehensive listing of all teacher vacancies. As a result, teachers are under-represented among the in-demand occupations of this report. This is just one example of an occupation impacted by data limitations on the metrics for demand.
- Currently, academic supply is measured by degree completers, CTE Concentrators, and registered apprenticeships. As noted above, this measure does not include the current workforce. Additionally, this does not include other measures of occupational readiness, like industry certifications.[25] Tennessee does not have a centralized collection of all industry certification test takers or completers. Future reports will seek to improve the comprehensiveness of Tennessee's supply for in-demand occupations.

[22] Several academic programs provide training for specific occupations, and in some cases, a single academic program can provide training for multiple occupations, resulting in many possible training opportunities for occupations. Occupations without any clear connected training remain in in-demand clusters.

[23] Bureau of Labor Statistics, Small-business options: Occupational outlook for self-employed workers (May 2018), https://www.bls.gov/careeroutlook/2018/article/self-employment.htm?view_full

[24] This occupation is used as an example and is not meant to be exhaustive. These occupations illustrate how the methodology and occupational conditions relate to the three metrics for demand, which impact whether occupations are on the in-demand occupation list.

[25] An industry certification is a credential recognized by business and industry at the local, state, or national level. It could be an assessment, an examination or a license that is administered and recognized by an industry third-party or governing board. Industry certificates measure competency in an occupation, and they validate the knowledge base and skills that show mastery in a particular industry or mastery of a particular competency needed in a certain industry.

How to Make the Most of the Report

This year's report manuscript maintains the career cluster structure, grouping occupations and aligned training programs in one place. In-demand occupations and aligned academic programs — including postsecondary degrees, high school career and technical education (CTE) concentrators, and apprenticeships — are organized by career cluster. Accompanying dashboards and data downloads localize this information by local workforce development area and are available for readers who prefer to work with the data directly.

In the following pages, the report will go through the 14 career clusters and give high level overviews of the in-demand occupations and aligned academic programs. For each cluster, the **demand** section will emphasize the economic impact of key industries within that cluster. The **supply** section highlights example programs within each cluster that lead to placement in in-demand occupations. The **unmet needs** section describes the gap between the current workforce and the needs of employers in Tennessee.

For more information on in-demand occupations and aligned academic programs, explore the additional resources that accompany this report:

- Supply & Demand Dashboard – New this year, this dashboard displays the full list of in-demand jobs and the aligned academic programs for each of the 14 career clusters. Each column can be sorted, and filters on the right side of the dashboard allow users to filter data based on select variables. A download button on each page allows users to download the data for each cluster; alternatively, there is also a download available on the first page for all data across all clusters. The in-demand jobs tables include the following fields:
    - **SOC Code** - The six-digit code denotes the Standard Occupational Classification (SOC) Code for the in-demand occupation.
    - **Occupation** - The name of the in-demand job.
    - **In-Demand TN** - Denotates if an occupation is in-demand statewide in Tennessee.
    - **In-Demand Total # of Regions** - The total number of Local Workforce Development Area regions, a number from one to nine, for which an occupation is in-demand. There are nine LWDAs composed of groups of counties within Tennessee.
    - **Statewide Entry-Level Wage** - The median entry-level yearly wage for employees in an occupation as of FY2023.
    - **Typical Entry-Level Education** - Represents the typical education level most workers need to enter an occupation, as assigned by the U.S. Bureau of Labor Statistics (BLS).[26]
    - **STEM** - Denotes the occupation as a Science, Technology, Engineering, and Math field, as defined by the U.S. Bureau of Labor Statistics.[27]
    - **Key to TNECD Industry Sectors** - Denotes the occupation is important to one or more of TNECD's target industry sectors.

[26] More information about education training levels in BLS data can be found here.
[27] More information about the STEM definition can be found here.

The academic supply tables include the following fields:

- **CIP Code** - The six-digit code denotes the Classification of Instructional Program (CIP Code) for the academic program.
- **Program Title** - The name of the academic or registered apprenticeship program.
- **Education Award Level** - Represents the degree level completed, including high school CTE concentrators or registered apprenticeships.
- **Number of Grads** - For postsecondary programs, the number of graduates from 2022-23 by CIP code and degree level. For high school CTE programs, the number of high school graduates who completed two or more courses in a CTE program of study or a career cluster during 2022-23. For Apprenticeships, the number of Registered Apprenticeship completers in 2023. Cells less than ten are suppressed.
- **% Employed in TN** - The percentage of graduates found in two quarters of Tennessee's Unemployment Insurance (UI) records two quarters after graduation. This excludes individuals who remain enrolled in education. Not available for registered apprenticeship completers.
- **Estimated First Year Wage** - The estimated first year average annual wages of Tennessee graduates found in UI data. Two quarters of wages are pulled two quarters after graduation and are calculated by multiplying the sum of quarterly wages by two then finding the median. Not available for registered apprenticeship completers.

- In-Demand Occupations Dashboard – This dashboard presents occupations throughout the state that are in-demand among Tennessee's business community. The analysis was conducted for the state of Tennessee as a whole, and for each of the state's nine regions. This dashboard and accompanying materials are tools to aid in local, regional, and state policy decision-making regarding alignment of workforce, education, and industry. The dashboard can be filtered to view in-demand jobs within broad occupational groups by LWDA, to view in-demand jobs within STEM fields, or to view in-demand jobs that support TNECD's target industry sectors. Explore additional details for each position such as wages, educational and training requirements, and indicators of demand.
- Tennessee Providers for Demand Occupations Dashboard – This dashboard presents details of academic programs that are aligned with in-demand occupations across regional, divisional, and statewide job markets. This dashboard allows filters by area, occupation code, in-demand occupation title, and program title.
- In-Demand Jobs Data Download – This downloadable data set shows the data used to derive the in-demand occupations list and provides analysis by each of the nine local workforce development areas and for the state as a whole.

In-Demand Occupations and Aligned Academic Program Highlights

TDLWD has noted where there is demand for trained individuals but few or no aligned training programs. They have established a threshold identifying academic programs where Tennessee employment rates are 60% or higher **and** confer wages exceeding the state median wage of $43,816 in 2023. These indicators signal greater labor force needs.

Each cluster has the total number of in-demand occupations and the total number of aligned academic programs, which includes postsecondary programs at each degree level, high school CTE programs, and apprenticeships.

Agriculture, Food, and Natural Resources

15 In-Demand Occupations | **46** Aligned Academic Programs

Demand: In 2023, farming operations occupied around 40% of the state's nearly 27 million acres of land area.[28] Farming generated $5.2 billion in cash receipts during 2023, with 59.8% of this value coming from crops and 40.1% from animals and animal products.[29] Tennessee has approximately 63,100 farming operations, ranking the ninth highest in the U.S.[30]

Tennessee has an estimated 8.47 billion live trees[31] and 14 million acres in forest.[32] Logging equipment operators supply raw materials to companies needing wood and forest products for manufacture. Veterinarians and veterinary technologists and technicians provide essential services for the health and safety of Tennessee's animals and animal products.

Employment opportunities in agriculture, food, and natural resources have expanded in recent years. Since 2019, there have been approximately 44 projects announced, more than 4,700 new jobs and more than $1.9 billion in capital investment.[33]

Supply: Graduates of the Environmental Science master's degree program had the second highest salaries in this cluster, after those of veterinary medicine. Several programs had high employment rates, including bachelor's degree programs in environment and natural resources management and policy (62% employment in Tennessee), and certificate programs in farm and ranch management (67%) and dog, pet, and animal grooming (71%). Veterinary technology/technician programs at the associate degree (63%) and one-to two- year certificate (73%) level also had high rates of employment. The only programs with graduates achieving salaries higher than the state median of $43,816 included veterinary medicine, bachelor's degree recipients in agricultural business and management, and high school CTE completers in food technology processing programs.

Unmet Needs: Occupations in demand in five or more regions include veterinary technologists and technicians and landscaping and groundskeeper workers and their supervisors. However, no programs in this cluster had graduates achieving placement rates of 60% or more and average salaries above the state median of $43,816.

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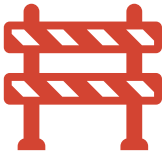
[28] United States Department of Agriculture, NASS, "2023 State Agriculture Overview - Tennessee," (2023).
[29] United States Department of Agriculture, "Farm Income and Wealth Statistics - Cash receipts by commodity," (2023).
[30] Haslam College of Business, "An Economic Report to the Governor of Tennessee," (2025).
[31] United States Department of Agriculture, "EVALIDator (Data Retrieval Tool for Tree Population Estimates)."
[32] Tennessee Department of Agriculture, "Forestry."
[33] Tennessee Department of Economic and Community Development, "Food and Beverage."

Architecture and Construction



27 In-Demand Occupations | **54** Aligned Academic Programs

Demand: Occupations in architecture and construction need skilled workers that design, plan, manage, build, and maintain structures. Tennessee's position as a top state to do business has generated economic development successes, which in turn create jobs in architecture and construction.

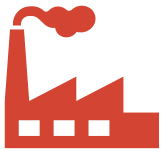
Several occupations in this group are in-demand statewide, and skilled workers are needed in every region or nearly every region across the state. Construction managers and interior designers typically require four-year degrees, while most other occupations in this group acquire skills through a two-year degree, postsecondary certificate, apprenticeship, or on-the-job training.

Many of the in-demand occupations in the construction trades are tied to residential and commercial construction. The need to build new housing stock across the state requires skilled tradespeople to fill that workforce. This includes construction managers, carpenters, cement masons and concrete finishers, construction laborers, operating engineers and other construction equipment operators, painters, plumbers, roofers and heating, air conditioning, and refrigeration mechanics and installers.

Supply: Among the six programs with the highest employment rates in architecture and construction in the state were three programs awarding one-to-two-year certificates and one which awarded a one-year certificate, shortening the amount of time required to enter the workforce. Aligning with an in-demand occupation in all nine of the local workforce development areas, the construction management bachelor's degree achieved an employment rate of 66% and the second highest first year median wage in this cluster. The highest wage was obtained by the high school CTE program of power plant technology.

Unmet Needs: The architecture and construction technology programs as well as construction management were the only programs with Tennessee employment of 60% or more and wages above the state median, emphasizing their need in the current economy. Meeting other needs in the construction workforce will likely require more wage investment and continued growth in apprenticeship programs.

Manufacturing



51 In-Demand Occupations | **47** Aligned Academic Programs

Demand: Manufacturing represents approximately 13% of Tennessee's gross domestic product, the largest of any sector in the state.[34] From December 2023 through November 2024, Tennessee exported $36.9 billion in manufactured goods.[35] The forecast for manufacturing employment in Tennessee suggests positive growth in 2025, in contrast to the national outlook which predicts a contraction in the sector.[36] The largest categories of exported manufactured goods in Tennessee in 2023 included computer and electronic products, transportation equipment, chemicals, miscellaneous manufactured commodities, machinery, and electrical equipment, appliances, and components.[37]

Tennessee has excelled in growing one of the strongest specialized manufacturing workforces in the country. Tennessee's manufacturing employment is 35% more concentrated than the national average.[38] Nearly every in-demand occupation in the manufacturing career cluster is key to the success of TNECD's target industry clusters. This is especially true for the automotive; rubber, ceramics, & glass; electrical equipment & appliances; and aerospace and defense clusters.

Since 2020, TNECD has announced over 370 manufacturing projects with over 54,500 new job commitments. Manufacturing jobs represent over half the new job commitments generated through TNECD's projects since 2020. The largest manufacturing job announcement in the state's history occurred in 2021, with Ford Motor Company. Ford announced its once-in-a-generation investment to create a 3,600-acre mega campus called Blue Oval City on the Memphis Regional Megasite to produce all-electric F-Series trucks beginning in 2025.[39] In 2024, Orano USA announced the company's multi-billion-dollar project, representing the single largest investment in Tennessee history. The new, multi-billion-dollar, state-of-the-art centrifuge uranium enrichment facility will be located in Oak Ridge and create more than 300 new direct jobs.[40]

Across various industries, there is a demand for skilled roles within the manufacturing sector. The consistent regional demand for supervisory and machinery operator roles demonstrates the need for managing complex production processes and operating advanced machinery, essential in

[34] U.S. Bureau of Economic Analysis, Gross Domestic Product by State, (2024, Quarter 3).
[35] U.S. Census Bureau, USA Trade Online, State Export Data, Commodities (31,32,33), (Dec. 2023 – Nov. 2024)
[36] Boyd Center for Business and Economic Research, "An Economic Report to the Governor of the State of Tennessee, 2025" (2025).
[37] U.S. Trade Representative, State Benefits of Trade, Tennessee (2023).
[38] U.S. Bureau of Labor Statistics, QCEW, Employment Location Quotient, (Jun. 2024)
[39] TNECD Press Release, (2021)
[40] TNECD Press Release, (2024)

maintaining the efficiency of production lines and ensuring adherence to quality standards. Furthermore, machinists and welders are key in manufacturing high-tolerance parts, integral in creating precise components. Maintenance and repair roles demonstrate a significant regional demand; workers in this field help to sustain operational efficiency and minimize equipment downtime.

Supply: The following occupations are in demand in eight of the nine Tennessee regions (LWDAs): sheet metal workers; first-line supervisors of production and operating workers; butchers and meat cutters; packaging, filling machine operators and tenders; installation, maintenance, and repair workers; inspectors, testers, sorters, samplers, and weighers; and production workers, all other. Aligned programs in manufacturing had some of the highest employment rates among clusters, with machine tool, tool and die technology, and machine shop technology and operations management and supervision achieving greater than 80% employment in Tennessee. Four of the top five programs by employment rates were certificate programs.

Unmet Needs: These same programs – electromechanical engineering technology (associate degree and certificate), machine tool technology, tool and die technology, machine shop, and operations and maintenance (certificate programs), as well the industrial mechanics and maintenance certificate programs, achieved 60% or greater employment rates and wages above the state median.

Transportation

20 In-Demand Occupations | **27** Aligned Academic Programs

Demand: Tennessee is a leading state in transportation, distribution, and logistics. Tennessee shares a border with eight states, making its location convenient and economical for moving freight and products across the United States and abroad. The state offers immediate access to eight interstate highways and has six Class I railroads, six commercial airports, and more than 970 main channel miles of commercially navigable waterways. These are among the characteristics of Tennessee that attract companies who rely on transportation positions.

Logisticians are in-demand statewide and have one of the highest paying entry-level wages for occupations in this cluster at $40,394. The median annual wage for logisticians in Tennessee in 2023 was $57,170 and about 554 openings for logisticians are projected each year, on average, from 2023 to 2032.

Supply: Certificate programs in diesel mechanics had the highest employment rates in this cluster, with the heavy equipment maintenance program providing supply for the in-demand occupation of mobile heavy equipment mechanic. Truck and bus driver training commanded the third highest first year wages among this cluster's programs.

Unmet Needs: Two certificate programs in the cluster meet the unmet need criteria of high placement rates and earnings above the state median. They include the programs for diesel mechanics and heavy equipment maintenance.

Business, Finance, and Government Management and Support Services

59 In-Demand Occupations | **142** Aligned Academic Programs

Demand: The business, finance, government management, and support services sectors are characterized by a concentration of managerial and professional occupations. Nationally, employment for business and financial occupations are expected to outpace the average growth for all occupations.[41] Home to ten Fortune 500 companies, Tennessee exhibits a sustained demand for these occupational categories.[42] These positions are significant in the context of the knowledge economy, where economic growth is increasingly reliant on the acquisition and application of knowledge and information.[43] This trend highlights the strategic importance of these occupations in supporting economic development.

In recent years, Tennessee's economic data indicates a steady growth in sectors such as headquarters and business support services as well as the finance and insurance sectors. The headquarters industry, for instance, has expanded in number of establishments by approximately 5%, equating to an addition of around 6,200 jobs over the past four years.[44] In a regional comparison, this growth rate placed Tennessee third in the southeast and 19th nationally in 2024.[45] The finance and insurance sector has also experienced growth, with employment increasing by 7%, which represents a net addition of around 8,000 jobs.[46] Furthermore, in 2022, the finance and insurance sector ranked seventh in the state for the number of new business applications, an indicator of sustained growth post-pandemic.[47]

The occupational data for Tennessee indicates a consistent statewide demand for managerial and analytical roles across multiple industries. The prevalence of management analysts, human resource managers, and accountants and auditors suggest a strategic focus on organizational efficiency, workforce management, and fiscal accountability.

Management analysts are central to improving business processes through their expertise in refining operational efficiencies and human capital strategies. This occupation requires technical

[41] Bureau of Labor Statistics, Occupational Outlook Handbook, Business and Financial Occupations.
[42] Fortune 500, (2024).
[43] Investopedia, "What is the Knowledge Economy? Definition, Criteria, and Examples," (2024)
[44] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, (Jan. 2020 – Jan. 2024).
[45] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, (2024).
[46] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, (Jan. 2020 – Jan. 2024).
[47] Boyd Center for Business and Economic Research, "An Economic Report to the Governor of the State of Tennessee, 2024" (2024).

proficiencies in data analysis and information systems, with job postings specifying competencies in SQL, MS Office, Jitterbit, GitHub, and Tableau skills.

Human resource managers and specialists are in-demand across the state. Human resource managers are professionals who navigate organizational dynamics and enhance workforce performance. The job market underscores the importance of advanced interpersonal abilities, analytical judgements, and the capacity to manage complex employee relations, with most positions requiring at least a bachelor's degree.

Accountants and auditors represent another category of professionals in demand, with over 250 of the online job postings for accountants calling for candidates possessing an American Institute of CPAs (AICPA) certification. Financial managers have a median wage over $129,900 in Tennessee and make up over 7% of the total annual projected job openings in management related occupations. Industries that predominately employ financial managers include accounting, tax preparation, and bookkeeping services, with over 300 job postings looking for candidates with an American Institute of CPAs (AICPA) certification.[48]

Supply: Small certificate programs in business administration and for administrative assistants and office technology employed all graduates, and the master's degree in finance has an employment rate of 85%, as does the associate degree in health care administration/management. The master's degree in finance also had the third highest annual wage, with business statistics among the top five programs in annual pay.

Unmet Needs: Multiple in-demand occupations are supported by programs that met the unmet needs high employment and high wage thresholds, including accounting, customer service management, finance, business statistics, business administration, health care administration, public policy analysis, and public administration.

[48] Information about occupational requirements and industry outlooks can be found by exploring resources available at Jobs4TN.gov.

Tennessee Department of Education

Four Pillars

TDOE Commissioner Lizzette Reynolds has introduced the Four Pillars plan to increase student outcomes in Tennessee.

The Four Pillars include:

- **Individualized advising** supports the High School and Beyond plan, which is required by State Board of Education Rule 0520-01-03-.03(11). This plan maps aptitude assessments, course selection, as well as opportunities for industry credentials, early postsecondary opportunities, and work-based learning placements based on the individual student's postsecondary goals.
- The **Seamless Transitions** pillar focuses on the transition of students from middle school to high school to postsecondary opportunities. This includes early postsecondary opportunities, such as dual enrollment, as part of the high school experience.
- **Alignment to Industry Credentials** focuses on the expansion of opportunities for all students to earn credentials of value in secondary and postsecondary, which prepare students for high-wage, in-demand, high-skill, and/or emerging occupations, including purposeful opportunities for special populations.
- The **Work-Based Learning** (WBL) pillar seeks to increase opportunities for all students to experience the work environment in their potential career.

The intent of this plan is to allow students to build a differentiated high school experience designed to prepare them for their career of choice, aligned to Tennessee's future workforce.

Sales and Marketing

15 In-Demand Occupations | **10** Aligned Academic Programs

Demand: The sales and marketing career cluster includes occupations that plan, manage, and perform marketing activities or are otherwise responsible for sales of goods and services to consumers.

Tennessee's private retail trade industry employs around 341,500 people as of January 2024, which reflects a net gain of approximately 9,800 jobs (3%) since January 2020.[49]

Sales occupations increasingly require skills with data analysis software, database querying software, enterprise planning software, and customer relationship management software. After the onset of the pandemic, many retail operations in Tennessee began offering pick-up and delivery of products at unprecedented rates, and these two occupations likely needed to upskill quickly to adapt to the changing marketplace.

First-line supervisors of retail sales workers are in-demand in every region of Tennessee. First-line supervisors of retail sales workers will likely continue to be on the forefront of managing the buy online, pick up in store (BOPIS) and/or click-and-collect processes in Tennessee.

This career cluster prepares students for marketing and sales positions which are prevalent in a vast array of other industries outside of retail sales. Marketing managers and sales managers, for example, often gain employment in headquarters operations or consulting firms.

Supply: The top employment rate of 65% for the certificate program in selling skills and sales operations can provide candidates filling a variety of positions such as retail sales supervisors and services sales positions, while the bachelor's degree in marketing can assist in filling positions requiring more technical product sales. Top annual wages in the cluster were earned by those with master's degrees in e-commerce and marketing management.

Unmet Needs: Although there is a need for retail sales supervisors and technical sales representatives in all regions of the state and for service sales representatives in eight regions, no programs in this cluster met the criteria for 60% or more employment of graduates and wages above the state median.

[49] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, NAICS 44-45 Retail Trade, (Jan. 2020 – Jan. 2024).

Health Sciences

31 In-Demand Occupations | **90** Aligned Academic Programs

Demand: Nationally, employment in the healthcare sector is projected to encounter approximately 1.9 million job openings annually from 2023 to 2033, with this expansion largely attributable to the aging demographics of the population.[50,51] Tennessee is the 26th nationwide and fifth in the southeast for its proportion of residents aged 65 and older. This is indicative of broader trends necessitating increased healthcare services.[52] The aging population not only amplifies the demand for healthcare professionals but also imposes broader labor market challenges. As the Baby Boomer generation transitions into retirement and population growth decelerates, the difficulty of replenishing the workforce is compounded.[53]

A comparison of new business applications shows that Tennessee's healthcare sector is more pronounced relative to the national average.[54] The state's health sciences occupations demonstrate a marked concentration within local service providers, including hospitals, outpatient clinics, and long-term care facilities. These roles commonly require formal qualifications, such as degrees or certificates, and often a license for practice. Tennessee's demand for allied health professionals is on an uptrend, highlighting a sector comprising of healthcare workers who support primary care providers.

TNECD's targeted life sciences industry sector encapsulates critical segments like biosciences logistics and distribution, medical devices and equipment, pharmaceuticals, and research and testing laboratories. Despite the exclusion of local healthcare services, there is a symbiotic relationship between these targeted segments and the broader healthcare industry, with each benefiting from shared regional assets. These assets include a network of tertiary institutions, premier research facilities, and a skilled workforce, which collectively underpin the state's life sciences infrastructure.

Statewide, there is a notable demand for mid-level technically skilled practitioners, specifically for licensed practical and licensed vocational nurses, physical therapist assistants, dental assistants, medical assistants, and phlebotomists. These roles are critical in the provision of patient care and

[50] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, Healthcare Occupations.
[51] Much of the state's population increase is driven by domestic net migration gains—more people moving into the state than moving out. Tennessee State Data Center, TN 2022 Population Gains Pushed by Record Domestic Net Migration
[52] Consumer Affairs, Elderly Population in U.S. by State, (2023).
[53] Boyd Center for Business and Economic Research, "An Economic Report to the Governor of the State of Tennessee, 2023" (2023).
[54] Boyd Center for Business and Economic Research, "An Economic Report to the Governor of the State of Tennessee, 2024" (2024).

functioning of healthcare facilities. They require specialized training, typically obtained through postsecondary nondegree awards or associate degrees. These professionals support the medical infrastructure by providing essential services to maintain patient health, aid in the management of chronic conditions, and contribute to the preventative care imperative in an era of demographic transition.

Supply: There are many aligned academic programs supplying in-demand health sciences occupations. Completers in the health sciences have some of the highest employment rates of any cluster. The highest employment rates for the health sciences programs are for associate degree programs in respiratory care (96%) and dental assisting (93%), with two other associate degree programs among the top five. The five programs with the highest earnings of graduates are all nursing programs, with registered nurses completing a post baccalaureate program earning more than $150,000 and mental health nursing graduates earning more than $113,000.

Unmet Needs: A total of 21 programs provided training for health sciences programs for which graduates had employment rates of 60% or more and median earnings more than the state median. This included three doctorate, two master's degree, one post baccalaureate certificate, three bachelor's degree, seven associate degree, and five certificate programs, and address many of the occupational health science shortages of personnel in the state.

Rural Healthcare Workforce Development

Rural communities in Tennessee often struggle to access quality healthcare due to factors like limited facilities, long travel distances, workforce shortages, and high costs. Governor Bill Lee is prioritizing initiatives to improve rural healthcare. The Tennessee Department of Labor and Workforce Development is leading efforts to address workforce shortages across various industries, with healthcare as a priority. The healthcare workforce in Tennessee's rural communities is facing significant shortages in multiple fields, including dental hygiene, nursing, social work, and medical technology. As the demand for healthcare services continues to grow, the challenge of recruiting and retaining talent is compounded by barriers that students and workers face, such as limited financial support and training opportunities.

This initiative aims to leverage existing healthcare training structures and expand apprenticeship and Workforce Development Initiatives (WDI) to strengthen the pipeline of healthcare professionals in rural communities. Financial support will be provided to sponsoring entities to offer training, certification, and apprenticeships, while also addressing ancillary costs like transportation, childcare, and examination fees that create barriers for participants.

Key Objectives

- **State and Local Partner Engagement:** Engage partners to leverage assistance for programming and participants.
- **Retain Current Workforce:** Foster retention through ongoing development and support.
- **Develop Local Talent:** Create local talent pipelines by building educational and career pathways.
- **Support Career Changers:** Provide training and certification programs for individuals transitioning into healthcare careers.
- **Recruit New Talent:** Attract new individuals into the workforce by offering support and opportunities.
- **Expand Existing Programs:** Utilize current resources to strengthen healthcare training for positions like CNA, Dental Assistant, EMT, Medical Assistant, and Pharmacy/Lab Technicians.
- **WDI, WBL, and Work Experience (WEX) Programs:** Identify short-term certification or credentialing programs that can be replicated across rural areas to provide quick, effective workforce entry.
- **Expand Apprenticeship Opportunities:** Increase access to apprenticeship and pre-apprenticeship programs in rural healthcare.
- **Collaborate with Job Centers & WIOA Programs:** Engage local American Job Centers and Workforce Innovation and Opportunity Act (WIOA) programs to promote rural healthcare careers.

Grants began on February 1, 2025, and continue through June 30, 2027.

Human Services

11 In-Demand Occupations | **46** Aligned Academic Programs

Demand: Human services occupations include those focused on societal and individual well-being. Nationally, employment in community and social occupations is projected to grow faster than the national average for all occupations and experience 299,400 annual openings from 2023 to 2033.[55]

Social and Human Service Assistants; Child, Family, and School Social Workers; Hairdressers, Hairstylists, and Cosmetologists; Educational, Guidance, and Career Counselors and Advisors; and Skincare Specialists are all examples of in-demand occupations that belong in this cluster.

Supply: Among the programs with the highest percent of graduates employed in Tennessee are the counselor education/school counseling and guidance services programs; this education specialist degree program has the highest rate of employment (76%) while the master's degree program in this field has the fifth highest (60%), addressing the need for educational counselors in seven LWDAs in the state. Human services master's degree graduates also could fill the need for social and human services assistants.

Unmet Needs: The counselor education/school counseling and guidance services programs and the human services program meet the dual criteria for unmet needs in this cluster.

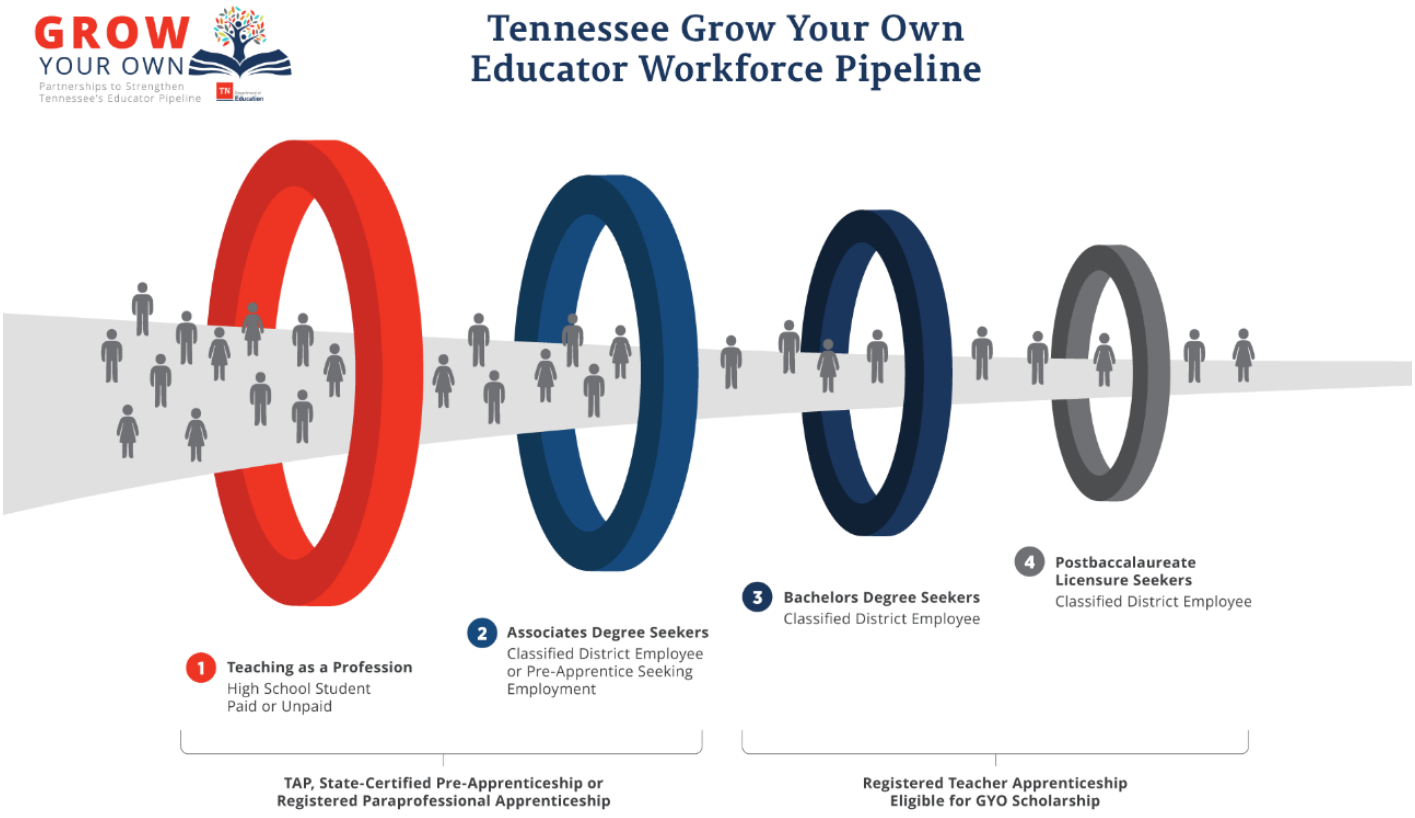
[55] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, Community and Social Service Occupations.

Grow Your Own Center
Growing Supply for High-Quality Teachers

In Tennessee, as well as around the nation, educators are in-demand. In response to the growing need, Tennessee's Grow Your Own initiative continues to support partnerships between Educator Preparation Providers (EPPs) and school districts to provide innovative, low-to-no-cost pathways to the teaching profession, continuing to build pipelines of qualified teachers and school district professionals. The Tennessee Grow Your Own (GYO) Center is a partnership between the TDOE and the University of Tennessee System with support from the TDLWD.[56] Within the state's apprenticeship structure, TDOE acts as the sponsor for all teacher registered apprenticeship programs and is fully responsible for administration, TDLWD registers programs as the state's apprenticeship agency, and the Tennessee GYO Center serves as an intermediary and supports program implementation across the state. EPPs deliver coursework to meet unique training needs, and Local Education Agencies (LEAs) act as the employer to provide on-the-job learning, wage progression and mentorship.

The GYO Center supports program development at four points of entry for learners:

1) Teaching as a Profession (TAP) programs for high school students,
2) Associate degree programs that are also pre-apprenticeships or paraprofessional apprenticeships,
3) Candidates completing bachelor's degrees as registered teacher apprentices, and
4) Candidates who have bachelor's degrees and do not have a teaching license.



[56] For more information about the Grow Your Own Center see their website at https://growyourown.tennessee.edu/.

The GYO Center enrolled a fall 2024 cohort of 148 new apprentices. In total, after two years, the program has enrolled 846 apprentices with an 85.8% retention/completion rate. Seventy-three pre-apprentices are enrolled in a community college, on the pathway to the registered teacher apprenticeship program. As a result, 189 new fully licensed teachers have completed, and 518 are actively participating.[57] All aspiring special education apprentices in the state now have access to a no-cost post-baccalaureate pathway to teacher licensure in special education. Ninety-two of Tennessee's 109 public school districts are now ready to offer apprenticeships for fall 2025.

The Tennessee Department of Education and the Tennessee Grow Your Own Center worked with seven LEAs across the state of Tennessee to pilot the state-certified pre-apprenticeship program for TAP program students in 2024.[58] The partnering LEAs were Kingsport City, Bristol City, Lawrence County, Lewis County, Clarksville Montgomery, Memphis-Shelby County Schools and Bradley County. Twenty-three additional school districts have expressed interest in a TAP state certified pre-apprenticeship since the pilot ended in fall 2024.

In the last year, the GYO program has expanded from nine EPP partners to fourteen.

EPP Partners

- Arete Public Montessori Residency
- Austin Peay State University
- Cumberland University
- East Tennessee State University
- King University
- Lincoln Memorial University
- Lipscomb University
- Middle Tennessee State University
- Relay Graduate School of Education
- University of Memphis
- University of Tennessee, Chattanooga
- University of Tennessee, Knoxville
- University of Tennessee, Martin
- University of Tennessee Southern

In collaboration with sixteen faculty fellows from seven universities across Tennessee and supported by a $1.8 million Ascendium Education Group grant, the Grow Your Own Center developed the Registered Teacher Apprenticeship Program of Study (RTAPS)[59]. This competency-based, fully virtual curriculum expands access to teacher preparation, particularly for aspiring educators in rural and underserved communities. Available for EPPs to adopt in December 2025, RTAPS provides a competency- based approach for apprentices with 60+ credit hours to become licensed educators. EPPs can offer streamlined pathways or incorporate RTAPS into existing programs. RTAPS aligns with Interstate Teacher Assessment and Support Consortium standards and incorporating virtual simulation technology for rigorous, authentic practice opportunities. It includes instructional materials, assessments, rubrics, and mentor support, advancing statewide teacher apprenticeship pathways.

[57] Data as of January 27, 2025.
[58] For more information on the Teaching as a Profession (TAP) Program, see https://growyourown.tennessee.edu/teaching-as-a-profession/.
[59] For more information on the Registered Teacher Apprenticeship Program of Study, see https://growyourown.tennessee.edu/registered-teacher-apprenticeship-program-of-study-rtaps/.

Education and Training

9 In-Demand Occupations | **75** Aligned Academic Programs

Demand: The education and training career cluster includes educators, administrators, trainers, and other learning support services. Recruitment and retention are critical for a high-quality and consistent teaching workforce. Across the nation and in Tennessee, teacher shortages and retention are a topic of concern. The Tennessee Department of Education conducts an annual survey, the Tennessee Educator Survey (TES), to understand the experience of educators across Tennessee. The results from the 2024 TES indicated that 80% of survey respondents plan to continue teaching in their current school next year, up slightly from 78% in 2023.[60,61]

Tennessee is pioneering new ways to develop teacher pipelines. Tennessee is the first state approved by the U.S. Department of Labor to establish the registered apprenticeship program for teaching in the country. Tennessee's teacher apprenticeship program aligns with leading practices in teacher preparation and development with the rigors and funding of the national registered apprenticeship process.[62]

In 2023, Governor Lee signed the Teacher Paycheck Protection Act, which is expected to give teachers the largest pay raise in state history. This act demonstrates Governor Lee's commitment to increase teacher salaries while working to recruit and retain highly qualified teachers.[63]

There is not a centralized data source on Tennessee preschool, elementary, and secondary teacher vacancies, so that information has not been included in this analysis. However, a TDLWD survey of all Tennessee local school district websites during the week of December 30, 2024 found 1,504 vacancies listed for certified teachers and related personnel. Preschool teachers are in demand in six of the nine LWDAs. Childcare challenges are currently impacting workforce participation in the state and the nation.

Supply: Tennessee's teacher apprenticeship program is a new and innovative way to improve the supply of Tennesseans in the teaching profession. The program had 30 completers in 2023. The highest employment levels for program graduates and completers in the cluster included three programs awarding post baccalaureate certificates, including reading teacher education (95%), teaching English as a second language/ESL (78%), and educational leadership and administration (69%). Graduates earning doctoral degrees in education administration and leadership at the

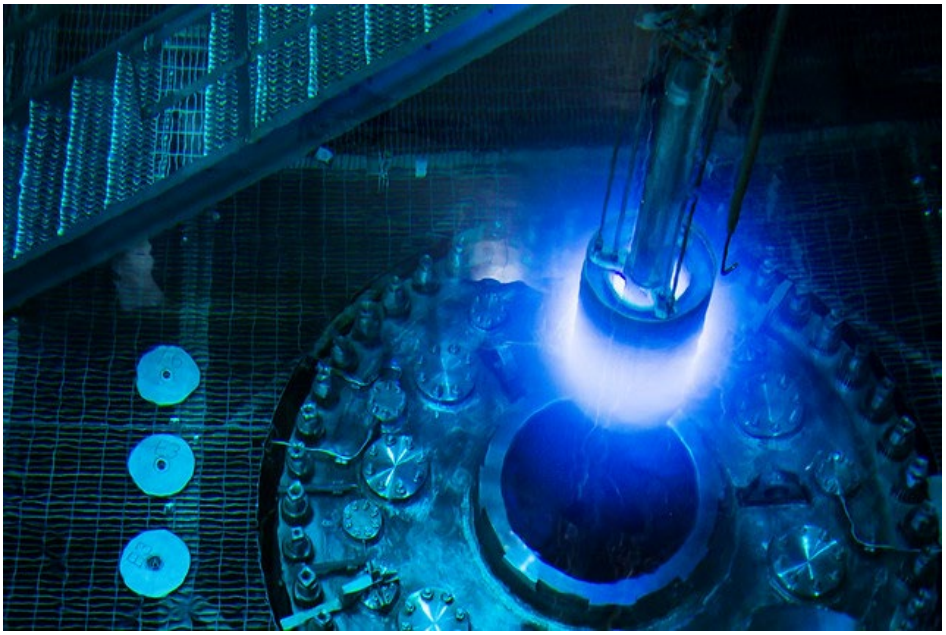
[60] Tennessee Department of Education, 2024 Tennessee Educator Survey.
[61] Tennessee Department of Education, 2023 Tennessee Educator Survey.
[62] Tennessee Department of Education, Grow Your Own.
[63] Teacher Paycheck Protection Act.

postsecondary and secondary level earned the highest wages in the cluster, well above the state median salary.

Unmet Needs: Nine educational programs met the employment and wage criteria for unmet needs: the doctoral and post-baccalaureate certificate (CPBA) programs in educational leadership and administration, the doctoral degree in higher education, the master's degree programs in secondary education, the master's and CPBA programs in reading teacher education, the master's in teacher education, the master's in human development, and the CPBA program in teaching English as a second language.

Nuclear Energy Supply Chain Investment Fund

Proposed by Governor Bill Lee during his 2023 State of the State address, the fund seeks to establish a nuclear development and manufacturing ecosystem built for the future of Tennessee by providing grant assistance to grow the nuclear supply chain by supporting nuclear power-related businesses and workforce development across Tennessee. In 2024, TNECD awarded grants directed at nuclear education curriculum developments to three higher education institutions: Roane State Community College; University of Tennessee, Knoxville; and Tennessee Tech University.



Roane State Community College's grant will go towards equipment purchases for education and training for their inaugural nuclear technology career pathway program. University of Tennessee, Knoxville's grant will provide funding for the establishment of a nuclear engineering minor program and for faculty to provide nuclear technical training and assistance to teachers and faculty across the state. Finally, Tennessee Tech's grant will support the start-up of a new Bachelor of Science in Nuclear Engineering program in their College of Engineering by funding the 2-year total cost for three critical personnel to launch and operate the program, including director, assistant professor, and technician.

Protective Services and Law

9 In-Demand Occupations | **23** Aligned Academic Programs

Demand: The protective services and law career cluster includes occupations focused on providing legal, public safety, and protective services.

Paralegals and Legal Assistants and Security guards are the two occupations that are in-demand in the most regions in Tennessee for this cluster. Paralegals and Legal Assistants have a median annual wage of over $50,500. They are projected to have around 650 annual openings in the 2022-2032 period, which accounts for about 42% of openings in Legal occupations.[64] Security guards typically work in the investigation and security services industry but can also work directly for colleges and universities and other public institutions. Security guards have a median annual wage of around $34,000 in Tennessee, and this occupation is projected to grow by 6.5% from 2022 to 2032.

Supply: Top employment programs in protective services were for programs in fire science/firefighting (88% for certificate earners and 78% for associate degree earners) and legal assistance/paralegal studies (70% for associate degree earners and 67% for certificate earners). The fire science/firefighting programs had the highest earnings in the area. Bachelor's and master's degree programs in criminal justice were also among the highest paid.

Unmet Needs: The fire science programs and associate and certificate programs in criminal justice/policing had more than 60% employment and paid more than the state median wage.

[64] Occupational profiles can be found at Jobs4TN.gov.

Arts and Communications

7 In-Demand Occupations | **68** Aligned Academic Programs

Demand: Tennessee's music and arts pedigree is unlike any other. Tennessee is the birthplace of country and rock 'n' roll music, the home of the blues, and the starting point of soul. Throughout the state, museums showcase stunning works in every medium and from many cultures.

Producers and directors are identified as an in-demand occupation statewide and employment in this occupation is projected to grow 27% from 2022 to 2032, which is faster than the average for all occupations in the state. The average statewide entry-level wage for this occupation is $38,198 and the median annual wage in 2023 for this occupation was $60,972.

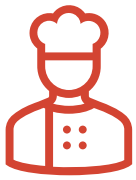
Nationally, it is expected that workers will be needed to meet demand for animation and visual effects in video games, movies, television, and on smartphones. In addition, arts and design workers are expected to create visually appealing and effective layouts of websites and other media platforms.

Graphic designers are in-demand in Tennessee in four regions. Employers seek candidates with skills in Adobe Creative Cloud software (including Illustrator, Photoshop, and InDesign), Microsoft Office, HTML, and JavaScript. Graphic designers are employed across many different industries, including printing and related support activities; specialized design services; advertising, public relations, and related services; management, scientific, and technical consulting services; and converted paper product manufacturing.

Supply: In a very competitive industry, the master's degree program in journalism achieved an employment rate of 67%. Three high school CTE programs were among those with employment rates in the 40% range, with completers earning above $40,000 annually in innovative programs in digital communications and recording and audiovisual technologies.

Unmet Needs: The master's degree in journalism had an employment rate of 71% and first year earnings of more than $57,000.

Leisure and Recreation



13 In-Demand Occupations | **26** Aligned Academic Programs

Demand: Tennessee is well-known for its great outdoors. According to the U.S. National Park Service, there are 13 national parks in Tennessee.[65] The Great Smoky Mountains National Park, received over 13.3 million visitors in 2023,[66] making it the most visited national park in the country.[67] There are also 59 state parks[68] and 84 natural areas[69] across Tennessee.

In the last four years, Tennessee's Leisure and Hospitality private sector employment has increased by 3.6%.[70] Most of the in-demand occupations in the leisure and recreation career cluster require only a high school diploma or equivalent. Food service managers; meeting, convention, and event planners; chefs and head cooks; supervisors of food-preparation and serving workers; supervisors of housekeeping and janitorial workers; pest control workers; and exercise trainers and group fitness workers are all in-demand in statewide and, for some of these, in all or nearly all regions in the state.

Supply: The highest employment rates were for those with certificates and associate degrees in culinary arts /chef training. The bachelor's degrees in hotel/motel management and parks and recreation also exceeded 59% employment. Three of the programs with graduates and completers achieving the highest wages addressed the shortage of exercise trainers and group fitness instructors in eight of the nine LWDAs.

Unmet Needs: Although there is a significant shortage of personnel in the leisure and hospitality industry across the state, no programs had employment rates of 60% or more and paid at or above the state median wage.

[65] National Park Service, Tennessee.
[66] National Park Services, Annual Park Recreation Visits Stats Report Viewer.
[67] USA Today, America's most-visited national parks.
[68] Tennessee State Parks, Find a Park.
[69] Tennessee Department of Environment & Conservation, List of Natural Areas.
[70] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Leisure and Hospitality, (Jan. 2020 – Jan. 2024)

Information Technology

12 In-Demand Occupations | **40** Aligned Academic Programs

Demand: Computer and information technology occupations typically have comparatively high wages in Tennessee compared to most other occupations. Information Technology (IT) based occupations - including computer and information systems managers, software developers, and computer programmers - earn a median wage of $100,000 and beyond. This is over double the median wage for all occupations in Tennessee. These occupations usually require a bachelor's degree. Additionally, candidates looking for roles in these fields will often be expected to complete live demonstrations of coding skills in addition to typical interview practices.

Information security analysts ensure appropriate security controls are in place to safeguard files and infrastructure from accidental or unauthorized modification, destruction, or disclosure. This fast-growing occupation has a median annual wage of over $98,400 in TN. Employment for information security analysts is also projected to grow by 49% between 2022 and 2032, making it one of the fastest growing occupations in the state.

Computer user support specialists are in-demand in seven regions across TN, the highest in this cluster. They provide technical assistance to users about software or hardware operation to resolve problems. Job skills necessary for this position include customer service, problem solving, and conflict management. These occupations are typically entry-level and can lead to exciting careers in IT.

Data Science opportunities are rapidly growing, with many jobs offering high salaries and the flexibility of remote work. In Tennessee, median earnings for these occupations are over $92,000, and employment is projected to grow nearly 60% between 2022 and 2032. This occupation requires skills in data analytics, statistical modeling, data mining, cleaning, and warehousing.

Tennessee has a strong and growing industry sector of Headquarters, Finance & Tech[71] that frequently employs information technology occupations. Tennessee also has unique research and development (R&D) assets and facilities, including St. Jude Children's Research Hospital, Vanderbilt University, Oak Ridge National Laboratory, U.S. Airforce Arnold Engineering Development Complex, and the University of Tennessee. These organizations provide world-changing technologies to businesses. The R&D assets and facilities also frequently employ information technology occupations. This clustering of industry, R&D, and education drives the need for IT professionals in Tennessee.

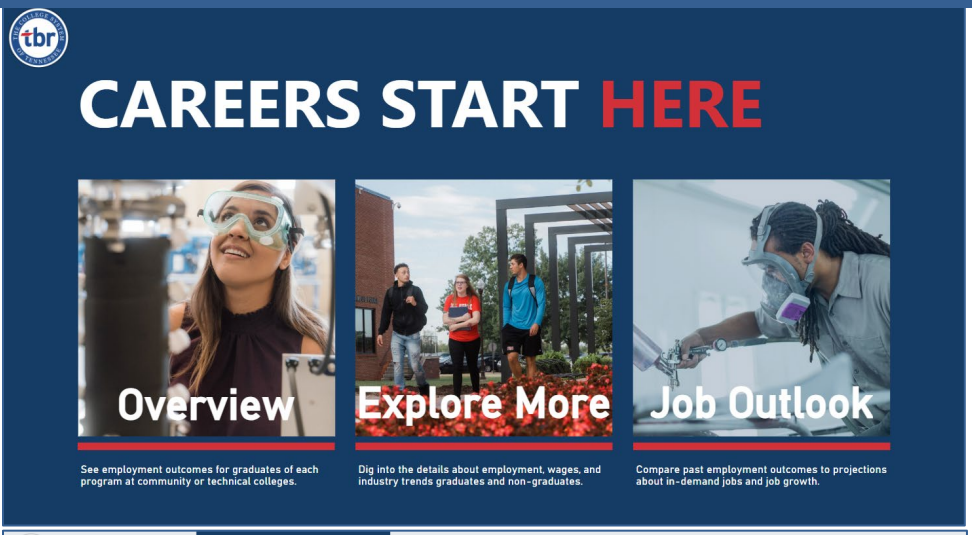
[71] TNECD, HQ, Finance and Tech.

Supply: Certificate programs in system, networking, and LAN/WAN management and computer and information systems security were among the five programs that had the highest employment rates in this cluster. The CPBA program in medical informatics had an employment rate of 68%. Graduates obtaining advanced degrees earned the highest wages in their first year of employment, such as the graduates of the doctoral program in computer science ($81,400). Graduates obtaining CPBA's in the specialized fields of project management and medical informatics earned more than $80,000 in the first year.

Unmet Needs: Individuals awarded one- to two-year certificates for system, networking, and LAN/WAN management and post baccalaureate certificates for medical informatics were the only completers achieving state employment rates of 60% or more and earning more than the state median wage in the first year.

Careers Start Here

TBR | The College System of Tennessee



A New Data Tool

TBR, the College System of Tennessee, released a new data tool in 2024 about post-college employment for students who enrolled at community colleges or the Tennessee Colleges of Applied Technology (TCAT).

This data tool was made possible through a data partnership between TBR and the Tennessee Department of Labor and Workforce Development.

The *Careers Start Here* dashboard shows employment rates, wages, and industries of employment during the decade after students leave college.

The dashboard allows colleges to deepen their understanding of employment outcomes by examining questions such as:

- How many students are employed in Tennessee after college, and in which industries are they employed?
- What are the average annual earnings for graduates and non-graduates after college?
- How do employment outcomes differ by students' characteristics, regions, or programs of study?

This data tool is publicly available at tbr.edu/data.

Engineering and Other STEM Programs

14 In-Demand Occupations | **71** Aligned Academic Programs

Demand: Engineering and engineering-related occupations play an instrumental role for Tennessee businesses. These positions provide critical functions in the design, building, and testing of products and equipment. Engineers and related positions are in high demand for several of TNECD's target industries, including automotive, aerospace and defense, chemical products, and electrical equipment and appliances.

In 2023, approximately 24,900 engineers were employed in Tennessee, with a median wage of about $98,600. The highest earning engineering occupations make $111,000 per year or more.

The Nuclear Energy Fund was approved by the Tennessee General Assembly in the 2023-2024 budget. The $50 million fund aims to expand the state's nuclear development and manufacturing ecosystem by providing grants and assistance to support nuclear power-related businesses and education/training programs across Tennessee. In 2023, Tennessee was 12th in the nation for nuclear engineering jobs, at 280 jobs, and the occupation is expected to grow by over 14% between 2022 and 2032.[72] Tennessee's strong nuclear engineering foundation will support further growth in nuclear energy in the state.

The Arnold Engineering Development Complex, an Air Force military facility in Tullahoma, is a major engineering asset to the state. It operates more than 68 aerodynamic and propulsion wind tunnels, rocket and turbine engine test cells, environmental chambers, arc heaters, ballistic ranges, sled tracks, centrifuges, and other specialized units.

In Tennessee, the highest in-demand occupations in this cluster are electrical and electronic engineering technologists and technicians (eight regions), industrial engineering technologists and technicians (eight regions), mechanical engineers (seven regions), industrial engineers (five regions) and electrical engineers (four regions). Technologists and technicians typically require associate degrees, while engineers require a bachelor's degree.

Tennessee is seeking to grow its pipeline of STEM workforce through its Future Workforce Initiative, which seeks to increase STEM training in K-12 schools.[73] There are currently 127 STEM and STE(A)M Designated Schools in Tennessee.[74] The Tennessee STEM Innovation Network, in

[72] TNECD analysis of employment data from U.S. Bureau of Labor Statistics, OEWS.
[73] Office of the Governor, Press Release, (2019).
[74] Tennessee Department of Education, Press Release, (2024).

partnership with Vanderbilt, studied the impact of STEM school designation.[75] Their initial key findings suggest that the requirements within the designation rubric support schools in establishing their STEM culture and community.

Supply: Programs with the top employment rates in the state in this cluster include associate degree and certificate programs in both chemical and manufacturing engineering technology. A smaller program in automation engineering technology had a 100% employment rate. The highest wages in the first year were earned by those with master's and doctoral degrees in professional engineering fields, with graduates of industrial engineering programs earning nearly $137,800. These graduates were in demand in five LWDAs.

Unmet Needs: Thirteen programs met the criteria of high employment rates and first year wages above the state median, only surpassed by the health sciences in the number of programs in this category. The programs included two awarding bachelor's degrees (civil engineering and mechatronics, robotics, and automation engineering), four associate, and seven certificate programs (including two in automation engineer technology and two in manufacturing engineering technology). The number of graduates in these programs provide strong support for a manufacturing resurgence in Tennessee.

[75] Tennessee STEM Innovation Network, Vanderbilt and TSIN STEM School Designation Impact Report.

Appendix A: Programs Meeting Unmet Needs

The 77 academic programs listed below are aligned with in-demand occupations, have graduates who are employed in Tennessee at a rate of 60% or higher, and earn wages exceeding the state median wage of $43,816 in 2023. These indicators signal that these programs fill unmet needs in Tennessee's labor force.

Cluster	Program Title	CIP Code	Education Award Level
Cluster Two: Architecture and Construction	Architectural Engineering Technologies/Technicians	15.0101	Associate degree
	Construction Engineering Technology/Technician	15.1001	Certificate one to two years
	Construction Management, General	52.2001	Bachelor's degree
Cluster Three: Manufacturing	Electromechanical/Electromechanical Engineering Technology/Technician	15.0403	Certificate less than one year
	Electromechanical/Electromechanical Engineering Technology/Technician	15.0403	Certificate one to two years
	Electromechanical/Electromechanical Engineering Technology/Technician	15.0403	Associate degree
	Industrial Mechanics and Maintenance Technology/Technician	47.0303	Certificate less than one year
	Industrial Mechanics and Maintenance Technology/Technician	47.0303	Certificate one to two years
	Machine Tool Technology/Machinist	48.0501	Certificate one to two years
	Machine Shop Technology/Assistant	48.0503	Certificate one to two years
	Tool and Die Technology/Technician	48.0507	Certificate one to two years
	Operations Management and Supervision	52.0205	Certificate less than one year
Cluster Four: Transportation	Heavy Equipment Maintenance Technology/Technician	47.0302	Certificate one to two years
	Diesel Mechanics Technology/Technician	47.0605	Certificate one to two years
Cluster Five: Business, Finance, Government Management, and Support Services	Public Administration	44.0401	Post-baccalaureate certificate
	Public Administration	44.0401	Master's degree
	Public Policy Analysis, General	44.0501	Master's degree
	Health/Health Care Administration/Management	51.0701	Associate degree
	Business Administration and Management, General	52.0201	Certificate one to two years
	Customer Service Management	52.0207	Certificate less than one year
	Accounting	52.0301	Bachelor's degree
	Accounting Technology/Technician and Bookkeeping	52.0302	Associate degree
	Finance, General	52.0801	Master's degree
	Business Statistics	52.1302	Master's degree
Cluster Seven: Health Sciences	Dental Hygiene/Hygienist	51.0602	Associate degree
	Dental Hygiene/Hygienist	51.0602	Bachelor's degree
	Physical Therapy Assistant	51.0806	Associate degree
	Nuclear Medical Technology/Technologist	51.0905	Certificate one to two years

Cluster	Program Title	CIP Code	Education Award Level
Cluster Seven: Health Sciences	Respiratory Care Therapy/Therapist	51.0908	Associate degree
	Surgical Technology/Technologist	51.0909	Certificate one to two years
	Surgical Technology/Technologist	51.0909	Associate degree
	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician	51.0910	Certificate one to two years
	Radiologic Technology/Science - Radiographer	51.0911	Bachelor's degree
	Magnetic Resonance Imaging (MRI) Technology/Technician	51.0920	Certificate less than one year
	Clinical/Medical Laboratory Technician	51.1004	Associate degree
	Clinical Laboratory Science/Medical Technology/Technologist	51.1005	Master's degree
	Ophthalmic Technician/Technologist	51.1803	Associate degree
	Occupational Therapy/Therapist	51.2306	Doctoral degree
	Registered Nursing/Registered Nurse	51.3801	Associate degree
	Registered Nursing/Registered Nurse	51.3801	Bachelor's degree
	Registered Nursing/Registered Nurse	51.3801	Post-baccalaureate certificate
	Registered Nursing/Registered Nurse	51.3801	Master's degree
	Family Practice Nurse/Nursing	51.3805	Doctoral degree
	Nursing Practice	51.3818	Doctoral degree
	Licensed Practical/Vocational Nurse Training	51.3901	Certificate one to two years
Cluster Eight: Human Services	Counselor Education/School Counseling and Guidance Services	13.1101	Master's degree
	Counselor Education/School Counseling and Guidance Services	13.1101	Education Specialist
	Human Services, General	44.0000	Master's degree
Cluster Nine: Education and Training	Educational Leadership and Administration, General	13.0401	Post-baccalaureate certificate
	Educational Leadership and Administration, General	13.0401	Doctoral degree
	Higher Education/Higher Education Administration	13.0406	Doctoral degree
	Secondary Education and Teaching	13.1205	Master's degree
	Reading Teacher Education	13.1315	Post-baccalaureate certificate
	Reading Teacher Education	13.1315	Master's degree
	Teacher Education and Professional Development, Specific Subject Areas, Other	13.1399	Master's degree
	Teaching English as a Second or Foreign Language/ESL Language Instructor	13.1401	Post-baccalaureate certificate
	Human Development and Family Studies, General	19.0701	Master's degree
Cluster Ten: Protective Services and Law	Criminal Justice/Police Science	43.0107	Certificate less than one year
	Criminal Justice/Police Science	43.0107	Associate degree
	Fire Science/Fire-fighting	43.0203	Certificate one to two years
	Fire Science/Fire-fighting	43.0203	Associate degree
Cluster Eleven: Arts and Communications	Journalism	09.0401	Master's degree

Cluster	Program Title	CIP Code	Education Award Level
Cluster Thirteen: Information Technology	System, Networking, and LAN/WAN Management/Manager	11.1002	Certificate one to two years
	Medical Informatics	51.2706	Post-baccalaureate certificate
Cluster Fourteen: Engineering and Other STEM	Civil Engineering, General	14.0801	Bachelor's degree
	Mechatronics, Robotics, and Automation Engineering	14.4201	Bachelor's degree
	Engineering Technologies/Technicians, General	15.0000	Certificate less than one year
	Engineering Technologies/Technicians, General	15.0000	Associate degree
	Electrical, Electronic, and Communications Engineering Technology/Technician	15.0303	Certificate less than one year
	Electrical, Electronic, and Communications Engineering Technology/Technician	15.0303	Associate degree
	Automation Engineer Technology/Technician	15.0406	Certificate less than one year
	Automation Engineer Technology/Technician	15.0406	Certificate one to two years
	Manufacturing Engineering Technology/Technician	15.0613	Certificate less than one year
	Manufacturing Engineering Technology/Technician	15.0613	Certificate one to two years
	Manufacturing Engineering Technology/Technician	15.0613	Associate degree
	Chemical Engineering Technology/Technician	15.0615	Certificate less than one year
	Chemical Engineering Technology/Technician	15.0615	Associate degree

Appendix B: In-Demand Occupations in All Nine LWDAs

The 17 in-demand occupations listed below are in-demand in all nine of Tennessee's local workforce development areas (LWDAs). These occupations are aligned with academic programs that fall short of the unmet needs criteria discussed in Appendix A or are not aligned with an academic program.

Cluster	Occupation*	SOC Code
Cluster One: Agriculture, Food, and Natural Resources Occupations	Landscaping and Groundskeeping Workers	37.3011
Cluster Two: Architecture and Construction Occupations	Construction Laborers	47.2061
	Plumbers, Pipefitters, and Steamfitters	47.2152
	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	49.9021
Cluster Four: Transportation Occupations	Heavy and Tractor-Trailer Truck Drivers	53.3032
	Industrial Truck and Tractor Operators	53.7051
Cluster Six: Sales and Marketing Occupations	First-Line Supervisors of Retail Sales Workers	41.1011
	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	41.4011
Cluster Seven: Health Sciences Occupations	Pharmacy Technicians	29.2052
	Dental Assistants	31.9091
	Medical Assistants	31.9092
	Phlebotomists	31.9097
Cluster Eight: Human Services Occupations	Healthcare Social Workers	21.1022
Cluster Twelve: Leisure and Recreation Occupations	Food Service Managers	11.9051
	First-Line Supervisors of Food Preparation and Serving Workers	35.1012
	First-Line Supervisors of Housekeeping and Janitorial Workers	37.1011
	Pest Control Workers	37.2021

*All of these occupations are in-demand statewide in addition to being in-demand in each LWDA, except for Healthcare Social Workers.