Governor's Investment in Technical Education (GIVE) 3.0

Industry 4.0 Apprenticeship Pathway – Blount County

Lead Entity: *Tennessee College of Applied Technology Knoxville*
Fiscal Agent: *Tennessee College of Applied Technology Knoxville*

IN PARTNERSHIP WITH:

Workforce/Economic Development Agency
Blount Partnership

Higher Education Institutions
Tennessee College of Applied Technology Knoxville
Pellissippi State Community College

LEA/School District
Blount County Schools

Employer Partners
Cherokee Millwright
Arconic
Denso

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Funding Requested:
$2,000,000

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Abstract/Project Summary

TCAT-Knoxville, in coordination with Pellissippi State Community College are proposing a Industry 4.0 Apprenticeship Pathway Give 3.0 proposal which will deliver Industrial Maintenance/Mechatronics, Machine Tool and Welding training for students at Blount County Schools, TCAT Knoxville and Pellissippi State Community College. With the new GIVE 3.0 proposal TCAT Knoxville along with educational partners want to duplicate the success of GIVE 2.0 in Anderson County which addressed some of the most pressing workforce-releated needs in the East Tennessee region, including barreier to education and training and a lack of awareness of viable career choices and training options in high-demand CTE fields. The success shown in Anderson County was due to the addition of a College and Career Naviagator which helped to see a 60% increase in dual enrollment from Fall 2022 to Fall 2023.

The Industry 4.0 Apprenticeship Pathway, as part of the GIVE 3.0 Collaborative effort, aims to tackle key workforce challenges in the East Tennessee region. This includes overcoming educational and training access barriers caused by a lack of career and training awareness in in-demand sectors, bridging the gap in early post-secondary education opportunities, enhancing student support services, and aligning educational outcomes with actual workforce demands. The initiative will enhance human resource capabilities, provide broader access to post-secondary educational avenues and registered and industry-recognized apprenticeship programs, promote targeted outreach and awareness efforts, and bolster essential student support services. These efforts are expected to boost enrollment and completion rates in industry certification, technical diploma programs and A.A.S. degrees, particularly in Machine Tool, and Welding training.

This innovative model will meet the high demand for skilled technicians for Industrial Maintenance, Mechatronics, Machine Tool and Welding and is designed to serve both high school and college students from Blount County Schools, Tennesee College of Applied Technology Knoxville and Pellissippi Community College, with a particular focus on reaching underserved groups such as special needs students, English language learners, minority, non-traditional, and economically disadvantaged populations by utilizing existing apprenticeship and pre-apprentice programs throughout Knox and Blount Counties.

Our approach includes three strategic directions:

- expanding and improving career exploration and awareness in primary education
- creating a cohesive and impactful work-based learning continuum from elementary through to post-secondary levels
- broadening access to apprenticeship programs in the manufacturing industry

We are poised to make a significant impact through dual enrollment, internships, recognized apprenticeship programs, early and capstone work-based learning experiences from kindergarten through 12th grade, and active parent and community engagement. The collaboration between the school district, TCAT Knoxville's and Pellissippi State's administration, industry stakeholders, and local workforce development entities will ensure the program's longevity, responding dynamically to the evolving workforce demands.

Section I. Demonstration of Need

Localized Data Demonstrating the Need for Action:

The evolving job landscape, skill requirements, and training necessities in East Tennessee highlight the growing importance of innovation and proactive teamwork. Recent discussions among regional higher education institutions, K-12 education systems, and employers have emphasized the urgent need to expand and enhance the skills of the workforce in manufacturing industries. This is deemed vital for the future prosperity of Blount County. The manufacturing industry represents the largest industry employer in Blount County, with 8,684 jobs and an average annual wage of $72,757, according to the Tennessee Department of Economic & Community Development. The Manufacturing Industry is shown to have the highest employment of any other industry in Blount County. *See Appendix A*

Unique occupations identifies Forging Machine Setters, Operators, and Tenders for Metal and Plastic employees 73. Denso Manufacturing Tennessee, Inc., a grant partner shows to be have the highest number employees in the county at 4,428.. *See Appendix A.*

The 2024 Supply and Demand Report states manufacturing has excelled in growing one of the strongest specialized manufacturing workforces in the country. Since 2019, TNECD has announced nearly 340 manufacturing projects with over 50,800 new job commitments.. Manufacturing occupations are forecasted growth in contrast to the national outlook which predicts a contraction in the sector. Nearly every in-demand occupation in the manufacturing career cluster is key to the success of TNECD's target industry clusters. TCAT Knoxville's GIVE 2.0 Anderson County grant was highlighted in the 2024 Supply and Demand Report where it has addressed skills gaps and the success of career awareness, exploration and preparation programs such as Remake Learning Days giving students opportunities to participate in hands-on

learning as early Kindergarden. *See Appendix C.*

For a detailed list of East Tennessee's high-demand jobs through 2026, refer to *Appendix D*, which includes these occupations and outlines labor market trends and specific local employment needs. The following chart details the demand for jobs directly influenced by the Industry 4.0 Apprenticeship Pathway GIVE 3.0 collaborative initiative.

Occupation Title	Related Technical Training Program	Annual Openings to 2026 in East TN	2020 Median Salary in Tn
Industrial Machinery Mechanics	Industrial Maintenance/Mechatronics	270	$47,212
Machinists	Machine Tool Technology	135	$45,531
Maintenance Workers, Machinery	Industrial Maintenance/Mechatronics	140	$43,495
Welders, Cutters, Solderers, and Brazers	Welding Technology	145	$37,817
Average			**$43,514**

The Drive to 55 initiative, which targets equipping 55% of the state's working-age population with a degree or certificate by the year 2025. As we draw near to this goal, it's imperative for the state to ensure that the credentials being awarded align with the workforce requirements of our local communities.

The Industry 4.0 Apprenticeship Pathway aligns with the three priorities reflected in the 2024 report released by the State collaborative on Reforming Education (SCORE) 1) Expand student opportunity by strengthening foundational policies 2) Build effective pathways between education and careers and 3) Ensure K-12 supports meet student needs. *See Appendix I.*

The Tennessee Department of Economic Development's 2024 Academic Supply report *(see appendix C)* highlights that there are 48 manufacturing jobs currently in high demand, with nine of these facing a critical shortage of skilled workers. These include positions like industrial electronics technicians, industrial mechanics, and maintenance workers. It's essential that we

synchronize our secondary and post-secondary educational programs with the actual needs of employers to bridge these gaps. Smith and Wesson opened it's headquarters in Blount County in 2023 in their 650,000 sq ft headquarters in Maryville. The headquarters is reported to add at least 620 new jobs. The employer partners of this grant employes more than 5,750 who work in the manufacturing industry in Blount County.

Clear Linkages Between Grant Activities and Local Needs:

The GIVE 3.0 Collaborative initiative is set to make a significant, positive impact on the workforce requirements within the East TN region. The partners of GIVE 3.0 have identified the most critical workforce-related challenges in the area, which this initiative aims to address: 1) overcoming barriers to access, such as enhancing understanding and awareness of viable career options in high-demand sectors; 2) the lack of sufficient opportunities for early post-secondary education and training; 3) the need for improved student support services; and 4) the disconnect between educational outcomes and workforce requirements. By introducing vital human resources, broadening access to various post-secondary opportunities, increasing the availability of industry-recognized certification programs, conducting targeted outreach and awareness efforts, providing essential student support services, and creating aligned apprenticeship pathways, the GIVE 3.0 initiative is poised to boost enrollment and completion rates in relevant technical diploma and certification programs, thereby fulfilling employer demands.

Employers, particularly those on the advisory boards of TCAT Knoxville, have consistently highlighted the challenge in finding local workers who possess the necessary technical skills to fulfill their workforce demands. A significant hurdle for students in accessing the education

required for employment stems from a lack of awareness about career paths and the educational programs aimed at equipping them with essential skills. This issue begins early in their educational journey. Both traditional and non-traditional students often encounter financial obstacles that necessitate employment while they strive to achieve their educational objectives. Despite the availability of various academic programs tailored to skill development, their rigidity fails to cater to the unique needs of non-traditional and underserved groups. This disconnect prevents students from engaging in these programs and acquiring the skills employers seek. The Industry 4.0 Apprenticeship Pathways initiative aims to address these issues by synchronizing secondary and post-secondary education with transfer pathways and apprenticeship opportunities at leading local employers.

Apprenticeships have historically provided a pathway for community members to enter the workforce and develop industry-relevant skills. Yet, these programs often operate in isolation, lacking coordination with academic efforts. The creation of ApprenticeshipTN, announced by the Governor, intends to bolster existing apprenticeship programs and ensure they complement the educational offerings at institutions like TCAT. This collaboration, which includes THEC and TBR, aims to enhance apprenticeship prospects and integrate them with TCAT's current programs, thereby elevating the number of skilled professionals in the workforce and opening doors for underrepresented students.

The Knoxville MSA, along with communities nationwide, faces a demographic shift as 24% of its workforce is projected to retire within the next decade. This transition exacerbates the challenge of unfilled positions due to a gap in education and skills.

In February 2024, the Knoxville MSA, inclusive of Blount county, reported 9,467 unique job vacancies, as detailed in the TNECD County Profile Tool Report. *See Appendix A: TNECD County Profile Tool* This figure underscores the critical demand for highly skilled workers in the region, a gap the GIVE 3.0 proposal aims to bridge. Through this initiative, students will have the chance to pursue industry-aligned education and apprenticeships, earn industry-recognized certifications, and effectively narrow the skills divide.

Section 2. Program Plan

Detailed Summary of Proposed Program:

There are four significant strategies/measurable objectives will be utilized as a part of the GIVE 3.0 initiative: S1) enhancing and expanding career pathway programs utilizing a stackable credentials approach; S2) developing and implementing a collaborative, meaningful, and structured work- based learning (WBL) continuum that begins in elementary school and continues through completion of post-secondary credentials; S3) expanding access to industry-recognized certification preparation and testing, including NC3, OSHA, AWS certifications for students and instructors in related programs; S4) creating and expanding access to registered apprenticeship opportunities with local industries.

The GIVE 3.0 initiative will focus on six overarching goals (G) within the Industry 4.0 Apprenticeship Pathway which includes Machine Tool Technology, Industrial Maintenance and Welding Technology:: G1) to enhance/expand career pathways, including expanded capacity in dual enrollment programs; G2) to increase awareness, interest, and preparedness for high-demand career fields; G3) to increase participation in dual enrollment opportunities; G4) to

increase access to and completion of industry-recognized certifications; G5) to increase access to and participation in work-based learning experiences which includes pre-apprenticeships and apprenticeships; and G6) to increase completion of technical diplomas, certificates, and AAS degrees. These goals are in direct relation to the local needs that were identified in the last section. They are part of our four major strategies/measurable objectives for our GIVE 3.0 initiative, providing measurable objectives (MO) for each project phase. You can see that our strategy/measurable objectives, goals, related activities, and accountability structure are embedded in our detailed project timeline included as *Appendix E: Project Timeline*.

Detailed Project Timeline and Overview:

Please see *Appendix E* to review the 48-month timeline showing critical convenings, activities, and actions, which comprises the development and implementation of the grant.

Key Phase Objectives and Measurements

There will be three key phases to the Industry 4.0 Apprenticeship Pathway including Phase One: Planning and Development of the objectives of the grant to ensure all strategies and goals will be met. Phase Two includes the full implementation of grant activities. Phase Three describes the process of the Post-Grant funding. Performance Metrics used for Career Awareness, Career, Exploration, Career Preparation and Career opportunities will be tracked using a monthly report submitted to the grant coordinator. The College & Career Navigator and Apprenticeship Specialist will each report out each month utilizing a Microsoft form to track data that will include the number of participants attending, name of event, type of event, date of event, number of certifications awarded to students, number of dual enrolled students for given semester, number of newly acquired pre-apprentices, apprentices, and number of companies served. S*ee Appendix K.*

Project Governance and Accountability Plan:

In addition to the aforementioned details in *Appendix E*, it includes the accountability, governance, goals, and strategies that each line item that it impacts. TCAT Knoxville is the lead entity and fiscal agent for the proposed GIVE 3.0 initiative and will maintain oversight throughout the project. The college will be responsible for the governance, meeting schedule and facilitation, and the decision-making structure for the project. The college's Strategic Impact Coordinator will serve as the co-project director alongside the College President to ensure that communication, processes, and progress data are accurately and timely reported to the GIVE 3.0 Collaborative.

The project steering committee members will meet quarterly at a partnership meeting to provide grant oversight during the entire grant period. The Project Steering Committee members will include the Director of Workforce Development at Blount Partnership, CTE Supervisor of Blount County Schools, Workforce Development Coordinator of Tennessee College of Applied Technology, Apprenticeship Specialist for Industry 4.0 Apprenticeship Pathway Grant, and representatives from industry partners and a representative from Apprenticeship TN office.

Structure of Work-Based Learning Program:

With the goal of students being better prepared for college and careers, TCAT's Apprenticeship Specialist and the College & Career Navigator will implement a WBL system that broadens student access, deepens learning experiences, and engages the community in a proactive approach to bridging the gap between elementary, middle and high school and/or post-secondary education and high demand, high-skill careers. They will utilize the state's WBL Framework to develop a quality program that includes career awareness, exploration, preparation, and training experiences. The Industry 4.0 Apprenticeship Pathway WBL program was designed to guide participants through sequenced experiences that ensure preparation for the next steps. The program met the state's expectations for structure, coordination, supervision of students, development of personalized learning plans, student assessment, and program evaluation. The expansion of this WBL program in the Industry 4.0 Apprenticeship Pathway grant will emphasis training

experiences such as apprenticeship opportunities. Please see below for an overview of our WBL continuum, which is also embedded in the timeline and specifically addresses our local industry needs. It can also be found in *Appendix F.*

The Apprenticeship Specialist will work with CTE Supervisor of our K-12's school partners in conjunction with our Industry / Business Partners through the Blount Partnership to develop pre-apprenticeship/internship opportunities with students from Blount and Knox Counties. These pre-apprenticeships/internships will align with our WBL continuum providing the student with EPSOs in Industrial Maintenance/Mechatronics, Machine Tool, and Welding Technology that they can use to gain credit-bearing stackable industry credentials that articulate into TCAT Knoxville and Pellissippi State Community College towards certificates, diplomas, or degrees. Please see *Appendix L* to see the articulation pathway between TCAT Knoxville and Pellissippi State Community College within Welding Technology program of study. *Appendix M* contains all signed MOU's utilized to detail the roles, responsibilities of each of the partnering schools, employers and economic development agency. Embedded within the MOU is a copy of the Work Based Activity Agreement that will be signed by the student, company, and college and detailing responsibilities and roles of each.

Section 3. Strength of Partnership

TCAT Knoxville, Pellissippi State, Blount County Schools, Blount Partnership, and the GIVE 3.0 employer partners have maintained solid partnerships for years, collaboratively pinpointing and tackling the region's workforce necessities and skill shortages. The introduction of GIVE 3.0 introduces a renewed emphasis on broadening career pathways and adopting a systematic progression of Work-Based Learning (WBL) experiences into our initiatives.

Detailed Description of Each Partner's Role and Capabilities of Each Mandatory Partner:

Each GIVE 3.0 partner is committed to the goals outlined in this proposal and will be actively involved in all phases of our GIVE 3.0 proposal. Specific project roles, assigned tasks, and related personnel and capabilities of each partner are included in *Appendix P* Memorandum of Understanding (MOU) outlining the partnership agreement from local and area employers and partnering postsecondary institutions. MOUs have been executed that establish an agreement among the GIVE 3.0 partners, outlining each

partner's respective benefits, roles, and responsibilities. *See Appendix M for all partner MOUs.*

Section 4. Budget Plan

Clear Alignment Between Funding Request and Grant Activities:

The attached budget plan reflects nearly 55% of grant funds to be utilized for salaries, benefits, and taxes. The positions in which will be needed to impact the following strategies and goals of this GIVE 3.0 proposal: S1) enhancing and expanding career pathway programs utilizing a stackable credentials approach; S2) developing and implementing a collaborative, meaningful, and structured work- based learning (WBL) continuum that begins in elementary school and continues through completion of post-secondary credentials; S3) expanding access to industry-recognized certification preparation and testing, including NC3, OSHA, certifications for students and instructors in related programs; S4) creating and expanding access to registered apprenticeship opportunities with local industries. G1) to enhance/expand career pathways, including expanded capacity in dual enrollment programs; G2) to increase awareness, interest, and preparedness for high-demand career fields; G3) to increase participation in dual enrollment opportunities; G4) to increase access to and completion of industry-recognized certifications; G5) to increase access to and participation in work-based learning experiences which includes pre-apprenticeships and apprenticeships; and G6) to increase completion of technical diplomas, certificates, and AAS degrees.

Apprenticeship Specialist who will be responsible for creating individualized apprenticeships and pre-apprenticeships that will prepare students for work in high-need fields by building relationships with a local employers within the Blount and Knox Counties with the intent to create apprenticeships and pre-apprenticeships opportunities for students. To collaborate closely with TCAT Knoxville, Pellissippi State Community College, Blount Partnership, and Blount County Schools, to identify career pathways for creating a sustainable pipeline through apprenticeship and transfer pathways.

The College & Career Navigator role functions and responsibilities include program planning, development, reporting and evaluation of Career Awareness, Exploration and Preparation of students K through 12th.

The instructor salaries for Machine Tool and Welding allow for the expansion of dual enrollment programs in Blount County Schools which aids in meeting all the strategies and goals of the grant.

The Professional Fee, Grant & Award category includes work-based stipends. All funds in this category will be used to meet the following goals G1) to enhance/expand career pathways, including expanded capacity in dual enrollment programs; G2) to increase awareness, interest, and preparedness for high-demand career fields; G5) to increase access to and participation in work-based learning experiences which includes pre-apprenticeships and apprenticeships.

The Supplies budget will be used to fund Tammy and Tommy TCAT Career Camps, Remake Learning Days, Lab in a Box, Dream it, Do it, CTE Career Nights, consumables needed in machine tool technology and welding technology labs, in addition to any marketing needs for the events that support Strategies 1) enhancing and expanding career pathway programs utilizing a stackable credentials approach; 2) developing and implementing a collaborative, meaningful, and structured work- based learning (WBL) continuum that begins in elementary school and continues through completion of post-secondary credentials.

Travel, Conferences and Meeting budget will fund SkillsUSA travel for secondary and post-secondary students participating in Machine tool, Industrial Maintenance, and welding competitions at the state and national level. SkillsUSA promotes leadership opportunities for all students, and this aligns with G2) to increase awareness, interest, and preparedness for high-demand career fields.

Role of proposed equipment request

The equipment included in the GIVE 3.0 budget is tied to employment and training needs to expand training opportunities to secondary and post-secondary students. Employer partners and other industry representatives have shared the need of additional welding training which would include expansion of available booths so that additional students can be trained. In addition to the welders needed for that expansion the employers have expressed the need for plasma cutters and RMD welding machines. The RMD machines. RMD welders stands for regulated metal deposition which is a process variant of gas metal arc welding (GMAW) and was developed with the aim to effectively control the metal transfer in the short-circuiting mode. Machine Tool Technology will need upgraded Lathes to stay abreast of industry standards. These types of machines are being used in local industry and skilled workers are being highly sought after. A van is needed to transport students from Eagleton College and Career Academy as the school offers a hybrid class schedule to offer flexibility in scheduling to students who need employment while attending school. It will also serve students from Samuel Everett School of Innovation which where the student learning is done from home. These two schools which will primarily utilize the handicap accessible van have approximately 600 students enrolled. 19% of which are economically disadvantaged and 12% are identified as having disabilities. The purchase of this equipment aligns with all the strategies and goals of this GIVE 3.0 proposal. *See Appendix B*

Explanation of Anticipated Indirect Costs:

Indirect expenses for GIVE 3.0 of 8% of the total grant award will go to TCAT Knoxville's general budget to cover GIVE 3.0 administration and facilitation expenses. This includes salaries costs incurred by grant director to maintain monthly, quarterly, annual grant meetings, preparing and maintaining GIVE 3.0 documentation for budget, metrics, narratives, and oversight of all grant deliverables.

Section 5. Sustainability

Plan for Sustaining the Program Beyond the 48-month Funding Period:

As enrollment dictates, TCAT Knoxville will sustain this initiative through the following:

- Absorb the cost of the Apprenticeship Specialist
- We will continue to support the technology, equipment, maintenance, and consumables for the post-secondary programs
- Providing professional development opportunities for post-secondary staff members

Based on enrollment demand, Blount County Schools will sustain the initiative through the following:

- Absorb the cost of the College and Career Naviagator
- Providing classroom and lab space, utilities, curriculum materials, and internet connectivity
- Providing other funding sources for secondary equipment, maintenance, and consumables
- Providing opportunities for teacher professional development
- Pursuing additional grant opportunities that align with this initiative

All educational institutions, Blount Partnership and industry partners will continue participating in an annual advisory committee meeting. The program's training, equipment needs, industry certification credentials, and work-based learning plans will be updated based on industry feedback and labor market demands. Industry partners have committed to supporting the program by providing work-based learning opportunities as long as there is a sustained demand in the labor market.

Plan for Maintaining Communication and Sharing Resources Among Program Partners:

Communication and sharing of resources among program partners will continue beyond the grant period. The partners have a longstanding history of working together to identify and address local workforce needs and skills gaps, and they will continue to do so.

Availability of Long-term Resources to House, Maintain, Repair Equipment:

Upkeep of equipment will be the responsibility of each partner who receives it. The equipment will be

housed on those campuses, and they will be responsible for including the equipment in the school's regular maintenance and inspection schedules.

Commitment/Strategy to Maintain a GIVE-developed WBL Program:

The college and project partners are committed to maintaining the GIVE 3.0 WBL program beyond the 48-month funding period. Once implemented, the WBL activities will become a regular part of the calendars for our employer partners, college faculty and staff, and the High School's EPSO emphases. Our WBL program will be continued because all partners will see the value it adds to our community and workforce.

Section 6. Economic Status Acknowledgement:

High Demand Programs

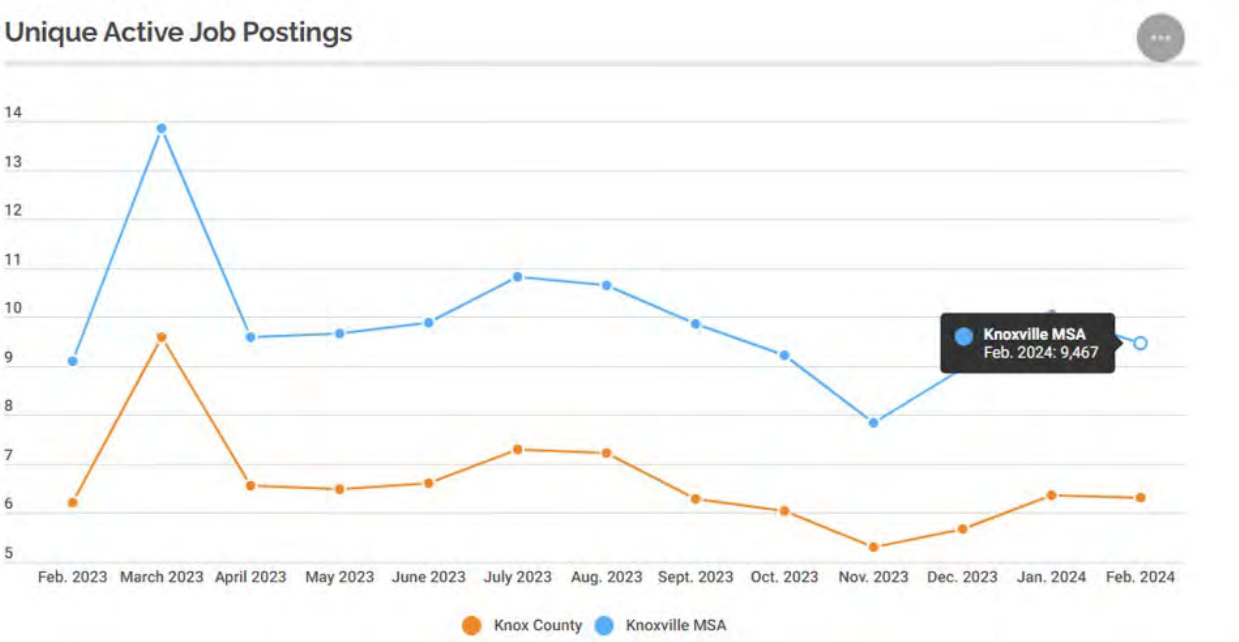
The proposed Industry 4.0 Apprenticeship Pathway targets Buffing Machine Tool Setters, Operators, and Tenders, SOC 51-4033; Welding, Cutters, Solders and Brazers, SOC 51-4121 as defined in the THEC Academic Supply for Occupational Demand Report. The reports states that over 1,300 high school graduates concentrated in Welding in 2021-22 and over half of those graduates were found in employed in Tennessee. In 2022-23, high schools offered four programs of study: Industrial Maintenance, Mechatronics, Welding, and Machining Technology. *See Appendix C and Appendix H*

Census Tracts in Persistent Poverty

The proposed Industry 4.0 Apprenticeship Pathway directly impacts students enrolled in Blount County Schools as they reside in a Persistent Poverty Cenus Tract as defined by the U.S. Census Bureau. *See Appendix H*

Appendices

Appendix A: TNECD County Profile Tool for Blount County



BLOUNT COUNTY

Population & Demographics

POPULATION & DEMOGRAPHICS

LOCATION

Time Zone	Eastern Time Zone
Grand Division	East Tennessee
Area (Square Miles)	558.8
County Seat	Maryville
Metropolitan Area	Knoxville, TN
ECD Region	East

POPULATION

Population *(2010)*	123,010
Population *(2020)*	135,280
Population Change *(2010 - 2020)*	10.00%
Population Forecast *(2040)*	156,579
Foreign Born Population	3,892

RACE (PERCENTAGE OF POPULATION)

White Alone	93.10%
Black or African American, alone	2.60%
American Indian And Alaska Native, alone	0.10%
Asian, alone	0.80%
Native Hawaiian or Other Pacific Islander, alone	0.10%

Foreign Born Persons (Percentage of Population)	3.00%
Language Other Than English Spoken At Home	3.70%
Civilian Veteran Population	10,255

Some Other Race, alone	0.30%
Two or More Races	2.90%
Hispanic or Latino	3.50%

AGE (PERCENTAGE OF POPULATION)	**MALE**	**FEMALE**	**TOTAL**
Under 5 Years Old	5.10%	4.80%	5.00%
Under 18 Years Old	21.10%	19.30%	20.20%
18-64 Years Old	60.20%	59.10%	59.60%
65 Years and Over	18.70%	21.60%	20.20%
Median Age	42.6	45.2	43.9

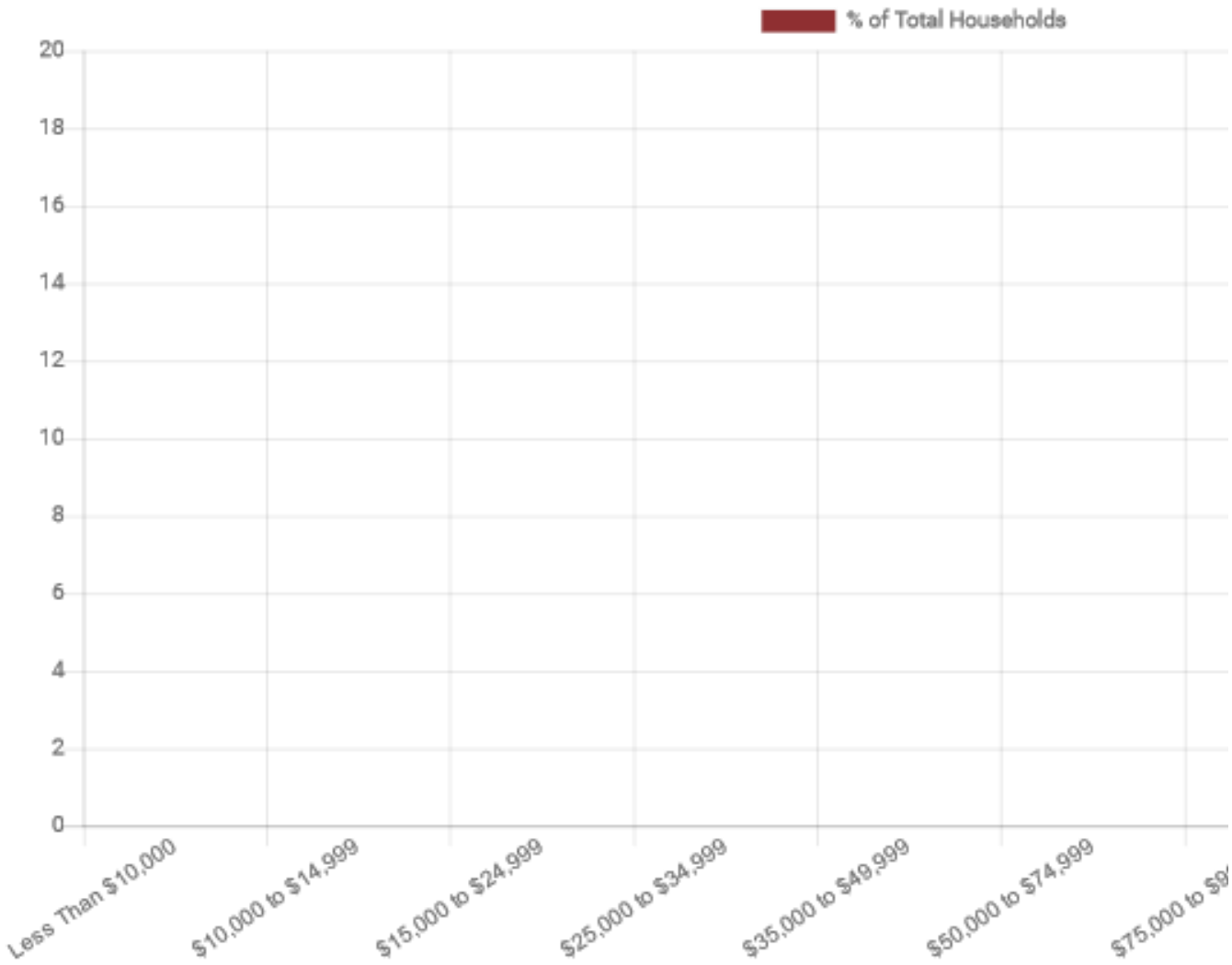
Sources:
U.S. Census Bureau, 2015-2019 5-Year American Community Survey
U.S. Census Bureau, 2019 Annual Population Estimates
U.S. Bureau of Labor Statistics
Tennessee State Data Center (2022)

HOUSING & INCOME

HOUSING & INCOME	
Households	51,274
Homeownership Rate	76.60%
Persons Per Household	2.53
Living In Same House 1 Year & Over	90.50%
Median Home Value	$192,800
Annual Home Sales	1,922
Median Sale Price of Homes Sold	$336,500
Persons In Households With Income Below Poverty Level	9.70%
Total Personal Income	$7.2B
Personal Income Per Capita	$52,596
County Median Wage	$19.13

HOUSEHOLD INCOME & BENEFITS	PERCENT OF HOUSEHOLD
Less Than $10,000	5.00%
$10,000 to $14,999	3.90%
$15,000 to $24,999	8.60%
$25,000 to $34,999	9.90%
$35,000 to $49,999	14.30%
$50,000 to $74,999	19.30%
$75,000 to $99,999	14.40%
$100,000 to $149,999	15.10%
$150,000 to $199,999	5.40%
$200,000 or More	4.10%
Median Household Income	$60,301

PERCENTAGE OF HOUSEHOLDS BY INCOME RANGE



Sources:
U.S. Census Bureau, 2016-2020 5-Year American Community Survey
Tennessee Housing Development Agency (2022)
U.S. Bureau of Economic Analysis (2021)
Economic Modeling Specialists Intl. (2022)

TAX STRUCTURE

PROPERTY TAX

Property Tax Rate (County)	$2.47
State Property Tax	None
Assessment Ratio: Residential Property	25%
Assessment Ratio: Farm Property	25%
Assessment Ratio: Commercial/ Industrial Property	40%
Assessment Ratio: Public Utility Property	55%
Assessment Ratio: Business Personal Property	30%

STATE TAX

State Income Tax on Wages	None
State Income Tax: Interest from Bonds and Notes and Dividends from Stock	None (Hall Income tax was fully repealed January 1, 2021)
Excise Tax (State)	6.5% of Tennessee taxable income

SALES TAX

State Sales Tax Rate	7.00%
County Sales Tax Rate	2.75%
Local Sales Tax Collections *(FY 2021)*	$79,420,010
Local Sales Tax Collections *(FY 2020)*	$66,673,332
Local Sales Tax Collections Growth *(FY 2020 - FY 2021)*	19.12%

STATE BOND RATINGS

Moody's	Aaa
Standard & Poor's	AAA
Fitch	AAA

DEBT PER CAPITA

State Debt per Capita	$992 (Lowest in U.S.)
County Debt Per Capita	$1,026

Franchise Tax (state)	0.25% of the greater of net worth or real and tangible property in Tennessee. The minimum tax is $100.
Unemployment Insurance Tax (state)	2.7% of the first $7,000 in wages for new employers

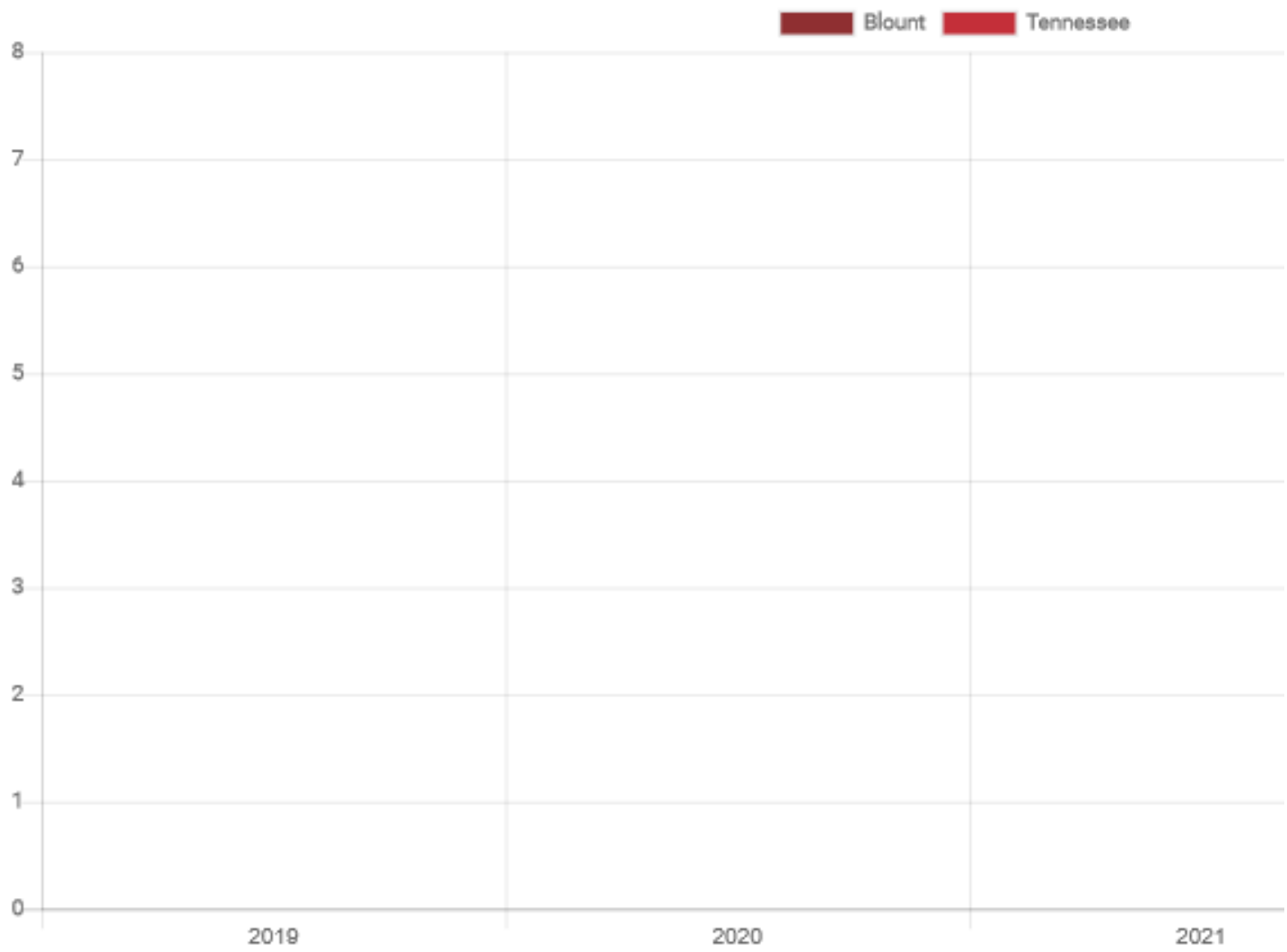
Sources:
Tennessee Comptroller of the Treasury (2022)
Tennessee Department of Revenue (2022)
The Tax Foundation (2022)

LABOR FORCE

LABOR FORCE ESTIMATES (2022)	TENNESSEE	BLOUNT
Labor Force	3,352,030	65,542
Employment	3,238,559	63,500
Unemployment	113,471	2,042
Unemployment Rate	3.40%	3.10%

UNEMPLOYMENT RATE*	TENNESSEE	BLOUNT
2019	3.30%	3.10%
2020	7.50%	6.40%
2021	4.50%	3.60%
2022	3.40%	3.10%

UNEMPLOYMENT RATE (BY PERCENTAGE)



Sources:
U.S. Bureau of Labor Statistics

INDUSTRIES

INDUSTRY	EMPLOYMENT	ESTABLISHMENTS	AVG. ANNUAL WAGES
Crop and Animal Production	44	9	$26,722
Mining, Quarrying, and Oil and Gas Extraction	31	1	$70,161
Utilities	82	8	$78,959
Construction	2,986	323	$58,754
Manufacturing	8,684	134	$72,757
Wholesale Trade	2,284	201	$83,928
Retail Trade	6,662	394	$45,615
Transportation and Warehousing	1,611	94	$49,483
Information	591	87	$117,816
Finance and Insurance	2,005	192	$76,233
Real Estate and Rental and Leasing	623	101	$37,277
Professional, Scientific, and Technical Services	2,906	334	$77,547
Management of Companies and Enterprises	764	20	$129,023
Administrative, Support, Waste Management and Remediation	3,500	195	$41,312
Educational Services	913	46	$36,838
Health Care and Social Assistance	4,055	287	$67,050

Arts, Entertainment, and Recreation	288	28	$21,505
Accommodation and Food Services	5,875	225	$26,601
Other Services (except Public Administration)	1,535	206	$48,982
Government	7,618	61	$50,196
Total	**53,071**	**2,953**	**$57,149**

UNIQUE OCCUPATIONS*	EMPLOYMENT	LOCATION QUOTIENT*
Pourers and Casters, Metal	107	43.33
Foundry Mold and Coremakers	73	14.07
Forging Machine Setters, Operators, and Tenders, Metal and Plastic	42	9.09
Fiberglass Laminators and Fabricators	60	8.34
Engine and Other Machine Assemblers	148	8.26

KEY CLUSTER	TOTAL EMPLOYMENT
Advanced Materials	16
Aerospace & Defense	499
Appliances & Electrical	45
Automotive	4,025
Business Services	2,672
Chemicals	43

Distribution & Logistics	2,419
Film, Music & Entertainment	59
Food & Beverage	101
Healthcare & Medical Devices	375

TOP EMPLOYERS

TOP COUNTY EMPLOYERS	ESTIMATED EMPLOYEES	CITY
Denso Manufacturing Tennessee, Inc.	4,428	Maryville
Blount Memorial Hospital, Inc.	2,060	Maryville
Blount County Board of Education	1,694	Maryville
Arconic Inc.	1,052	Alcoa
Blackberry Farm	1,000	Walland
Vanderbilt Mortgage & Finance	994	Maryville
Clayton Homes, Inc.	750	Maryville
Blount County Government	606	Maryville
Newell Brands Inc.	561	Maryville

TRANSPORTATION & LOGISTICS

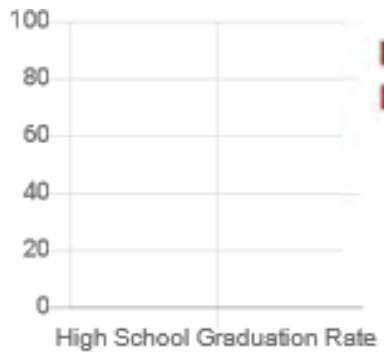
TRANSPORTATION	
Nearest Commercial Service Airport	McGhee Tyson (Knoxville)
Distance to Nearest Commercial Service Airport	4
Daily Flights At Nearest Commercial Service Airport	79
Nearest General Aviation Airport	McGhee Tyson (Knoxville)
Distance to Nearest General Aviation Airport	4.4
Runway Length at Nearest General Aviation Airport	10,000'
Mean Travel Time to Work (Minutes)	25.5
Access of Interstate	I-140
U.S. Highways	129, 321, 411
State Highways	33, 35, 71, 72, 73, 115, 162, 333, 334, 335, 336, 337, 446, 447
Nearest Port (From County Seat)	Lenoir City
Railroads Serving County	CSX, NS

Sources:
Tennessee Department of Transportation
U.S. Census Bureau, 2016-2020 5-Year American Community Survey

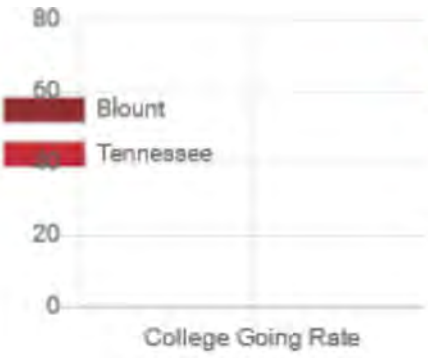
EDUCATION

GENERAL STATS	BLOUNT	TENNESSEE
Population Aged 25-64 With High School Degree Or Higher	90.70%	89.50%
Population Aged 25-64 With Associate's Degree Or Higher	34.60%	36.70%
Population Aged 25-64 With Bachelor's Degree Or Higher	24.60%	28.70%
High School Graduation Rate	95%	89%
College Going Rate	60.30%	63.40%
Average ACT Score	21.4	20.2

HIGH SCHOOL GRADUATION RATE



COLLEGE GOING RATE



AVERAGE ACT SCORE

BLOUNT COUNTY SCHOOLS	ENROLLMENT
Elementary Schools	4,864
Middle Schools	2,302

High Schools	3,158

ALCOA CITY SCHOOLS	ENROLLMENT
Elemetary Schools	834
Middle Schools	458
High Schools	571

MARYVILLE CITY SCHOOLS	ENROLLMENT
Elemetary Schools	2,201
Middle Schools	1,185
High Schools	1,569

REGIONAL HIGHER EDUCATION INSTITUTIONS	CITY	ENROLLMENT
Maryville College	Maryville	1,196
The University of Tennessee-Knoxville	Knoxville	31,201
Pellissippi State Community College	Knoxville	10,396
Tennessee College of Applied Technology-Knoxville	Knoxville	1,914
Johnson University	Knoxville	1,140
Hiwassee College	Madisonville	283

Sources:
U.S. Census Bureau, 2017 1-Year American Community Survey,
U.S. Census Bureau, 2013-2017 5-Year American Community Survey
Tennessee Department of Education (2017-2018)

National Center for Education Statistics (2016-2017)
Tennessee Higher Education Commission
† Regional higher education institutions include those within the selected and surrounding counties.

HEALTH & PUBLIC SAFETY

DOCTORS	
Number of Doctors	284

OVERWEIGHT & OBESITY PREVALENCE	
Adults*	8.90%
Children (Grade 8)**	38.50%

REGIONAL HOSPITALS	NUMBER OF BEDS	CITY
Blount Memorial Hospital	199	Maryville
Peninsula Hospital	94	Louisville
The University of Tennessee Medical Center	685	Knoxville
Fort Sanders Regional Medical Center	365	Knoxville
Parkwest Medical Center	323	Knoxville
Tennova Healthcare-Turkey Creek Medical Center	111	Knoxville
Tennova Healthcare-North Knoxville Medical Center	107	Powell
East Tennessee Children's Hospital	95	Knoxville
LeConte Medical Center	77	Sevierville
Sweetwater Hospital Association	59	Sweetwater
Knoxville Rehabilitation Hospital	57	Knoxville
Select Specialty Hospital-Knoxville	35	Knoxville

Select Specialty Hospital-North Knoxville	33	Powell

Sources:
Tennessee Department of Health (2014)
Tennessee Bureau of Investigation (2014)
† Regional hospitals include those within the selected and surrounding counties.

CLIMATE

CLIMATE	
Average High Temperature	69.8°F
Average Low Temperature	48.3°F
Average Annual Temperature	59°F
Annual Rainfall	60.59"
Elevation (at County Seat)	980'
Prevailing Winds	Southwest

Sources:
National Oceanic and Atmospheric Administration (2023)

COMMUNITY INFORMATION

ALCOA	
Population (2020)	9,561
Charter Type	Private Act
Local Option Sales Tax Rate	2.75%
City Property Tax Rate	$2.27
Phone Number	(865) 380-4700
Retire Tennessee Participant	No

Tennessee Downtowns Participant	No
Main Street Participant	No

FRIENDSVILLE

Population (2020)	847
Charter Type	Private Act
Local Option Sales Tax Rate	2.75%
Phone Number	(865) 995-2831
Retire Tennessee Participant	No
Tennessee Downtowns Participant	No
Main Street Participant	No

LOUISVILLE

Population (2019)	4,133
Charter Type	General Law Mayor-Alderman
Local Option Sales Tax Rate	2.75%
Phone Number	(865) 681-1983
Retire Tennessee Participant	No
Tennessee Downtowns Participant	No
Main Street Participant	No

MARYVILLE

Population (2020)	28,974
Charter Type	Private Act
Local Option Sales Tax Rate	2.75%
City Property Tax Rate	$2.27
Phone Number	(865) 273-3900
Retire Tennessee Participant	No
Tennessee Downtowns Participant	No
Main Street Participant	Yes

ROCKFORD

Population (2020)	759
Charter Type	General Law Manager-Commission
Local Option Sales Tax Rate	2.75%
Phone Number	(865) 970-9665
Retire Tennessee Participant	No
Tennessee Downtowns Participant	No
Main Street Participant	No

TOWNSEND

Population (2020)	358

Charter Type	Private Act
Local Option Sales Tax Rate	2.75%
Phone Number	(865) 448-6886
Retire Tennessee Participant	No
Tennessee Downtowns Participant	No
Main Street Participant	No

ADDITIONAL COMMUNITY INFORMATION

ThreeStar Certified County	Yes

Sources:
Tennessee Municipal Technical Advisory Service
Tennessee Department of Revenue (2015)
Tennessee Comptroller of the Treasury (2015)
U.S. Census Bureau, 2010-2014 5-Year American Community Survey

Appendix B: Budget

GRANT BUDGET				
GIVE Program Competitive Grant				
The grant budget line-item amounts below shall be applicable only to expenses incurred during the following				
Applicable Period:	BEGIN: July 1, 2024	END:	June 30, 2028	
POLICY 03 Object Line-item Reference	EXPENSE OBJECT LINE-ITEM CATEGORY 1	GRANT CONTRACT	GRANTEE PARTICIPATION	**TOTAL PROJECT**
1, 2	Salaries, Benefits & Taxes	$1,095,200	0.00	**$1,095,200**
4, 15	Professional Fee, Grant & Award 2	$40,000	0.00	**$40,000**
5, 6, 7, 8, 9, 10	Supplies, Telephone, Postage & Shipping, Occupancy, Equipment Rental & Maintenance, Printing & Publications	$290,000	0.00	**$290,000**
11, 12	Travel, Conferences & Meetings	$60,000	0.00	**$60,000**
13	Interest 2	0.00	0.00	**0.00**
14	Insurance	0.00	0.00	**0.00**
16	Specific Assistance to Individuals	0.00	0.00	**0.00**
17	Depreciation 2	0.00	0.00	**0.00**
18	Other Non-Personnel 2	0.00	0.00	**0.00**
20	Capital Purchase 2	$366,720	0.00	**$366,720**
22	Indirect Cost	$148,080	0.00	**$148,080**
24	In-Kind Expense	0.00	0.00	**0.00**
25	**GRAND TOTAL**	**$2,000,000**	**0.00**	**$2,000,000**

Appendix C: THEC Academic Supply and Occupational Demand Report

ACADEMIC SUPPLY FOR OCCUPATIONAL DEMAND REPORT

2024

TN Economic & Community Development

TN Department of Education

TN Department of Labor & Workforce Development

THEC TSAC

Table of Contents

Executive Summary

The *Improving the Pipeline for Tennessee's Workforce: 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 K12 and postsecondary graduates to employment data in P20 Connect.

This year's report maintains the Career Cluster structure, grouping occupations and aligned training programs in one place. Accompanying dashboards and data downloads are also available for readers who prefer to work with the data directly.

Multiple state agencies facilitate this report's completion and there are many audiences for this report. Each year, efforts to refine and improve the report and associated outputs will continue to ensure the report is useful in education and workforce planning.

This Report:

- Identifies in-demand occupations and aligned academic programs at the postsecondary and secondary levels and registered apprenticeships organized across 14 career clusters.
- Includes in-demand occupations tables identifying the region(s) where the occupation is in-demand, entry level wages, indicators for jobs which are in STEM fields and those which support TNECD's target industries, and the typical training level required for employment.
- Contains aligned academic programs tables with information about degree production and completers, matriculation into Tennessee's job market, and first-year wages for those identified in Tennessee employment data.
- Captures select agency initiatives promoting education and workforce alignment in K12, higher education, and the workforce.

In-Demand Occupations and Aligned Academic Program Highlights

The Tennessee Department of Labor and Workforce Development (TDLWD) has established a threshold to identify where there is demand for trained individuals but few or no aligned training programs. This section identifies academic programs where Tennessee employment rates are 60 percent or higher[1] and confer wages exceeding the state median wage of $39,929 in 2022. 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

14 In-Demand Occupations | **33** Aligned Academic Programs

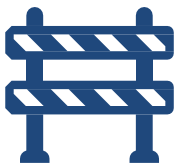
Veterinarians are **in demand** in two regions in Tennessee. In 2021-22, 84 Doctor of Veterinary Medicine (DVM) degrees were granted with estimated first-year wages of $97,618, outpacing other graduates in this cluster. Nearly half of DVM graduates (45 percent) are working in the state, a larger share than in the previous year. Occupations in-demand in more than four regions in the state include supervisors of landscaping workers, landscaping workers, and veterinary technologists/technicians.

Supply: The Environmental and Natural Resources Policy master's degree program had the second highest salaries in this cluster. Several programs had high employment rates, including bachelor's degree programs in environment and natural resources management and policy (85 percent), veterinary sciences (66 percent), and environmental studies (74 percent). Veterinary technology/technician programs at the associate degree (80 percent) and one-to two- year certificate (75 percent) level also had high rates of employment. High school CTE programs in agribusiness, food technology and processing and horticulture

[1] Employment data comes from Tennessee's Unemployment Insurance (UI) records which do not capture individuals who are not covered in UI data or who work out of state.

science had more than half their concentrators employed in Tennessee with wages higher than the state median wage.

Unmet needs: Across the state, needs exist for veterinary technologists and technicians and landscaping supervisors.



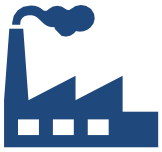
Architecture and Construction

27 In-Demand Occupations | **38** Aligned Academic Programs

With Tennessee's economy continuing its growth and with historically low unemployment rates, architecture and construction workers across the board are **in-demand**. Of the 27 occupations identified, 10 are in-demand in six of nine local workforce development areas (LWDAs).

Supply: Of all clusters, program completers in this cluster have some of the highest rates of employment in Tennessee. Eleven of the 18 postsecondary programs have employment rates of 60 percent or more, with six programs exceeding 70 percent. The highest employment rates are for the 1–2-year certificate programs for HVAC (75 percent), electrician (73 percent), and electrical and power transmission installation/installers (72 percent).

Other programs meeting the **unmet need** criteria in this cluster are electrician (<1 year certificate) and plumbing technology (1-2-year certificate). Meeting this workforce challenge is complicated by the low entry level wages. Only five in-demand occupations in this cluster have wages exceeding the state median: telecommunications line installers, plumbers, brick and block masons, and construction managers and supervisors.



Manufacturing

48 In-Demand Occupations | **37** Aligned Academic Programs

There are 48 manufacturing occupations identified as **in-demand**. There are several occupations in-demand in eight or more LWDAs, but only one confers a typical entry level wage more than the state median, first line supervisors of production and operating workers. All in-demand occupations in this cluster except coating, painting, and spraying workers require a high school education or the equivalent corresponding with wage levels below the state median.

Fifteen postsecondary programs with 10 or more completers **addressed training needs** for in-demand occupations in the manufacturing sector and all but three had rates of employment in Tennessee greater than 60 percent. The bachelor's degree in electromechanical engineering technology/technician ($74,667) and 1-2-year certificate completers in industrial mechanics and maintenance technology ($57,663) had high wages in this cluster. Nine aligned academic programs meet the **unmet need** criteria, including: industrial electronics technician (1–2-year certificates), industrial mechanics, maintenance workers (<1 year and 1-2-year certificates), and operations maintenance and supervision (<1 year certificate).

Transportation

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

Tennessee is a leading state in transportation, distribution, and logistics, and the need for additional workers is widespread. Of the 18 **in-demand** occupations, half are in demand in eight or nine of the LWDAs. Typical educational training requirements for occupations in this cluster are high school or the equivalent. Occupations requiring additional training include automotive service technicians and mechanics and heavy and tractor-trailer truck drivers.

Supply: The master's degree in supply chain management confers the highest wages for aligned programs in this cluster ($90,629). <1-year and 1-2-year certificate programs in this cluster had employment rates of 60 percent or more. Postsecondary supply in this cluster is supported by 2,592 high school CTE concentrators and 40 apprenticeship completers. High school CTE programs in automobile mechanics and autobody collision and repairs had higher median wages than postsecondary certificate programs. Additional workers with high school level training only are needed in the Transportation cluster.

Several programs meeting the **unmet need** criteria include short-term certificate programs for diesel mechanics, truck and bus drivers, and logistics, materials, and supply chain management.

Business, Finance and Government Management and Support Services

50 In-Demand Occupations | **135** Aligned Academic Programs

Of the 50 occupations **in demand** in this cluster, 11 are in demand in all nine of Tennessee's LWDAs. There are 128 postsecondary, five high school CTE, and two apprenticeship programs to **supply** these occupational needs. Multiple in-demand occupations are supported by programs that meet **unmet need** thresholds, including general and operations managers, human resources managers, management analysts and market research analysts, accountants and auditors, bookkeeping, accounting, and auditing clerks, customer service representatives, and human resources assistants.

Sales and Marketing

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

There are five occupations **in-demand** in seven or more LWDAs and only one, sales managers and technical sales representatives, requires a bachelor's degree; the others typically require a high school degree only. Eight postsecondary, two high school CTE programs, and one new apprenticeship program provided **training** for these occupations. Notably, high school CTE concentrators found in Tennessee employment data were earning first-year wages comparable to the state median.

The bachelor's degree in marketing/marketing management which provides training for sales managers and the e-commerce master's degree program met **unmet need** criteria with high Tennessee employment rates and wages above the state median.

Health Sciences

28 In-Demand Occupations | **81** Aligned Academic Programs

Healthcare and social assistance is expected to be the largest industry in Tennessee by 2030, with employment of healthcare practitioners and support workers expected to increase by more than 63,500.[2] Of the 28 **in-demand** occupations in Tennessee's LWDAs, six were in demand in eight or more areas. There are significant shortages of registered nurses, as measured by job openings, though there is not in evidence across all LWDAs which may be a limitation of our methodologies. Typical training levels for in-demand occupations in the Health Sciences cluster include bachelor's and higher, postsecondary nondegree awards, and associate or high school degrees.

There are many aligned academic programs **supplying** in-demand health sciences occupations. Completers in the health sciences have some of the highest employment rates

[2] Tennessee Department of Labor and Workforce Development. Tennessee's Economy, 2022-2023, p. 15.

of any career cluster. Licensed practical nurses (LPNs) graduated from 1-2-year certificate programs with employment rates of 77 percent and median wages of $47,280; physical therapist assistants in associate degree programs had employment rates of 81 percent and median wages of $42,700. LPNs and physical therapy assistants are **needed** in all LWDAs. There are several programs that meet unmet need criteria and more information can be found in the aligned academic supply tables.

Human Services

11 In-Demand Occupations | **62** Aligned Academic Programs

In Tennessee, employment in community and social service occupations is projected to grow by nearly 8,000 jobs from 2020 to 2030 and personal service jobs are expected to grow by nearly 25,000.[3] The pandemic shed new light on the need to expand behavioral health for adults and children. Social and human services assistants, requiring a high school degree, are **in-demand** in seven of the nine regions of Tennessee. Healthcare social workers and educational, guidance, and career counselors and advisors are in-demand in six regions.

A total of 62 postsecondary programs **provide training** related to in-demand occupations in the human services cluster, including the high school CTE program in human development and family studies and the certificate program in substance abuse and addiction counseling. Few postsecondary programs in this cluster have high placement and wages above the state median. The cosmetology certificate programs have employment just over 50 percent, but median wages are low; high school CTE median wages for cosmetology are nearly twice as high as those of the certificate programs.

Education and career counselors' programs meet the **unmet need** threshold and are available at the master's (69 percent employed, $48,510 annual median wage) and education specialist (77 percent employed, $46,295 median wage) degree levels. Social workers have master's degree and post-baccalaureate certificate programs available, with employment rates of 62 percent or more and wages above the state median. The family and community services post-baccalaureate certificate program has the highest employment rate of all aligned academic programs in the cluster.

[3] Tennessee Department of Labor and Workforce Development. Tennessee's Economy, 2022-2023, p. 15.

Education and Training

7 In-Demand Occupations | **73** Aligned Academic Programs

The education and training career cluster includes educators, administrators, librarians, counselors, and other learning support services as **in-demand** in Tennessee. Successful teacher recruitment and retention are essential for a high-quality education workforce; however, teacher shortages remain a challenge. The limitations of the report's current methodology led to an underestimation of the demand for teachers, and therefore, some teacher positions are not listed as an in-demand occupations in the report. Preschool teachers are in demand in four areas of the state.

Childcare challenges are currently impacting workforce participation in the state and the nation. A recent study in one state found that 28 percent of those surveyed said "they or someone in their household has left a job, not taken a job, or greatly changed jobs because of problems with childcare in the last 12 months.[4]

Tennessee's teacher apprenticeship program is a new and innovative way to improve the **supply** of Tennesseans in the teaching profession. The program had 28 completers in 2022. Several aligned academic programs in this cluster meet **unmet need** criteria, including the bachelor's degree in early childhood education which had an employment rate of 74 percent and median pay of nearly $43,000. The master's degree program in library and information science had an employment rate of 54 percent and a first-year median wage of $50,180.

[4] Missouri Chamber of Commerce, Nov. 30, 2021. New Research Shows Missouri Loses $1.35 Billion in Annual Economic Opportunity Due to Childcare Gaps - Missouri Chamber (mochamber.com)

Protective Services and Law

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

The protective services and law cluster includes occupations focused on providing legal, public safety, and protective services. Corrections officers and jailers and security guards are **in demand** in three regions of the state.

Supply for these occupations typically requires a high school degree or the equivalent. High school CTE programs across the state had 2,575 concentrators in corrections; 52 percent of them obtained employment at wages about $1,000 less than the state median wage. There are hundreds of vacancies for correctional officers in the state that could be filled with high school concentrators in the corrections program.

Programs with employment rates of 60 percent or more and earnings greater than the state median wage, considered **unmet need**, included the master's degree program in criminal justice/law enforcement administration, and the <1-year certificate and the associate degree program in criminal justice/police science.

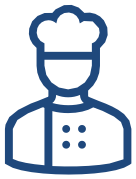
Arts and Communications

8 In-Demand Occupations | **73** Aligned Academic Programs

The Arts & Economic Prosperity 5 Study finds the nonprofits arts and culture sector is a $1.17 billion industry in Tennessee, supporting over 38,000 full-time equivalent jobs. **In-demand** occupations in three or more areas include graphic designers, printing press operators, and editors.

The program **supplying** graphics design at the bachelor's degree level had an employment rate of 56 percent and salary less than the state median. Editors can work in a variety of fields and the bachelor's degree in journalism had an employment rate of more than 60 percent and wages below $35,000.

Higher rates of pay could induce more individuals into these occupations. Just two programs met the **unmet need** criteria: the master's degree in mass communication and the post-baccalaureate certificate in educational and instructional technology. Individuals with education technology skills are increasingly in demand as online learning has expanded at the elementary, secondary, and postsecondary levels.



Leisure and Recreation

13 In-Demand Occupations | **29** Aligned Academic Programs

In Tennessee, the arts, entertainment, and recreation industries are expected to have five percent annual growth from 2020 to 2030, while accommodation and food services employment will grow by three percent.[5] Most of the **in-demand** occupations in the leisure and recreation cluster require only a high school degree or the equivalent. Food service managers, supervisors of housekeeping and janitorial workers, exercise trainers, and pest control workers are in-demand in all LWDAs in the state. Chefs and head cooks, coaches and scouts, and food service supervisors are in-demand in seven areas.

There are training opportunities to **supply** these in-demand occupations, though wages are low for program completers. Culinary arts/chef training is available at the associate degree and certificate level, as well as high school CTE and apprenticeship levels. Employment rates for all are above 60 percent.

The situation is similar with the hotel/motel management programs. Without increasing wages or developing pathway opportunities, vacancies for food service managers and supervisors, chefs and head cooks, and housekeeping supervisors will likely remain **unmet**. Pest control workers are needed in all nine LWDAs and may require training programs to increase the workforce.

[5] Tennessee Department of Labor and Workforce Development, WIRED, Long Term Industry Projections 2020-2030

Information Technology

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

Information technology (IT) occupations are **in demand** in Tennessee and across the nation. IT occupations are projected to grow 2.9 percent annually from 2020 to 2030, faster than the average for all occupations.[6] The most in-demand IT occupations include computer user support specialists, computer network support specialists, computer systems analysts, information security analysts, and software developers. Computer user and network support specialists usually require some college but less than a bachelor's degree, while the other occupations usually require a bachelor's degree.

Forty programs ranging from apprenticeships to doctoral degrees **provide training** for these occupations. Certificate programs (1-2-year) in information technology (93 percent) and System, Networking, and LAN/WAN management (95 percent) have the highest share of their graduates found employed in Tennessee. While short term trends have shown some volatility, IT employment is expected to have strong growth long term.

There are several aligned academic programs meeting **unmet need** criteria, including the post-baccalaureate certificate in medical informatics, bachelor's degree for computer systems analysts and computer and information sciences, the associate degree in information technology, and certificates for information security analysts and computer systems networking and telecommunications.

[6] Tennessee Department of Labor and Workforce Development, WIRED, Long Term Industry Projections 2020-2030

Engineering and Other STEM Programs

15 In-Demand Occupations | **103** Aligned Academic Programs

Engineering and related occupations play an instrumental role in Tennessee businesses and are connected to several of TNECD's target industries. The occupations that are **in-demand** in the most regions of Tennessee are electrical and electronic engineering technologists and technicians, electrical, industrial, and mechanical engineers, and architectural and civil drafters. Engineers require a bachelor's degree, while the technologists, technicians, and drafters require associate degrees. The electrical and electronics engineering and mechanical engineering bachelor's degree programs had employment rates of more than 50 percent and wages over $70,000.

Several aligned academic programs in the Engineering and Other STEM cluster met the qualifications for **unmet needs**. Tennessee employers hired 66 percent of graduates from the master's degree program in industrial engineering with first-year wages of $106,816. More than 72 percent of completers in electrical, electronic, and communications engineering technology programs were found in Tennessee employment data with wages above the state median. Multiple additional programs have 60 percent or more graduates employed in Tennessee making greater first-year wages than the Tennessee median, including drafting and design technology, mechatronics, robotics, and automation engineering (bachelor's), and civil engineering (bachelor's), among others.

Introduction

This report is prepared pursuant to Tennessee Code Annotated § 49-7-112(b), which directs the Tennessee Higher Education Commission (THEC), in partnership with the Tennessee Department of Labor and Workforce Development (TDLWD), Tennessee Department of Economic and Community Development (TNECD), and Tennessee Department of Education (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.

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 in this report. Accompanying dashboards and workbooks localize this information by local workforce development area.

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. 43.3 percent of the class of 2023 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. 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 Tennessee Higher Education Commission (THEC) and Tennessee Student Assistance Corporation (TSAC) are *relentlessly focused on increasing the number of Tennesseans with a postsecondary credential.* **The goal is to have 55 percent 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 and 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 percent by 2025**. As of September 2023, Tennessee's Labor Force Participation rate was 59.4 percent.

The Tennessee Department of Economic and Community Development (TNECD)'s mission is to *enhance Tennessee's competitiveness by driving job creation, generating economic growth, and facilitating community development.* As part of this mission, TNECD seeks **to be the number one state in the southeast for high quality jobs** and supports 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 captures the 2024 in-demand occupations across Tennessee and the aligned secondary and postsecondary academic programs. 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**[7] 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 the career clusters framework which organizes occupations and training programs providing common pathways for prospective students to occupations (and vice versa). [8,9,10]

[7] 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.
[8] For more information see Advance CTE's website explaining the 16 National Career Clusters Framework here.
[9] Tennessee Department of Education's Career Cluster Framework can be found here.
[10] 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.

The Tennessee Department of Labor and Workforce Development (TDLWD) uses a crosswalk to link 2020 Classification of Instructional Programs (CIP)[11] to the 2018 Standard Occupational Classification (SOC)[12, 13] 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[14], secondary concentrators[15], and employment outcomes captured in this report.

[11] 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.
[12] 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.
[13] 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.
[14] Select Tennessee Independent Colleges and Universities Association (TICUA) institutions report to P20 Connect and those completers and their associated job market outcomes are included.
[15] For purposes of this report, high school CTE concentrators reflect a student completing two course credits within a CTE program of study.

How to Read Tables in this Section

Occupations have been grouped throughout this report based on their career clusters, which are groupings of occupations and their connected training programs. Each career cluster has a table of the in-demand occupations and tables with the aligned academic program supply.[16] For most career clusters, there are multiple tables showing academic program supply, including postsecondary degree completers, high school CTE concentrators, and registered apprenticeships.

Cluster One: Agriculture, Food, and Natural Resources

Cluster Two: Architecture and Construction

Cluster Three: Manufacturing

Cluster Four: Transportation

Cluster Five: Business, Finance and Government Management and Support Services

Cluster Six: Sales and Marketing

Cluster Seven: Health Sciences

Cluster Eight: Human Services

Cluster Nine: Education and Training

Cluster Ten: Protective Services and Law

Cluster Eleven: Arts and Communication

Cluster Twelve: Leisure and Recreation

Cluster Thirteen: Information Technology

Cluster Fourteen: Engineering and Other STEM

[16] For purposes of this report, each occupation is categorized into only one cluster. In practice an occupation may be relevant to additional career clusters.

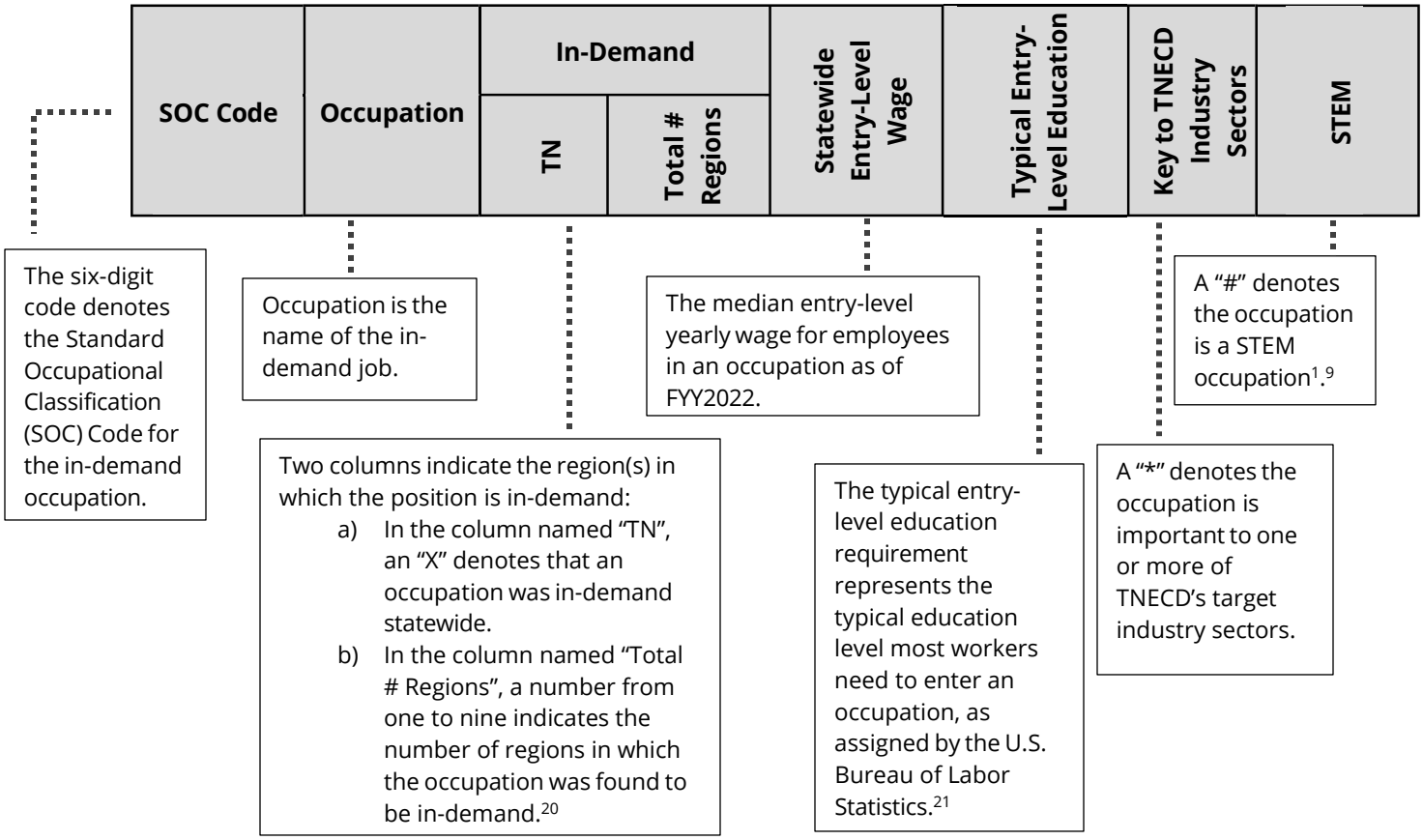
The in-demand occupations tables highlight occupations in TNECD's target industry clusters.[17] TNECD has nine prioritized clusters for business expansion and recruitment. TNECD configures its incentives to support specific business segments, systematically chosen to align with the state's distinctive economic competencies. This strategic alignment is designed to stimulate job creation and foster investment in industries where Tennessee exhibits a competitive advantage.[18]

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**

The tables for in-demand occupations and aligned academic supply are referenced below by column to help the reader quickly learn more about the occupation.

[17] More information on each target industry sector is available at https://tnecd.com/.
[18] TNECD, "Open ECD Tax Incentives", Transparent TN

In-Demand Occupation Table Legend:



[19] TNECD and TDLWD use the U.S. BLS definition for Science, Technology, Engineering, and Math (STEM). More information about this definition can be found here: U.S. Bureau of Labor Statistics, Additional OEWS data sets, STEM data, May 2021 (XLS).

[20] There are nine Local Workforce Development Areas (LWDAs), or regions, composed of groups of counties within Tennessee. An occupation with a "9" indicates that the occupation was found to be in-demand for each of the nine LWDAs, or regions, within the state.

[21] More information about education training levels in BLS data can be found here.

Academic Supply Table Legend:

For Postsecondary Completers:

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage

The six-digit code denotes the Classification of Instructional Program (CIP Code) for the academic program.[22]

Program Title is the name of the academic program.

Education Award Level represents the degree level completed. Degree levels include less than one-year certificates (C<1YR), one-to-two-year certificates (C1-2YR), associate (AA), bachelor's (BA), post-baccalaureate certificates (CPBA), master's (MA), education specialists (EDS), doctoral (D), and professional degrees (P).[23]

The Number of Graduates from 2021-22 by CIP code and degree level. Cells less than ten are suppressed.

Share of Graduates Employed in Tennessee represents 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.

Estimated First Year Annual Wages of Graduates Employed in Tennessee denotes the estimated first year average annual wages of 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.

For High School CTE Concentrators:

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage

The six-digit code denotes the Classification of Instructional Program (CIP Code) assigned to the High School CTE Program.

Same as above.

Education Award Level will be CTE HS program.

Number of Grads represents the number of high school graduates who completed two or more courses in a CTE program of study a career cluster (HS CTE Concentrator). This data reflects completers from 2021-22.

Same as above.

Same as above.

For Federal Registered Apprenticeship Completers:

CIP Code	Program Title	Number of Completers 2022

Same as above.

Program Title is the name of the Registered Apprenticeship program.

The number of Registered Apprenticeship completers in 2022.

[22] More information about CIP codes can be found here.

[23] TCAT diplomas are captured within the certificate degree level.

Cluster One: Agriculture, Food, and Natural Resources Occupations

In 2022, farming operations occupied approximately 40 percent of the state's nearly 27 million acres of land area. Farming generated $5.2 billion in cash receipts during 2022, with 59.2 percent of this value coming from crops and 40.8 percent from animals and animal products. Tennessee has approximately 69,500 farming operations, ranking the eighth highest in the U.S.[24]

Tennessee has an estimated 8.47 billion live trees[25] and 14 million acres in forest.[26] 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 2018, there have been approximately 50 projects announced, more than 5,400 new jobs and more than $2 billion in capital investment.[27]

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
19-2041	Environmental Scientists and Specialists, Including Health		2	$48,769	Bachelor's degree	*	#
19-4021	Biological Technicians	X	2	$36,456	Bachelor's degree	*	#
29-1131	Veterinarians		2	$71,536	Doctoral or professional degree		
29-2056	Veterinary Technologists and Technicians	X	4	$27,785	Associate degree		

[24] An Economic Report to the Governor of Tennessee, 2024, page 51
[25] United States Department of Agriculture, EVALIDator (Data Retrieval Tool for Tree Population Estimates)
[26] Tennessee Department of Agriculture, Forestry
[27] Tennessee Department of Economic and Community Development, Food and Agriculture webpage

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	X	7	$35,497	High school diploma or equivalent		
37-3011	Landscaping and Groundskeeping Workers	X	4	$26,448	No formal educational credential		
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation		1	$28,359	High school diploma or equivalent		
37-3013	Tree Trimmers and Pruners		2	$36,081	High school diploma or equivalent		
45-2091	Agricultural Equipment Operators		1	$29,493	No formal educational credential		
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse		1	$27,585	No formal educational credential	*	
45-4022	Logging Equipment Operators		2	$35,389	High school diploma or equivalent		
51-3093	Food Cooking Machine Operators and Tenders		3	$30,632	High school diploma or equivalent	*	
51-8031	Water and Wastewater Treatment Plant and System Operators		2	$32,884	High school diploma or equivalent		
53-7081	Refuse and Recyclable Material Collectors		3	$21,842	No formal educational credential		

Agriculture, Food, and Natural Resources Aligned Academic Programs

Postsecondary Agriculture, Food, and Natural Resources Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
01.0101	Agricultural Business and Management, General.	BA	13	38%	$34,083
01.0101	Agricultural Business and Management, General.	MA	*	*	*
01.0102	Agribusiness/Agricultural Business Operations.	BA	106	62%	$39,974
01.0307	Horse Husbandry/Equine Science and Management.	BA	*	*	*
01.0307	Horse Husbandry/Equine Science and Management.	MA	*	*	*
01.0504	Dog/Pet/Animal Grooming.	C < 1 YR	*	*	*
01.0605	Landscaping and Groundskeeping.	C < 1 YR	*	*	*
01.8001	Veterinary Medicine.	P	84	45%	$97,618
01.8101	Veterinary Sciences/Veterinary Clinical Sciences, General.	BA	38	66%	$29,451
01.8301	Veterinary/Animal Health Technology/Technician and Veterinary Assistant.	C < 1 YR	*	*	*
01.8301	Veterinary/Animal Health Technology/Technician and Veterinary Assistant.	C 1-2 YR	16	75%	$30,273
01.8301	Veterinary/Animal Health Technology/Technician and Veterinary Assistant.	AA	49	80%	$31,284
03.0101	Natural Resources/Conservation, General.	D	*	*	*
03.0103	Environmental Studies.	BA	19	74%	$40,702
03.0103	Environmental Studies.	D	*	*	*
03.0104	Environmental Science.	BA	65	57%	$32,614
03.0104	Environmental Science.	CPBA	*	*	*
03.0104	Environmental Science.	MA	15	47%	$39,000
03.0201	Environmental/Natural Resources Management and Policy, General.	BA	26	85%	$33,688
03.0204	Environmental/Natural Resource Economics.	BA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
03.0207	Environmental/Natural Resource Recreation and Tourism.	BA	*	*	*
03.0299	Environmental/Natural Resources Management and Policy, Other.	MA	15	53%	$54,316
03.0501	Forestry, General.	BA	25	48%	$32,785
03.0501	Forestry, General.	MA	*	*	*
15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician.	AA	*	*	*
26.1201	Biotechnology.	AA	*	*	*
26.1307	Conservation Biology.	BA	*	*	*
30.3301	Sustainability Studies.	CPBA	*	*	*
30.3301	Sustainability Studies.	BA	15	40%	$31,341

Tennessee colleges offer an array of academic programs to support in-demand occupations in the Agriculture, Food, and Natural Resources Cluster. Agriculture and farming are major parts of Tennessee's economy and that is evidenced through the programs offered across the state. Tennessee Tech University (TTU) offers a program in Environmental and Sustainability Studies (CIP 03.0103) with 7 timely concentrations, including Environmental Leadership, Environmental Sustainability, and Environmental Technology, among others.

TCAT Hohenwald is taking steps to ensure a strong future workforce for the forestry and agriculture industries in Southern Middle Tennessee. With GIVE 2.0 funding, TCAT Hohenwald is developing pathways and creating opportunities for secondary and postsecondary students to gain the skills needed for a capable workforce in the region.

High School CTE Agriculture, Food, and Natural Resources Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
01.0102	Agribusiness/Agricultural Business Operations.	CTE HS	223	55%	$43,373
01.1002	Food Technology and Processing	CTE HS	68	53%	$43,584
01.1103	Horticulture Science	CTE HS	1,639	50%	$40,206
01.8301	Veterinary/Animal Health Technology/Technician and Veterinary Assistant.	CTE HS	2,508	51%	$38,365

Over half of 2021-22 high school graduate concentrators in agribusiness and food technology were found in Tennessee's labor market making wages greater than the state median. Agriculture, Food, and Natural Resources is the second most popular career cluster in Tennessee high schools with over 13,000 concentrators enrolled in the 2022-23 school year. The Alvin C. York Agricultural Institute in Jamestown, TN is a high school program that provides students hands-on learning on a working farm, including livestock and row crop experiences. In 2024-25, Meat Science will be introduced as a new program of study to prepare students for careers in food technology and processing.

Agriculture, Food, and Natural Resources Apprenticeship Completers, 2021-22

CIP Code	Program Title	Number of Completers 2022
15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician.	*

Governor's Investment in Vocational Education (GIVE)

TCAT Hohenwald

The Governor's Investment in Vocational Education (GIVE) program aims to create long-term partnerships between Tennessee Colleges of Applied Technology (TCATs), community colleges, industries, economic development/workforce agencies, and K-12 schools. Its main goal is to identify and address the "skills gaps" present in the local workforce. GIVE is a competitive grant that awards of up to $1 million to local higher education entities to facilitate collaboration between K12, higher education, and workforce partners.

With funding from GIVE 2.0, TCAT Hohenwald is providing more workforce training opportunities in South Central Tennessee, with an emphasis on Forestry and Agriculture. As a result, secondary schools in Hickman, Maury, Lewis, and Wayne County can now offer their students dual enrollment opportunities in Forestry and Agricultural Technology. Dual enrollment numbers increased in spring 2023 from twenty (20) to one hundred (100) in fall 2023. Students can also earn industry credentials, such as OSHA 10, while enrolled in the dual enrollment program. Post-secondary students now have access to a newly renovated facility with state-of-the-art equipment and expert trainers to help enhance their training. Nine (9) students are currently working towards completing their Forest Worker Certificate, which is available through the Tennessee Forestry Association.

Cluster Two: Architecture and Construction Occupations

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, cost estimators, 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 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.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
11-9021	Construction Managers	X	9	$57,319	Bachelor's degree		
17-3022	Civil Engineering Technologists and Technicians		1	$34,855	Associate degree	*	#
27-1025	Interior Designers		1	$34,016	Bachelor's degree		
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers		3	$44,789	High school diploma or equivalent		
47-2021	Brick masons and Block masons		4	$41,222	High school diploma or equivalent		
47-2031	Carpenters	X	8	$34,417	High school diploma or equivalent		
47-2051	Cement Masons and Concrete Finishers	X	5	$34,620	No formal educational credential		
47-2061	Construction Laborers	X	9	$29,001	No formal educational credential		
47-2071	Paving, Surfacing, and Tamping Equipment Operators	X	2	$34,601	High school diploma or equivalent		

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
47-2073	Operating Engineers and Other Construction Equipment Operators	X	8	$35,999	High school diploma or equivalent	*	
47-2111	Electricians	X	9	$38,893	High school diploma or equivalent	*	
47-2121	Glaziers		1	$26,755	High school diploma or equivalent	*	
47-2131	Insulation Workers, Floor, Ceiling, and Wall		1	$24,966	No formal educational credential		
47-2141	Painters, Construction and Maintenance	X	8	$31,049	No formal educational credential		
47-2151	Pipelayers		1	$34,530	No formal educational credential		
47-2152	Plumbers, Pipefitters, and Steamfitters	X	9	$40,166	High school diploma or equivalent	*	
47-2181	Roofers	X	4	$31,273	No formal educational credential		
47-3013	Helpers--Electricians	X	5	$30,220	High school diploma or equivalent		
47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters		1	$25,853	High school diploma or equivalent		
47-4011	Construction and Building Inspectors		6	$39,021	High school diploma or equivalent		
47-4090	Miscellaneous Construction and Related Workers	X	3	$29,362	High school diploma or equivalent		
49-2098	Security and Fire Alarm Systems Installers	X	4	$35,674	High school diploma or equivalent		
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers		9	$35,517	Postsecondary nondegree award	*	
49-9052	Telecommunications Line Installers and Repairers	X	4	$41,153	High school diploma or equivalent		
49-9098	Helpers--Installation, Maintenance, and Repair Workers	X	7	$27,063	High school diploma or equivalent		
53-7011	Conveyor Operators and Tenders		1	$32,113	No formal educational credential	*	
53-7021	Crane and Tower Operators		2	$37,531	High school diploma or equivalent		

Governor's Investment in Vocational Education (GIVE)

Cleveland State

The Governor's Investment in Vocational Education (GIVE) program aims to create long-term partnerships between Tennessee Colleges of Applied Technology (TCATs), community colleges, industries, economic development/workforce agencies, and K-12 schools. Its main goal is to identify and address the "skills gaps" present in the local workforce. GIVE is a competitive grant that awards of up to $1 million to local higher education entities to facilitate collaboration between K12, higher education, and workforce partners.

Cleveland State has launched a Mechanical Electrical Plumbing (MEP) program at the Partnerships in Industry and Education (PIE) Innovation Center in Cleveland, TN, with the help of funding from GIVE 2.0. This educational facility helps to prepare students for postsecondary careers and workforce opportunities in the region. The PIE Innovation Center offers a unique learning experience by bringing together business, industry, secondary and postsecondary educational opportunities, and nonprofit services under one roof. This approach provides students with the necessary tools, education, and life skills to succeed. Partnerships with TCAT-Athens, Cleveland State Community College, and Chattanooga State Technical Community College enable students to use dual credit, dual enrollment, industry certification, to seamlessly transition into postsecondary programming. Students have access to embedded work-based learning and experiential learning in Science, Technology, Engineering, and Math (STEM) subjects, to help students visualize their future and promote design thinking.

Architecture and Construction Aligned Academic Programs

Postsecondary Architecture and Construction Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
15.0101	Architectural Engineering Technologies/Technicians.	C < 1 YR	12	25%	$34,311
15.0101	Architectural Engineering Technologies/Technicians.	AA	21	57%	$44,135
15.0201	Civil Engineering Technologies/Technicians.	AA	*	*	*
15.1001	Construction Engineering Technology/Technician.	C 1-2 YR	*	*	*
15.1001	Construction Engineering Technology/Technician.	AA	11	64%	$62,613
46.0101	Mason/Masonry.	C 1-2 YR	*	*	*
46.0301	Electrical and Power Transmission Installation/Installer, General.	C < 1 YR	47	68%	$45,390
46.0301	Electrical and Power Transmission Installation/Installer, General.	C 1-2 YR	53	72%	$31,318
46.0302	Electrician.	C < 1 YR	75	71%	$39,900
46.0302	Electrician.	C 1-2 YR	187	73%	$37,913
46.0415	Building Construction Technology/Technician.	C < 1 YR	30	57%	$26,038
46.0415	Building Construction Technology/Technician.	C 1-2 YR	121	59%	$35,413
46.0502	Pipefitting/Pipefitter and Sprinkler Fitter.	C < 1 YR	*	*	*
46.0502	Pipefitting/Pipefitter and Sprinkler Fitter.	C 1-2 YR	21	57%	$35,855
46.0503	Plumbing Technology/Plumber.	C < 1 YR	*	*	*
46.0503	Plumbing Technology/Plumber.	C 1-2 YR	17	71%	$49,647
46.9999	Construction Trades, Other.	C < 1 YR	17	59%	$33,844
46.9999	Construction Trades, Other.	C 1-2 YR	25	64%	$30,487
47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician.	C < 1 YR	67	67%	$35,468
47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician.	C 1-2 YR	337	75%	$40,763
50.0408	Interior Design.	AA	18	39%	$39,810

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
50.0408	Interior Design.	BA	68	71%	$43,320
52.2001	Construction Management, General.	BA	84	70%	$62,960

As Tennessee builds necessary facilities to house a growing number of employers and employees alike, Tennessee's colleges offer academic programs to build the skills needed for in-demand occupations in the Architecture and Construction Cluster. Tennessee's public and private institutions are preparing students with the tradecraft to support this growth from the ground up.

Middle Tennessee State University (MTSU) offers a Bachelor of Science in Construction Management with two concentrations: Commercial Construction Management and Land Development/Residential Building Construction Management. The program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE) and a new building is under construction to house this program and Concrete Management.

Educational partners in the Northwest Tennessee region are reducing the shortage of skilled workers in the building construction trades. Secondary (high school) partners in Lake, Dyer, Obion, and Lauderdale counties, and postsecondary partner, TCAT Northwest, are working together to train the upcoming generation of electricians, construction equipment operators, sheet metal workers, pipe layers, and helpers, brick masons and block masons, and helpers, and related occupations, including construction and building inspectors.

High School CTE Architecture and Construction Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
15.0101	Architectural Engineering Technologies/Technicians.	CTE HS	643	53%	$39,102
46.0415	Building Construction Technology/Technician.	CTE HS	891	53%	$38,487
46.9999	Construction Trades, Other.	CTE HS	471	53%	$39,453

High school CTE pathways offer students the opportunity to explore and gain skills in in-demand occupations in the Architecture and Construction cluster. The Building Construction Technology path graduated nearly 900 high school concentrators in 2021-22. The Architecture and Construction cluster houses several programs of study, including Residential and Commercial Construction, Mechanical, Electrical and Plumbing Systems, Structural Systems, Architectural and Engineering Design, and Interior Design with approximately 5,600 high school participants in 2022-23. While in these pathways, students can participate in pre-apprenticeships with Home Builders Institute and can earn multiple construction and heating, ventilation, and air conditioning (HVAC) credentials. Knox County Schools offers on-site work-based learning programs where students build cabins and participate in all aspects of construction, including supervising other students.

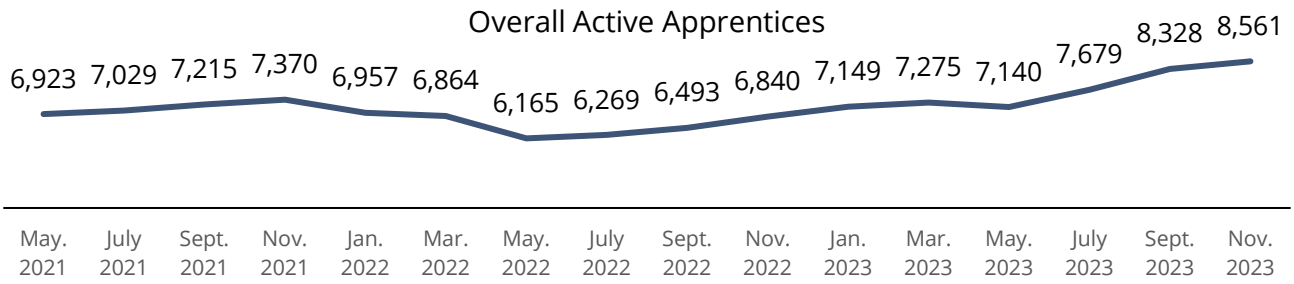
Architecture and Construction Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
15.0501	Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician.	18
46.0201	Carpentry/Carpenter.	56
46.0302	Electrician.	341
46.0303	Lineworker.	52
46.0402	Concrete Finishing/Concrete Finisher.	*
46.0403	Building/Home/Construction Inspection/Inspector.	*
46.0408	Painting/Painter and Wall Coverer.	*
46.0414	Insulator.	14
46.0502	Pipefitting/Pipefitter and Sprinkler Fitter.	84
46.0503	Plumbing Technology/Plumber.	30
46.9999	Construction Trades, Other.	45
48.0509	Ironworking/Ironworker.	25

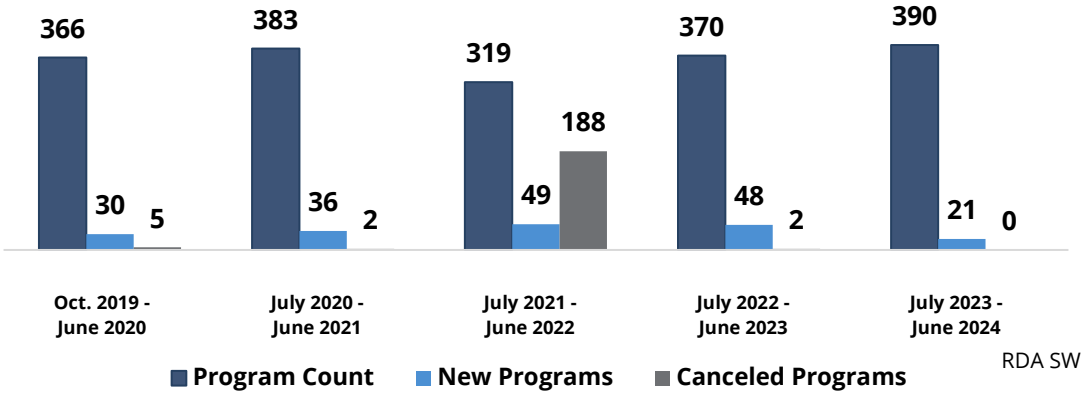
Apprenticeship Tennessee

Tennessee's Office of Apprenticeship is persistent in its efforts to expand Registered Apprenticeship Programs (RAPs) to employers throughout the State. Tennessee is one of 28 states and territories to operate as a State Apprenticeship Agency. Apprenticeship TN builds strong partnerships with community agencies, workforce development partners, and employers in each of the Grand Divisions. The Apprenticeship TN team utilizes its partnership with the nine Local Workforce Development Boards (LWDBs) to connect employers with new or expanding RAPs to Workforce Innovation and Opportunity Act (WIOA) services and other funding opportunities to support the success of their programs.

In FY23, Apprenticeship TN operated through a combination of state appropriations and two federal grants. In addition to state funds, Tennessee was awarded a U.S. Department of Labor State Apprenticeship Expansion Basic Formula Funding grant for FY24.



Apprenticeship TN continues to build new apprenticeship programs for traditional and non-traditional occupations, including 47 new programs during FY23. Participants are gaining access to earn-and- learn models (individuals are paid and learn on the job) across industry sectors including, Early Childhood Educator, Electrician, Certified Nursing Assistant, Dental Assistant, Tool and Die Maker, Commercial Drone Pilot, Project Manager, Construction Laborer, Help Desk Support Technician, Power Line worker, and Mechatronics Technician. The number of registered occupational programs offered by existing sponsors continues to rise. From July 2022 to June 2023, 31 new occupational programs were added to existing sponsors. As of June 2023, Tennessee had 7,407 active apprentices, with 1,016 completing a Registered Apprenticeship this year.



Cluster Three: Manufacturing Occupations

Manufacturing represents approximately 15 percent of Tennessee's gross domestic product, the largest of any sector in the state.[28] From November 2022 through October 2023, Tennessee exported $35.2 billion in manufactured goods.[29] The largest categories of exported manufactured goods in the last year included computer and electronic products, transportation equipment, chemicals, miscellaneous manufactured commodities, machinery, and electrical equipment, appliances, and components. The forecast for manufacturing employment in Tennessee suggests growth, in contrast to the national outlook which predicts a contraction in the sector.[30]

Tennessee has excelled in growing one of the strongest specialized manufacturing workforces in the country. Tennessee's manufacturing employment is 34 percent more concentrated than the national average.[31] Nearly every in-demand occupation in the manufacturing career cluster is key to the success of TNECD's target industry clusters.

Since 2019, TNECD has announced nearly 340 manufacturing projects with over 50,800 new job commitments. Manufacturing jobs represent over half the new job commitments generated through TNECD's projects since 2019. 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.[32] In 2022, LG Chem announced its plan to invest approximately $3.2 billion to establish what is expected to be the largest cathode manufacturing facility in the United States. This facility, to be in Clarksville, Tennessee, will support the expanding U.S. electric vehicle market.[33]

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 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.

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[28] U.S. Bureau of Economic Analysis, Gross Domestic Product by State, 2022 Quarter 3

[29] U.S. Census Bureau, USA Trade Online, State Export Data, Commodities (31,32,33), December 2021 – November 2022

[30] Boyd Center for Business and Economic Research, *An Economic Report to the Governor of the State of Tennessee*, 2024

[31] U.S. Bureau of Labor Statistics, QCEW, Employment Location Quotient, June 2023

[32] TNECD Press Release

[33] TNECD Press Release

Governor's Investment in Vocational Education (GIVE)

TCAT Knoxville

The Governor's Investment in Vocational Education (GIVE) program aims to create long-term partnerships between Tennessee Colleges of Applied Technology (TCATs), community colleges, industries, economic development/workforce agencies, and K-12 schools. Its main goal is to identify and address the "skills gaps" present in the local workforce. GIVE is a competitive grant that awards of up to $1 million to local higher education entities to facilitate collaboration between K12, higher education, and workforce partners.

With funding from GIVE 2.0, Tennessee College of Applied Technology (TCAT) Knoxville created an Industrial Development Initiative at Anderson County Career Technical Center. The project has addressed some of the most pressing workforce-related needs in the East Tennessee region, including barriers to education and training and a lack of awareness of viable career choices and training options in high-demand CTE fields. Remake Learning Days, a work-based learning initiative, engaged over nine hundred (900) Anderson County 6th-grade students in the fall 2023. Students participated in hands-on learning experiences in virtual welding and built electrical motors providing interactive and immersive exposure to CTE fields. Dual enrollment in CTE fields for grades 10-12 has increased from one hundred twenty (120) students in the fall of 2022 to over one hundred ninety-two (192) in the fall of 2023.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry	STEM
		TN	Total # Regions				
11-3051	Industrial Production Managers		1	$67,138	Bachelor's degree	*	
13-1051	Cost Estimators	X	7	$44,082	Bachelor's degree	*	
19-4031	Chemical Technicians	X	1	$36,583	Associate degree	*	#
47-2211	Sheet Metal Workers		3	$33,669	High school diploma or equivalent	*	
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers		6	$44,257	High school diploma or equivalent	*	
49-2011	Computer, Automated Teller, and Office Machine Repairers	X	2	$28,753	Some college, no degree	*	
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	X	7	$42,036	Postsecondary nondegree award	*	
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment		3	$42,785	Postsecondary nondegree award	*	
49-9041	Industrial Machinery Mechanics		3	$42,307	High school diploma or equivalent	*	
49-9043	Maintenance Workers, Machinery		3	$39,681	High school diploma or equivalent	*	
49-9044	Millwrights		1	$33,130	High school diploma or equivalent	*	
49-9062	Medical Equipment Repairers		1	$39,218	Associate degree	*	
49-9071	Maintenance and Repair Workers, General		3	$29,546	High school diploma or equivalent	*	
49-9099	Installation, Maintenance, and Repair Workers, All Other	X	8	$31,048	High school diploma or equivalent		
51-1011	First-Line Supervisors of Production and Operating Workers	X	9	$42,576	High school diploma or equivalent	*	
51-2041	Structural Metal Fabricators and Fitters	X	3	$34,613	High school diploma or equivalent	*	
51-2051	Fiberglass Laminators and Fabricators		1	$31,482	High school diploma or equivalent	*	

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry	STEM
		TN	Total # Regions				
51-2090	Miscellaneous Assemblers and Fabricators	X	9	$29,981	High school diploma or equivalent	*	
51-3021	Butchers and Meat Cutters	X	8	$27,032	No formal educational credential	*	
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	X	3	$25,258	No formal educational credential	*	
51-3092	Food Batchmakers	X	4	$28,478	High school diploma or equivalent	*	
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic		1	$30,112	High school diploma or equivalent	*	
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic		2	$30,043	High school diploma or equivalent	*	
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	X	5	$30,208	High school diploma or equivalent	*	
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic		1	$31,143	High school diploma or equivalent	*	
51-4041	Machinists		5	$35,236	High school diploma or equivalent	*	
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic		2	$29,650	High school diploma or equivalent	*	
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	X	7	$32,150	High school diploma or equivalent	*	
51-4121	Welders, Cutters, Solderers, and Brazers	X	8	$35,801	High school diploma or equivalent	*	
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders		5	$31,350	High school diploma or equivalent	*	
51-4199	Metal Workers and Plastic Workers, All Other	X	5	$30,910	High school diploma or equivalent	*	
51-7011	Cabinetmakers and Bench Carpenters	X	1	$27,441	High school diploma or equivalent		

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry	STEM
		TN	Total # Regions				
51-7041	Sawing Machine Setters, Operators, and Tenders, Wood		3	$28,324	High school diploma or equivalent		
51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing		1	$26,964	High school diploma or equivalent		
51-8013	Power Plant Operators		1	$67,638	High school diploma or equivalent		
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders		2	$31,319	High school diploma or equivalent	*	
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders		3	$29,759	High school diploma or equivalent	*	
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	X	3	$28,954	High school diploma or equivalent	*	
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders		1	$31,503	High school diploma or equivalent	*	
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders		1	$33,758	High school diploma or equivalent	*	
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	X	8	$29,647	High school diploma or equivalent	*	
51-9111	Packaging and Filling Machine Operators and Tenders	X	9	$28,334	High school diploma or equivalent	*	
51-9123	Painting, Coating, and Decorating Workers		2	$29,977	No formal educational credential	*	
51-9124	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	X	8	$32,008	High school diploma or equivalent	*	
51-9161	Computer Numerically Controlled Tool Operators	X	7	$34,838	High school diploma or equivalent	*	
51-9198	Helpers--Production Workers	X	4	$27,539	High school diploma or equivalent	*	
51-9199	Production Workers, All Other	X	7	$26,715	High school diploma or equivalent	*	

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry	STEM
		TN	Total # Regions				
53-7063	Machine Feeders and Offbearers		1	$32,656	No formal educational credential	*	

Manufacturing Aligned Academic Programs

Postsecondary Manufacturing Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
15.0403	Electromechanical/Electromechanical Engineering Technology/Technician.	C < 1 YR	73	52%	$49,845
15.0403	Electromechanical/Electromechanical Engineering Technology/Technician.	C 1-2 YR	26	81%	$41,766
15.0403	Electromechanical/Electromechanical Engineering Technology/Technician.	AA	93	84%	$54,827
15.0403	Electromechanical/Electromechanical Engineering Technology/Technician.	BA	10	80%	$74,667
15.0702	Quality Control Technology/Technician.	C < 1 YR	*	*	*
41.0303	Chemical Process Technology.	C < 1 YR	*	*	*
41.0303	Chemical Process Technology.	C 1-2 YR	*	*	*
47.0101	Electrical/Electronics Equipment Installation and Repair Technology/Technician, General.	AA	*	*	*
47.0105	Industrial Electronics Technology/Technician.	C < 1 YR	*	*	*
47.0105	Industrial Electronics Technology/Technician.	C 1-2 YR	11	73%	$40,914
47.0303	Industrial Mechanics and Maintenance Technology/Technician.	C < 1 YR	110	61%	$40,031
47.0303	Industrial Mechanics and Maintenance Technology/Technician.	C 1-2 YR	436	77%	$57,663
47.0303	Industrial Mechanics and Maintenance Technology/Technician.	AA	*	*	*
48.0501	Machine Tool Technology/Machinist.	C < 1 YR	31	81%	$36,812
48.0501	Machine Tool Technology/Machinist.	C 1-2 YR	213	77%	$42,111
48.0503	Machine Shop Technology/Assistant.	C 1-2 YR	12	50%	$30,900
48.0507	Tool and Die Technology/Technician.	C < 1 YR	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
48.0507	Tool and Die Technology/Technician.	C 1-2 YR	*	*	*
48.0508	Welding Technology/Welder.	C < 1 YR	177	59%	$34,966
48.0508	Welding Technology/Welder.	C 1-2 YR	601	71%	$39,550
48.0510	Computer Numerically Controlled (CNC) Machinist Technology/CNC Machinist.	C < 1 YR	*	*	*
48.0510	Computer Numerically Controlled (CNC) Machinist Technology/CNC Machinist.	C 1-2 YR	*	*	*
52.0205	Operations Management and Supervision.	C < 1 YR	26	77%	$41,923
52.0205	Operations Management and Supervision.	BA	*	*	*

Public and private investment continue to fuel growth in Tennessee's manufacturing sector. Likewise, investments at Tennessee colleges and universities are resulting in academic programs that are better equipped to create Tennessee's workforce of tomorrow. The breadth of programs offered in the Manufacturing Cluster highlight the array of opportunities available in this growing sector of the state's economy.

High School CTE Manufacturing Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
15.0407	Mechatronics, Robotics, Automotive. Engineering. Technology/Tech.	CTE HS	466	53%	$37,211
48.0503	Machine Shop Technology/Assistant.	CTE HS	431	51%	$38,210
48.0508	Welding Technology/Welder.	CTE HS	1,315	53%	$37,751

High school programming is available to encourage students' exploration and credit accumulation towards programs in the Manufacturing cluster. Notably, over 1,300 high school graduates concentrated in Welding in 2021-22 and over half of those graduates were found in employed in Tennessee. In 2022-23, high schools offered four programs of study: Industrial Maintenance, Mechatronics, Welding, and Machining Technology. In addition to early postsecondary opportunities (EPSOs) in partnership with Tennessee Colleges of Applied Technology, students have opportunities to participate in school-based enterprises

such as Oak Ridge High School's Wildcat Manufacturing, a student-run business that provides real-world experience by obtaining work projects from local businesses.[34]

Manufacturing Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
15.0403	Electromechanical/Electromechanical Engineering Technology/Technician.	18
15.0407	Mechatronics, Robotics, and Automation Engineering Technology/Technician.	*
41.0303	Chemical Process Technology.	79
47.0101	Electrical/Electronics Equipment Installation and Repair Technology/Technician, General.	*
47.0303	Industrial Mechanics and Maintenance Technology/Technician.	39
48.0501	Machine Tool Technology/Machinist.	10
48.0506	Sheet Metal Technology/Sheetworking.	62
48.0507	Tool and Die Technology/Technician.	13
48.0508	Welding Technology/Welder.	*
48.9999	Precision Production, Other.	*

[34] The Composites iacmi Institute, Wildcat Manufacturing: The Story Behind IACMI Members Meeting SWAG, https://iacmi.org/wildcat-manufacturing-story-behind-smm2023-swag/

Supporting Postsecondary Access in Rural Communities (SPARC)

TCAT Knoxville

Supporting Postsecondary Access in Rural Communities (SPARC) is a program that aims to provide Career and Technical Education (CTE) to high school and adult learners in ninety-one (91) counties of Tennessee. The program focuses on overcoming three main obstacles: inadequate infrastructure, limited geographic access to higher education, and insufficient dual enrollment options for CTE. SPARC collaborates closely with local communities and education stakeholders to ensure that these obstacles are eliminated.

Anderson County has partnered with Tennessee College of Applied Technology (TCAT) Knoxville to expand its CTE course offerings with the help of SPARC funds. Two welding programs at Anderson High and Clinton High School have been fully equipped because of SPARC funds. Students can now acquire skills using state-of-the-art trainers and equipment and earn industry credentials as dual enrollment students. They can further their training at the TCAT Knoxville's Anderson County Higher Education Center or their main campus in Knoxville. This investment has helped to increase the number of potential welders in the area.

Cluster Four: Transportation Occupations

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 some of the characteristics that attract companies reliant on transportation positions in Tennessee.

Logisticians are in-demand statewide and have one of the highest paying entry-level wages for occupations in this cluster at $47,298. The median annual wage for logisticians in 2022 in Tennessee was $63,650 with about 500 openings for logisticians projected each year, on average, from 2020 to 2030.[35]

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
13-1081	Logisticians	X	8	$47,298	Bachelor's degree	*	
43-5021	Couriers and Messengers		4	$24,187	High school diploma or equivalent	*	
43-5061	Production, Planning, and Expediting Clerks	X	8	$34,837	High school diploma or equivalent	*	
43-5071	Shipping, Receiving, and Inventory Clerks		9	$30,541	High school diploma or equivalent	*	
49-3021	Automotive Body and Related Repairers	X	8	$33,235	High school diploma or equivalent		
49-3023	Automotive Service Technicians and Mechanics		7	$31,045	Postsecondary nondegree award	*	
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	X	8	$36,840	High school diploma or equivalent	*	
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	X	7	$39,800	High school diploma or equivalent	*	
49-3093	Tire Repairers and Changers		4	$26,203	High school diploma or equivalent		
53-3031	Driver/Sales Workers		3	$19,365	High school diploma or equivalent	*	

[35] TN Dept of Labor and Workforce Development, Employment Projections 2020-2030, onetonline.org

Mobile American Job Center (AJC)

The mission of the Mobile American Job Center (AJC) is to provide employment resources and one-on-one assistance to all Tennesseans, especially those in rural areas who do not have access to brick-and-mortar AJCs. Clients with barriers to employment are frequently unemployed, underemployed, skills-deficient, and/or have a lack of transportation, among other barriers. Lack of transportation or not having a brick-and-mortar AJC close to where clients live can be barriers to employment and access to supportive services provided by the workforce system. For those who lack computer skills, access to employment services is vital. Mobile AJCs provide a solution to these issues by bringing workforce services to the public.

Mobile AJCs are staffed by Wagner-Peyser and partner programs staff. Any service that is provided in brick-and-mortar is also provided on the Mobile AJC. Mobile AJC staff reaches out to common organizations found in every community to provide employment services, including homeless shelters, public housing, prisons, faith-based organizations, Department of Human Services (DHS) offices, YWCAs and YMCAs, local food banks, and senior citizen facilities.

Employer Resources

Mobile AJCs support employers who are opening a new facility or seeking employees. Mobile AJCs also provide services to assist employers and employees in the event of a business closure or layoff. Tennesseans can file for their unemployment benefits online through a Mobile AJC.

The Mobile AJCs support recruitment and provide access to job seekers who may need assistance with an online application, updating their resume, or interview tips. Mobile AJCs help Tennesseans and employers across the state at all stages of the workforce development continuum.

Mobile American Job Center Outreach Strategy

Mobile AJCs advance workforce development in all 95 counties by:
• Meeting with local Chambers of Commerce to inform local businesses of Mobile AJC resources. This includes tours of Mobile AJCs to increase awareness of the benefits the mobile units provide.
• Building partnerships between educational institutions and sponsoring organizations to open new pathways for growth and success and pave a better road to the future for students.
• Reaching out to Community Tennessee Rehabilitation Centers to provide job services to those with disabilities, as well as providing services to people with disabilities, generally.
• Visiting VA hospitals and supporting veterans generally to assist with their workforce-related needs.
• Serving senior citizens by visiting retirement facilities, senior community centers, and assisted living facilities. The Mobile AJC can assist senior citizens in finding jobs that are appropriate for their capabilities, as well as refer them to other services that might be needed.

Best Practices

Mobile AJCs strive to serve the State of Tennessee by creating events to assist both the public and private sectors, giving tours, and talking about the services that are offered through the Mobile AJC. Some examples are listed below:

Re-entry events: The Mobile AJCs assist those who are 30 days from release from incarceration, as well as those who are on probation or parole, in learning how to create a resume, job search and interview for a position, as well as teaching soft skills. This is crucial information for those who are justice-involved when reentering society.

TAA Open House: Mobile AJCs have partnered with the Trade Adjustment Assistance (TAA) Program staff. TAA staff support workers who have lost their jobs due to foreign trade with opportunities to become reemployed. They have held an Open House across the state, primarily in rural areas, to raise awareness and provide services for workers who have been impacted by foreign trade and are covered under U.S. Department of Labor (U.S. DOL) certified trade petitions.

High Schools, Colleges, Universities, TCATs: The Mobile AJCs have an ongoing relationship with the high school and college students, assisting high school seniors who are not college-bound, as well as individuals ready to graduate from a higher education program who are about to enter the workforce.

Non-Profits: The Mobile AJCs serve non-profits regularly. Recently, a Mobile AJC event was held at a church – participants were made-up of immigrants from 16 different countries. Several participants had multiple degrees, having worked as doctors, nurses, attorneys, etc. in the past; however, their credentials are not valid in the US. Participants are working low-paying jobs to get by and cannot support their families. The Mobile AJC, with assistance from an interpreter, presented a workshop on how to job search in the U.S. and assisted participants in searching for jobs online. The success of this programming has resulted in plans to conduct a series of events, including additional workshops.

The Tennessee Department of Labor and Workforce Development's (TDLWD) involvement through the Mobile AJC forum has allowed TDLWD staff to engage, enhance, enable, and empower all Tennesseans to the work force. In 2023, TDLWD was invited to present at the Regional Convening of U.S. DOL where staff presented on the Mobile AJC and best practices for serving rural communities.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
53-3032	Heavy and Tractor-Trailer Truck Drivers	X	9	$37,627	Postsecondary nondegree award	*	
53-3033	Light Truck Drivers		8	$27,967	High school diploma or equivalent	*	
53-3052	Bus Drivers, Transit and Intercity		1	$28,920	High school diploma or equivalent		
53-5021	Captains, Mates, and Pilots of Water Vessels		1	$60,066	Postsecondary nondegree award		
53-7051	Industrial Truck and Tractor Operators	X	9	$31,285	No formal educational credential	*	
53-7061	Cleaners of Vehicles and Equipment		1	$23,254	No formal educational credential	*	
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	X	9	$27,637	No formal educational credential	*	
53-7064	Packers and Packagers, Hand		2	$24,443	No formal educational credential	*	

Transportation Aligned Academic Programs

Postsecondary Transportation Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
47.0302	Heavy Equipment Maintenance Technology/Technician.	C 1-2 YR	*	*	*
47.0603	Autobody/Collision and Repair Technology/Technician.	C < 1 YR	30	63%	$26,863
47.0603	Autobody/Collision and Repair Technology/Technician.	C 1-2 YR	115	67%	$34,059
47.0604	Automobile/Automotive Mechanics Technology/Technician.	C < 1 YR	100	66%	$28,556
47.0604	Automobile/Automotive Mechanics Technology/Technician.	C 1-2 YR	204	74%	$37,306

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
47.0604	Automobile/Automotive Mechanics Technology/Technician.	AA	*	*	*
47.0605	Diesel Mechanics Technology/Technician.	C < 1 YR	61	66%	$34,542
47.0605	Diesel Mechanics Technology/Technician.	C 1-2 YR	106	71%	$43,130
49.0205	Truck and Bus Driver/Commercial Vehicle Operator and Instructor.	C < 1 YR	373	62%	$52,289
52.0203	Logistics, Materials, and Supply Chain Management.	C < 1 YR	38	74%	$44,059
52.0203	Logistics, Materials, and Supply Chain Management.	BA	403	47%	$62,207
52.0203	Logistics, Materials, and Supply Chain Management.	MA	15	47%	$90,629

Tennessee colleges offer an array of academic programs to train those who support Tennessee's supply chain.

Nashville State Community College offers short-term certificates in Supply Chain, Logistics, and Transportation—all of which are 21 hours or less. With estimated first year wages of over $44,000, these certificate programs represent a tremendous investment opportunity.

With the help of SPARC 4.0 funding, Hardeman County is committed to enhancing the opportunities for Automotive dual enrollment students. SPARC 4.0 funding has been used to purchase advanced training equipment and simulators so high school students can gain practical experience in a real shop environment. This includes using multiple lifts, wheel alignment systems, and other equipment commonly found in an automotive shop.

High School CTE Transportation Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
47.0603	Autobody/Collision and Repair Technology/Technician.	CTE HS	269	51%	$37,857
47.0604	Automobile/Automotive Mechanics Technology/Technician.	CTE HS	1,561	53%	$39,578
51.0810	Emergency Care Attendant (EMT Ambulance)	CTE HS	762	51%	$39,430

HS CTE students completing concentrations in the transportation cluster in 2021-2022 are shown in the table above. Through HS CTE pathways, students have access to dual enrollment programs like Milan High School's partnership with TCAT Jackson where students begin earning clock hours in their freshmen year in a Maintenance and Light Repair lab outfitted with equipment purchased with Innovative School Model grant funds. Through the same grant, some schools are beginning Aviation Flight programs, such as Elizabethton High School where Aviation Flight students earn their private pilot license before they graduate from high school.

Transportation Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
47.0302	Heavy Equipment Maintenance Technology/Technician.	*
47.0604	Automobile/Automotive Mechanics Technology/Technician.	14
47.0606	Small Engine Mechanics and Repair Technology/Technician.	*
49.0205	Truck and Bus Driver/Commercial Vehicle Operator and Instructor.	26
52.0203	Logistics, Materials, and Supply Chain Management.	*

Innovative School Models

The Tennessee Department of Education (TDOE), under the direction of Commissioner Lizzette Gonzalez Reynolds, exhibits a strong commitment to Career and Technical Education (CTE) for all students. Building upon the state's strong commitment to ensure Tennessee is future workforce ready, over $560 million in funds were allocated to support Innovative School Model grants, which expand CTE opportunities in 839 Tennessee middle and high schools. Governor Bill Lee and the Tennessee General Assembly awarded $530 million in state funds, which were supplemented by $32.9 million in Elementary and Secondary School Emergency Relief 3.0 (ESSER) funds to support Innovative School Model grants.

School districts have a diverse set of projects underway as a result of this funding. Some projects aim to increase offerings of middle school CTE programs and career exploration. Career coaches are being hired in both middle and high schools to assist counselors with the creation of differentiated coursework based on student goals. Innovative School Model grants also allow districts to purchase equipment, such as forklifts and hydraulic and pneumatic trainers, for manufacturing and industrial maintenance programs. Health science programs, through these grants, can increase access to virtual equipment which give students the ability for in-depth exploration of the human body and virtual surgical opportunities. Schools are using classrooms and libraries as an opportunity to build makerspaces, with access to 3D printers, drones, podcasting equipment, and laser etchers. Several districts have purchased vans to help students overcome transportation barriers to work-based learning experiences. This grant is especially meaningful for smaller districts.

Cluster Five: Business, Finance, Government Management, and Support Services Occupations

The business, finance and 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 for all occupations.[36] Home to ten Fortune 500 companies, Tennessee exhibits a sustained demand for these occupational categories.[37] 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.

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 by approximately 10 percent, equating to an addition of around 5,100 jobs over the past five years. In a regional comparison, this growth places Tennessee fourth in the southeast and 18th nationally.[38] The finance and insurance sector has also experienced growth, with employment increasing by nine percent, representing an addition of 10,400 jobs. [39] In terms of new job creation within this sector, Tennessee ranks ninth nationally and fifth in the southeast over a five-year period. 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.[40]

The occupational data for Tennessee indicates a consistent statewide demand for managerial and analytical roles across multiple industries, with a particular emphasis on positions requiring a bachelor's degree for entry. 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 proficiencies in data analysis and information systems, with job postings specifying competencies in SQL, MS Office, Jitterbit, GitHub, and Tableau skills.[41]

Human resource managers and specialists are in-demand across the state and they are professionals who navigate organizational dynamics and enhance workforce performance.

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[36] Bureau of Labor Statistics, Occupational Outlook Handbook, Business and Financial Occupations
[37] Fortune500, 2023
[38] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2016 - 2021
[39] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2016 - 2021
[40] Boyd Center for Business and Economic Research, *An Economic Report to the Governor of the State of Tennessee*, 2024
[41] Jobs4TN.gov, Occupation Data, Occupation Summary

The job market underscores the importance of advanced interpersonal abilities, analytical judgements, and the capacity to manage complex employee relations, with most positions necessitating at least a bachelor's degree.

Accountants and auditors represent another category of professionals in demand, with over 300 of the online job postings for accountants calling for candidates possessing an American Institute of CPAs (AICPA) certification.[42] Financial managers have a median wage over $129,900 in Tennessee and make up over 10 percent of the total annual projected job openings in management related occupations. Industries in which they are predominately employed include accounting, tax preparation, and bookkeeping services, with over 100 job postings looking for candidates with an American Institute of CPAs (AICPA) certification.[43]

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
11-1011	Chief Executives	X	3	$44,748	Bachelor's degree	*	
11-1021	General and Operations Managers		9	$57,596	Bachelor's degree	*	
11-3031	Financial Managers		6	$82,470	Bachelor's degree	*	
11-3061	Purchasing Managers		4	$82,474	Bachelor's degree	*	
11-3071	Transportation, Storage, and Distribution Managers		7	$59,054	High school diploma or equivalent	*	
11-3121	Human Resources Managers		9	$70,763	Bachelor's degree	*	
11-9041	Architectural and Engineering Managers		5	$95,598	Bachelor's degree	*	#
11-9111	Medical and Health Services Managers	X	8	$66,563	Bachelor's degree	*	
11-9141	Property, Real Estate, and Community Association Managers	X	7	$39,179	High school diploma or equivalent		
11-9151	Social and Community Service Managers	X	6	$52,722	Bachelor's degree		
11-9199	Managers, All Other		1	$45,698	Bachelor's degree	*	
13-1031	Claims Adjusters, Examiners, and Investigators		1	$44,488	High school diploma or equivalent		

[42] Jobs4TN.gov, Occupation Data, Occupation Summary
[43] Jobs4TN.gov, Occupation Data, Occupation Summary

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
13-1071	Human Resources Specialists	X	8	$38,070	Bachelor's degree	*	
13-1111	Management Analysts	X	9	$56,766	Bachelor's degree	*	
13-1141	Compensation, Benefits, and Job Analysis Specialists		1	$36,492	Bachelor's degree	*	
13-1151	Training and Development Specialists		3	$35,709	Bachelor's degree	*	
13-1161	Market Research Analysts and Marketing Specialists	X	9	$37,623	Bachelor's degree	*	
13-2011	Accountants and Auditors	X	9	$47,341	Bachelor's degree	*	
13-2041	Credit Analysts		1	$49,877	Bachelor's degree	*	
13-2051	Financial and Investment Analysts		2	$55,252	Bachelor's degree	*	
13-2072	Loan Officers		4	$43,149	Bachelor's degree	*	
13-2082	Tax Preparers	X	2	$22,256	High school diploma or equivalent	*	
15-2031	Operations Research Analysts	X	3	$40,653	Bachelor's degree	*	#
27-3031	Public Relations Specialists		2	$18	Bachelor's degree	*	
31-9094	Medical Transcriptionists	X	1	$22,987	Postsecondary nondegree award		
41-3021	Insurance Sales Agents	X	8	$33,265	High school diploma or equivalent		
43-1011	First-Line Supervisors of Office and Administrative Support Workers		4	$39,887	High school diploma or equivalent	*	
43-3011	Bill and Account Collectors	X	5	$28,169	High school diploma or equivalent	*	
43-3021	Billing and Posting Clerks	X	7	$31,557	High school diploma or equivalent	*	
43-3031	Bookkeeping, Accounting, and Auditing Clerks		9	$30,253	Some college, no degree	*	
43-3051	Payroll and Timekeeping Clerks	X	8	$32,642	High school diploma or equivalent		
43-3071	Tellers		2	$26,812	High school diploma or equivalent		
43-4031	Court, Municipal, and License Clerks		1	$29,295	High school diploma or equivalent		

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
43-4051	Customer Service Representatives	X	9	$26,365	High school diploma or equivalent	*	
43-4071	File Clerks		4	$26,735	High school diploma or equivalent		
43-4111	Interviewers, Except Eligibility and Loan	X	3	$28,355	High school diploma or equivalent		
43-4131	Loan Interviewers and Clerks		1	$29,417	High school diploma or equivalent		
43-4151	Order Clerks	X	4	$27,503	Some college, no degree	*	
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	X	9	$30,909	Associate degree		
43-4199	Information and Record Clerks, All Other		3	$25,783	High school diploma or equivalent		
43-5032	Dispatchers, Except Police, Fire, and Ambulance	X	9	$28,534	High school diploma or equivalent	*	
43-5051	Postal Service Clerks	X	7	$46,508	High school diploma or equivalent		
43-5052	Postal Service Mail Carriers		1	$39,935	High school diploma or equivalent		
43-6011	Executive Secretaries and Executive Administrative Assistants	X	9	$41,469	High school diploma or equivalent	*	
43-6013	Medical Secretaries and Administrative Assistants		1	$28,172	High school diploma or equivalent		
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	X	9	$27,859	High school diploma or equivalent	*	
43-9021	Data Entry Keyers	X	6	$27,789	High school diploma or equivalent	*	
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service		2	$26,131	High school diploma or equivalent		
43-9061	Office Clerks, General	X	7	$23,733	High school diploma or equivalent	*	
43-9199	Office and Administrative Support Workers, All Other		5	$22,727	High school diploma or equivalent		

Business, Finance, Government Management, and Support Services Aligned Academic Programs

Postsecondary Business, Finance, Government Management, and Support Services Degrees 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
01.0103	Agricultural Economics.	MA	*	*	*
09.0900	Public Relations, Advertising, and Applied Communication.	BA	*	*	*
09.0901	Organizational Communication, General.	BA	*	*	*
09.0902	Public Relations/Image Management.	BA	122	43%	$42,627
09.0902	Public Relations/Image Management.	MA	*	*	*
09.0905	Health Communication.	CPBA	*	*	*
09.0907	International and Intercultural Communication.	BA	*	*	*
09.0909	Communication Management and Strategic Communications.	MA	14	79%	$64,088
09.0999	Public Relations, Advertising, and Applied Communication, Other.	BA	*	*	*
15.1501	Engineering/Industrial Management.	BA	88	67%	$61,647
15.1501	Engineering/Industrial Management.	CPBA	*	*	*
15.1501	Engineering/Industrial Management.	MA	20	35%	$106,526
42.2804	Industrial and Organizational Psychology.	MA	27	41%	$53,315
43.0301	Homeland Security.	BA	*	*	*
43.0302	Crisis/Emergency/Disaster Management.	BA	17	35%	$51,091
43.0302	Crisis/Emergency/Disaster Management.	CPBA	*	*	*
44.0401	Public Administration.	BA	12	58%	$29,474
44.0401	Public Administration.	CPBA	13	69%	$90,567
44.0401	Public Administration.	MA	84	67%	$59,886
44.0401	Public Administration.	D	*	*	*
44.0501	Public Policy Analysis, General.	BA	*	*	*
44.0501	Public Policy Analysis, General.	CPBA	*	*	*
44.0501	Public Policy Analysis, General.	MA	15	67%	$54,606
44.0503	Health Policy Analysis.	CPBA	*	*	*
44.9999	Public Administration and Social Service Professions, Other.	AA	*	*	*
44.9999	Public Administration and Social Service Professions, Other.	BA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
45.0601	Economics, General.	BA	66	47%	$45,119
45.0601	Economics, General.	MA	*	*	*
45.0601	Economics, General.	D	*	*	*
45.0603	Econometrics and Quantitative Economics.	BA	*	*	*
45.0603	Econometrics and Quantitative Economics.	MA	*	*	*
45.0603	Econometrics and Quantitative Economics.	D	*	*	*
45.0605	International Economics.	BA	*	*	*
45.0699	Economics, Other.	BA	*	*	*
45.1001	Political Science and Government, General.	BA	453	53%	$33,533
45.1002	American Government and Politics (United States).	CPBA	*	*	*
45.1004	Political Economy.	BA	10	10%	*
45.1201	Urban Studies/Affairs.	BA	19	63%	$46,380
46.0401	Building/Property Maintenance.	C < 1 YR	*	*	*
46.0401	Building/Property Maintenance.	C 1-2 YR	*	*	*
50.1001	Arts, Entertainment, and Media Management, General.	BA	*	*	*
50.1002	Fine and Studio Arts Management.	BA	*	*	*
50.1003	Music Management.	BA	116	66%	$27,702
50.1004	Theatre/Theatre Arts Management.	BA	*	*	*
51.0701	Health/Health Care Administration/Management.	AA	11	91%	$37,200
51.0701	Health/Health Care Administration/Management.	BA	113	55%	$43,857
51.0701	Health/Health Care Administration/Management.	CPBA	*	*	*
51.0701	Health/Health Care Administration/Management.	MA	84	63%	$57,802
51.0702	Hospital and Health Care Facilities Administration/Management.	MA	18	44%	$72,288
51.0706	Health Information/Medical Records Administration/Administrator.	BA	14	86%	$42,853
51.0706	Health Information/Medical Records Administration/Administrator.	CPBA	*	*	*
51.0706	Health Information/Medical Records Administration/Administrator.	MA	16	50%	$85,660
51.0710	Medical Office Assistant/Specialist.	C < 1 YR	*	*	*
51.0710	Medical Office Assistant/Specialist.	C 1-2 YR	17	71%	$30,622
51.0713	Medical Insurance Coding Specialist/Coder.	C < 1 YR	32	56%	$26,535

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
51.0713	Medical Insurance Coding Specialist/Coder.	C 1-2 YR	14	71%	$34,451
51.0719	Clinical Research Coordinator.	CPBA	*	*	*
51.2002	Pharmacy Administration and Pharmacy Policy and Regulatory Affairs.	MA	*	*	*
51.2211	Health Services Administration.	CPBA	*	*	*
51.3802	Nursing Administration.	MA	12	67%	$79,853
52.0101	Business/Commerce, General.	BA	52	52%	$56,578
52.0101	Business/Commerce, General.	CPBA	*	*	*
52.0101	Business/Commerce, General.	MA	67	51%	$62,043
52.0201	Business Administration and Management, General.	BA	1708	57%	$44,939
52.0201	Business Administration and Management, General.	CPBA	*	*	*
52.0201	Business Administration and Management, General.	MA	1666	51%	$71,084
52.0201	Business Administration and Management, General.	D	27	15%	*
52.0204	Office Management and Supervision.	BA	13	31%	*
52.0206	Non-Profit/Public/Organizational Management.	BA	12	33%	*
52.0206	Non-Profit/Public/Organizational Management.	CPBA	*	*	*
52.0206	Non-Profit/Public/Organizational Management.	MA	*	*	*
52.0207	Customer Service Management.	C < 1 YR	14	93%	$44,270
52.0207	Customer Service Management.	BA	*	*	*
52.0209	Transportation/Mobility Management.	C < 1 YR	12	42%	$53,545
52.0210	Research and Development Management.	CPBA	11	73%	$73,263
52.0211	Project Management.	CPBA	*	*	*
52.0213	Organizational Leadership.	AA	*	*	*
52.0213	Organizational Leadership.	BA	180	48%	$56,426
52.0213	Organizational Leadership.	CPBA	33	64%	$49,600
52.0213	Organizational Leadership.	MA	88	33%	$60,000
52.0213	Organizational Leadership.	D	18	11%	*
52.0215	Risk Management.	BA	*	*	*
52.0299	Business Administration, Management and Operations, Other.	AA	11	64%	$42,014
52.0299	Business Administration, Management and Operations, Other.	MA	61	39%	$54,751

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
52.0301	Accounting.	BA	492	67%	$49,161
52.0301	Accounting.	CPBA	*	*	*
52.0301	Accounting.	MA	216	70%	$63,979
52.0302	Accounting Technology/Technician and Bookkeeping.	C < 1 YR	*	*	*
52.0302	Accounting Technology/Technician and Bookkeeping.	C 1-2 YR	16	69%	$45,144
52.0302	Accounting Technology/Technician and Bookkeeping.	AA	22	77%	$45,346
52.0304	Accounting and Finance.	BA	*	*	*
52.0305	Accounting and Business/Management.	BA	*	*	*
52.0401	Administrative Assistant and Secretarial Science, General.	C < 1 YR	*	*	*
52.0401	Administrative Assistant and Secretarial Science, General.	C 1-2 YR	33	88%	$33,675
52.0401	Administrative Assistant and Secretarial Science, General.	AA	70	71%	$33,540
52.0402	Executive Assistant/Executive Secretary.	C < 1 YR	72	61%	$24,088
52.0402	Executive Assistant/Executive Secretary.	C 1-2 YR	160	68%	$29,205
52.0407	Business/Office Automation/Technology/Data Entry.	C < 1 YR	11	82%	$36,728
52.0407	Business/Office Automation/Technology/Data Entry.	C 1-2 YR	36	69%	$34,516
52.0501	Business/Corporate Communications, General.	BA	*	*	*
52.0601	Business/Managerial Economics.	BA	78	59%	$43,509
52.0701	Entrepreneurship/Entrepreneurial Studies.	C < 1 YR	35	54%	$41,651
52.0701	Entrepreneurship/Entrepreneurial Studies.	AA	*	*	*
52.0701	Entrepreneurship/Entrepreneurial Studies.	BA	30	57%	$38,000
52.0701	Entrepreneurship/Entrepreneurial Studies.	CPBA	*	*	*
52.0703	Small Business Administration/Management.	BA	*	*	*
52.0803	Banking and Financial Support Services.	C < 1 YR	*	*	*
52.0803	Banking and Financial Support Services.	AA	*	*	*
52.0803	Banking and Financial Support Services.	BA	*	*	*
52.0803	Banking and Financial Support Services.	CPBA	*	*	*
52.1001	Human Resources Management/Personnel Administration, General.	BA	58	66%	$43,411
52.1001	Human Resources Management/Personnel Administration, General.	CPBA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
52.1001	Human Resources Management/Personnel Administration, General.	MA	23	61%	$67,090
52.1005	Human Resources Development.	CPBA	*	*	*
52.1005	Human Resources Development.	MA	12	50%	$77,980
52.1101	International Business/Trade/Commerce.	BA	27	37%	$62,389
52.1206	Information Resources Management.	BA	*	*	*
52.1207	Knowledge Management.	CPBA	*	*	*
52.1299	Management Information Systems and Services, Other.	CPBA	*	*	*
52.1301	Management Science.	BA	12	33%	*
52.1301	Management Science.	CPBA	48	38%	$79,738
52.1301	Management Science.	MA	27	48%	$90,592
52.1301	Management Science.	D	13	0%	*
52.1302	Business Statistics.	BA	177	44%	$57,904
52.1302	Business Statistics.	MA	68	63%	$87,289
52.1399	Management Sciences and Quantitative Methods, Other.	MA	67	40%	$90,395
52.9999	Business, Management, Marketing, and Related Support Services, Other.	C < 1 YR	*	*	*
52.9999	Business, Management, Marketing, and Related Support Services, Other.	BA	*	*	*

Mirroring the growth of Business, Finance, Government Management, and Support Service occupations in the Tennessee economy, almost all public and private institutions in the state offer at least one academic program supporting an in-demand occupation in the career cluster. The University of Tennessee at Martin offers the only master's level program in Strategic Communication in the state. This program prepares students with an array of skills to enter the dynamic world of corporate messaging. Middle Tennessee State University's Recording Industry program continues to generate national appeal as students learn about the operational and financial side of the state's iconic music industry. The wide array of occupations and programs supporting this cluster are evident across Tennessee colleges.

High School CTE Business, Finance, Government Management, & Support Service Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
44.0499	Public Administration, Other	CTE HS	61	57%	$38,436
51.2211	Health Services Administration.	CTE HS	24	46%	$48,333
52.0204	Office Management and Supervision.	CTE HS	1,642	53%	$38,923
52.0302	Accounting Technology/Technician and Bookkeeping.	CTE HS	468	54%	$38,196
52.1005	Human Resources Development.	CTE HS	*	*	*

Over 2,000 high school graduates concentrated in a Business, Finance, Government Management, and Support Services aligned training program in 2021-22. The largest program was relating to Office Management and Supervision, while the program paying the highest first-year wage was the Health Services Administration pathway which graduated 24 students earning over $48,000.

In 2022-23, over 8,000 Tennessee high school concentrators participated in Business Management, Office Management, Accounting, and Banking and Finance programs of study. Through these pathways, students can earn business-related industry credentials, too, including the Microsoft Office Specialist Power Point Associate certification.

Business, Finance, Government Management, and Support Services Apprenticeships 2022

CIP Code	Program Title	Number of Completers 2022
52.0401	Administrative Assistant and Secretarial Science, General.	*
43.0399	Homeland Security, Other.	14

Cluster Six: Sales and Marketing Occupations

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 343,800 people, which reflects a net gain of approximately 6,700 jobs (2.0 percent) since 2018.[44]

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, necessitating a rapid change for skills in the 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 too. Marketing managers and sales managers, for example, often gain employment in headquarters operations or consulting firms.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
11-2021	Marketing Managers		5	$75,266	Bachelor's degree	*	
11-2022	Sales Managers		7	$76,167	Bachelor's degree	*	
13-1020	Buyers and Purchasing Agents		1	$37,965	Bachelor's degree	*	
13-2052	Personal Financial Advisors	X	5	$38,353	Bachelor's degree		
27-1026	Merchandise Displayers and Window Trimmers		5	$27,948	High school diploma or equivalent	*	
41-1011	First-Line Supervisors of Retail Sales Workers	X	9	$29,629	High school diploma or equivalent		
41-1012	First-Line Supervisors of Non-Retail Sales Workers		3	$48,153	High school diploma or equivalent	*	
41-2021	Counter and Rental Clerks		4	$24,890	No formal educational credential		

[44] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, NAICS 44-45 Retail Trade, June 2018 - June 2023

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
41-2022	Parts Salespersons		2	$23,247	No formal educational credential	*	
41-3011	Advertising Sales Agents	X	2	$28,501	High school diploma or equivalent		
41-3031	Securities, Commodities, and Financial Services Sales Agents		2	$41,695	Bachelor's degree		
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	X	8	$35,066	High school diploma or equivalent	*	
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products		7	$42,249	Bachelor's degree	*	#
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products		6	$34,217	High school diploma or equivalent	*	
41-9022	Real Estate Sales Agents	X	7	$23,636	High school diploma or equivalent		
53-7065	Stockers and Order Fillers		2	$25,704	High school diploma or equivalent	*	

Sales and Marketing Aligned Academic Programs

Postsecondary Sales and Marketing Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
09.0903	Advertising.	BA	68	57%	$35,681
09.0903	Advertising.	MA	*	*	*
52.0208	E-Commerce/Electronic Commerce.	MA	21	67%	$53,150
52.1401	Marketing/Marketing Management, General.	BA	739	60%	$42,456
52.1401	Marketing/Marketing Management, General.	MA	*	*	*
52.1803	Retailing and Retail Operations.	C 1-2 YR	*	*	*
52.1804	Selling Skills and Sales Operations.	C < 1 YR	16	56%	$41,218
52.1902	Fashion Merchandising.	BA	*	*	*

The programs in the Sales and Marketing cluster prepare students with the skills to engage in today's commercial marketplace. The University of Tennessee at Martin has a Bachelor of marketing with concentrations in professional sales and strategic marketing. Nashville State Community College has a certificate program in retail management equipping students to interface directly with customers. Many programs within the cluster incorporate community-based learning opportunities that allow students to gain real-world experience and connections as they enter the workforce, like Austin Peay State University's marketing program.

High School CTE Sales and Marketing Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
52.0701	Entrepreneurship/Entrepreneurial Studies.	CTE HS	547	52%	$39,625
52.1401	Marketing/Marketing Management, General.	CTE HS	2,051	50%	$39,345

Over 2,500 high school CTE concentrators graduated in the marketing cluster in 2021-22 with the majority coming from the marketing management program. In 2022-23, the high school CTE marketing pathway enrolls over 6,000 Tennessee high school concentrators across three programs of study: Marketing Management, Entrepreneurship, and Supply Chain

Management. Collierville High School students enrolled in supply chain management had the opportunity to earn the Certified Logistics Associate certification[45] to support the demand for the logistics workforce in Southwest Tennessee.

Sales and Marketing Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
52.1909	Special Products Marketing Operations.	*

[45] Tennessee Department of Education, Certified Logistics Associate (CLA), https://www.tn.gov/content/dam/tn/education/ccte/eps/credentials/cte_sic_CertifiedLogisticsAssoc.pdf

Cluster Seven: Health Sciences Occupations

Nationally, employment in the healthcare sector is projected to experience 1.8 million job openings annually from 2022 to 2032, attributable to the aging demographics.[46,47] Tennessee is 26th nationwide and fifth in the southeast for its proportion of residents aged 65 and older. This aging is indicative of broader trends necessitating increased healthcare services.[48] As the Baby Boomer cohort transitions into retirement and population growth decelerates, the difficulty of replenishing the workforce is compounded.[49]

A comparison of new business applications shows that Tennessee's healthcare sector business applications are up relative to the national average.[50] The state's health sciences occupations demonstrate a concentration within local service providers, including hospitals, outpatient clinics, and long-term care facilities. These roles commonly necessitate formal qualifications, such as degrees or certificates, and often a license for practice. Tennessee's demand for allied health professionals is on an upward trend, highlighting a sector comprising 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 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.

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[46] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, Healthcare Occupations

[47] 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

[48] Consumer Affairs, Elderly Population in U.S. by State, 2023

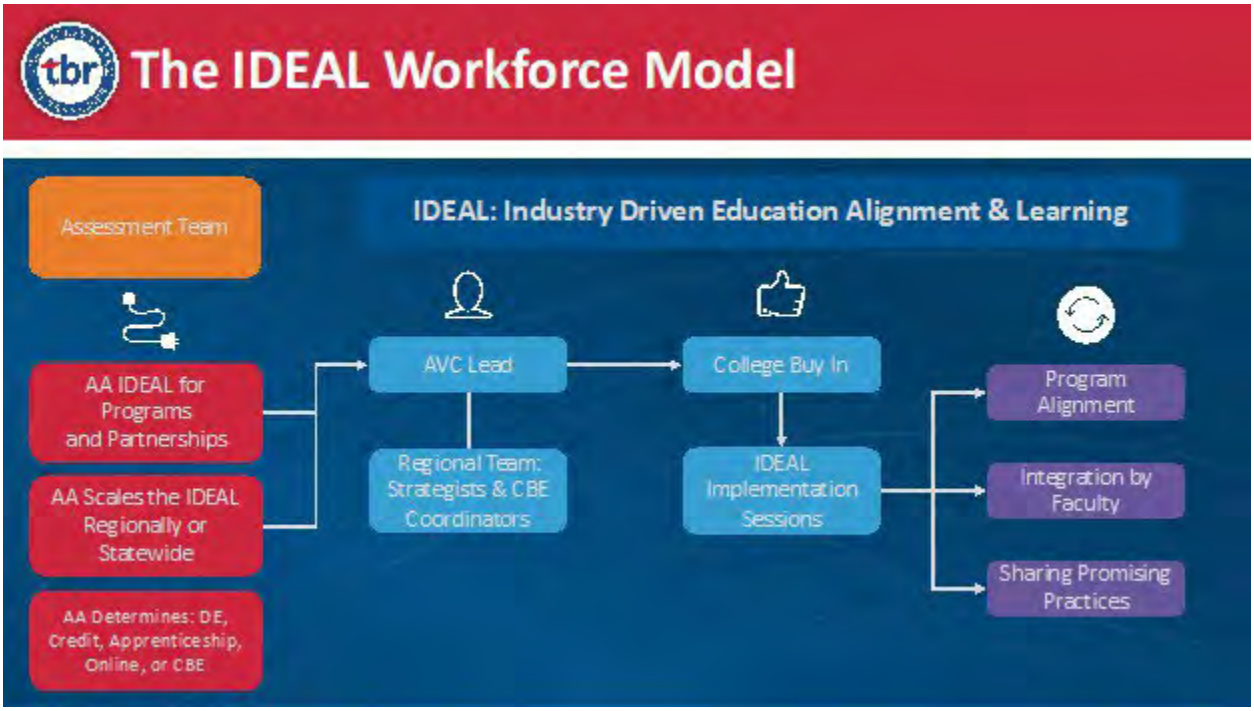
[49] Boyd Center for Business and Economic Research, *An Economic Report to the Governor of the State of Tennessee*, 2023

[50] Boyd Center for Business and Economic Research, *An Economic Report to the Governor of the State of Tennessee*, 2024

The Tennessee Board of Regent's IDEAL Workforce Model

The Tennessee Board of Regents (TBR) delivers comprehensive, state-of-the-art training services for new and existing business and industry workforce partners to increase the number of workforce training hours produced by TBR, its institutions, and the number of companies served. This comprehensive approach ensures that TBR colleges are uniquely positioned to rapidly respond to the workforce needs of existing and emerging industries across the state.

TBR has created the **IDEAL Workforce Model**, Industry-Driven Education Aligned Learning, to scale regional or statewide training programs for industry partners that are referred to TBR by entities such as the Governor's Office, the Legislature, state agencies like Economic and Community Development or Department of Labor and Workforce Development, and the Chancellor's Office. This work is supported by collaborative efforts across TBR's External Affairs' Center for Workforce Development, the Office of Academic Affairs, and the Center for Apprenticeships divisions.



The Industry-Driven Education Aligned Learning (IDEAL) model is used by TBR after a regional assessment team completes the intake process with a referred company. That team works to assess industry needs, identify aligned training, or create custom training. This regional assessment team also identifies if the training can be provided as a traditional academic program, short-term workforce training, registered apprenticeship, dual enrollment opportunity, competency-based education, or as a multimodal approach that incorporates two or more of these strategies.

The workforce opportunity is presented to all college Presidents, Chief Academic Officers, and Directors for Workforce Development in a virtual statewide meeting. The industry partner is given time to present their workforce need, the in-kind contributions they will provide to catalyze the new training program, and the facility, equipment, and faculty requirements for training if they have offered it in another context (e.g., another state or region). A champion from TBR summarizes the viable training options to the colleges, such as apprenticeship or dual enrollment. Over subsequent weeks, college presidents are asked to signal their interest in exploring the opportunity further and to identify a campus lead. When a college chooses to participate in the effort, TBR's External Affairs and Academic Affairs staff lead them through a series of facilitated implementation sessions where faculty and workforce development staff work to embed or create new programs and/or training to meet the industry demand.

TBR has used this model to successfully create new training programs for Amazon and their AWS certifications, the National Tile Contractors Association in collaboration with the TN Department of Economic & Community Development, the TN Forestry Association in collaboration with the TN Department of Agriculture, the Direct Support Professional Program in collaboration with TennCare, the Floor Covering Education Foundation, Massage Therapy programs in collaboration with The Ingram Group, and the University of Tennessee's Grow Your Own Teacher Apprenticeship.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry	STEM
		TN	Total # Regions				
19-5011	Occupational Health and Safety Specialists		7	$50,877	Bachelor's degree	*	
29-1031	Dietitians and Nutritionists		2	$39,276	Bachelor's degree		
29-1071	Physician Assistants		6	$80,670	Master's degree		
29-1122	Occupational Therapists		2	$69,832	Master's degree		
29-1123	Physical Therapists		3	$70,626	Doctoral or professional degree		
29-1126	Respiratory Therapists		5	$48,462	Associate degree		
29-1127	Speech-Language Pathologists	X	7	$52,259	Master's degree		
29-1141	Registered Nurses		4	$54,486	Bachelor's degree		
29-1151	Nurse Anesthetists		1	$135,887	Master's degree		
29-1171	Nurse Practitioners		6	$62,741	Master's degree		
29-1292	Dental Hygienists		1	$47,693	Associate degree		
29-2031	Cardiovascular Technologists and Technicians		1	$33,216	Associate degree		
29-2032	Diagnostic Medical Sonographers		6	$54,196	Associate degree		
29-2042	Emergency Medical Technicians		2	$27,833	Postsecondary nondegree award		
29-2052	Pharmacy Technicians		8	$28,760	High school diploma or equivalent		
29-2055	Surgical Technologists	X	6	$40,456	Postsecondary nondegree award		
29-2057	Ophthalmic Medical Technicians		1	$30,187	Postsecondary nondegree award		
29-2061	Licensed Practical and Licensed Vocational Nurses	X	9	$36,873	Postsecondary nondegree award		
29-2081	Opticians, Dispensing		1	$29,024	High school diploma or equivalent		
31-1131	Nursing Assistants		3	$26,850	Postsecondary nondegree award		
31-2011	Occupational Therapy Assistants		3	$47,282	Associate degree		
31-2021	Physical Therapist Assistants	X	9	$46,871	Associate degree		
31-9011	Massage Therapists	X	3	$32,572	Postsecondary nondegree award		

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry	STEM
		TN	Total # Regions				
31-9091	Dental Assistants	X	9	$32,692	Postsecondary nondegree award		
31-9092	Medical Assistants	X	9	$28,974	Postsecondary nondegree award		
31-9093	Medical Equipment Preparers	X	1	$26,101	High school diploma or equivalent		
31-9097	Phlebotomists	X	8	$29,229	Postsecondary nondegree award		
31-9099	Healthcare Support Workers, All Other		5	$26,002	High school diploma or equivalent		

Health Sciences Aligned Academic Programs

Postsecondary Health Sciences Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
19.0501	Foods, Nutrition, and Wellness Studies, General.	BA	24	71%	$34,290
19.0504	Human Nutrition.	CPBA	*	*	*
30.1901	Nutrition Sciences.	BA	*	*	*
30.1901	Nutrition Sciences.	CPBA	*	*	*
30.1901	Nutrition Sciences.	MA	19	53%	$50,252
30.1901	Nutrition Sciences.	D	*	*	*
51.0202	Audiology/Audiologist.	D	38	21%	$74,319
51.0203	Speech-Language Pathology/Pathologist.	MA	47	55%	$55,912
51.0204	Audiology/Audiologist and Speech-Language Pathology/Pathologist.	MA	88	50%	$51,899
51.0204	Audiology/Audiologist and Speech-Language Pathology/Pathologist.	D	*	*	*
51.0299	Communication Disorders Sciences and Services, Other.	CPBA	12	42%	$59,631

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
51.0601	Dental Assisting/Assistant.	C < 1 YR	*	*	*
51.0601	Dental Assisting/Assistant.	C 1-2 YR	122	81%	$29,788
51.0601	Dental Assisting/Assistant.	AA	17	82%	$29,017
51.0602	Dental Hygiene/Hygienist.	AA	45	82%	$54,350
51.0602	Dental Hygiene/Hygienist.	BA	73	70%	$57,539
51.0707	Health Information/Medical Records Technology/Technician.	C < 1 YR	29	52%	$24,045
51.0707	Health Information/Medical Records Technology/Technician.	C 1-2 YR	105	76%	$31,590
51.0801	Medical/Clinical Assistant.	C < 1 YR	27	74%	$28,046
51.0801	Medical/Clinical Assistant.	C 1-2 YR	85	69%	$30,979
51.0801	Medical/Clinical Assistant.	AA	*	*	*
51.0803	Occupational Therapist Assistant.	AA	59	76%	$33,482
51.0805	Pharmacy Technician/Assistant.	C < 1 YR	15	87%	$29,472
51.0805	Pharmacy Technician/Assistant.	C 1-2 YR	82	65%	$30,313
51.0806	Physical Therapy Assistant.	AA	79	81%	$42,688
51.0809	Anesthesiologist Assistant.	AA	*	*	*
51.0901	Cardiovascular Technology/Technologist.	AA	12	92%	$50,786
51.0904	Emergency Medical Technology/Technician (EMT Paramedic).	C < 1 YR	474	84%	$46,534
51.0904	Emergency Medical Technology/Technician (EMT Paramedic).	C 1-2 YR	149	84%	$61,942
51.0904	Emergency Medical Technology/Technician (EMT Paramedic).	AA	44	93%	$67,358
51.0905	Nuclear Medical Technology/Technologist.	C < 1 YR	*	*	*
51.0905	Nuclear Medical Technology/Technologist.	C 1-2 YR	10	40%	$65,484
51.0908	Respiratory Care Therapy/Therapist.	AA	77	84%	$59,695
51.0908	Respiratory Care Therapy/Therapist.	BA	41	63%	$57,801
51.0909	Surgical Technology/Technologist.	C 1-2 YR	95	73%	$48,405
51.0909	Surgical Technology/Technologist.	AA	42	83%	$44,677
51.0910	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician.	C 1-2 YR	19	89%	$65,493
51.0910	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician.	BA	*	*	*
51.0912	Physician Associate/Assistant.	MA	222	27%	$87,321
51.1001	Blood Bank Technology Specialist.	C < 1 YR	18	83%	$32,153
51.1009	Phlebotomy Technician/Phlebotomist.	C < 1 YR	33	67%	$24,651
51.1012	Sterile Processing Technology/Technician.	C < 1 YR	13	100%	$46,194
51.1012	Sterile Processing Technology/Technician.	C 1-2 YR	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
51.1801	Opticianry/Ophthalmic Dispensing Optician.	AA	17	88%	$34,770
51.1803	Ophthalmic Technician/Technologist.	AA	*	*	*
51.2202	Environmental Health	AA	*	*	*
51.2202	Environmental Health	BA	*	*	*
51.2202	Environmental Health	D	*	*	*
51.2306	Occupational Therapy/Therapist.	MA	128	50%	$59,335
51.2306	Occupational Therapy/Therapist.	D	23	61%	$60,650
51.2308	Physical Therapy/Therapist.	D	163	63%	$69,146
51.3101	Dietetics/Dietitian.	BA	14	21%	*
51.3101	Dietetics/Dietitian.	CPBA	13	23%	*
51.3102	Clinical Nutrition/Nutritionist.	MA	34	53%	$44,607
51.3203	Nursing Education.	CPBA	*	*	*
51.3501	Massage Therapy/Therapeutic Massage.	C < 1 YR	21	48%	$29,987
51.3501	Massage Therapy/Therapeutic Massage.	C 1-2 YR	*	*	*
51.3801	Registered Nursing/Registered Nurse.	AA	923	89%	$65,179
51.3801	Registered Nursing/Registered Nurse.	BA	2457	68%	$68,386
51.3801	Registered Nursing/Registered Nurse.	CPBA	10	50%	$88,744
51.3801	Registered Nursing/Registered Nurse.	MA	368	69%	$84,905
51.3804	Nurse Anesthetist.	D	25	8%	*
51.3805	Family Practice Nurse/Nursing.	CPBA	12	50%	$109,872
51.3805	Family Practice Nurse/Nursing.	MA	164	50%	$85,751
51.3805	Family Practice Nurse/Nursing.	EDS	20	10%	*
51.3805	Family Practice Nurse/Nursing.	D	43	65%	$100,835
51.3808	Nursing Science.	D	*	*	*
51.3809	Pediatric Nurse/Nursing.	CPBA	*	*	*
51.3809	Pediatric Nurse/Nursing.	MA	*	*	*
51.3810	Psychiatric/Mental Health Nurse/Nursing.	CPBA	19	37%	$111,350
51.3810	Psychiatric/Mental Health Nurse/Nursing.	MA	13	77%	$91,234
51.3810	Psychiatric/Mental Health Nurse/Nursing.	EDS	*	*	*
51.3810	Psychiatric/Mental Health Nurse/Nursing.	D	*	*	*
51.3818	Nursing Practice.	BA	35	66%	$46,244
51.3818	Nursing Practice.	D	147	56%	$104,036
51.3899	Registered Nursing, Nursing Administration, Nursing Research and Clinical Nursing, Other.	BA	*	*	*
51.3901	Licensed Practical/Vocational Nurse Training.	C < 1 YR	114	61%	$30,354
51.3901	Licensed Practical/Vocational Nurse Training.	C 1-2 YR	1107	77%	$47,280
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide.	C < 1 YR	51	71%	$25,824

Tennessee colleges and universities offer a myriad of academic programs to support the growing demand for skilled professionals in the Health Sciences Cluster. Like most states in the country, Health Sciences careers are a growing part of the Tennessee economy, but demand continues to run ahead of supply. Public and private institutions continue to expand their capacity to train more students to enter these needed occupations.

Beyond increasing individual capacity, institutions are also working strategically to create partnerships to meet the needs of Tennessee. The University of Tennessee Southern (UTS) and the University of Tennessee Health Sciences Center have a newly approved joint Bachelor of Science in Nursing (BSN) program that builds on the existing strengths of the BSNs at both schools to share resources more effectively across UT campuses. The partnership will strengthen UTS's program, which serves the Southern Middle region and provides nurses for rural and underserved populations.

High School CTE Health Sciences Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide.	CTE HS	2,424	52%	$38,783

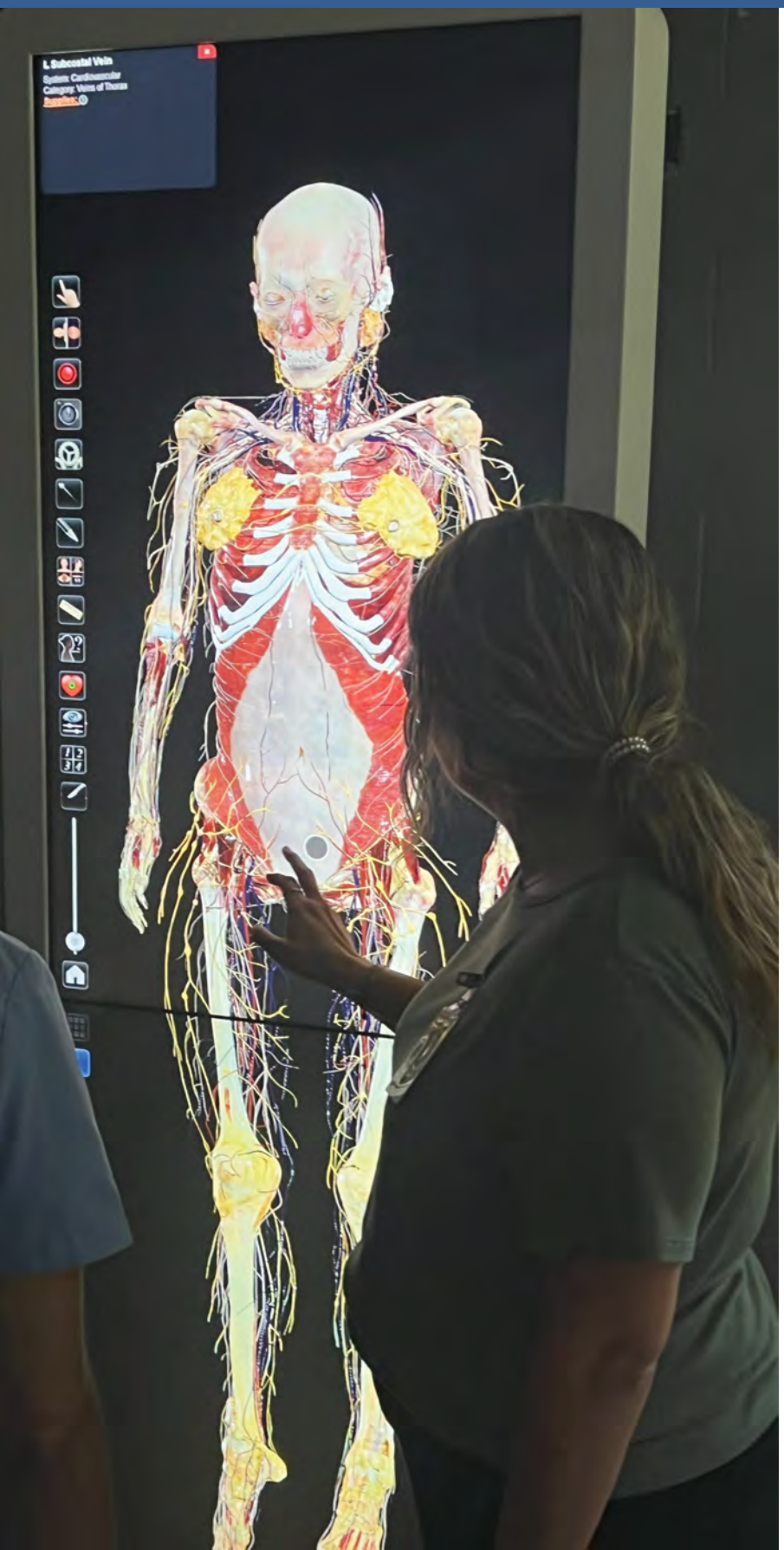
Over 2,400 high school CTE concentrators graduated in the nursing pathway in 2021-22 with over half found employed in Tennessee's workforce. This program offers high school students the opportunity to earn their CNA and LPN certifications in high school. The Health Science pathway is the most popular among high school students with 18,000 students enrolled across Diagnostic Services, Therapeutic Services, Emergency Services, Nursing Services, and Sport and Human Performance programs. In 2024-25, schools will have the option to offer a new program, Behavioral Health, to prepare for the growing mental health medicine needs. Elizabethton High School offers students opportunities in clinical settings as well as the opportunity to earn industry credentials as a Certified Nursing Assistant (CNA).

Health Sciences Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
51.0707	Health Information/Medical Records Technology/Technician.	*
51.0801	Medical/Clinical Assistant.	22
51.0909	Surgical Technology/Technologist.	*
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide.	26

Governor’s Investment in Vocational Education (GIVE)

Nashville State



The Governor's Investment in Vocational Education (GIVE) program aims to create long-term partnerships between Tennessee Colleges of Applied Technology (TCATs), community colleges, industries, economic development/workforce agencies, and K-12 schools. Its main goal is to identify and address the "skills gaps" present in the local workforce. GIVE is a competitive grant that awards of up to $1 million to local higher education entities to facilitate collaboration between K12, higher education, and workforce partners.

Nashville State Community College (NSCC) launched an emergency medical services program to equip students from two area high schools with skills and credentials to help them succeed in the workforce or continue their postsecondary studies. Building on existing initiatives at Creek Wood High School in Charlotte and Dickson County High School in Dickson, this GIVE grant has created conditions to increase instruction and enrollment, purchase necessary equipment, and offer a broader range of student credentials. One of the program's key components is the EMS Practicum, which allows students to work alongside EMS professionals in the county EMS service and learn about the 911 call center. With the help of GIVE 2.0 funding, the program aims to establish a pipeline of future EMS professionals who will have the necessary skills to succeed quickly in this in-demand field.

Cluster Eight: Human Services Occupations

Human services occupations focus on societal and individual well-being. Nationally, employment in community and social occupations is projected to grow faster than the national average and experience 281,600 annual openings from 2022 to 2032.[51] As our society grows and changes, demand for occupations focusing on nutritional, behavioral, and mental health will likely increase.

Social and Human Service Assistants, Mental Health and Substance Abuse Social Workers, Hairdressers, Hairstylists, and Cosmetologists, Educational, Guidance, and Career Counselors and Advisors, and Skincare Specialists are all in-demand statewide.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
21-1012	Educational, Guidance, and Career Counselors and Advisors	X	6	$38,462	Master's degree		
21-1013	Marriage and Family Therapists		3	$31,941	Master's degree		
21-1019	Counselors, All Other		1	$25,915	Master's degree		
21-1022	Healthcare Social Workers		6	$36,976	Master's degree		
21-1023	Mental Health and Substance Abuse Social Workers	X	3	$30,737	Master's degree		
21-1092	Probation Officers and Correctional Treatment Specialists		1	$36,031	Bachelor's degree		
21-1093	Social and Human Service Assistants	X	7	$26,193	High school diploma or equivalent		
25-1125	History Teachers, Postsecondary		1	$44,522	Doctoral or professional degree		
39-5012	Hairdressers, Hairstylists, and Cosmetologists	X	5	$20,559	Postsecondary nondegree award		
39-5094	Skincare Specialists	X	1	$21,173	Postsecondary nondegree award		
39-9041	Residential Advisors		1	$24,260	High school diploma or equivalent		

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

Human Services Aligned Academic Programs

Postsecondary Human Services Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
05.0210	Disability Studies.	BA	*	*	*
12.0401	Cosmetology/Cosmetologist, General.	C < 1 YR	48	54%	$19,490
12.0401	Cosmetology/Cosmetologist, General.	C 1-2 YR	400	54%	$20,078
12.0402	Barbering/Barber.	C < 1 YR	*	*	*
12.0402	Barbering/Barber.	C 1-2 YR	34	41%	$13,634
12.0409	Aesthetician/Esthetician and Skin Care Specialist.	C < 1 YR	18	61%	$32,571
12.0410	Nail Technician/Specialist and Manicurist.	C < 1 YR	13	38%	$16,583
12.0413	Cosmetology, Barber/Styling, and Nail Instructor.	C < 1 YR	*	*	*
12.0499	Cosmetology and Related Personal Grooming Arts, Other.	C < 1 YR	27	67%	$23,071
13.1101	Counselor Education/School Counseling and Guidance Services.	CPBA	*	*	*
13.1101	Counselor Education/School Counseling and Guidance Services.	MA	170	69%	$48,510
13.1101	Counselor Education/School Counseling and Guidance Services.	EDS	31	77%	$46,295
13.1102	College Student Counseling and Personnel Services.	MA	18	50%	$52,000
13.1102	College Student Counseling and Personnel Services.	D	*	*	*
19.0707	Family and Community Services.	BA	10	20%	*
19.0707	Family and Community Services.	CPBA	12	83%	$39,947
24.0101	Liberal Arts and Sciences/Liberal Studies.	CPBA	*	*	*
30.1101	Gerontology.	CPBA	*	*	*
30.2001	International/Globalization Studies.	BA	15	53%	$26,571
42.2703	Developmental and Child Psychology.	BA	*	*	*
42.2799	Research and Experimental Psychology, Other.	BA	309	63%	$29,841
42.2799	Research and Experimental Psychology, Other.	MA	*	*	*
42.2799	Research and Experimental Psychology, Other.	D	16	6%	*
42.2803	Counseling Psychology.	BA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
42.2803	Counseling Psychology.	CPBA	*	*	*
42.2804	Industrial and Organizational Psychology.	BA	14	50%	$50,907
42.2806	Educational Psychology.	CPBA	*	*	*
42.2813	Applied Psychology.	BA	*	*	*
44.0000	Human Services, General.	BA	40	58%	$33,377
44.0000	Human Services, General.	MA	13	54%	$39,580
44.0201	Community Organization and Advocacy.	AA	*	*	*
44.0701	Social Work.	BA	418	65%	$36,970
44.0701	Social Work.	MA	567	62%	$47,692
44.0701	Social Work.	D	18	11%	*
44.0799	Social Work, Other.	CPBA	97	65%	$49,296
45.0201	Anthropology, General.	MA	20	30%	$44,917
45.0201	Anthropology, General.	D	*	*	*
45.0299	Anthropology, Other.	CPBA	*	*	*
45.0301	Archeology.	MA	*	*	*
45.0701	Geography.	MA	*	*	*
45.0701	Geography.	D	*	*	*
45.0901	International Relations and Affairs.	MA	14	57%	$39,498
45.0999	International Relations and National Security Studies, Other.	CPBA	*	*	*
45.1001	Political Science and Government, General.	MA	*	*	*
45.1001	Political Science and Government, General.	D	*	*	*
45.1101	Sociology, General.	CPBA	*	*	*
45.1101	Sociology, General.	MA	19	37%	$40,962
45.1101	Sociology, General.	D	*	*	*
51.1501	Substance Abuse/Addiction Counseling.	C < 1 YR	*	*	*
51.1503	Clinical/Medical Social Work.	CPBA	*	*	*
51.1504	Community Health Services/Liaison/Counseling.	BA	*	*	*
51.1505	Marriage and Family Therapy/Counseling.	MA	83	22%	$48,489
51.1508	Mental Health Counseling/Counselor.	MA	89	49%	$44,566
51.2314	Rehabilitation Science.	BA	24	67%	$23,711
51.2316	Horticulture Therapy/Therapist.	CPBA	*	*	*
54.0101	History, General.	MA	47	51%	$33,772
54.0101	History, General.	D	11	64%	$45,000
54.0105	Public/Applied History.	D	*	*	*
54.0108	Military History.	MA	*	*	*

As Tennessee's population grows, Tennessee's institutions offer an increasing number of academic programs across training levels to support in-demand occupations in the Human Services Cluster. School counselors are in-demand and Counselor Education/School Counseling and Guidance Services programs employ more than sixty percent of graduates in Tennessee with wages exceeding the state median.

Across academic institutions and credential levels, students have opportunities to learn the skills needed to enter careers that serve our communities. Social workers are needed across the state and postsecondary institutions produced over 900 social worker graduates in 2021-22 at the baccalaureate and master's degree levels. A challenge to recruitment in this occupational area may be relatively low wages for the training requirements.

In addition to degree programs offered across community colleges and universities, TCATs across the state have added the Barbering and Cosmetology Instructor Training program, including Chattanooga, Dickson, Elizabethton, Hohenwald, McMinnville, Murfreesboro, Northwest, and Oneida.

High School CTE Human Services Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
12.0401	Cosmetology/Cosmetologist, General.	CTE HS	1,164	54%	$37,089
12.0402	Barbering/Barber.	CTE HS	48	71%	$35,798
19.0799	Human Development, Family Studies, and Rel.	CTE HS	1,479	52%	$38,416

The Human Services career cluster offers multiple pathways to expose high school students to careers in human services. The cosmetology and human development programs graduated more than 1,000 HS CTE concentrators each in 2021-22. In 2022-23, programs in this cluster enrolled over 8,000 Tennessee high school concentrators across four programs of study: Human and Social Sciences, Dietetics and Nutrition, Cosmetology, and Barbering. Licenses are required for cosmetology and barbering occupations and students may begin logging hours in pursuit of licenses while in high school. Bearden High School offers Dietetics & Human & Social Sciences pathway, where students can gain hands-on experiences in human services careers as part of the high school's they are new academy model.

Tennessee Investment in Student Achievement (TISA)

Student-Based Funding Formula

In 2022, Tennessee policymakers restructured its student-based, public school funding formula, called the Tennessee Investment in Student Achievement (TISA) program. Under TISA, a portion of public education funding is allocated to districts enrolling students in high-wage, in-demand, high skill programs of study. Each CTE program will be categorized into tiers, established by State Board of Education rule. This tiered system, based on statewide employment needs, encourages school districts to offer programs of study leading to long-term and emerging local employment needs based on in-demand Standard Occupational Classification (SOC) codes. The formula will focus heavily on in-demand fields for the State of Tennessee. Additional funding is offered for students earning industry credentials from the "Valued" and "Preferred" tiers on the state-promoted list.

Cluster Nine: Education and Training Occupations

The education and training career cluster includes educators, administrators, trainers, counselors, and other learning support services occupations. 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 concern. In 2023, Governor Lee signed the Teacher Paycheck Protection Act, which will give teachers the largest pay raise in state history. This Act continues Governor Lee's commitment to increase teacher salaries while working to recruit and retain highly qualified teachers. [52]

Tennessee is pioneering new ways to develop teacher pipelines and ensure that all schools are staffed with high-quality educators. Tennessee is the first state approved by the U.S. Department of Labor to establish a 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.[53]

The Tennessee Department of Education (TDOE), in partnership with the Tennessee Education Research Alliance (TERA) at Vanderbilt University, conducts an annual Tennessee Educator Survey (TES), to understand the experience of educators across Tennessee. The results from the 2023 TES indicated that 78 percent of survey respondents plan to continue teaching in their current school next year, up slightly from 77 percent in 2022.[54]

The TES also highlights several initiatives in Tennessee aimed at providing for individual student needs that may be impacted by a lack of qualified educators. Tennessee instituted the **Tennessee Accelerating Literacy and Learning Corps** (TN ALL Corps), a research-based high-dosage, low-ratio tutoring program for elementary and middle school. Following its second year of implementation, the TES revealed that educators largely viewed the program as enhancing student learning, but approximately 58 percent of administrators identified a shortage of available tutors as a barrier to implementing the TN ALL Corps tutoring program within their schools.[55] Further, TDOE's **Innovative High Schools Model** aims to prepare students for success after graduation through participation in local programs aligned to in-demand careers. CTE teachers, reported through the TES, indicate significant interest in these programs from students.

While efforts exist to mitigate the challenges experienced in the education and training cluster, needs persist to support the education enterprise.

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[52] Teacher Paycheck Protection Act
[53] Tennessee Department of Education, Grow Your Own
[54] Tennessee Department of Education, 2023 Tennessee Educator Survey
[55] Tennessee Department of Education, 2023 Tennessee Educator Survey

Grow Your Own
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 supports partnerships between Educator Preparation Providers (EPPs) and school districts to provide innovative, no-cost pathways to the teaching profession and continues to build pipelines of qualified teachers and school district professionals.

In January 2022, Tennessee was the first state to be approved by the US Department of Labor to establish a permanent Grow Your Own (GYO) model. Clarksville-Montgomery County School System and Austin Peay State University's Teacher Residency program was the first registered apprenticeship program for teaching in the country. Tennessee was the first state to sponsor Teacher Occupation Apprentice programs between school districts and Educator Preparation Providers (EPPs) to expand the teacher pipeline and address educator shortages.

Tennessee invested $20 million to support the Grow Your Own Center as a partnership between the Tennessee Department of Education and the University of Tennessee, which is dedicated to supporting and scaling best practices around the state. There are currently 9 EPPs that are part of the GYO initiative, and each program is adapted based on the needs of the aspiring educators and local workforce.

- Arete Memphis Montessori Residency
- Austin Peay State University
- Lincoln Memorial University
- Lipscomb University
- University of Memphis
- University of Tennessee, Chattanooga
- University of Tennessee, Knoxville
- University of Tennessee, Martin
- University of Tennessee Southern

In November 2023, Tennessee's State Board of Education (SBE) began forming an Educator Licensure Review Committee to review current rules and policies governing educator licensure, including strengths, challenges, and potential changes. The Committee will include representation from educators, district and state education leaders, and legislators from across the state. The Committee will address relevant board rules and educator licensure requirements aiming to identify recommendations to ensure that the licensure system and policies meet the needs in Tennessee.[56]

[56] Tennessee State Board of Education, Tennessee Board of Education Seeks to Develop and Educator Licensure Review Committee, November 30, 2023, retrieved from https://www.tn.gov/sbe/news/2023/11/30/tennessee-state-board-of-education-seeks-to-develop-an--educator-licensure-review-committee.html

TDOE is actively working with stakeholders across Tennessee to operationalize this new formula component. During a quarterly statewide CTE director meeting, administrators were asked to connect SOC codes from their local labor market information to high school programs of study. The directors were asked to consider information gleaned from program advisory councils during the Comprehensive Local Needs Assessment (CLNA) process in fall 2023. The CLNA process requires CTE Directors to review current program offerings in line with local employment needs. They are also asked to determine the number of students enrolled in those programs to identify if more career exploration is needed to help students choose a program of study. Postsecondary and business representatives gathered to share information relevant to their program and employment needs. This allowed for directors to capture emerging trends in employment that will inform their program of study offerings in the coming school years.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
11-9033	Education Administrators, Postsecondary		3	$66,289	Master's degree		
25-1194	Career/Technical Education Teachers, Postsecondary	X	3	$39,132	Bachelor's degree		
25-1199	Postsecondary Teachers, All Other		4	$35,513	Doctoral or professional degree		
25-2011	Preschool Teachers, Except Special Education		4	$22,499	Associate degree		
25-3021	Self-Enrichment Teachers	X	3	$21,641	High school diploma or equivalent		
25-3099	Teachers and Instructors, All Other		3	$31,087	Bachelor's degree		
25-4022	Librarians and Media Collections Specialists		2	$41,310	Master's degree		

Education and Training Aligned Academic Programs

Tennessee's public and private institutions have a bevy of programs meant to prepare students to address needs in education and training professions. Most in-demand occupations in this cluster require at least a bachelor's degree and Tennessee employment rates are generally high for graduates.

Educator preparation providers (EPPs) structure academic programs that train teachers in different ways. Most EPPs structure programs around general CIP codes including teaching/education or curriculum and instruction (13.0101 or 13.0301) while preparing graduates to be licensed in specific grade bands (elementary, middle, or high) and/or academic disciplines (math, English, history, etc.). However, EPPs can structure programs more narrowly using specialized CIP codes. For example, 13.1312 Music Teacher Education programs specifically prepare graduates to be Music teachers. While specialized CIPs and programs are options for EPPs, generalized programs are favored to not limit students' licensure opportunities or the faculty that may teach in the program.

Postsecondary Education and Training Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
13.0401	Educational Leadership and Administration, General.	CPBA	30	73%	$72,769
13.0401	Educational Leadership and Administration, General.	MA	448	83%	$66,171
13.0401	Educational Leadership and Administration, General.	EDS	34	76%	$72,080
13.0401	Educational Leadership and Administration, General.	D	132	80%	$81,468
13.0406	Higher Education/Higher Education Administration.	CPBA	*	*	*
13.0406	Higher Education/Higher Education Administration.	MA	*	*	*
13.0406	Higher Education/Higher Education Administration.	D	12	42%	$96,757
13.0411	Superintendency and Educational System Administration.	EDS	*	*	*
13.0499	Educational Administration and Supervision, Other.	CPBA	*	*	*
13.0499	Educational Administration and Supervision, Other.	D	97	45%	$80,501
13.0603	Educational Statistics and Research Methods.	CPBA	*	*	*
13.1203	Junior High/Intermediate/Middle School Education and Teaching.	BA	77	75%	$41,538
13.1203	Junior High/Intermediate/Middle School Education and Teaching.	MA	*	*	*
13.1205	Secondary Education and Teaching.	BA	76	82%	$43,546
13.1205	Secondary Education and Teaching.	MA	38	66%	$53,907
13.1206	Teacher Education, Multiple Levels.	BA	310	81%	$43,710
13.1210	Early Childhood Education and Teaching.	BA	94	74%	$42,724
13.1210	Early Childhood Education and Teaching.	CPBA	*	*	*
13.1210	Early Childhood Education and Teaching.	MA	21	48%	$46,213
13.1210	Early Childhood Education and Teaching.	D	*	*	*
13.1211	Online Educator/Online Teaching.	CPBA	*	*	*
13.1302	Art Teacher Education.	BA	*	*	*
13.1302	Art Teacher Education.	MA	*	*	*
13.1303	Business and Innovation/Entrepreneurship Teacher Education.	MA	*	*	*
13.1305	English/Language Arts Teacher Education.	BA	18	50%	$44,100
13.1305	English/Language Arts Teacher Education.	MA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
13.1306	Foreign Language Teacher Education.	MA	*	*	*
13.1307	Health Teacher Education.	BA	*	*	*
13.1310	Sales and Marketing Operations/Marketing and Distribution Teacher Education.	BA	*	*	*
13.1311	Mathematics Teacher Education.	BA	*	*	*
13.1311	Mathematics Teacher Education.	MA	*	*	*
13.1312	Music Teacher Education.	BA	31	45%	$45,422
13.1312	Music Teacher Education.	MA	*	*	*
13.1314	Physical Education Teaching and Coaching.	BA	31	35%	$35,691
13.1314	Physical Education Teaching and Coaching.	MA	*	*	*
13.1315	Reading Teacher Education.	MA	38	76%	$58,211
13.1315	Reading Teacher Education.	D	*	*	*
13.1316	Science Teacher Education/General Science Teacher Education.	BA	*	*	*
13.1322	Biology Teacher Education.	BA	*	*	*
13.1322	Biology Teacher Education.	MA	*	*	*
13.1323	Chemistry Teacher Education.	BA	*	*	*
13.1323	Chemistry Teacher Education.	MA	*	*	*
13.1324	Drama and Dance Teacher Education.	BA	*	*	*
13.1328	History Teacher Education.	BA	*	*	*
13.1328	History Teacher Education.	MA	*	*	*
13.1330	Spanish Language Teacher Education.	BA	*	*	*
13.1330	Spanish Language Teacher Education.	MA	*	*	*
13.1334	School Librarian/School Library Media Specialist.	CPBA	*	*	*
13.1399	Teacher Education and Professional Development, Specific Subject Areas, Other.	CPBA	*	*	*
13.1399	Teacher Education and Professional Development, Specific Subject Areas, Other.	MA	129	78%	$51,352
13.1399	Teacher Education and Professional Development, Specific Subject Areas, Other.	EDS	*	*	*
13.1401	Teaching English as a Second or Foreign Language/ESL Language Instructor.	BA	*	*	*
13.1401	Teaching English as a Second or Foreign Language/ESL Language Instructor.	CPBA	95	86%	$66,306
13.1401	Teaching English as a Second or Foreign Language/ESL Language Instructor.	MA	42	57%	$58,126
13.1502	Adult Literacy Tutor/Instructor.	CPBA	*	*	*
13.9999	Education, Other.	BA	15	13%	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
19.0101	Family and Consumer Sciences/Human Sciences, General.	BA	72	60%	$30,036
19.0101	Family and Consumer Sciences/Human Sciences, General.	MA	12	67%	$49,736
19.0401	Family Resource Management Studies, General.	BA	66	64%	$32,077
19.0402	Consumer Economics.	BA	29	24%	$36,960
19.0701	Human Development and Family Studies, General.	BA	68	57%	$34,418
19.0701	Human Development and Family Studies, General.	CPBA	*	*	*
19.0701	Human Development and Family Studies, General.	MA	28	54%	$50,308
19.0701	Human Development and Family Studies, General.	D	*	*	*
19.0704	Family Systems.	BA	*	*	*
19.0901	Apparel and Textiles, General.	BA	24	67%	$36,509
25.0101	Library and Information Science.	CPBA	*	*	*
25.0101	Library and Information Science.	MA	173	54%	$50,180
25.0102	Children and Youth Library Services.	CPBA	*	*	*
50.0912	Music Pedagogy.	C < 1 YR	*	*	*
50.0912	Music Pedagogy.	CPBA	*	*	*

While there were no HS CTE concentrator graduates in 2021-22, CTE enrollments from more recent academic years indicate that will change. In 2022-23, the Education and Training career cluster had 2,000 Tennessee high school concentrators enrolled across three programs: Teaching as a Profession, Early Childhood Education Careers, and Educational Guidance and Social Services. Students enrolled in these pathways can earn the Child Development Associate (CDA) industry credential and participate in work-based learning experiences within the local school system and at childcare facilities. Dyersburg State Community College (DSCC) partners with multiple West Tennessee high schools to offer dual enrollment courses that lead to CDA credentialing.[57] Students in the Teaching as a Profession program at Macon County High School are applying teaching concepts and skills in real world settings by working alongside mentoring teachers to plan, present, assess, and adapt

[57] Dyersburg State Community College, Tennessee Early Childhood Training Alliance, https://www.dscc.edu/tecta/

instruction with diverse populations throughout the school district. The Educational Guidance and Social Services program is new and was created specifically to address the demand for school counselors. High school programming is evolving to meet the needs of the education and training workforce.

Education and Training Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
13.1206	Teacher Education, Multiple Levels.	28
13.1210	Early Childhood Education and Teaching.	*

Cluster Ten: Protective Services and Law Occupations

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

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 are represented in the workforce of TNECD's aerospace & defense industry sector. This sector contains companies specializing in the production of aerospace parts and helicopters to handguns and uranium for nuclear weapons, necessitating personnel for onsite security and protection.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
33-3012	Correctional Officers and Jailers		3	$32,193	High school diploma or equivalent		
33-9032	Security Guards		3	$23,955	High school diploma or equivalent	*	
43-5031	Public Safety Telecommunicators		1	$28,863	High school diploma or equivalent		

Protective Services and Law Aligned Academic Programs

Colleges in Tennessee offer several programs beginning at the certificate level to support the needs for correctional officers and security guards. The <1-year certificate program in Police Science graduated over 260 completers in 2021-22 and boasts a nearly 90 percent employment rate in Tennessee with median first-year wages exceeding $46,000.

Postsecondary Protective Services and Law Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
43.0102	Corrections.	C 1-2 YR	*	*	*
43.0103	Criminal Justice/Law Enforcement Administration.	BA	550	62%	$36,410

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
43.0103	Criminal Justice/Law Enforcement Administration.	MA	87	60%	$49,567
43.0104	Criminal Justice/Safety Studies.	AA	96	71%	$33,458
43.0104	Criminal Justice/Safety Studies.	BA	113	43%	$48,828
43.0104	Criminal Justice/Safety Studies.	MA	*	*	*
43.0106	Forensic Science and Technology.	CPBA	*	*	*
43.0107	Criminal Justice/Police Science.	C < 1 YR	268	89%	$46,660
43.0107	Criminal Justice/Police Science.	C 1-2 YR	*	*	*
43.0107	Criminal Justice/Police Science.	AA	17	94%	$44,777
43.0199	Corrections and Criminal Justice, Other.	C < 1 YR	*	*	*
43.0199	Corrections and Criminal Justice, Other.	AA	*	*	*
43.0406	Forensic Science and Technology.	BA	16	63%	$34,592
45.0401	Criminology.	BA	15	47%	$22,234

High School CTE Protective Services and Law Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
43.0102	Corrections.	CTE HS	2,575	52%	$38,756

Over 2,500 high school CTE concentrators graduated in 2021-22 as part of the Corrections pathway with over half of graduates found in the Tennessee workforce. The Law, Public Safety, Corrections, and Security pathways enrolled 7,500 concentrators across its three programs of study: Criminal Justice, Pre-Law, and Fire Management Services in 2022-23. High school CTE programs offer an important opportunity to expose high school students to an in-demand career. Heritage High School in Blount County offers the Criminal Justice and Correction Services pathway which educates students on the standards and practices of police, courts, and corrections with knowledge and practical application.

Cluster Eleven: Arts and Communication Occupations

Tennessee's music and arts pedigree is unparalleled. Tennessee is the birthplace of country music and rock 'n' roll, 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. World-renowned attractions in Tennessee include Elvis Presley's Graceland, Sun Studio, Memphis Rock 'n' Soul Museum, Stax Museum of American Soul Music, Grand Ole Opry, Ryman Auditorium, Country Music Hall of Fame and Museum, Schermerhorn Symphony Center, Brooks Museum of Art, Cheekwood Botanical Gardens and Museum of Art, Frist Center for the Visual Arts, The Parthenon, Hunter Museum of Art, Knoxville Museum of Art, and the International Storytelling Center. The National Museum of African American Music in Nashville is among the latest museums to add to this list.

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 four regions in Tennessee. 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.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
25-1121	Art, Drama, and Music Teachers, Postsecondary		1	$43,067	Master's degree		
27-1011	Art Directors		1	$49,809	Bachelor's degree		
27-1024	Graphic Designers		4	$33,811	Bachelor's degree	*	
27-2012	Producers and Directors	X	1	$34,885	Bachelor's degree		
27-2041	Music Directors and Composers		1	$28,797	Bachelor's degree		
27-3041	Editors	X	3	$35,259	Bachelor's degree		
27-4011	Audio and Video Technicians		1	$31,202	Postsecondary nondegree award		
51-5112	Printing Press Operators		5	$28,846	High school diploma or equivalent		

Arts and Communication Aligned Academic Programs

As the music capitol of the world, Tennessee's institutions offer students a variety of ways to pursue the dream of joining in Tennessee's rich artistic heritage.

Middle Tennessee State University offers an audio production baccalaureate degree that offers hands-on experience in state-of-the-art facilities for those who want to create today's hits. Other programs offering practical experiences include Bethel's theories of musicology and University of Tennessee, Knoxville's master's degree in composition.

Multiple programs exist to teach students about music and how to support musical talents in others. East Tennessee State University offers a bachelor's degree in Bluegrass, Old-Time, and Roots Music exploring the history of the region's sound and the University of Memphis has a master's degree in musical pedagogy from the University of Memphis.

Programs within the Arts and Communications cluster range from the certificate to doctoral level. Beyond music, programs in the cluster offer training in public relations, fine arts, journalism, mass media communications, and more.

Postsecondary Arts and Communication Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
09.0100	Communication, General.	BA	185	62%	$33,637
09.0100	Communication, General.	MA	*	*	*
09.0101	Speech Communication and Rhetoric.	BA	210	50%	$38,277
09.0102	Mass Communication/Media Studies.	AA	*	*	*
09.0102	Mass Communication/Media Studies.	BA	223	62%	$30,633
09.0102	Mass Communication/Media Studies.	MA	110	62%	$48,209
09.0102	Mass Communication/Media Studies.	D	15	33%	$50,000
09.0199	Communication and Media Studies, Other.	BA	14	71%	$43,012
09.0401	Journalism.	BA	210	63%	$34,679
09.0401	Journalism.	MA	17	47%	$47,919
09.0402	Broadcast Journalism.	BA	*	*	*
09.0499	Journalism, Other.	BA	*	*	*
09.0701	Radio and Television.	BA	*	*	*
09.0702	Digital Communication and Media/Multimedia.	BA	25	52%	$27,688
09.0906	Sports Communication.	BA	*	*	*
09.9999	Communication, Journalism, and Related Programs, Other.	BA	29	69%	$32,353
10.0105	Communications Technology/Technician.	AA	80	61%	$26,804

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
10.0203	Recording Arts Technology/Technician.	C < 1 YR	*	*	*
10.0203	Recording Arts Technology/Technician.	C 1-2 YR	*	*	*
10.0203	Recording Arts Technology/Technician.	AA	10	50%	$22,896
10.0203	Recording Arts Technology/Technician.	BA	*	*	*
10.0203	Recording Arts Technology/Technician.	MA	*	*	*
13.0501	Educational/Instructional Technology.	CPBA	17	71%	$56,743
13.0501	Educational/Instructional Technology.	MA	32	41%	$56,773
23.1302	Creative Writing.	BA	18	44%	$19,736
23.1303	Professional, Technical, Business, and Scientific Writing.	BA	*	*	*
23.1304	Rhetoric and Composition.	BA	17	41%	$22,462
30.1401	Museology/Museum Studies.	BA	*	*	*
30.1401	Museology/Museum Studies.	CPBA	*	*	*
39.0501	Religious/Sacred Music.	BA	11	0%	*
50.0101	Visual and Performing Arts, General.	AA	*	*	*
50.0101	Visual and Performing Arts, General.	BA	19	63%	$28,905
50.0102	Digital Arts.	AA	28	64%	$24,349
50.0102	Digital Arts.	BA	24	33%	$30,335
50.0401	Design and Visual Communications, General.	BA	*	*	*
50.0402	Commercial and Advertising Art.	C < 1 YR	16	44%	$19,993
50.0402	Commercial and Advertising Art.	C 1-2 YR	51	55%	$21,664
50.0402	Commercial and Advertising Art.	AA	58	53%	$32,804
50.0409	Graphic Design.	BA	43	56%	$34,136
50.0501	Drama and Dramatics/Theatre Arts, General.	BA	102	55%	$22,658
50.0501	Drama and Dramatics/Theatre Arts, General.	MA	10	20%	*
50.0506	Acting.	C < 1 YR	11	64%	$17,781
50.0506	Acting.	BA	*	*	*
50.0507	Directing and Theatrical Production.	BA	*	*	*
50.0509	Musical Theatre.	BA	*	*	*
50.0599	Dramatic/Theatre Arts and Stagecraft, Other.	BA	*	*	*
50.0601	Film/Cinema/Media Studies.	BA	15	47%	$11,579
50.0602	Cinematography and Film/Video Production.	C < 1 YR	*	*	*
50.0602	Cinematography and Film/Video Production.	BA	88	56%	$25,739
50.0602	Cinematography and Film/Video Production.	CPBA	*	*	*
50.0602	Cinematography and Film/Video Production.	MA	*	*	*
50.0701	Art/Art Studies, General.	BA	251	61%	$28,362
50.0701	Art/Art Studies, General.	MA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
50.0702	Fine/Studio Arts, General.	BA	94	51%	$21,334
50.0702	Fine/Studio Arts, General.	MA	*	*	*
50.0703	Art History, Criticism and Conservation.	BA	13	23%	*
50.0703	Art History, Criticism and Conservation.	MA	*	*	*
50.0708	Painting.	BA	*	*	*
50.0901	Music, General.	AA	*	*	*
50.0901	Music, General.	BA	212	52%	$35,666
50.0901	Music, General.	CPBA	*	*	*
50.0901	Music, General.	MA	69	42%	$39,174
50.0901	Music, General.	D	*	*	*
50.0903	Music Performance, General.	AA	40	73%	$19,208
50.0903	Music Performance, General.	BA	13	8%	*
50.0903	Music Performance, General.	MA	*	*	*
50.0904	Music Theory and Composition.	BA	*	*	*
50.0905	Musicology and Ethnomusicology.	BA	*	*	*
50.0913	Music Technology.	BA	79	53%	$32,963
50.0999	Music, Other.	C 1-2 YR	*	*	*
50.0999	Music, Other.	BA	39	26%	$25,255

High School CTE Arts and Communications Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
09.0702	Digital Communication and Media/Multimedia.	CTE HS	1,290	51%	$41,537
10.0299	Audiovisual Communications Technologies/Tech., Other	CTE HS	960	52%	$36,632

Over 2,000 high school graduates in 2021-22 concentrated in the Arts and Communications cluster with over half found employed in Tennessee. The Arts, A/V Technology, and Communications career cluster has 5,800 Tennessee high school concentrators enrolled in Digital Arts and Design, Audio/Visual Production and Fashion Design programs of study in 2022-23. Students enrolled in these courses can earn industry credentials in multiple Adobe platforms. Elizabethton High School offers students work-based learning experiences within the school to create pictures, graphics, live streams of events, promotional videos, and design work for the school system.

Cluster Twelve: Leisure and Recreation Occupations

Tennessee is well-known for its great outdoors. According to the U.S. National Park Service, there are 13 national parks in Tennessee.[58] The Great Smoky Mountains National Park, received over 12.9 million visitors in 2022,[59] making it the most visited national park in the country.[60] There are also 57 state parks[61] and 84 natural areas[62] across Tennessee.

In the last five years, Tennessee's Leisure and Hospitality private sector employment has increased by 6.7 percent.[63] Most of the in-demand occupations in the leisure and recreation career cluster require only a high school diploma or equivalent. Food service managers, lodging 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 nearly all regions in the state.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
11-9051	Food Service Managers	X	9	$34,011	High school diploma or equivalent		
11-9081	Lodging Managers	X	5	$27,107	High school diploma or equivalent		
13-1121	Meeting, Convention, and Event Planners	X	3	$31,431	Bachelor's degree		
27-2022	Coaches and Scouts	X	7	$23,088	Bachelor's degree		
35-1011	Chefs and Head Cooks	X	7	$38,123	High school diploma or equivalent		

[58] National Park Service – Tennessee

[59] National Park Services, Annual Park Recreation Visits Stats Report Viewer

[60] USA Today, America's most-visited national parks

[61] Tennessee State Parks, Find a Park

[62] Tennessee Department of Environment & Conservation, List of Natural Areas

[63] U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Leisure and Hospitality, June 2018 – June 2023

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	X	7	$26,522	High school diploma or equivalent		
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	X	9	$29,997	High school diploma or equivalent		
37-2021	Pest Control Workers	X	9	$28,807	High school diploma or equivalent		
39-1014	First-Line Supervisors of Entertainment and Recreation Workers, Except Gambling Services		2	$24,851	High school diploma or equivalent		
39-7010	Tour and Travel Guides		2	$22,511	High school diploma or equivalent		
39-9031	Exercise Trainers and Group Fitness Instructors	X	9	$24,048	High school diploma or equivalent		
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks		1	$27,834	High school diploma or equivalent		
51-3011	Bakers		2	$23,867	No formal educational credential	*	

Leisure and Recreation Aligned Academic Programs

Postsecondary Leisure and Recreation Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
12.0500	Cooking and Related Culinary Arts, General.	C < 1 YR	*	*	*
12.0503	Culinary Arts/Chef Training.	C 1-2 YR	28	71%	$33,304
12.0503	Culinary Arts/Chef Training.	AA	19	63%	$33,916
31.0101	Parks, Recreation, and Leisure Studies.	BA	*	*	*
31.0301	Parks, Recreation, and Leisure Facilities Management, General.	BA	29	79%	$27,444
31.0501	Sports, Kinesiology, and Physical Education/Fitness, General.	BA	402	59%	$31,185
31.0501	Sports, Kinesiology, and Physical Education/Fitness, General.	MA	55	55%	$47,901
31.0501	Sports, Kinesiology, and Physical Education/Fitness, General.	D	*	*	*
31.0504	Sport and Fitness Administration/Management.	BA	237	47%	$32,513
31.0504	Sport and Fitness Administration/Management.	CPBA	10	20%	*
31.0504	Sport and Fitness Administration/Management.	MA	83	36%	$44,461
31.0505	Exercise Science and Kinesiology.	BA	942	60%	$30,703
31.0507	Physical Fitness Technician.	BA	*	*	*
31.0508	Sports Studies.	BA	*	*	*
31.0508	Sports Studies.	MA	*	*	*
31.0599	Sports, Kinesiology, and Physical Education/Fitness, Other.	BA	*	*	*
31.9999	Parks, Recreation, Leisure, Fitness, and Kinesiology, Other.	BA	*	*	*
52.0901	Hospitality Administration/Management, General.	BA	64	55%	$39,280
52.0901	Hospitality Administration/Management, General.	D	*	*	*
52.0904	Hotel/Motel Administration/Management.	C < 1 YR	*	*	*
52.0904	Hotel/Motel Administration/Management.	C 1-2 YR	*	*	*
52.0904	Hotel/Motel Administration/Management.	AA	34	74%	$29,806
52.0904	Hotel/Motel Administration/Management.	BA	12	58%	$32,591
52.0905	Restaurant/Food Services Management.	C < 1 YR	*	*	*

While most in-demand occupations in the Leisure and Recreation cluster require a high school diploma only, there are postsecondary programs offered that place students in desirable careers. Academic programs in this cluster fuel the industry that annually welcomes millions of tourists and Tennesseans as they experience the sights, sounds, and adventures that the state offers.

The hotel/motel administration programs are small but do place a large share of their graduates in Tennessee. Wages are lower than the state median for graduates of these programs which may be a challenge for recruitment.

Post-baccalaureate programs in sports, kinesiology and fitness boast the highest wages for postsecondary graduates in this cluster. Middle Tennessee State University offers a Leisure and Sport Management program which is the only program of its kind at Tennessee's public institutions, where students have experiential learning opportunities that prepare them for work after the classroom.

High School CTE Leisure and Recreation Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
12.0503	Culinary Arts/Chef Training.	CTE HS	1,915	51%	$38,235
31.0507	Physical Fitness Technician.	CTE HS	1,573	51%	$38,160
52.0901	Hospitality Administration/Management, General.	CTE HS	144	39%	$39,459

High school CTE concentrator graduates in the Leisure and Recreation cluster were sizeable in 2021-22. Nearly 2,000 graduates completed a culinary arts program of study and just over half were found in Tennessee's job market. Another 1,500 graduates completed concentrations in fitness. In 2022-23, the Hospitality and Tourism career cluster had 5,500 concentrators enrolled in its Culinary Arts and Hospitality and Tourism Management career clusters. Students participating in this cluster can earn multiple ServSafe industry credentials and participate in on-site culinary businesses. The Taste of Liberty is a student-run restaurant opened in fall 2023 at Liberty Technology High School through the Jackson-Madison County School District.[64]

[64] Liberty Technology High School, Taste of Liberty (Culinary Arts), https://www.jmcss.org/domain/1124

Leisure and Recreation Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
12.0502	Bartending/Bartender.	*
12.0503	Culinary Arts/Chef Training.	*

Cluster Thirteen: Information Technology Occupations

Computer and information technology occupations typically have comparatively high wages in Tennessee compared to most other occupations. Information Technology (IT) based occupations - including computer network architects, software developers and database administrators - earn a median wage of $78,000, almost double the median wage for all occupations in TN. These occupations usually require a bachelor's degree and specialized skills, depending on the field. [65]

As a result of the COVID-19 pandemic, the workplace has changed. Many workers enjoy remote work and seek out work-from-home opportunities. The availability of broadband, especially in rural areas of the state, is key to connecting workers to remote work job opportunities. For this continued expansion, there will be a need for IT infrastructure support and security. Occupations, like information security analysts and computer user support specialists, are crucial for companies with ever growing technological needs. This situation offers a great opportunity for Tennesseans to fulfill the global workforce shortage remotely.

Multiple IT occupations pay high wages and require important technical and soft skills for success. Information security analysts (cybersecurity) 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 $95,000 in Tennessee.[66] Online job postings for Cybersecurity are seeking candidates with skills in computer science, network and system security, and customer service. Computer user support specialists 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 great for entry level experience and can lead to exciting careers in IT. Finally, Data Science occupations yield earnings at $94,000, which is the highest median earnings of any other information technology occupation.[67] This occupation requires skills in data analytics, statistical modeling, data mining, cleaning, and warehousing.

Tennessee has a strong and growing Headquarters, Finance & Tech[68] sector that frequently employs IT professionals. Tennessee also has unique research and development (R&D)

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[65] TNECD analysis of employment data from U.S. Bureau of Labor Statistics, Jobs4tn – Employment and Wage Statistics Jobs4tn OEWS, LMI

[66] TNECD analysis of employment data from U.S. Bureau of Labor Statistics, Jobs4tn – Occupation Profile Information Security Analysts, LMI

[67] TNECD analysis of employment data from U.S. Bureau of Labor Statistics, Jobs4tn – Occupation profile, Data Scientists, LMI

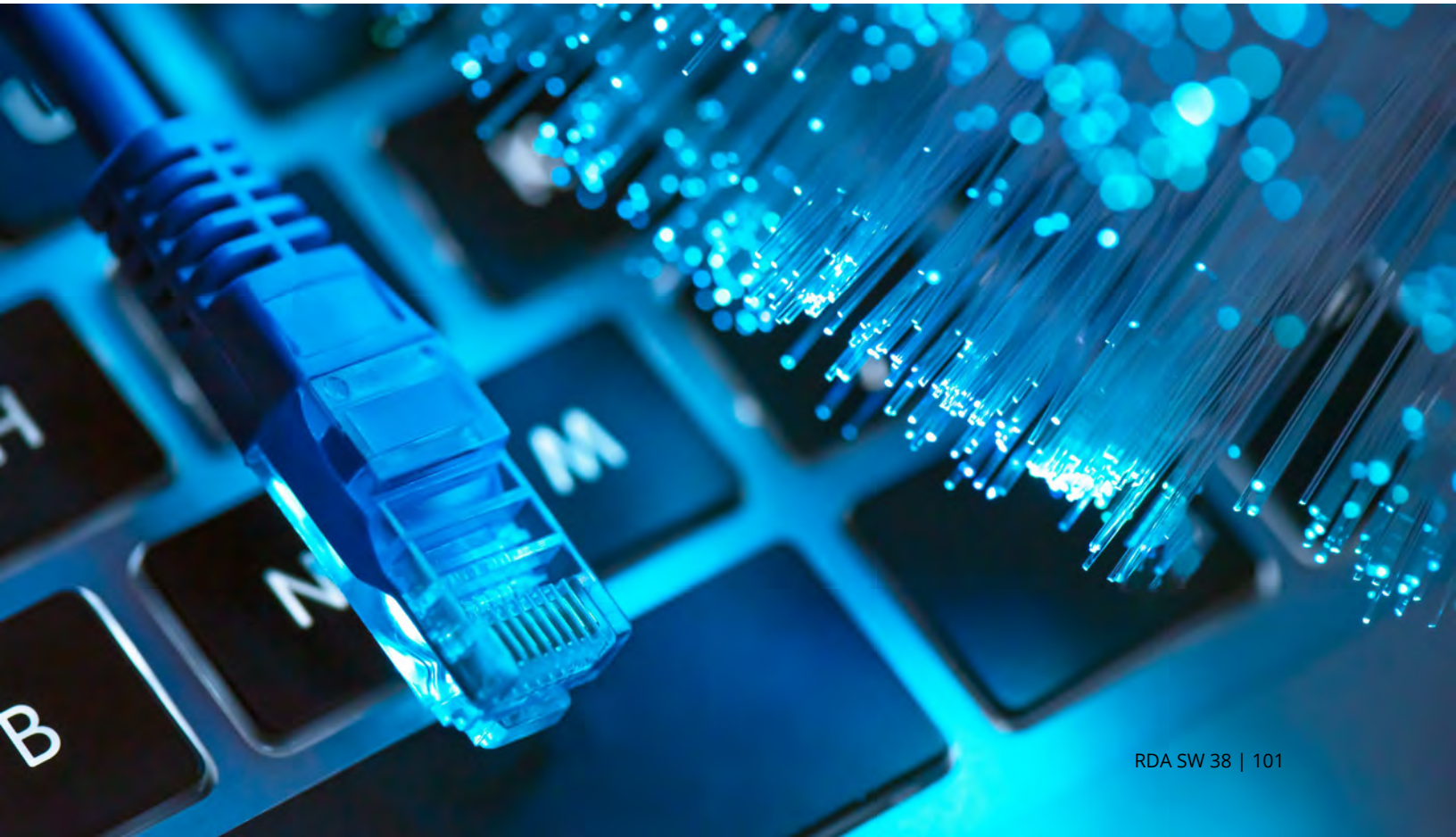
[68] TNECD, HQ, Finance and Tech

Tennessee Broadband Accessibility Grant

Broadband availability reduces workforce gaps by providing opportunities for student learning and training and by connecting jobseekers with potential employers. The goal of the Tennessee Department of Economic and Community Development's (TNECD) broadband accessibility grant is to facilitate broadband access to all Tennesseans while promoting practices that increase deployment and encourage adoption.

The broadband accessibility grant program is designed to offset capital expenses in the deployment of broadband in unserved areas. Funds are targeted to areas that are unlikely to receive broadband service without grant funding. To date, broadband infrastructure programs have awarded grants to serve over **449,695** Tennesseans. TNECD has also used federal funding to further close the digital divide through digital opportunity projects.

In 2024, $50M of digital opportunity projects will be announced to encourage adoption, digital skills training, workforce development programs, and outreach to underserved populations. Additional federal funding through the Infrastructure Investment and Jobs Act will provide further resources for infrastructure and digital opportunity programs over the next 5-10 years.



assets and facilities, including St. Jude Children's Research Hospital, Vanderbilt University, Oak Ridge National Laboratory (ORNL), U.S. Airforce Arnold Engineering Development Complex, and the University of Tennessee. These organizations provide world-changing technologies to businesses R&D assets and facilities frequently employ information technology occupations. The co-existence of Headquarters, Finance, and Tech industries, R&D, and education drives the need for IT professionals in our state.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry Sectors	STEM
		TN	Total # Regions				
11-3021	Computer and Information Systems Managers		1	$87,828	Bachelor's degree	*	#
15-1211	Computer Systems Analysts	X	4	$59,031	Bachelor's degree	*	#
15-1212	Information Security Analysts	X	5	$68,001	Bachelor's degree	*	#
15-1231	Computer Network Support Specialists		5	$42,299	Associate degree	*	#
15-1232	Computer User Support Specialists	X	9	$36,615	Some college, no degree	*	#
15-1241	Computer Network Architects		1	$75,483	Bachelor's degree	*	#
15-1244	Network and Computer Systems Administrators		2	$53,125	Bachelor's degree	*	#
15-1252	Software Developers	X	5	$64,372	Bachelor's degree	*	#
15-1253	Software Quality Assurance Analysts and Testers		1	$55,735	Bachelor's degree	*	#
15-1254	Web Developers		1	$39,652	Bachelor's degree	*	#
15-1299	Computer Occupations, All Other		1	$38,872	Bachelor's degree	*	#

Information Technology Aligned Academic Programs

Postsecondary Information Technology Degrees, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
11.0101	Computer and Information Sciences, General.	BA	95	60%	$60,835
11.0101	Computer and Information Sciences, General.	MA	70	24%	$70,108
11.0103	Information Technology.	C < 1 YR	50	74%	$39,889
11.0103	Information Technology.	C 1-2 YR	14	93%	$30,419
11.0103	Information Technology.	AA	326	70%	$45,107
11.0103	Information Technology.	BA	73	40%	$48,485
11.0103	Information Technology.	MA	145	49%	$78,000
11.0104	Informatics.	BA	*	*	*
11.0104	Informatics.	MA	*	*	*
11.0401	Information Science/Studies.	BA	12	75%	$49,899
11.0501	Computer Systems Analysis/Analyst.	BA	36	67%	$41,104
11.0701	Computer Science.	BA	481	57%	$60,000
11.0701	Computer Science.	CPBA	*	*	*
11.0701	Computer Science.	MA	109	45%	$89,633
11.0701	Computer Science.	D	*	*	*
11.0802	Data Modeling/Warehousing and Database Administration.	BA	*	*	*
11.0802	Data Modeling/Warehousing and Database Administration.	CPBA	*	*	*
11.0802	Data Modeling/Warehousing and Database Administration.	MA	36	56%	$74,828
11.0804	Modeling, Virtual Environments and Simulation.	BA	*	*	*
11.0901	Computer Systems Networking and Telecommunications.	C < 1 YR	21	86%	$39,964
11.0901	Computer Systems Networking and Telecommunications.	C 1-2 YR	21	71%	$38,845
11.1002	System, Networking, and LAN/WAN Management/Manager.	C < 1 YR	11	91%	$39,975
11.1002	System, Networking, and LAN/WAN Management/Manager.	C 1-2 YR	22	95%	$48,000
11.1003	Computer and Information Systems Security/Auditing/Information Assurance.	C < 1 YR	12	67%	$56,596
11.1003	Computer and Information Systems Security/Auditing/Information Assurance.	BA	*	*	*
11.1005	Information Technology Project Management.	CPBA	30	33%	$75,922

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
11.1006	Computer Support Specialist.	C < 1 YR	112	54%	$26,586
11.1006	Computer Support Specialist.	C 1-2 YR	115	65%	$32,900
11.9999	Computer and Information Sciences and Support Services, Other.	MA	*	*	*
14.0903	Computer Software Engineering.	BA	11	27%	*
14.0903	Computer Software Engineering.	MA	*	*	*
51.2706	Medical Informatics.	AA	*	*	*
51.2706	Medical Informatics.	BA	*	*	*
51.2706	Medical Informatics.	CPBA	24	63%	$59,992
51.2706	Medical Informatics.	MA	10	50%	$57,005
52.1201	Management Information Systems, General.	BA	137	66%	$49,778

The ever-changing IT field requires academic programs to be nimble as they work to be at the cutting edge of today's technologies. Institutions from across the state offer credentials at several different levels to meet the need for qualified IT specialists that are the underpinning of an increasingly digital economy. Several short-term certificate programs are available across Tennessee's community colleges yielding high wages and high Tennessee employment rates. Academic programs such as the newly approved master's degree in business cybersecurity at the University of Tennessee, Knoxville strive to create flexibility for students. This program and others are offered completely online to meet the needs of today's Tennessee students.

High School CTE Information Technology Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
11.0201	Computer Programming/Programmer, General	CTE HS	1,141	50%	$38,341
11.1002	System, Networking, and LAN/WAN Management/Manager.	CTE HS	338	55%	$37,902
11.1003	Computer and Information Systems Security/Auditing/Information Assurance.	CTE HS	290	54%	$35,044

High schools are increasingly offering students the opportunity to explore IT professions and earn credentials to prepare them for in-demand occupations. Over 1,100 high school graduates in 2021-22 concentrated in the Computer Programming program of study. The Information Technology cluster had 4,500 students enrolled in Coding, Cybersecurity, Web

Design, and Networking Systems programs in 2022-23. Students can earn multiple industry credentials in the CIW and CompTIA catalog, as well as JavaScript and ISC2. In addition to these pathway opportunities, Computer Science is being introduced as a graduation requirement beginning with the freshmen in the 2024-25 school year.

Information Technology Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
11.0201	Computer Programming/Programmer, General.	*

Governor’s Investment in Vocational Education (GIVE)

Pellissippi State

The Governor's Investment in Vocational Education (GIVE) program aims to create long-term partnerships between Tennessee Colleges of Applied Technology (TCATs), community colleges, industries, economic development/workforce agencies, and K-12 schools. Its main goal is to identify and address the "skills gaps" present in the local workforce. GIVE is a competitive grant that awards of up to $1 million to local higher education entities to facilitate collaboration between K12, higher education, and workforce partners.

Pellissippi State Community College (PSCC) launched the Information Technology College to Career Collaborative (ITC3), funded by GIVE 2.0. This initiative expands Information Technology (IT) career pathways using a stackable credentials approach. This includes the expansion of IT-related course crosswalks and articulation agreements and the development of IT 4+1 plans with partner high schools. To ensure that students have access to in-demand, industry-recognized certification testing, such as CompTIA A+, Network+, Security+, and others, a collaborative and structured work-based learning (WBL) continuum has been implemented. This continuum starts in middle school and continues through the completion of postsecondary credentials, linking high school and postsecondary programming for students. The ITC3 initiative aims to provide students with a comprehensive and meaningful IT education that prepares them for successful careers.

Cluster Fourteen: Engineering and Other STEM Occupations

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 needed across TNECD's target industries, including automotive, aerospace and defense, chemical products, and electrical equipment and appliances. In 2022, approximately 39,000 engineers were employed in Tennessee, with a median wage of about $93,000. The highest earning engineering occupations make $110,000 per year or more. [69]

Governor Bill Lee, in the 2023 State of the State, said, "No other state in the country comes close to Tennessee's legacy, resources and potential to be a leader in nuclear energy." He proposed $50 million in a Nuclear Fast Track fund to recruit companies to our state that will establish a nuclear development and manufacturing ecosystem. Tennessee is the fifth in the nation for nuclear engineering jobs, at 630 jobs.[70] Tennessee's strong nuclear engineering foundation will support further growth in nuclear energy in the state.

The Arnold Engineering Development Complex (AEDC), 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, electrical and electronic engineering technologists and technicians are in-demand in nine regions and electrical engineers in six regions. The technologists and technicians require associate degrees, while the engineers require a bachelor's degree.

[69]TNECD analysis of employment data from U.S. Bureau of Labor Statistics, Jobs4TN, OEWS.
[70]TNECD analysis of employment data from U.S. Bureau of Labor Statistics, OEWS.

SOC Code	Occupation	In-Demand		Statewide Entry-Level Wage	Typical Entry-Level Education	Key to TNECD Industry	STEM
		TN	Total # Regions				
17-2011	Aerospace Engineers		1	$73,216	Bachelor's degree	*	#
17-2051	Civil Engineers		3	$63,044	Bachelor's degree	*	#
17-2071	Electrical Engineers		6	$69,108	Bachelor's degree	*	#
17-2072	Electronics Engineers, Except Computer		2	$73,513	Bachelor's degree	*	#
17-2081	Environmental Engineers		1	$67,372	Bachelor's degree	*	#
17-2112	Industrial Engineers		5	$64,622	Bachelor's degree	*	#
17-2141	Mechanical Engineers	X	5	$63,696	Bachelor's degree	*	#
17-2199	Engineers, All Other		3	$60,599	Bachelor's degree	*	#
17-3011	Architectural and Civil Drafters	X	5	$42,907	Associate degree	*	#
17-3013	Mechanical Drafters		1	$37,096	Associate degree	*	#
17-3023	Electrical and Electronic Engineering Technologists and Technicians	X	9	$42,313	Associate degree	*	#
17-3026	Industrial Engineering Technologists and Technicians		4	$37,458	Associate degree	*	#
19-1021	Biochemists and Biophysicists		1	$67,327	Doctoral or professional degree	*	#
19-2012	Physicists		1	$66,038	Doctoral or professional degree	*	#
19-2031	Chemists		2	$44,305	Bachelor's degree	*	#

Engineering and Other STEM Aligned Academic Programs

Postsecondary Degrees in Engineering and Other STEM, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
14.0101	Engineering, General.	BA	20	60%	$62,098
14.0101	Engineering, General.	MA	21	33%	$64,255
14.0101	Engineering, General.	D	38	16%	$87,753
14.0201	Aerospace, Aeronautical, and Astronautical/Space Engineering, General.	BA	42	26%	$39,033
14.0201	Aerospace, Aeronautical, and Astronautical/Space Engineering, General.	MA	12	17%	*
14.0201	Aerospace, Aeronautical, and Astronautical/Space Engineering, General.	D	*	*	*
14.0401	Architectural Engineering.	BA	12	50%	$57,109
14.0801	Civil Engineering, General.	BA	174	70%	$66,327
14.0801	Civil Engineering, General.	MA	43	56%	$71,053
14.0801	Civil Engineering, General.	D	11	55%	$55,606
14.0901	Computer Engineering, General.	BA	50	54%	$68,000
14.0901	Computer Engineering, General.	MA	*	*	*
14.0901	Computer Engineering, General.	D	*	*	*
14.1001	Electrical and Electronics Engineering.	BA	198	54%	$75,680
14.1001	Electrical and Electronics Engineering.	MA	35	37%	$89,788
14.1001	Electrical and Electronics Engineering.	D	20	5%	*
14.1201	Engineering Physics/Applied Physics.	BA	*	*	*
14.1201	Engineering Physics/Applied Physics.	D	*	*	*
14.1301	Engineering Science.	BA	*	*	*
14.1301	Engineering Science.	D	*	*	*
14.1401	Environmental/Environmental Health Engineering.	MA	*	*	*
14.1901	Mechanical Engineering.	BA	444	57%	$70,069
14.1901	Mechanical Engineering.	MA	43	37%	$81,180
14.1901	Mechanical Engineering.	D	12	33%	*
14.3501	Industrial Engineering.	BA	41	37%	$70,818
14.3501	Industrial Engineering.	MA	29	66%	$106,816
14.3501	Industrial Engineering.	D	*	*	*
14.4201	Mechatronics, Robotics, and Automation Engineering.	BA	62	71%	$70,470
14.9999	Engineering, Other.	CPBA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
14.9999	Engineering, Other.	MA	*	*	*
14.9999	Engineering, Other.	D	16	31%	$108,241
15.0000	Engineering Technologies/Technicians, General.	C < 1 YR	57	88%	$73,223
15.0000	Engineering Technologies/Technicians, General.	AA	115	80%	$50,188
15.0000	Engineering Technologies/Technicians, General.	BA	211	70%	$59,070
15.0000	Engineering Technologies/Technicians, General.	CPBA	*	*	*
15.0000	Engineering Technologies/Technicians, General.	MA	*	*	*
15.0303	Electrical, Electronic, and Communications Engineering Technology/Technician.	C < 1 YR	26	73%	$50,940
15.0303	Electrical, Electronic, and Communications Engineering Technology/Technician.	AA	85	79%	$53,365
15.0303	Electrical, Electronic, and Communications Engineering Technology/Technician.	BA	12	75%	$43,210
15.0305	Telecommunications Technology/Technician.	C 1-2 YR	*	*	*
15.0406	Automation Engineer Technology/Technician.	C < 1 YR	13	92%	$59,615
15.0406	Automation Engineer Technology/Technician.	C 1-2 YR	*	*	*
15.0612	Industrial Technology/Technician.	C < 1 YR	*	*	*
15.0612	Industrial Technology/Technician.	AA	51	73%	$39,533
15.0612	Industrial Technology/Technician.	MA	12	33%	*
15.0613	Manufacturing Engineering Technology/Technician.	C < 1 YR	18	83%	$69,004
15.0613	Manufacturing Engineering Technology/Technician.	C 1-2 YR	25	80%	$52,038
15.0613	Manufacturing Engineering Technology/Technician.	AA	*	*	*
15.0614	Welding Engineering Technology/Technician.	C < 1 YR	*	*	*
15.0614	Welding Engineering Technology/Technician.	AA	*	*	*
15.0615	Chemical Engineering Technology/Technician.	C < 1 YR	*	*	*
15.0615	Chemical Engineering Technology/Technician.	C 1-2 YR	*	*	*
15.0615	Chemical Engineering Technology/Technician.	AA	20	80%	$59,021
15.0801	Aeronautical/Aerospace Engineering Technology/Technician.	BA	13	62%	$60,492
15.1201	Computer Engineering Technology/Technician.	AA	*	*	*
15.1301	Drafting and Design Technology/Technician, General.	C < 1 YR	33	76%	$34,441
15.1301	Drafting and Design Technology/Technician, General.	C 1-2 YR	50	66%	$41,138
15.1303	Architectural Drafting and Architectural CAD/CADD.	C < 1 YR	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
15.1306	Mechanical Drafting and Mechanical Drafting CAD/CADD.	C < 1 YR	*	*	*
15.1306	Mechanical Drafting and Mechanical Drafting CAD/CADD.	C 1-2 YR	*	*	*
26.0101	Biology/Biological Sciences, General.	MA	40	45%	$47,776
26.0101	Biology/Biological Sciences, General.	D	17	35%	$46,095
26.0102	Biomedical Sciences, General.	BA	10	40%	*
26.0102	Biomedical Sciences, General.	MA	*	*	*
26.0102	Biomedical Sciences, General.	D	23	30%	$55,378
26.0202	Biochemistry.	MA	*	*	*
26.0202	Biochemistry.	D	*	*	*
26.0203	Biophysics.	BA	*	*	*
26.0204	Molecular Biology.	MA	31	42%	$50,275
26.0204	Molecular Biology.	D	*	*	*
26.0503	Medical Microbiology and Bacteriology.	MA	*	*	*
26.0503	Medical Microbiology and Bacteriology.	D	*	*	*
26.1001	Pharmacology.	MA	*	*	*
26.1101	Biometry/Biometrics.	CPBA	*	*	*
26.1102	Biostatistics.	CPBA	*	*	*
26.1102	Biostatistics.	D	*	*	*
26.1199	Biomathematics, Bioinformatics, and Computational Biology, Other.	CPBA	*	*	*
26.1301	Ecology.	MA	*	*	*
26.1301	Ecology.	D	11	27%	*
26.1309	Epidemiology.	CPBA	*	*	*
26.1309	Epidemiology.	MA	*	*	*
26.1309	Epidemiology.	D	*	*	*
26.9999	Biological and Biomedical Sciences, Other.	MA	52	63%	$55,381
26.9999	Biological and Biomedical Sciences, Other.	D	10	50%	$49,220
30.0101	Biological and Physical Sciences.	BA	39	54%	$26,041
30.0601	Systems Science and Theory.	D	*	*	*
30.1501	Science, Technology and Society.	MA	*	*	*
30.1701	Behavioral Sciences.	BA	*	*	*
30.2501	Cognitive Science, General.	CPBA	*	*	*
40.0501	Chemistry, General.	BA	194	48%	$39,804
40.0501	Chemistry, General.	MA	19	32%	$56,473
40.0501	Chemistry, General.	D	28	25%	$59,000
40.0599	Chemistry, Other.	BA	*	*	*

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
40.0801	Physics, General.	MA	22	9%	*
40.0801	Physics, General.	D	20	15%	*
51.2010	Pharmaceutical Sciences.	MA	*	*	*
51.2010	Pharmaceutical Sciences.	D	*	*	*

Academic programs at Tennessee's higher education institutions are equipping students with the skills needed for the in-demand occupations of the Engineering and Other STEM cluster. This cluster represents some of the highest growth fields in the state and around the country.

Schools are working together to create pipelines where students can stack credentials as the work towards a career. East Tennessee State University recently had a Bachelor of Science Mechatronics Engineering program approved. This program is built for transfer with articulation agreements with two community colleges already on in place and additional agreements with TCATs expected soon. The program was developed in consultation with industry partners.

Tennessee's institutions are also committed to creating programs that meet emerging needs. In May 2024, Tennessee Tech will present a Nuclear Engineering program to Tennessee's Higher Education Commission (THEC) designed specifically to address Gov. Lee's call to enhance Tennessee's nuclear presence.

High School CTE Engineering and Other STEM Concentrators, 2021-22

CIP Code	Program Title	Educ. Award Level	Number of Grads	% Employed in TN	Estimated First Year Annual Wage
15.0303	Electrical, Electronic, and Communications Engineering Technology/Technician.	CTE HS	508	49%	$39,041
15.9999	Engineering Technologies/Technicians, Other	CTE HS	928	50%	$40,768

Multiple efforts are underway to expand engineering and STEM programming for secondary students. Tennessee is seeking to grow its pipeline of STEM workforce through its Future Workforce Initiative, which increases STEM training in K-12 schools. [71] There are currently 88

[71] Office of the Governor, Press Release

STEM and STE(A)M Designated Schools in Tennessee.[72] The Tennessee STEM Innovation Network, in partnership with Vanderbilt, studied the impact of STEM school designation.[73] Their initial key findings suggest that the requirements within the designation rubric support schools in establishing their STEM culture and community.

The Engineering and Other STEM career cluster enrolled 7,000 Tennessee high school students in BioSTEM, Engineering, Technology, and Advanced STEM Applications in 2022-23. Enrolled students can earn industry credentials in Autodesk, Solidworks (Computer-Aided Design), and Intellitek robotics as part of the Engineering and Other STEM pathway. Memphis-Shelby County's East High School TSTEM Academy created a "STEM fest" to celebrate student brilliance. The day consisted of experiments and hands-on projects that allowed students to showcase their creativity.

High schools are also partnering with employers to support the pipeline of engineering and STEM graduates. Toyota Motor Manufacturing (Toyota TN) has announced the launch of its Engineering, Manufacturing and Mechatronics (EM^2) Institute in partnership with the Jackson- Madison School District.

Engineering and Other STEM Apprenticeship Completers, 2022

CIP Code	Program Title	Number of Completers 2022
15.0001	Applied Engineering Technologies/Technicians.	*
15.0305	Telecommunications Technology/Technician.	*
15.0899	Mechanical Engineering Related Technologies/Technicians, Other.	*
15.1702	Power Plant Technology/Technician.	*
41.0301	Chemical Technology/Technician.	14

[72] Tennessee STEM Innovation Network, STEM and STE(A)M Designated Schools

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

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 jobs, the Center for Economic Research in Tennessee (CERT) analyzes postings, openings, and hires for an occupation relative to total number of individuals employed in the occupation. Occupations which meet at least two of these three requirements considered in-demand:

- The ratio of job postings (2022) to the number of individuals employed in an occupation is greater than or equal to the median ratio for all occupations in the region.
- The ratio of hires (2022) to the number of individuals employed in an occupation is greater than or equal to the median ratio for all occupations in the region.
- 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.

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 percent of the median wage for the region. This analysis is completed at the statewide level and for each of the 9 local workforce development areas (LWDAs). To ensure the identification of in-demand occupations across diverse regional economies, the methodology employs a minimum employment threshold of .04 percent 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 2022 release of the Occupational Employment and Wage Estimates (OEWS). OEWS publication standards require redaction for employment figures for some occupations. In cases where OEWS has redacted information, and a 2020 employment estimate from the Tennessee Department of Labor and Workforce Development Long-Term Occupational Projections was

available, the 2020 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.[74]

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.[75]

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.[76]

[74] 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 Data > Jobs by Occupations.

[75] The Tennessee Department of Labor & Workforce Development's 2020 – 2030 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).

[76] Lightcast, Hires Methodology, https://kb.lightcast.io/en/articles/6957581-hires-methodology

Aligned Academic Programs

An **aligned academic program**[77] 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.[78] 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 P20 Connect statewide longitudinal data system. Tennessee's 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.

Student outcome data at the *postsecondary level* for the 2021-22 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.[79] 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 *secondary level* reflect 2021-2022 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.[80] Cells with less than 10 awards are suppressed.

Tennessee completers of registered apprenticeship in 2021-2022 are also included. As they are not currently in the P20 system, no wage or employment data are available. Registered Apprenticeship programs are those approved by the U.S. Department of Labor or a State

[77] 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.

[78] More information about BLS and NCES CIP to SOC Crosswalk can be found here.

[79] This includes UT Health Science Center. UT Southern is not currently in the THEC Student Information System, so it is not a part of the P20 Connect postsecondary completions.

[80] 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.

Apprenticeship Agency with an employer that has an occupational objective and standards for implementation and completion of the apprenticeship.[81]

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.[82] 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.

[81] More information about Registered Apprenticeships in Tennessee can be found here. This analysis is limited to Federal Registered Apprenticeships.

[82] This methodological improvement began with 2023 reporting. As a result, approximately 20 percent 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.[83,84] 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.[85]
- 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.[86] 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.[87] 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.

[83] 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.

[84] Occupations without any clear connected training remain in in-demand clusters.

[85] 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

[86] 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.

[87] 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.

Appendix D: East Tennessee In Demand Occupations to 2026

East Tennessee

(Anderson, Blount, Campbell, Claiborne, Cocke, Grainger, Hamblen, Jefferson, Knox, Loudon, Monroe, Morgan, Roane, Scott, Sevier, and Union Counties)

In Demand Occupations to 2026

Personal Skills and Abilities

- ● advanced skills required
- ❍ moderate skills required
- A artistic/creative ability required

Job Title	2016-2026 Average Annual Openings	2018 Median Salary	Personal Skills: Reading (English)	Math Skills	Service Orientation	Persuasion Skills	Science Skills	Computer Programming Skills	Repairing Skills	Artist/Creative Ability
Doctoral or professional degree										
Lawyers	80	$100,947	●	❍	●	●				A
Health Specialties Teachers, Postsecondary	75	n/a	●	●	●	●	●			
Master's degree										
Educational, Guidance, School, and Vocational Counselors	95	$48,276	●	❍	●	●				A
Education Administrators, Postsecondary	90	$87,599	●	❍	●	❍	❍			A
Education Administrators, Elementary and Secondary School	80	$81,360	●	●	●	●				
Nurse Practitioners	75	$95,168	●	❍	●	●	●			
Bachelor's degree										
General and Operations Managers	825	$83,083	●	❍	●	●	❍			
Registered Nurses	605	$56,850	●	❍	●	●	❍			
Elementary School Teachers, Except Special Education	385	$49,360	●	❍	●	●	❍			A
Accountants and Auditors	320	$64,088	●	●	●	●				
Financial Managers	250	$80,047	●	●	●	●				
Secondary School Teachers, Except Special and Career/Technical Education	240	$50,515	●	❍	●	●	❍			A
Middle School Teachers, Except Special and Career/Technical Education	175	$50,131	●	●	●	●				A
Human Resources Specialists	165	$49,042	●	❍	●	❍				A
Child, Family, and School Social Workers	160	$42,335	●	❍	●	●	❍			A
Medical and Health Services Managers	150	$84,512	●	❍	●	●	❍			
Sales Managers	140	$99,215	●	●	●	●				
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	140	$67,244	●	❍	●	●				A
Market Research Analysts & Marketing Specialists	125	$51,117	●	●	❍	●	❍	❍		
Loan Officers	125	$60,790	●	●	●	❍				
Management Analysts	115	$79,069	●	●	●	●				
Construction Managers	115	$70,177	●	●	●	●	❍			

✓ Jobs in Demand ✓ Positive Job Growth ✓ At least 75 expected annual job openings

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East Tennessee

(Anderson, Blount, Campbell, Claiborne, Cocke, Grainger, Hamblen, Jefferson, Knox, Loudon, Monroe, Morgan, Roane, Scott, Sevier, and Union Counties)

In Demand Occupations to 2026

Personal Skills and Abilities
- ● advanced skills required
- ❍ moderate skills required
- A artistic/creative ability required

Job Title	2016-2026 Average Annual Openings	2018 Median Salary	Personal Skills: Reading (English)	Math Skills	Service Orientation	Persuasion Skills	Science Skills	Computer Programming Skills	Repairing Skills	Artist/Creative Ability
Bachelor's degree continued										
Software Developers, Applications	115	$84,101	●	❍	❍	❍	❍	●		
Administrative Services Managers	110	$81,656	●	❍	●	●				
Civil Engineers	105	$97,800	●	●	●	●	●	❍	❍	
Industrial Engineers	100	$85,927	●	●	❍	❍				A
Wholesale and Retail Buyers, Except Farm Products	100	n/a	●	●	●	●				
Training and Development Specialists	90	$52,511	●	❍	●	●				A
Chief Executives	85	$146,321	●	●	●	●				A
Compliance Officers	80	$56,060	●	❍	●	●				
Network and Computer Systems Administrators	80	$73,799	●	❍	●	❍	❍	●	●	
Software Developers, Systems Software	80	$92,844	●	●	❍	❍		❍		
Cost Estimators	75	$51,573	●	●	❍	●				
Mechanical Engineers	75	$95,014	●	●	●	●	●	❍		A
Kindergarten Teachers, Except Special Education	75	$49,582	●	❍	●	●				A
Associate's degree			●	●	●					
Industrial Engineering Technicians	115	$46,790	●	●	❍	❍	❍		❍	
Physical Therapist Assistants	95	$58,500	●	❍	●	❍	❍			
Paralegals and Legal Assistants	85	$40,824	●		●	❍				
Medical and Clinical Laboratory Technicians	80	n/a	●	❍	●	❍	●		❍	
Postsecondary non-degree award										
Heavy and Tractor-Trailer Truck Drivers	1,235	$42,519	●	❍	❍	❍			❍	
Licensed Practical and Licensed Vocational Nurses	350	$37,175	●	❍	●	●	❍			
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	215	$41,990	●	❍	❍	❍	❍		●	
Dental Assistants	130	$37,857	●	❍	●	❍	❍			
Telecommunications Equipment Installers and Repairers, Except Line Installers	95	$40,451	●	❍	❍	❍	❍	❍	●	

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Department of Labor & Workforce Development

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East Tennessee

(Anderson, Blount, Campbell, Claiborne, Cocke, Grainger, Hamblen, Jefferson, Knox, Loudon, Monroe, Morgan, Roane, Scott, Sevier, and Union Counties)

In Demand Occupations to 2026

Personal Skills and Abilities

- ● advanced skills required
- ❍ moderate skills required
- A artistic/creative ability required

Job Title	2016-2026 Average Annual Openings	2018 Median Salary	Personal Skills: Reading (English)	Math Skills	Service Orientation	Persuasion Skills	Science Skills	Computer Programming Skills	Repairing Skills	Artist/Creative Ability
Some college, no degree										
Computer User Support Specialists	180	$41,266	●	❍	●	❍	❍	❍	❍	
High school diploma or equivalent										
First-Line Supervisors of Office and Administrative Support Workers	675	$49,639	●	❍	●	●				
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	445	$48,646	●	❍	●	●				
Food Service Managers	425	$46,888	●	❍	●	●				
First-Line Supervisors of Production and Operating Workers	330	$57,876	●	❍	❍	●			❍	
Electricians	275	$52,036	●	●	❍	❍	❍		●	
Industrial Machinery Mechanics	270	$47,212	❍	❍	❍	❍	❍	❍	●	
First-Line Supervisors of Construction Trades and Extraction Workers	245	$52,846	●	❍	●	●	❍		❍	
First-Line Supervisors of Non-Retail Sales Workers	230	$63,661								
First-Line Supervisors, Mechanics, Installers, Repairers	205	$60,192	●	●	●	●			●	
Police and Sheriff's Patrol Officers	180	$39,428	●	❍	●	●				
Chefs and Head Cooks	160	$46,901	●	●	●	●				A
Property, Real Estate, and Community Association Managers	150	$43,032	●	❍	●	●				
Welders, Cutters, Solderers, and Brazers	145	$37,817	●	❍	❍	❍			❍	
Bus and Truck Mechanics and Diesel Engine Specialists	140	$39,953	❍	❍	❍	❍			●	
Maintenance Workers, Machinery	140	$43,495	●	❍	❍	❍			●	
Machinists	135	$45,531	●	❍	❍	❍			❍	
Operating Engineers and Other Construction Equipment Operators	130	$38,236	❍	❍	❍	❍			❍	
Plumbers, Pipefitters, and Steamfitters	125	$44,121	●	❍	●	❍			●	

✓ Jobs in Demand ✓ Positive Job Growth ✓ At least 75 expected annual job openings

Department of Labor & Workforce Development

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East Tennessee

(Anderson, Blount, Campbell, Claiborne, Cocke, Grainger, Hamblen, Jefferson, Knox, Loudon, Monroe, Morgan, Roane, Scott, Sevier, and Union Counties)

In Demand Occupations to 2026

Personal Skills and Abilities
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Job Title	2016-2026 Average Annual Openings	2018 Median Salary	Personal Skills: Reading (English)	Math Skills	Service Orientation	Persuasion Skills	Science Skills	Computer Programming Skills	Repairing Skills	Artist/Creative Ability
High school diploma or equivalent continued										
Executive Secretaries and Executive Administrative	115	$48,021	●	❍	●	❍				
Welding, Soldering, and Brazing Machine Setters, Operators, and	95	$36,688	❍	❍	❍	❍			❍	
First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	75	n/a	●	❍	●	●			❍	

✓ Jobs in Demand ✓ Positive Job Growth ✓ At least 75 expected annual job openings

For more information, please contact:
Workforce Insights, Research and Reporting Engine Division
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Appendix E: Project Timeline

Appendix E: Project Timeline

Phase	Quarter	ACTIVITY	DESCRIPTION	Accountability Goverance	Goals Impacted	Strategy Impacted
One	Q1 July - Sept 2024	Grant Event	Grant Award Letter Notification	THEC	All	All
One	Q1 July - Sept 2024	Grant Event	Notify industry, education, and workforce partners of the award	TCAT Knoxville	All	All
One	Q1 July - Sept 2024	Budgetary Item	Obtain official quotes/bids/sole source letters for equipment	TCAT Knoxville	All	All
One	Q1 July - Sept 2024	Grant Event	GIVE grant committee meeting/announcement/celebration	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
One	Q1 July - Sept 2024	Grant Event	The announcement at School Board Meeting	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
One	Q1 July - Sept 2024	Budgetary Item	Order Equipment and Supplies for Classrooms and Lab areas for HS, and TCAT Knoxville	TCAT Knoxville	All	All
One	Q1 July - Sept 2024	Budgetary Item	Create and post Apprenticeship Specialist, Work-Based Learning Navigator, and Welding/Machine Tool Dual Enrollment Instructor positions	TCAT Knoxville	All	All
One	Q1 July - Sept 2024	Grant Event	Update Dual Enrollment course enrollment guide and schedules for the new year to reflect GIVE 3.0 programs	TCAT Knoxville, Pellissippi State	G3	S1, S3
One	Q1 July - Sept 2024	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
One	Q1 July - Sept 2025	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
One	Q1 July - Sept 2026	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
One	Q2 Oct - Dec 2024	Grant Event	Conduct interviews for posted positions	TCAT Knoxville, Pellissippi State	All	All
One	Q2 Oct - Dec 2024	Grant Event	Host ribbon cutting and advisory meeting for the GIVE 2.0 grant committee and the community	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Three	Q3 Jan - Mar 2028	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Three	Q4 Apr - Jun 2028	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end to share out final attainment data	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q1 July - Sept 2024	Career Awareness	Lab in a Box	Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q1 July - Sept 2024	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q1 July - Sept 2024	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q1 July - Sept 2024	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of July, August and September	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q1 July - Sept 2025	Career Awareness	Tommy and Tammy TCAT Career Camps	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q1 July - Sept 2025	Career Awareness	Lab in a Box	Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q1 July - Sept 2025	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q1 July - Sept 2025	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q1 July - Sept 2025	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of July, August and September	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q1 July - Sept 2026	Career Awareness	Tommy and Tammy TCAT Career Camps	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q1 July - Sept 2026	Career Awareness	Lab in a Box	Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q1 July - Sept 2026	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q1 July - Sept 2026	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All

Appendix E: Project Timeline

Two	Q1 July - Sept 2026	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of July, August and September	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q1 July - Sept 2027	Career Awareness	Tommy and Tammy TCAT Career Camps	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q1 July - Sept 2027	Career Awareness	Lab in a Box	Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q1 July - Sept 2027	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q1 July - Sept 2027	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q1 July - Sept 2027	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of July, August and September	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q1 July - Sept 2027	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q2 Oct - Dec 2024	Career Preparation	MFG Month Celebration/Industry Tours	TCAT Knoxville, Pellissippi State	All	All
Two	Q2 Oct - Dec 2024	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q2 Oct - Dec 2024	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of October, November and December	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q2 Oct - Dec 2024	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q2 Oct - Dec 2025	Career Preparation	MFG Month Celebration/Industry Tours	TCAT Knoxville, Pellissippi State	All	All
Two	Q2 Oct - Dec 2025	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q2 Oct - Dec 2025	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of October, November and December	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q2 Oct - Dec 2025	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q2 Oct - Dec 2026	Career Preparation	MFG Month Celebration/Industry Tours	TCAT Knoxville, Pellissippi State	All	All
Two	Q2 Oct - Dec 2026	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q2 Oct - Dec 2026	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of October, November and December	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q2 Oct - Dec 2026	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q2 Oct - Dec 2027	Career Preparation	MFG Month Celebration/Industry Tours	TCAT Knoxville, Pellissippi State	All	All
Two	Q2 Oct - Dec 2027	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q2 Oct - Dec 2027	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of October, November and December	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q2 Oct - Dec 2027	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q3 Jan - Mar 2025	Career Preparation	SkillsUSA High School Regional Hosted by TCAT Knoxville	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2025	Grant Event	Hire for posted positions	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All

Appendix E: Project Timeline

Two	Q3 Jan - Mar 2025	Career Preparation	ACE Bootcamp	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q3 Jan - Mar 2025	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2025	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q3 Jan - Mar 2025	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of January, February and March	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q3 Jan - Mar 2025	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q3 Jan - Mar 2026	Career Preparation	SkillsUSA High School Regional Hosted by TCAT Knoxville	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2026	Career Preparation	ACE Bootcamp	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q3 Jan - Mar 2026	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2026	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q3 Jan - Mar 2026	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of January, February and March	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q3 Jan - Mar 2026	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q3 Jan - Mar 2027	Career Preparation	SkillsUSA High School Regional Hosted by TCAT Knoxville	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2027	Career Preparation	ACE Bootcamp	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q3 Jan - Mar 2027	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2027	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q3 Jan - Mar 2027	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of January, February and March	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q3 Jan - Mar 2027	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q3 Jan - Mar 2028	Career Preparation	SkillsUSA High School Regional Hosted by TCAT Knoxville	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2028	Career Preparation	ACE Bootcamp	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q3 Jan - Mar 2028	Training Experiences	Dual Enrollment Registration Event	TCAT Knoxville, Pellissippi State	All	All
Two	Q3 Jan - Mar 2028	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q3 Jan - Mar 2028	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of January, February and March	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q4 Apr - Jun 2025	Career Preparation	SkillsUSA State Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2025	Career Preparation	SkillsUSA National Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2025	Career Awareness	Remake Learning Days	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2025	Career Exploration	Dream it, Do it	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2025	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All

Appendix E: Project Timeline

Two	Q4 Apr - Jun 2025	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of April, May and June	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q4 Apr - Jun 2025	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q4 Apr - Jun 2026	Career Preparation	SkillsUSA State Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2026	Career Preparation	SkillsUSA National Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2026	Career Awareness	Remake Learning Days	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2026	Career Exploration	Dream it, Do it	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2026	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q4 Apr - Jun 2026	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of April, May and June	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q4 Apr - Jun 2026	Project Steering Committee	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County	All	All
Two	Q4 Apr - Jun 2027	Career Preparation	SkillsUSA State Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2027	Career Preparation	SkillsUSA National Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2027	Career Awareness	Remake Learning Days	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2027	Career Exploration	Dream it, Do it	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2027	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q4 Apr - Jun 2027	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of April, May and June	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q4 Apr - Jun 2027	Project Steering Committee Meeting	A Quarterly Project Steering Committee Meeting set up on the third week of the month of quarter end	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All
Two	Q4 Apr - Jun 2028	Career Preparation	SkillsUSA State Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2028	Career Preparation	SkillsUSA National Competition	TCAT Knoxville, Pellissippi State	All	All
Two	Q4 Apr - Jun 2028	Career Awareness	Remake Learning Days	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2028	Career Exploration	Dream it, Do it	TCAT Knoxville, Pellissippi State	G2, G3, G4, G5	S2, S3
Two	Q4 Apr - Jun 2028	Grant Quarterly Report	Quarterly Narrative, Inventory and Budget Report Due	TCAT Knoxville	All	All
Two	Q4 Apr - Jun 2028	Partnership Monthly Report	Monthly Narrative, Data Report, and Reimbursement Request Reports due by the 25th of April, May and June	TCAT Knoxville, Pellissippi State, Anderson County Schools, Anderson County Chamber	All	All

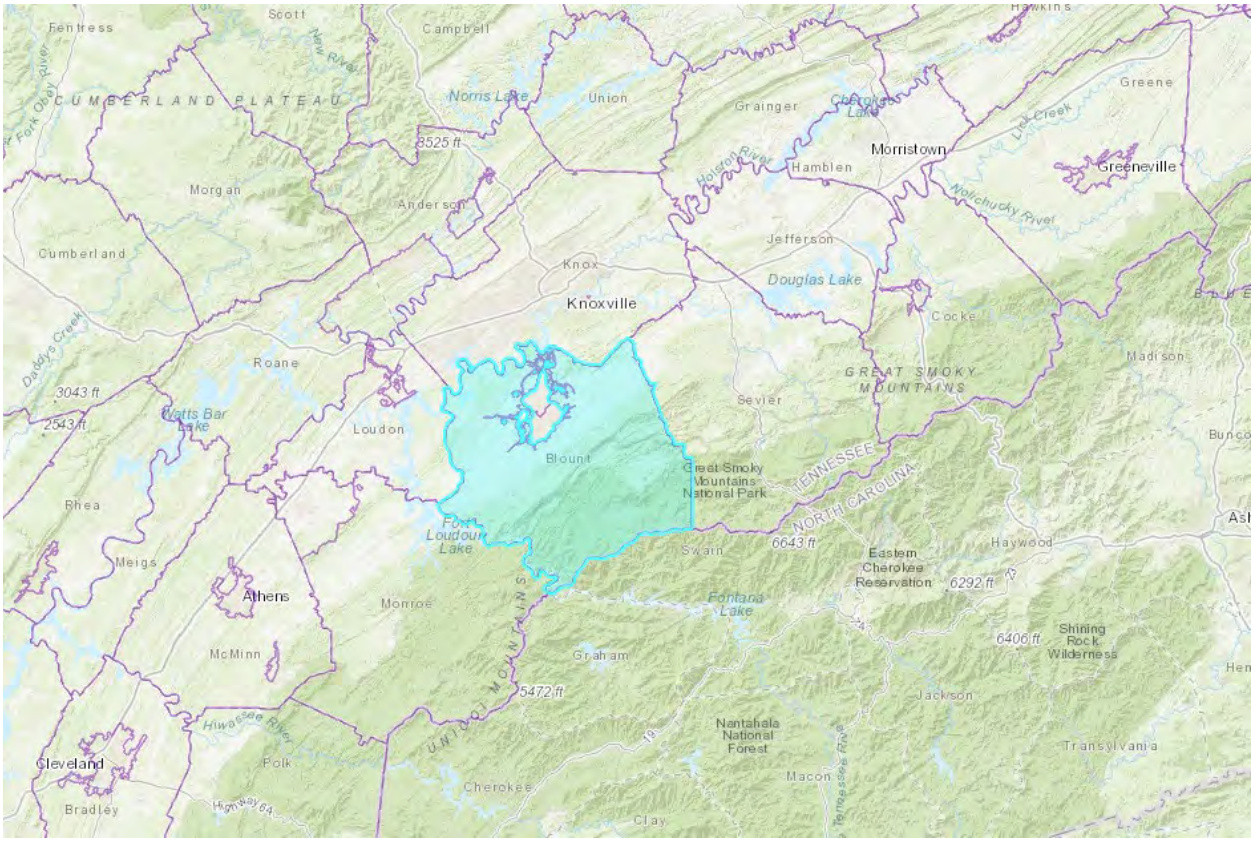
Appendix F: WBL continuum framework

Appendix H: High demand Programs & Census Tract Information

East Tennessee - Occupations with High Employer Demand

OES 2019 SOC Code	Description	2020 Jobs	2020 Employment Concentration (National Avg. is 1.00)	2028 Projected Employment	Annual Openings (2018 - 2028)	Job Postings: Openings Advertised Online 20:	2020 Hires	Entry Level Earnings	Median Earnings	Experienced Earnings
51-4121	Welders, Cutters, Solderers, and Brazers	1,630	1.14	2,068	233	156	1,420	$15.92	$20.21	$23.66

Census Tracts in Persistent Poverty: 1989 to 2015-2019			
State	County	Zip Code	Census Track of Persistent Poverty
Tennessee	Blount County	47009	47009010100



Appendix I: SCORE_The State Collaborative on Reforming Education Report

SCORE
State Collaborative on Reforming Education

Building A BRIGHTER FUTURE

2024 State Of Education In Tennessee

SCORE
State Collaborative on Reforming Education

Building A BRIGHTER FUTURE

2024 State Of Education In Tennessee

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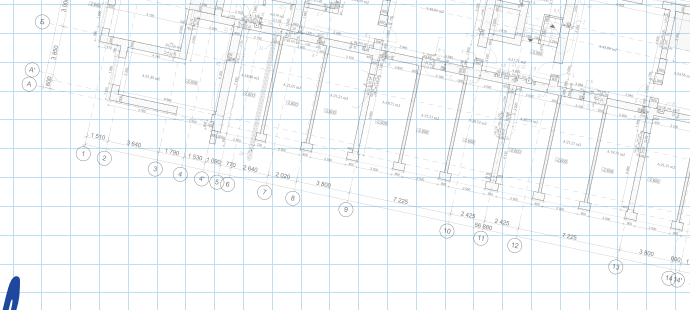


A Letter from SENATOR BILL FRIST AND DAVID MANSOURI

Dear Friends,

2024 marks 15 years since the State Collaborative on Reforming Education (SCORE) was founded with a mission to catalyze transformative change in Tennessee education so that all students can achieve success.

Today, our commitment to Tennessee students and their success remains stronger than ever. Grounded in our mission, strengthened by our partnerships, and led by student-focused priorities, we continue to boldly support innovative policies and practices that align with our overall goals that:

- All students receive an excellent public K-12 education.
- All students earn a credential or postsecondary degree of value that prepares them for a career enabling economic independence.
- Economically disadvantaged students, students of color, and rural students see improved success across all goals relative to their peers.

Through the tireless work of so many educators, policymakers, advocates, and community leaders, the past 15 years have laid a strong foundation for sustainable improvement for students and for educational change in our state. Tennessee has been a trailblazer by championing student-centered strategies, setting high expectations for students and educators, holding systems accountable for student outcomes, and investing in research-backed initiatives to improve student learning and preparation for careers. Ultimately, these efforts have led to progress for students from kindergarten to the workforce.

But as we look to the next chapter, Tennessee must do more. While student outcomes in Tennessee are trending in the right direction, far too many students are still being left behind. Just over one-third of elementary students are proficient in English and math, and a closer look at the data suggests opportunity gaps by race and socioeconomic status have widened. Higher education institutions are not graduating enough students to meet workforce demands overall and are even further behind in increasing postsecondary attainment for students from historically underserved groups.

Importantly, as the education landscape is evolving so is the labor market. As new jobs emerge and Tennessee's economy grows, our state's approach must evolve to ensure our education systems are preparing students for jobs that will enable economic independence and choice-filled lives. We must better understand what the data tell us about how students are moving through these pathways, and we must use that information to support all students – particularly those with the highest needs – on pathways to earn degrees and credentials of value.

On the pages that follow, you'll find SCORE's specific recommendations on how, together, we can expand Tennessee's vision for student success and enter the next chapter of education transformations. Our 2024 priorities are:

- Expand student opportunity by strengthening foundational policies.
- Build effective pathways between education and careers.
- Ensure K-12 supports meet student needs.

Senator
Bill Frist, MD

The work to build a brighter future for Tennessee students will take all of us, and it will be a continuous journey. We have no doubt that with our shared advocacy efforts and clear focus, Tennessee will shape an education system that is aligned to the new realities of our state's labor market and gives students the opportunities they need and deserve.

Join us as we roll up our sleeves for the next phase of education transformation in Tennessee.

Sincerely,

Senator Bill Frist, MD
SCORE Chairman
and Founder

David Mansouri
SCORE President
and CEO

"Our state's approach must evolve to ensure our education systems are preparing students for jobs that will enable economic independence and choice-filled lives."

David Mansouri

The NEXT FRONTIER For TRANSFORMING EDUCATION IN TENNESSEE

Tennessee is a leader in piloting and scaling efforts to strengthen student success. Foundational strategies have been grounded in high expectations for educators, schools, and students - from the time students enter the classroom to the time they receive a degree or credential. This work is yielding demonstrated results for students. However, while progress has been made, it is clear more needs to be done. Tennessee's next challenge is to expand its vision for education so that each student not only has the opportunity to succeed in school but also has the opportunity to be prepared for a career that enables economic independence.

Laying The Foundation For Success

Tennessee began its journey leading the nation in education transformation after recognizing a failure to meet student needs in the early 2000s. State leaders took bold action to improve student outcomes, creating a foundation of student-centered policies across K-12 and postsecondary education. Tennessee's foundational policies include:

- **High expectations:** Rigorous state-specific K-12 academic standards establish high expectations for students. Together with a multiple-measure teacher evaluation system to support continuous improvement for educators and a statewide district and school accountability system, these policies all contribute to holding Tennessee accountable to high expectations.

- **Data monitoring:** Administering statewide K-12 assessments aligned to Tennessee's academic standards at least once a year and publicly reporting that data allow for monitoring of student progress. Further, the state created a system that links data across sectors to begin understanding how students move between K-12, postsecondary education, and the workforce. This information provides the basis for data-driven decision-making.

- **Postsecondary education outcomes-based funding:** Funding Tennessee's colleges and universities based primarily on student outcomes, including credit accumulation and graduation rates, established the expectation that institutions are rewarded for results rather than only for enrolling students.

- **Access to postsecondary education:** The expansive suite of state scholarships available to students – including Tennessee Promise, Tennessee Reconnect, and the Dual Enrollment Grant – offers financial assistance to reduce the cost of pursuing education beyond high school.

These foundational policies created a strong base that proved critical as the COVID-19 pandemic created chaos for education systems across the United States. Tennessee responded swiftly with additional student-centered policies and practices. These efforts included:

- **Foundational literacy skills:** The state legislature passed the Tennessee Literacy Success Act to ensure all students receive foundational literacy skills instruction in the classroom, including explicit phonics instruction, and all teachers are prepared to teach those skills through their educator preparation provider (EPP) coursework.[1]

- **K-12 student-based funding:** With the 2022 passage of the Tennessee Investment in Student Achievement (TISA) Act, the state moved to a student-weighted K-12 funding formula that funds school districts based on the specific needs of each student.[2] This shift from the previous resource-based model ensures that more state dollars flow toward districts with greater need, such as those with higher proportions of students from low-income families and students living in rural communities. The formula also includes per-student direct funding to support key priority areas such as early literacy and career and technical education (CTE), as well as outcome bonuses to reward districts when students achieve certain outcomes.

- **Summer learning and tutoring:** With the Tennessee Learning Loss Remediation and Student Acceleration Act, Tennessee pioneered efforts in statewide summer learning and tutoring programs for students, directing sustained investments toward both initiatives.[3]

- **Dual enrollment expansion:** The state significantly expanded access to the Dual Enrollment Grant by allowing the grant to cover up to five courses for students who maintain eligibility, extending eligibility for dual enrollment at Tennessee Colleges of Applied Technology (TCATs) to ninth and 10th graders (in addition to juniors and seniors), and lowering the ongoing cumulative GPA requirement from 2.75 to 2.0.[4]

- **Momentum year postsecondary education goals:** In response to notable drops in the state's college-going rate, the Tennessee Higher Education Commission (THEC) announced a 2023 momentum year initiative with three primary goals to motivate improved outcomes.[5] These goals were increasing the college-going rate, increasing adult enrollment in postsecondary education, and improving alignment in education and workforce training.[6]

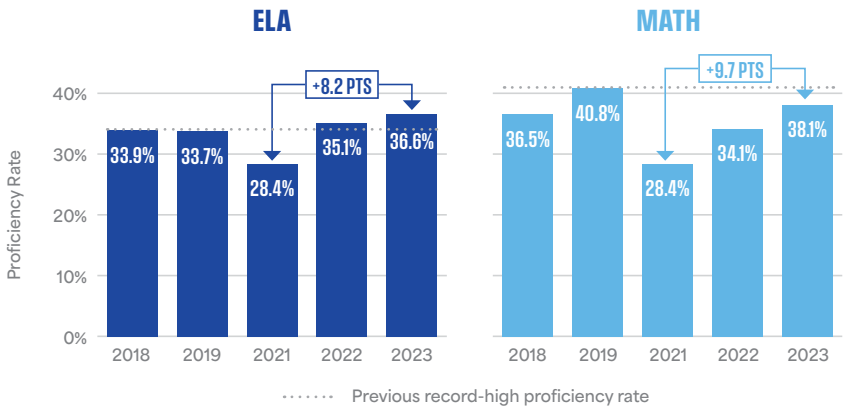
Tennessee's leadership in supporting student success and putting students first is clear. As we move into 2024, it is essential to closely monitor student outcomes to build on prior efforts and push for the next phase of improvements.

As A Result Of State Efforts, Student Outcomes Are Improving

Bold initiatives to improve student learning placed Tennessee on the national stage. Data show the state's third to eighth graders made some of the most growth in math and reading scores between 2009 and 2015, according to the National Assessment of Educational Progress (NAEP).[7] When COVID-19 disruptions significantly impacted student learning and caused dramatic declines in achievement, education leaders in Tennessee responded with a renewed commitment to advance student learning for pandemic recovery and beyond.[8] That commitment to accelerating student learning is starting to pay off.

Tennessee students made large gains on state assessments in both English language arts (ELA) and math in the two years since the 2021 lows. **Tennessee is one of the few states exceeding prepandemic ELA proficiency levels, with ELA proficiency rates for all students in grades 3-8 almost 3 percentage points higher than the 2019 rate.**[9] Promisingly, a closer look shows that third-grade ELA proficiency, which has been a primary focus of recent policy changes, reached record highs for all students in 2023. The math proficiency rate for students in grades 3-8 is still shy of the prepandemic high but did improve by almost 10 percentage points between 2021 and 2023. The recent gains across subject areas indicate positive momentum, but with fewer than 40 percent of our state's third to eighth graders reading and writing on grade level today and proficiency rates disproportionately lower for students of color, there is still much more progress to be made.

TENNESSEE HAS SEEN LARGE GAINS ACROSS SUBJECTS SINCE 2021, NEARLY CATCHING UP TO OR SURPASSING PREPANDEMIC RESULTS

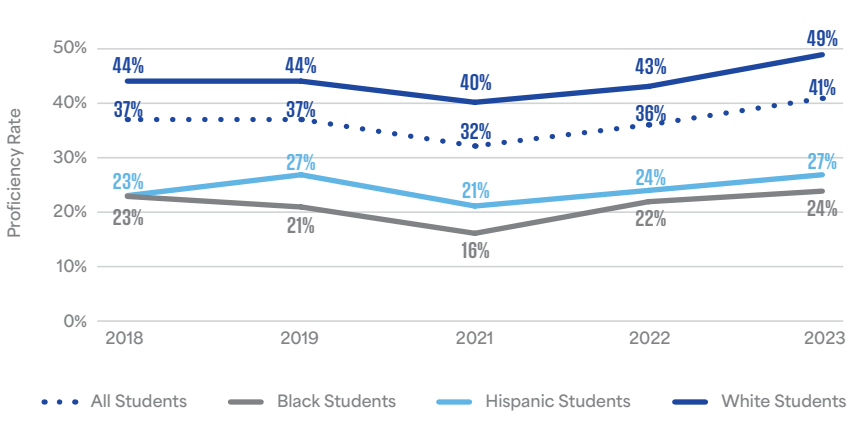


Grades 3-8 ELA TCAP proficiency for ELA and math, 2018-2023

Data Note: Due to school closures and assessment waivers, data are not available for 2020.

Source: TDOE state-level assessment data downloads, 2023

THIRD-GRADE ELA PROFICIENCY RATES REACHED RECORD HIGHS IN 2023



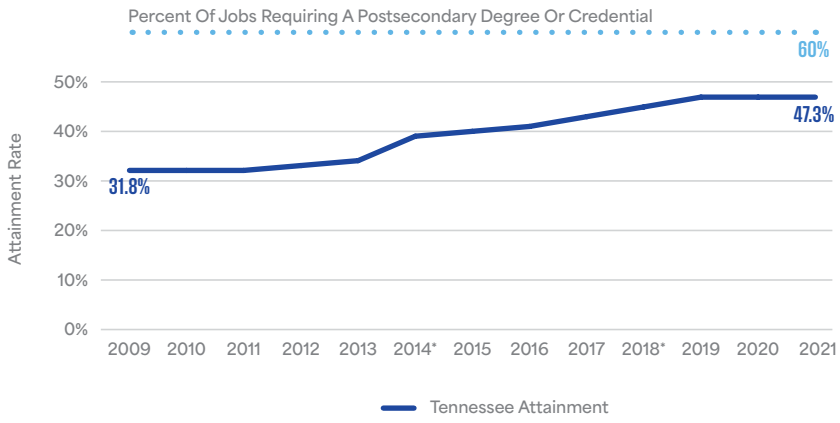
TCAP grade 3 ELA proficiency rates by student group, 2018-2023

Data Note: Due to school closures and assessment waivers, data are not available for 2020.

Source: TDOE state-level assessment data downloads, 2023

Postsecondary outcomes are improving as well. The state's college-going rate is rebounding from a pandemic low, marking progress toward the state's momentum year goal with a 1.5 percentage point increase since 2021.[10] Beyond college-going, monitoring the number of Tennesseans with some kind of postsecondary education (i.e. postsecondary attainment) is critically important for understanding how many are prepared for success in the workforce. Around 60 percent of the state's jobs require some kind of postsecondary education.[11] Though not at the 60 percent mark, the state's postsecondary attainment rate continues to trend upward and reached 47.3 percent in 2021.

TENNESSEE'S ATTAINMENT RATE CONTINUES TO INCREASE BUT REMAINS SHORT OF MEETING WORKFORCE NEEDS



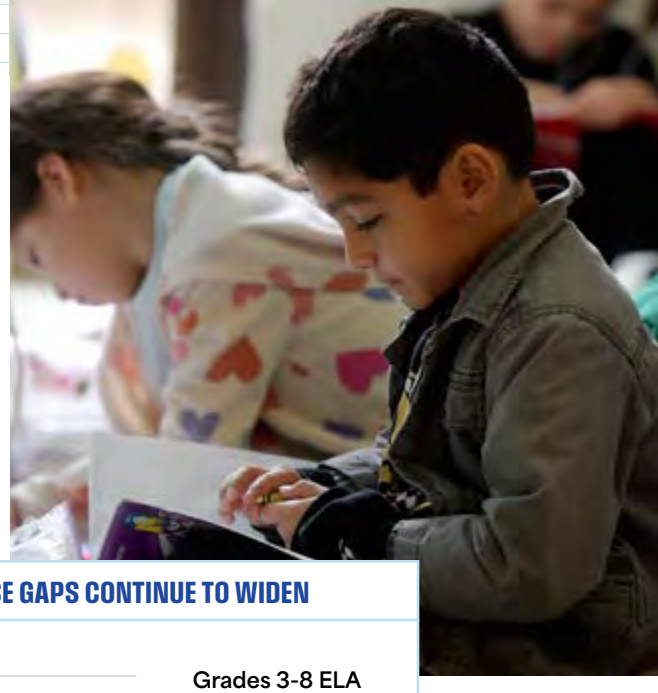
Percentage of Tennesseans ages 25-64 holding a degree or credential, 2009-2021.

Data Note: In 2014, workforce-relevant certificates were included in calculations. In 2018, industry-recognized certifications were included in calculations.

Source: Lumina Foundation Stronger Nation Report, 2022

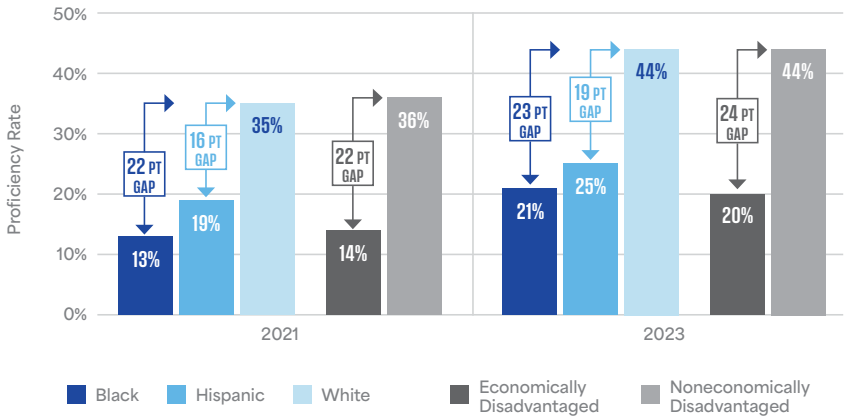
Still, The Path Forward For Students Remains Challenging

Progress should be celebrated and is helpful in identifying policies and practices that are working for students. However, maintaining the state's commitment to improved student outcomes and a prepared workforce does not mean being content with the current set of policies and practices, particularly when not all students have the supports needed to achieve success.



In Tennessee, proficiency rates are not equal across student groups. White and noneconomically disadvantaged (non-ED) students were larger drivers of the overall grade 3-8 student growth in the past two years, reflecting widening opportunity gaps for students of color and economically disadvantaged (ED) students. In 2023, the White-Black and White-Hispanic ELA proficiency gaps grew to 23 percentage points and 19 percentage points, respectively. The ELA proficiency gap between non-ED and ED students reached 24 percentage points in 2023. This trend is the same for math.[12] **Widening opportunity gaps illustrate that Tennessee is not doing enough to serve students with the greatest needs.**

ELA PROFICIENCY RATES DIFFER BY RACE AND INCOME, AND THOSE GAPS CONTINUE TO WIDEN

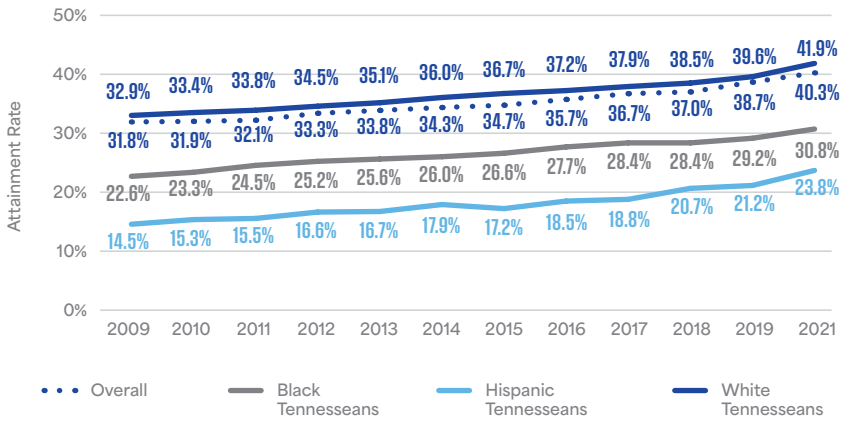


Grades 3-8 ELA equity gaps by student group, 2023

Source: TDOE state-level assessment data downloads, 2023

Opportunity gaps for students also persist into post-secondary education. Despite steady progress across groups, Black and Hispanic Tennesseans are far less likely to hold a postsecondary degree than White Tennesseans.[13] A variety of factors may contribute to these gaps including lack of academic preparation in K-12 and financial pressures.[14] To ensure every Tennessean has the opportunity to be prepared for a career that enables economic independence and to fulfill economic needs, the state needs to better support students of color.

TO MEET WORKFORCE NEEDS, TENNESSEE MUST BETTER SUPPORT HISTORICALLY UNDERSERVED POPULATIONS



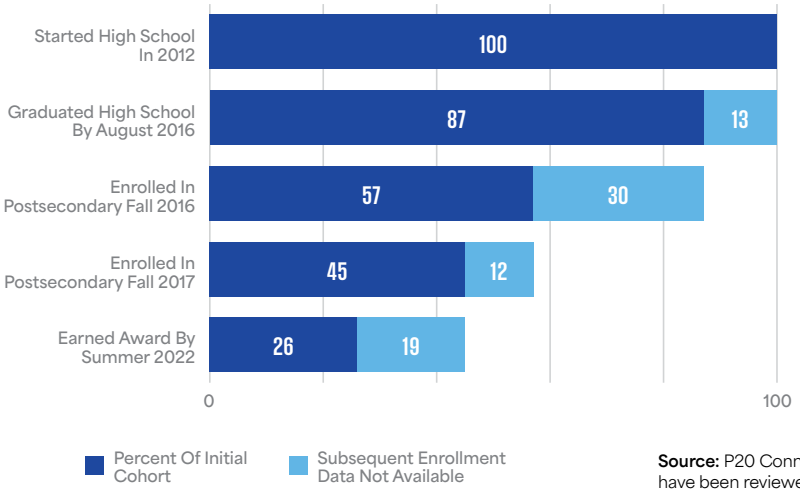
Percentage of Tennesseans ages 25-64 holding a degree by race/ethnicity, 2009-2021

Data Note: Degrees include graduate or professional degrees, bachelor's degrees, and associate degrees

Source: Lumina Foundation Stronger Nation Report, 2022

Tennessee's current K-12 and postsecondary education systems create a leaky education pipeline for students, particularly those with the highest needs. Only 26 percent of Tennessee students who started high school in 2012 went on to attend college and earn an award by the summer of 2022 (within six years of them graduating high school). When conducting the same analysis for students of color in that cohort, the number is even more alarming. Only 15 percent of Black students and 16 percent of Hispanic students who started high school in 2012 went on to enroll in college and earn a postsecondary degree or credential by the summer of 2022. **The pipeline from K-12 through postsecondary education – and ultimately to the job market – is broken, losing too many Tennesseans along the way who want and deserve better opportunities.**

ONLY ONE-QUARTER OF HIGH SCHOOL STUDENTS SUCCESSFULLY NAVIGATE THE POSTSECONDARY PIPELINE

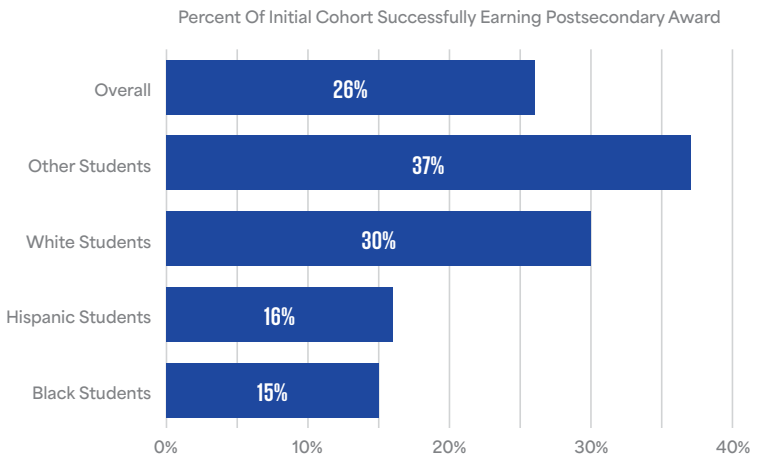


Longitudinal trajectory for students starting ninth grade in 2012 through the postsecondary education pipeline

Data Note: High school graduates were identified using TDOE Accountability protocol: those who received a regular or alternate diploma before the end of Summer 2016. Postsecondary enrollment and completion rates calculated using THEC, TICUA, and NSC data; awards data do not include out-of-state NSC data, industry-recognized credentials, nondegree credentials, or military enlistments, so the true metric is likely higher than that shown by available data.

Source: P20 Connect aggregate data request, 2023. Data have been reviewed by THEC, TICUA, and TDOE.

STUDENT SUCCESS FROM HIGH SCHOOL ENTRY TO POSTSECONDARY GRADUATION VARIES BY STUDENT GROUP



Longitudinal trajectory for students starting ninth grade in 2012 through the postsecondary education pipeline by race/ethnicity

Data Note: Race/ethnicity from TDOE variable in P20 TN Connect. Overall category is created combining all subgroups including those listed specifically. The "Other Student" group includes race ethnicity categories Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, and missing or unknown. There were no missing or unknown categorized students reported outside of the initial cohort data.

Source: P20 Connect aggregate data request, 2023. Data have been reviewed by THEC, TICUA, and TDOE.

The transformative changes to the state's education system up to this point are not yet fully supporting achievement for all students. As Tennessee approaches its next frontier of education transformation, there is a need to both strengthen existing systems and implement promising new initiatives to better meet the needs of all students.

The Education And Economic Landscape Is Evolving

In evaluating areas for improvement in Tennessee's education system, it is critical to recognize the new education and work landscapes. For example, postsecondary education can offer students a path toward a choice-filled life, but only if it's connected to career opportunities. And Tennessee's labor market is changing. Consider the following:

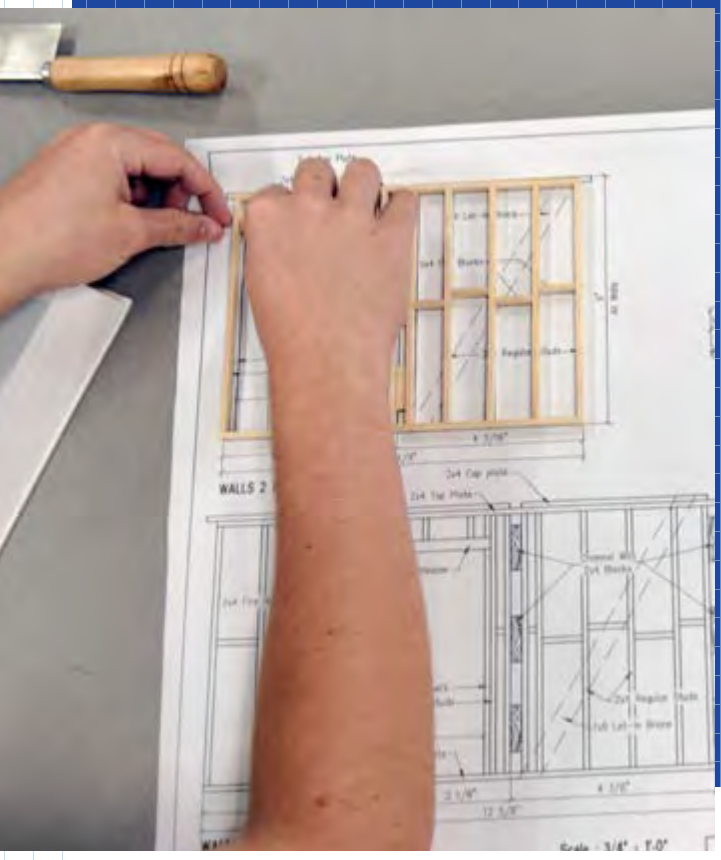
- **Job opportunities are shifting.** Between 2019 and 2022, 8.6 million workers changed jobs across the United States labor market – a 50 percent increase from the previous three years.[15] Projections estimate 12 million more occupational shifts through 2030.[16]

- **There are not enough educated Tennesseans to meet employer needs.** There are 56 available workers for every 100 jobs in the state.[17] Further, almost 70 percent of Tennessee business leaders surveyed in 2023 indicated there are not enough appropriately trained workers to meet their employment needs.[18]

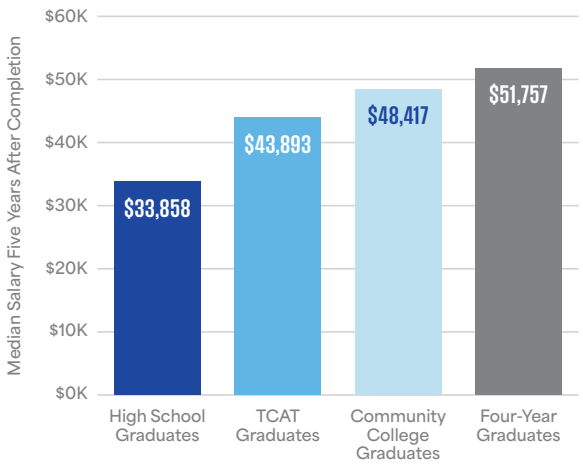
- **New businesses are flocking to Tennessee, and existing businesses are flourishing.** At the beginning of 2023, there were over 20,000 new business filings in the state and almost 200,000 business renewals – both of which are at a record high.[19]

- **The significant economic growth Tennessee has experienced since the pandemic may slow.** The state's economic growth is expected to remain positive, with an overall outlook more optimistic than national estimates.[20] However, economists project the growth will decelerate, suggesting that postsecondary degrees and credentials with employer value will be even more important for individuals navigating the job market.[21]

To prepare Tennesseans for jobs enabling economic independence, the education system must better align and respond to the labor market. This alignment and ability to adapt to the workforce is essential for students. **Tennesseans with postsecondary training valued by employers qualify for a larger portion of the state's jobs, show greater resilience in the job market during economic downturns, and experience greater earnings throughout their lifetime.**



COLLEGE GRADUATES, ON AVERAGE, EARN 1.5 TIMES MORE THAN HIGH SCHOOL GRADUATES



Median full-time wages five years after completion by degree type for 2015-16 graduates. High school graduates reflects 2015-16 high school graduates with no additional postsecondary enrollment. All other categories reflect 2015-16 degree completers.

Source: P20 Connect, 2022

Recent innovations are starting to better connect what students learn in the classroom to what employers need in the workforce. K-12 innovative school model grants were awarded by the state in 2021 and 2023 to build up programs that prepare students for the jobs of today and tomorrow, and CTE direct funding through TISA is meant to sustain the programs most beneficial for students.[22] In postsecondary education, the state has greatly expanded access to the Dual Enrollment Grant at TCATs, and community colleges are piloting initiatives to increase student access to career advising and workforce-relevant certificates in their first semester.[23] In addition, employers are partnering with high schools and universities to pioneer programs that lead to in-demand, high-wage job opportunities.[24] These innovations are essential in an ever-changing labor market but are neither expansive nor comprehensive enough to support all students.

A strategic alignment across education and the workforce is necessary to build a brighter future for Tennessee students and prepare them for success in a rapidly evolving economy. Systems must be intentionally designed around this connection. In Tennessee's next phase of education transformations, the end goal cannot just be students earning a degree or credential but instead must be students earning a degree or credential that specifically leads to economic independence. Every Tennessean deserves the opportunity to gain the education and skills needed to succeed in a career and live a choice-filled life.

With this context in mind, SCORE recommends three priorities to drive the state's efforts forward in 2024:

1. **Expand Student Opportunity By Strengthening Foundational Policies**
2. **Build Effective Pathways Between Education And Careers**
3. **Ensure K-12 Supports Meet Student Needs**


Building
A BRIGHTER FUTURE

2024 Priority

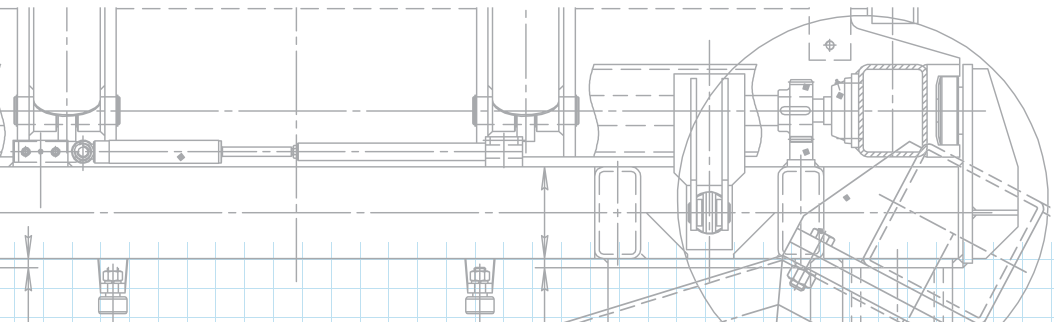
EXPAND STUDENT OPPORTUNITY BY STRENGTHENING FOUNDATIONAL POLICIES

A willingness to continuously improve characterizes good leadership. As a national education policy leader, Tennessee must consistently work to meet the evolving needs of the state and its students. It is not logical, nor is it effective, to rely on decades-old policy and practice to serve students, particularly when we know that efforts thus far have not yet advanced student outcomes to where they need to be.

QUESTIONS TO GUIDE MEANINGFUL IMPROVEMENT

When revisiting foundational policies, there are several key student-centered questions state leaders should be asking to drive continued improvement:

- What student outcome did this policy intend to impact? Do data show that outcome has changed since implementation of the policy? Is that outcome still the primary outcome we hope to impact?
- How does this policy impact student success in education, career, and life? Are students experiencing meaningful gains as a result of this policy? Do we have the data needed to answer these questions?
- Were there any unintended consequences of this policy? If so, how could those consequences be addressed?
- What do students, parents, and educators say about their experience with this policy? Are any components of the policy creating barriers to student success?
- What has changed in our community, state, or country since the first implementation of this policy? Is the policy meeting the need of today's students?



While there are many areas where Tennessee's education policy leadership is evident, three deserve particular attention in the months ahead: longitudinal data, Tennessee Promise, and outcomes-based funding. The state can celebrate its success across data, postsecondary access, and postsecondary completion while also embracing the opportunity to strengthen these nationally recognized policies. We must commit to the important process of evaluating where these efforts are not meeting their full potential and making the necessary adjustments.

As a state dedicated to continuous student-centered improvement, Tennessee should consider the following in its next wave of reforms:

1. **Prioritize the use of longitudinal data to drive student outcomes.**
2. **Enhance the Tennessee Promise scholarship and the community college student experience.**
3. **Revise the postsecondary outcomes-based funding formula to prioritize long-term student success.**

Tennessee's longitudinal data system holds a wealth of information about students' progress through classrooms to careers but is not easily accessible.

Data are foundational for good decision-making.[25] Students and families deserve access to data in order to understand which educational opportunities lead to high-wage careers. School leaders need data to know which K-12 opportunities jumpstart students on the path to postsecondary education and the workforce and to see where opportunity gaps exist. Employers require data to understand which education programs can provide them with the talent they need. And all groups need a line of sight into the connection between educational opportunities and emerging careers to understand how to support students on their paths through school to the workplace. For the power of data to be fully realized, data must be accessible and presented in ways that are meaningful to and actionable for key stakeholders. In meeting that need, Tennessee is behind.

GREATER TOGETHER: A DATA-DRIVEN PARTNERSHIP

Greater Together Clarksville is a data-driven partnership aimed at supporting students as they navigate the transition from K-12 to postsecondary education. Working collaboratively, the Clarksville-Montgomery County School System (CMCSS) and its three local partner colleges and universities – Austin Peay State University (APSU), Tennessee College of Applied Technology-Dickson (TCAT-Dickson), and Nashville State Community College (NSCC) – along with tnAchieves, developed an innovative data-sharing agreement (also known as a memorandum of understanding, or MOU) in October 2021. Each partner put in substantial efforts to develop the MOU, and those efforts paid off. The agreement enabled each of the five entities to securely share student-level data, set goals, monitor key indicators of postsecondary success, and ultimately remove barriers to student success.

tnAchieves manages a dashboard of information for each institution to monitor the progress of Tennessee Promise-eligible students through key milestones such as FAFSA completion, submission of applications, and enrollment in summer bridge programs. The dashboard of each postsecondary institution is populated with data on CMCSS seniors who indicated an intention to attend that college on their Promise applications. This information helps partners quickly intervene to ensure that seniors successfully transition to postsecondary education and also supports longer-term efforts to refine programming and supports. For example, colleges may reach out to students who have not completed parts of the application process, and any student enrolled in a college but not signed up for a summer bridge program by the deadline will get a personal phone call from their high school's college counselor.

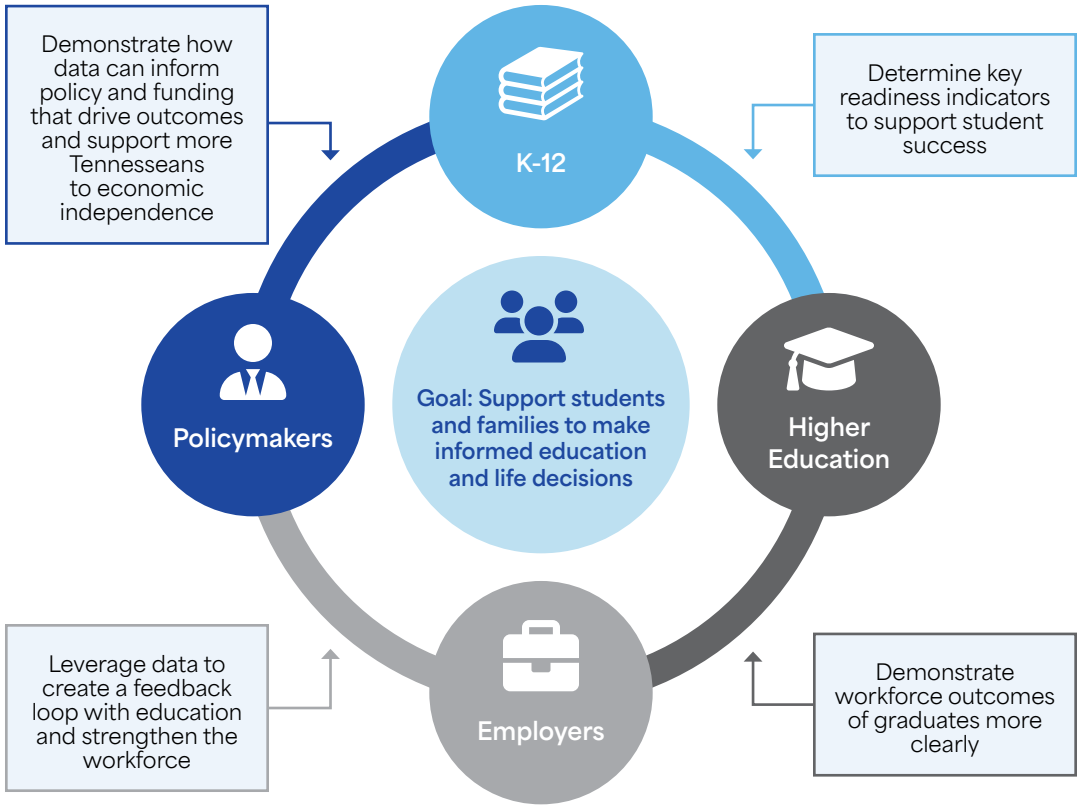
At the crux of the initiative is meaningful data sharing. Regularly collaborating over real-time and straightforward data access enables partners to refine programming to strengthen student readiness and postsecondary success. Greater Together Clarksville exemplifies the promise of an MOU to bridge data gaps between K-12 and postsecondary education and plug holes of the often-leaky education pipeline. Facilitating the development and approval of MOUs would allow more innovative partnerships like Greater Together to thrive.

Longitudinal data systems are key to effective state-level data efforts. A statewide longitudinal data system (SLDS) connects data over time to offer insight into students' education-to-work journeys and identify trends that inform decision-making. As a state committed to data collection and monitoring, Tennessee established its SLDS leadership in 2012 with the development of the Tennessee Longitudinal Data System, known as P20 Connect TN, to link student-level information across education, workforce, and social services sectors.[26] That leadership continues today. In 2023, the state established Tennessee's Data Analytics for Transparency and Accountability system (TN DATA), a new cloud-based longitudinal data hub designed to better leverage the data at scale.[27]

Many partner agencies across the state contribute data to the longitudinal system, including the Tennessee Department of Education (TDOE), the Tennessee Higher Education Commission (THEC), the Tennessee Department of Labor and Workforce Development (TDLWD), and the Tennessee Department of Human Services (DHS).[28] As a result, TN DATA includes a range of metrics such as state assessment results, demographics, wages, unemployment claims, and receipt of benefits. The securely linked data, housed by the state's Office of Evidence and Impact (OEI), can be used to evaluate the impact of state investments and better understand the connections between education and work in Tennessee.

Despite the existence of a wealth of information within TN DATA, that information is not easily accessible to those outside of state agencies, including those working most closely with students. Of the 40 states with a longitudinal data system in place, Tennessee is one of only three without a public-facing website for its system.[29] Instead, Tennessee's system is leveraged mainly by internal state analysts and academic researchers who go through a months-long formal research request process to access the data. Academic research is one important use for Tennessee's longitudinal data system, but it does not reflect its full potential.

LONGITUDINAL DATA PROVIDE INSIGHT INTO STUDENTS' PATHS FROM EDUCATION TO THE LABOR MARKET



Tennessee has the basis for data-driven decision-making in place but needs to take the next steps to make data more usable in ways that can support student success. Without access to data that is linked across sectors, it is difficult for schools, districts, and postsecondary institutions to develop supports that drive lifelong student success and to know whether their efforts are having the intended results. Likewise, it's hard for employers to understand how to strengthen partnerships with education entities in order to provide students with opportunities to gain skills for rewarding career opportunities. **The state can strategically share aggregate data with communities, institutions, and employers to drive decision-making, while maintaining all important privacy and security requirements.**

What does it look like to make this kind of data accessible and effectively use it? To answer this question, Tennesseans can look to two other states in our region: Kentucky and Virginia. Kentucky's Center for Statistics (KYSTATS) creates a postsecondary feedback report to monitor student employment outcomes by postsecondary institution, major, credential type, and demographics. The Virginia Office of Education Economics (VOEE) offers an education and workforce alignment dashboard that allows users to compare education programs to workforce needs at the regional level.[30] Both of these examples are tools Tennessee could and should create.

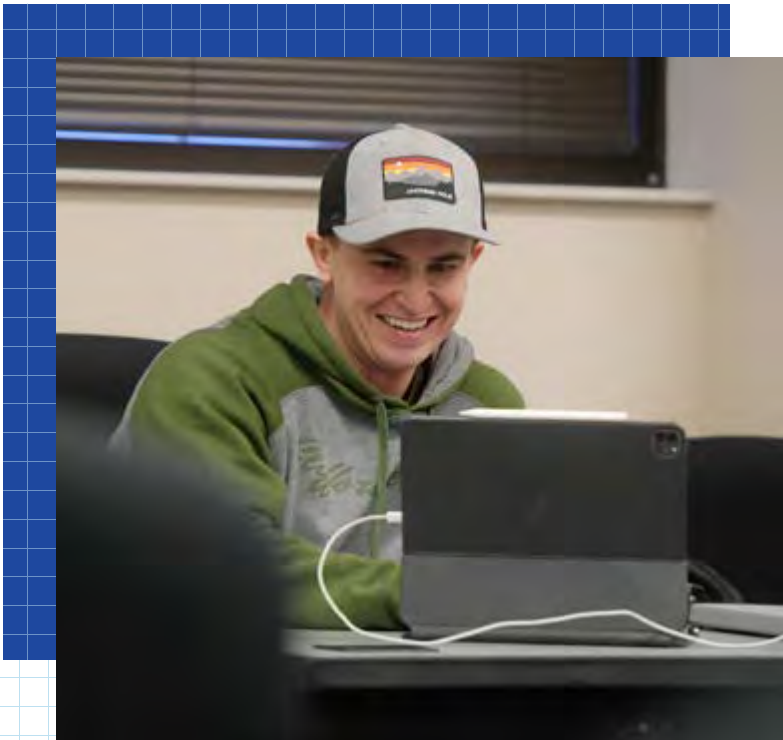
While highlighting critical data needs will be a through line to this report, the following recommendations focus specifically on strengthening the state's longitudinal data efforts. By facilitating secure data sharing and creating public-facing dashboards that examine the education-to-work pipeline, Tennessee could unlock the power of longitudinal data in driving education transformation to better serve students.

SCORE recommends prioritizing the use of longitudinal data to drive student outcomes.

- **Create public-facing dashboards.** OEI should create data dashboards that give the public a powerful tool for understanding student progress through K-12, postsecondary education, and careers. For instance, these dashboards should include information such as how many students who concentrate in CTE go on to an aligned postsecondary program or career, as well as wage outcomes for students based on the degree or credential earned.

- **Add career-relevant information to the TN DATA system.** Requiring TDLWD to collect Standard Occupational Classification (SOC) codes, the recognized classification system for occupations in data systems, and add them to the TN DATA hub would facilitate connections between postsecondary opportunities and particular jobs.

- **Bolster the state's TN DATA efforts.** Elevating and expanding existing longitudinal data efforts through state law will help establish a shared vision for data access and use and ensure that vision persists over time. Further, THEC should launch a data working group made up of OEI, the Tennessee Board of Regents (TBR), TDOE, and the Tennessee Independent Colleges and Universities Association (TICUA) to codevelop a model data-sharing MOU for high schools, postsecondary institutions, and student support organizations to use as a template. A model agreement could streamline the development of data-driven partnerships across the state and ensure longitudinal data are more consistently leveraged to support student success.



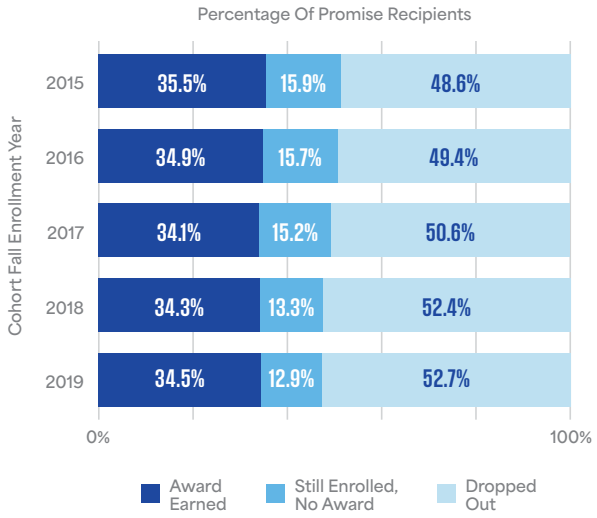
Tennessee Promise paved the way in expanding college access, but students still struggle to successfully navigate the postsecondary experience.

Tennessee Promise is a last-dollar scholarship that covers the remaining cost of tuition and fees at community and technical colleges for Tennessee high school graduates after other grant aid is applied. Tennessee became the first state to provide statewide tuition-free access to community and technical colleges when the General Assembly established Tennessee Promise in 2014.[31] Since then, at least 19 other states have followed Tennessee's lead and launched similar programs.[32]

Tennessee Promise is a landmark policy for expanding postsecondary access and providing coaching support for students. The introduction of Tennessee Promise resulted in an initial surge of enrollment and an increase to the state's college-going rate for high school graduates of almost 10 percent.[33] Further, Tennessee Promise is not only a scholarship but also a mentoring program.[34] The program's partnering organizations, tnAchieves and the Ayers Foundation Trust, are responsible for assigning students to mentors who help them through key milestones (like college applications and the financial aid process) across K-12 to postsecondary education.[35] Since 2018, partnering organizations also offer students more proactive coaching to support retention and completion once they are enrolled in a community or technical college.[36]

While Tennessee Promise increased postsecondary access for Tennessee students, it has not gone far enough in supporting completion – suggesting its return on investment is not what it could be. Only 34.5 percent of Promise students in the 2019 cohort earned a degree or credential within six semesters, by which point students were past the five-semester eligibility limit for the scholarship.[37] Moreover, with only 27 percent of community college students overall, 12 percent of Black community college students, and 23 percent of Hispanic community college students graduating within three years, outcomes are not where they need to be across the board.[38] With even more career opportunities today hinging on postsecondary education, it is essential that more community college students, Promise students included, are able to successfully navigate their postsecondary experience.

JUST OVER ONE-THIRD OF TENNESSEE PROMISE STUDENTS EARN AN AWARD BY THE END OF SEMESTER SIX



Tennessee Promise student outcomes by cohort enrollment year by semester six of enrollment, 2015-2019

Source: THEC Tennessee Promise Annual Report, 2023

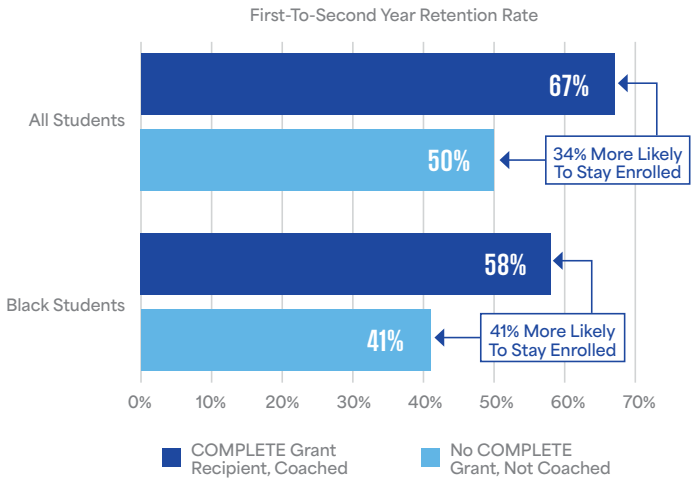
Not only are the majority of Tennessee Promise students not earning a degree or credential, the majority are also not transferring to four-year institutions. Fewer than 20 percent of Promise students in the 2019 cohort transferred to a university after enrolling in a community college.[39] Data show that students who complete an associate degree designed for transfer but do not actually transfer experience lower median wages than those who complete a traditional associate degree.[40] As such, Promise students who intend to transfer to earn a bachelor's degree but do not may be disadvantaged when looking for jobs compared to those who intended to earn an associate degree.

Though completion and transfer rates are not where they should be, there is enormous potential for Tennessee Promise to drive improved graduation rates.[41] Research finds that grant aid positively impacts persistence and degree completion.[42] The value of monetary support is evident through the early results of Promise completion grants, which can be accessed by Tennessee Promise students who participate in the coaching program and experience financial need.[43] The completion grants pilot program serves to remove barriers to postsecondary success by assisting students with costs outside of tuition and fees.[44] There are five

categories of costs covered by the completion grants pilot: food, housing, transportation, books/supplies, and class-specific fees.[45]

In the Fall 2022 Promise cohort, 1,821 students received one or more completion grants from tnAchieves, with an average of $124 awarded per grant.[46] An analysis found that students who received the grant in addition to coaching were 34 percent more likely to remain enrolled following their first year than their peers not involved in the coaching program.[47] Black students who received a grant and coaching experienced an even larger impact, being 41 percent more likely than their peers to stay enrolled.[48] A relatively small per-student investment through these grants is yielding a meaningful impact. However, when the pilot program ends students will no longer benefit from these grants without sustained support.

COMPLETE GRANTS AND COACHING SHOW LARGE PAYOFF FOR STUDENTS



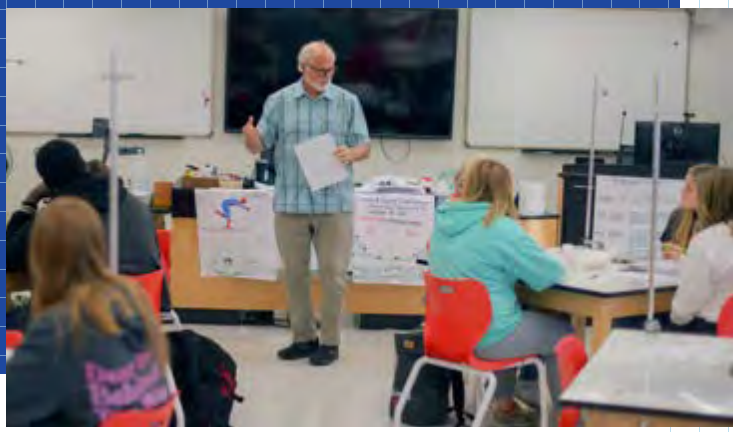
First-to-second year retention rates for Fall 2022 TN Promise eligible students at community colleges based on 14th day enrollment by COMPLETE grant and coaching status, by student group

Data Note: To receive a COMPLETE grant, students must be Pell-eligible; all comparison groups depicted represent Pell-eligible students.

Source: tnAchieves data request, 2023

National research also reveals that community college students often find the path to graduation unclear.[49] A lack of clear information about what courses and programs a student needs to reach their career goals creates barriers to earning a degree or credential valued by employers.[50] Meta-majors, or career clusters of related majors in a broad subject area, are one strategy to outline a clear path toward graduation and a career.[51] However, a 2023 report found that less than half of Tennessee's community colleges operate meta-majors at scale.[52] Students could more effectively navigate community college if all institutions outlined clear pathways aligned with student interests and aspirations.[53]

The state has the opportunity to further improve Tennessee Promise and the community college experience by prioritizing completion and grounding the work in a goal of ensuring every student earns a postsecondary degree or credential that prepares them for a successful career. As the landmark scholarship approaches its 10th year, Tennessee can be a national leader again by reexamining the program to identify ways to maximize its positive impact on the lives of Tennesseans.



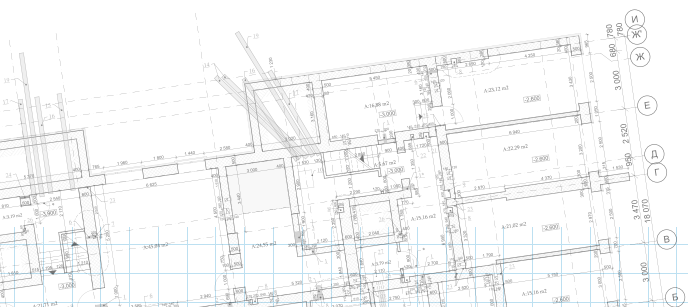
SCORE recommends enhancing the Tennessee Promise scholarship and the community college student experience.

- **Incentivize on-time completion and transfer for Tennessee Promise students.** The General Assembly should update statute to allow Promise students who earn an associate degree on time to continue receiving their last-dollar scholarship for their first semester pursuing a bachelor's degree or pursuing another stackable postsecondary opportunity at a community or technical college. As Promise students are eligible for the scholarship for five semesters, this shift would ensure all students can receive their fifth semester of the scholarship, incentivize on-time associate degree completion, and support transfer to four-year institutions for students hoping to earn a bachelor's degree.

- **Make Tennessee Promise completion grants permanent.** Completion grants are having a big impact on student outcomes. By making the pilot program permanent, policymakers can make these supports a completion-focused pillar of the Tennessee Promise program.

- **Scale meta-majors across the state's community colleges.** TBR should ensure every community college is operating meta-majors at scale. Upon selecting a meta-major, students should be arranged into cohorts that include a first-year schedule that fulfills all their core requirements. Each meta-major should also articulate its alignment to K-12 CTE career clusters and dual enrollment courses, as well as high-wage, in-demand degrees and credentials.

- **Publicly report data on the postsecondary programs of study Tennessee Promise students choose to pursue.** To better understand if students are pursuing paths aligned to high-wage, in-demand career paths, the Tennessee Promise annual report should include information on which postsecondary opportunities students are pursuing. THEC should also produce a Promise student dashboard alongside the report to make key student experience and outcome data more accessible to the public. These data can inform career-focused mentoring and coaching efforts, as well as continuous improvement to the program.



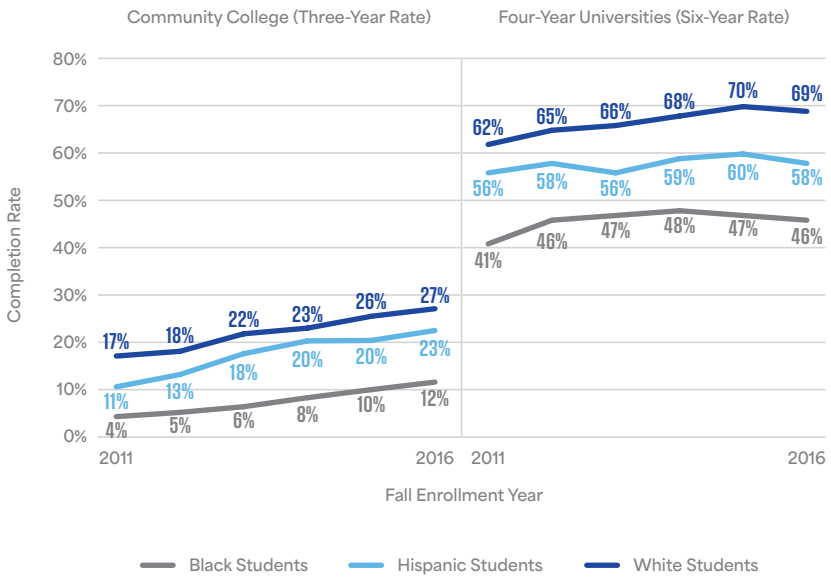
While the outcomes-based postsecondary funding formula is a nationally recognized state policy, it could go further to ensure student success.

Tennessee was the first state to systemically incentivize postsecondary outcomes through funding.[54] In 2010, Tennessee adopted an outcomes-based postsecondary funding formula to award the majority of state appropriations via outcomes – a model the state continues to use today.[55] With over 80 percent of state dollars awarded based on outcomes, Tennessee is one of only five states that awards more than 25 percent of appropriations for colleges and universities based on student outcomes.[56] The outcomes-based funding formula was and remains an important model that goes beyond postsecondary access to prioritize completion.

Though outcomes-based funding is an innovative completion-focused policy, the model has had a limited impact on student outcomes on the whole.[57] Tennessee-specific research found that the adoption of the formula did not significantly impact degree earning overall.[58] There was some increase in the production of shorter-term certificates at community colleges, and outcomes for full-time students at all postsecondary institutions were more promising than those for part-time students.[59] While the research suggests an ability for the state's outcomes-based funding formula to drive improved student outcomes, it has not accomplished those improvements across the board.

Tennessee's student outcomes clearly have room for improvement. Today, only one in every four first-time full-time freshmen graduate from community college in three years, and only three in every five graduate from a university in six years.[60] These outcomes also differ greatly across student racial and gender groups. For example, males enrolled in community college experience lower graduation rates than females across racial groups, with the lowest rates for Black males.[61]

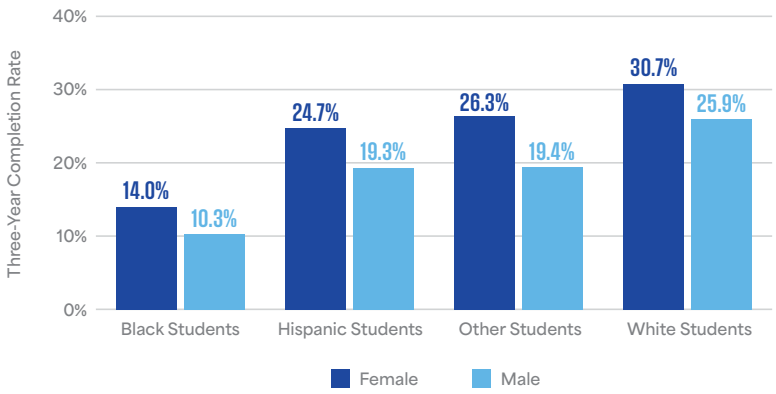
POSTSECONDARY GRADUATION RATES ACROSS SECTORS HAVE ROOM FOR IMPROVEMENT



150-percent time to completion rate for first-time, full-time freshman (FTFTF) at community colleges and four-year universities by student group, Fall enrollment 2011-2016

Source: THEC Fact Book, 2023. 150-percent completion rates for community colleges were retrieved through a data request to THEC.

BOTH GENDER AND RACIAL COMPLETION GAPS EXIST AT COMMUNITY COLLEGES, WITH ONLY ONE IN 10 BLACK MALE STUDENTS GRADUATING IN 2022



150-percent time to completion rates for community college students by race and gender, 2019 entering cohort

Data Note: The "Other Students" race category includes American Indian or Native Alaskan, Native Hawaiian or Pacific Islander, and Two or More Races

Source: TBR student graduation rates dashboard, 2023

Bold improvements to the outcomes-based funding formula could better align institutional incentives to student success. It is time for the state, THEC, and THEC's formula review committee to look under the hood to perform a more comprehensive evaluation of the formula's components.[62] For example, the dual enrollment metric remains focused on enrollment rather than outcomes; the credit accumulation metric represents progress toward but not earning of a degree or credential; there is no graduation rate metric for community colleges; and while universities have both a graduation rate and degrees per 100 full-time equivalent (FTE) metric, there is no recognition for on-time university completion. Further, the premium that awards more dollars based on the type of degree or credential earned only applies to high-need STEM fields, excluding in-demand fields such as management and architecture, which have some of the highest median entry-level wages in the state.[63] Finally, there is currently no explicit consideration for high-wage fields.

Tennessee must take steps to shift the formula metrics to reflect the outcomes of highest importance for the state and its students and to incentivize paths toward careers that enable economic independence.

OUTCOMES-BASED FUNDING FORMULA METRICS

Community Colleges	Universities
Students Accumulating 12 Hrs.	Students Accumulating 30 Hrs.
Students Accumulating 24 Hrs.	Students Accumulating 60 Hrs.
Students Accumulating 36 Hrs.	Students Accumulating 90 Hrs.
Associate Degrees	Bachelor's And Associate Degrees
Long-Term Certificates	Masters/Ed. Specialist Degrees
Short-Term Certificates	Doctoral/Law Degrees
Dual Enrollment	Research, Service, And Sponsored Programs
Job Placements	Six-Year Graduation Rate
Transfers Out With 12 Hrs.	Degrees Per 100 FTE
Workforce Training/Contact Hours	
Awards Per 100 FTE	

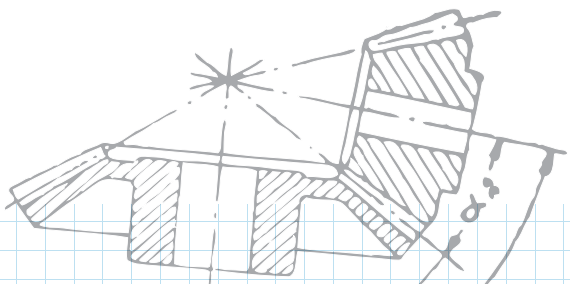
As the first state to adopt outcomes-based funding, Tennessee can set an example of stepping back to evaluate opportunities for significant improvement and boldly moving forward with new approaches. Success will require setting an updated vision for the formula that is in line with state priorities, holds institutions accountable for outcomes most beneficial for students, and prioritizes workforce alignment. The state should not pass up this opportunity to build on its prior work to craft a formula that reflects the importance of a future where all students earn a degree or credential that enables economic independence.

SCORE recommends revising the postsecondary outcomes-based funding formula to prioritize long-term student success.

» **Refine the focus of the formula metrics.** The outcomes in the funding formula should accurately reflect the most important state priorities for student success. As the state takes the first steps to revise the formula, the statutorily required outcomes-based funding review committee should consider which metrics could be removed or streamlined, such as metrics for credit accumulation and degrees per 100 FTE. If certain metrics are removed, it may create space for the addition of other metrics, such as three-year graduation rates for community colleges.

» **Ensure all formula metrics are based on student outcomes.** The dual enrollment metric is currently the only formula metric based solely on enrollment. The bar should be raised to only reward dual enrollment when students take at least 12 credits that apply toward program-of-study requirements, the equivalent to one full-time semester.

» **Ensure the outcomes-based funding premium structure is aligned to student opportunity.** To start, the outcomes-based funding formula review committee should discuss expanding the high-need premium beyond solely STEM fields and adding a high-wage premium. In the future, THEC should explore how to continue aligning the formula to career paths that enable economic independence for students.

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Building
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2024 Priority

BUILD EFFECTIVE PATHWAYS BETWEEN EDUCATION AND CAREERS

Education is the foundation for preparing students for careers. More than half of jobs in Tennessee require education beyond high school.[64] But with postsecondary attainment rates currently at 47.3 percent, the state is not fully meeting economic needs.[65] Further, the need for an educated and well-prepared workforce is only intensifying in Tennessee. Jobs that enable economic independence are increasingly shifting toward individuals with more education and skill, and rapid increases in job openings in the past three years have resulted in a severe shortage of qualified workers.[66]

For Tennesseans, a high school diploma alone will not secure a job that leads to long-term economic independence.[67] Students need some kind of education beyond high school, which can range from an industry credential to a degree. A 2023 study estimated that Tennessee students experienced a 14.5 percent return on investment for the time and money spent on earning a bachelor's degree and a 9.5 percent return for earning an associate degree.[68] Nondegree credentials, such as certificates and certifications, can also lead to higher rates of employment and higher median incomes for adults.[69] On a whole, postsecondary education leads to increased earnings and sets students up for a choice-filled life, but degrees and credentials must be connected to career paths with high-demand, high-wage jobs.

Education and work are becoming increasingly interconnected. However, the paths between educational opportunities and careers are murky, and not all opportunities offered across the state effectively help students progress toward economic independence.

The new future of student success hinges on improved alignment across education and careers. To improve alignment and build effective pathways between education and careers, Tennessee should:

1. **Give Tennesseans clear information on which degrees and credentials lead to careers.**
2. **Identify and incentivize quality early postsecondary and career experiences for students.**
3. **Develop strong partnerships across education and industry to increase alignment.**

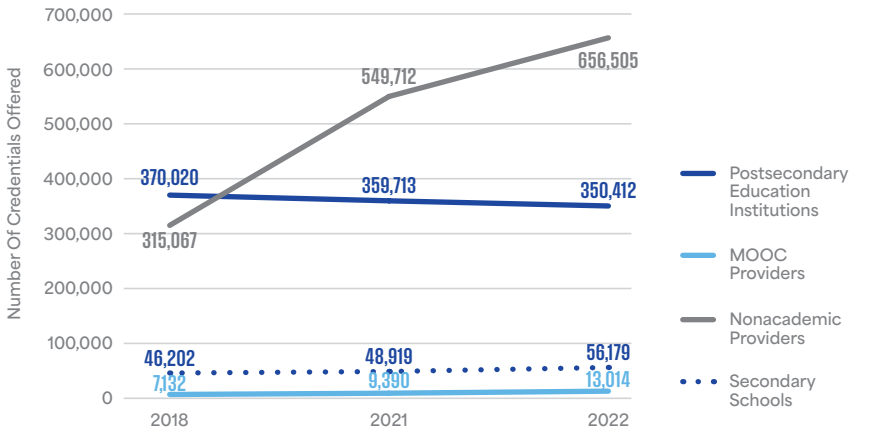
In a growing landscape of degree and credential opportunities, there is limited available information to understand which opportunities are of highest value.

The credential marketplace in the United States is growing. There are now more than one million unique degree and credential opportunities available for students, an increase of 46 percent since 2019.[70] These opportunities include degrees, licenses, badges, certificates, and microcredentials, among others, and can sometimes stack upon one another to help students progress through their careers.

The entities offering credential opportunities vary from traditional colleges and universities to nonacademic providers (including employers themselves) to

massive open online course (MOOC) providers, with data collection and reporting varying across these entities. Postsecondary institutions generally report more data on participation and outcomes than other providers. However, they still do not report comprehensive data on courses that do not count for college credit, even though estimates suggest that over 40 percent of community college students are enrolled in noncredit programs and many noncredit programs offer targeted training for employers.[71] Though Tennessee's Colleges of Applied Technology (TCATs) do report noncredit program data and community colleges report some noncredit workforce training information to the Tennessee Higher Education Commission (THEC), this reporting does not capture all programs and not all data are publicly available. With so many options and varying levels of data availability, it is not always clear to employers and students which opportunities lead to a career that enables economic independence.

STUDENTS NAVIGATE A COMPLEX MAZE OF DEGREES AND CREDENTIALS WITH CURRENTLY OVER ONE MILLION UNIQUE OPPORTUNITIES AVAILABLE



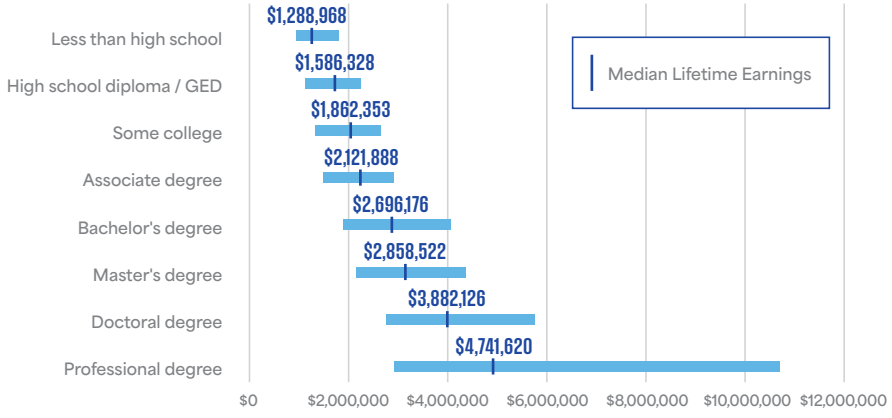
Number of degrees and credentials offered by providers, 2019-2022

Data Note: MOOC refers to massive open online courses. Secondary school counts include high school diplomas, alternative certificates from secondary schools, and high school equivalency credentials.

Source: Credential Engine, 2023

Availability of postsecondary opportunities is important, but not all opportunities yield meaningful economic returns. The lifetime earnings of individuals vary largely, and there is overlap in the salary ranges by level of education.[72] For instance, this overlap means some associate degree holders earn the same or less than some individuals with only a high school diploma. **To ensure students are investing their time and money effectively, they need information on which degrees and credentials lead to economic independence.**

DUE TO WIDE VARIATION IN EARNINGS BY EDUCATION LEVEL, IT IS CRITICAL FOR STUDENTS TO HAVE INFORMATION ON QUALITY DEGREES AND CREDENTIALS

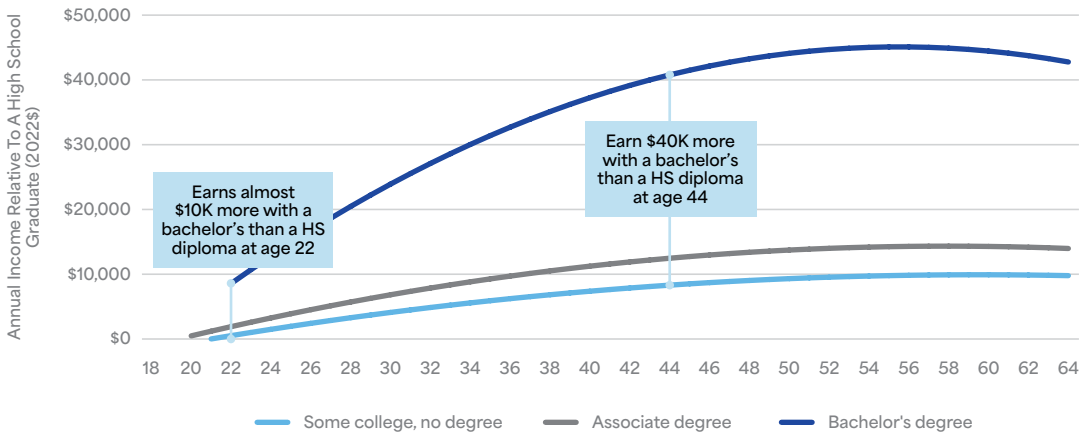


Lifetime earning ranges for Tennesseans by highest educational attainment

Source: Georgetown Center on Education and the Workforce, 2023

Further, evaluating the economic returns of a postsecondary degree or credential is not a simple task. Research shows that the return on investment of a postsecondary degree widens at midcareer. As such, evaluating earnings immediately after graduation may not be the best time to understand the full scope of postsecondary education's impact on an individual's economic standing. It is difficult to communicate to a prospective student that an opportunity is worth pursuing when the largest benefit is experienced 10, 20, or even 30 years in the future – especially when the data we have are limited to start with. Additionally, students do not always earn just one credential. Many students stack credentials, earning multiple throughout their lifetime to impact their earnings and career opportunities at multiple career stages.

COLLEGE-EDUCATED WORKERS IN TENNESSEE EARN MORE THAN HIGH SCHOOL-EDUCATED WORKERS, AND THAT GAP GROWS THROUGH MID-CAREER



Estimates of additional earnings with a college education in Tennessee, relative to high school-educated workers, by age (2022$)

Data Note: Author's calculations using 2011-2021 American Community Survey (ACS) samples, limited to 18-to-64 year-old high school graduates in the labor force, not attending school, and excluding workers with graduate degrees. Tennessee statistics additionally exclude individuals who have lived in the state less than one year.

Source: Carruthers, Celeste K. *The Value of a College Education in Tennessee*, 2023

Understanding these paths between postsecondary education and careers is particularly important for the state's low-income students, as education beyond high school is a potential catalyst for economic mobility. Currently, Tennessee children are less likely to out-earn their parents in adulthood when compared to similar children across the nation.[73] Even more concerning, when looking at Black and White students in similar neighborhoods, White students experience higher rates of economic mobility than Black students.[74] These trends need to change, and postsecondary education could be the tool to improve economic mobility for the state's low-income students and students of color if there is understanding about which opportunities are of highest value. **Much is at stake for students from historically underserved groups as they choose which opportunities to pursue.**

We know postsecondary education matters but do not always know which opportunities lead to a thriving future. Students deserve access to information that allows them to trust the programs they pursue will translate to quality career opportunities. Counselors and advisors play an important role in supporting students, but they also need data to guide students toward fruitful paths. The new vision for Tennessee students should not be earning degrees or credentials for the sake of it but earning those that allow for a choice-filled life. To accomplish this vision, Tennessee must collect data on educational offerings and workforce needs and determine which degrees and credentials lead to economic independence.

SCORE recommends giving Tennesseans clear information on which degrees and credentials lead to careers.

- **Create a statewide definition for quality postsecondary degrees and credentials.** State agencies, in partnership with employers and nongovernmental education partners, should create a framework to define the elements of quality degrees and credentials. A definition for quality degrees and credentials should include indicators such as alignment to careers that are high-wage, in-demand, and/or offer societal value. Once the definition is identified, the state should align policy and programs to the definition of quality and share information about where those credentials are offered across the state.

- **Collect and report noncredit program data.** The state should require and appropriate funding for the Tennessee Board of Regents (TBR) to collect data on noncredit programs and capture a complete picture of educational offerings and their alignment with the labor market. Additionally, TBR should launch an alignment taskforce to improve alignment across noncredit and credit programs, creating more pathways for students to continue education.

- **Conduct an analysis of future skills needed for success in the workforce.** The Tennessee Department of Labor and Workforce Development (TDLWD) should work with employers to determine the durable and technical skills that are most essential to create economic opportunity for Tennesseans. These identified skills should inform the intentional design and revision of postsecondary opportunities to prepare students for the state's future of work.

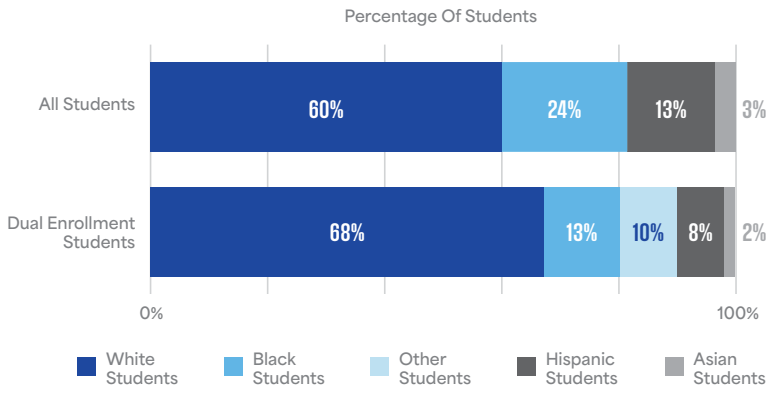
Early postsecondary and career experiences can be valuable opportunities for students, but quality is often unknown, and access is not equitable.

Early postsecondary and career experiences can kickstart a student's trajectory toward postsecondary education and a career. Unfortunately, limited data make it difficult to get a good picture of the quality of Tennessee's early postsecondary and career opportunities and the outcomes for students who participate.

Tennessee offers various early postsecondary opportunities (EPSOs) that allow students to earn college credits and valuable workforce training while still in high school. EPSOs include dual enrollment (DE), Advanced Placement (AP), dual credit, International Baccalaureate (IB), College Level Examination Program (CLEP), Cambridge International Examinations, and industry certifications.[75] Starting in the 2018-19 school year, the General Assembly required each school district to give its students the opportunity to participate in at least four EPSOs.[76] Currently, Tennessee students participate in DE and AP at the highest rates, and earning postsecondary credit through an EPSO is one factor of whether or not the state considers a student college and career ready.[77]

Available data show that student groups participate in EPSOs at different rates. For almost all EPSOs, publicly available information on participation rates by race and socioeconomic group does not exist. Dual enrollment is the exception, with detailed information on DE at community colleges uniquely available through TBR dashboards. These data show that both Black and Hispanic students are underrepresented in dual enrollment compared to overall K-12 demographics.[78]

STUDENTS OF COLOR ARE UNDERREPRESENTED IN DUAL ENROLLMENT COMPARED TO THE OVERALL K-12 POPULATION



Dual enrollment student demographics across community and technical colleges compared to K-12 overall demographics

Data Note: The "Other Students" race category includes American Indian or Native Alaskan, Native Hawaiian or Pacific Islander, and Two or More Races

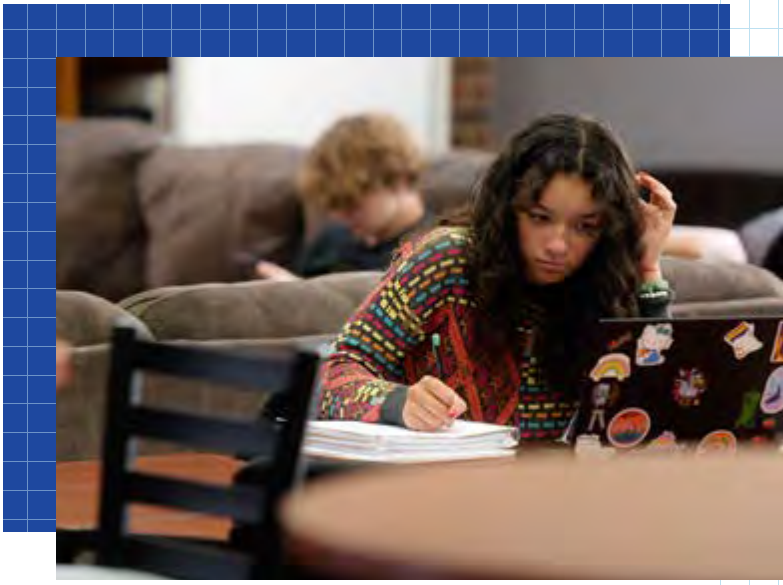
Data Note: Undocumented students do not have access to the Dual Enrollment Grant, which has implications for dual enrollment access

Source: TDOE enrollment data downloads and TBR dual enrollment dashboard, 2023

EPSOs offer benefits to students, though not all are equally valuable or used to their full potential. National research finds that dual enrollment and early college models are associated with improved high school graduation, college enrollment, credit accumulation, and degree attainment outcomes.[79] But despite Tennessee's Dual Enrollment Grant fully covering up to five courses and the state spending on that grant totaling more than $48 million (higher than spending on Tennessee Promise and Tennessee Reconnect combined), more than half of community college DE students earn six credits or less – the equivalent of only two courses.[80] Beyond dual enrollment, Tennessee's dual credit exam pass rates are only 6 percent, meaning that fewer than one in 10 students participating in that EPSO receive college credit.[81] Further, research shows, for example, that the state's math dual credit course has no significant impact on postsecondary enrollment rates.[82] **The state and districts need data on the efficacy of EPSOs and their alignment to the labor market in order to evaluate the impact of investments, understand which are positively serving students, and prioritize the ones that are working well.**

Tennessee is also committed to providing students with early career opportunities like career and technical education (CTE), work-based learning (WBL), and industry credentials.[83] Currently, 55 percent of Tennessee students concentrate in CTE (students taking two or more CTE courses in a program of study) and 40,000 are enrolled in an approved WBL course.[84] These experiences can contribute to improved student outcomes, with research showing that CTE concentrators are more likely to pursue postsecondary education and experience larger future earnings when compared to non-CTE concentrators.[85]

Still, the vast majority of data around early career experiences, particularly for WBL and industry credentials, are not publicly available. While the state does have a list of promoted industry credentials aligned with employer need, there is no information on which students are earning those credentials and if they experience any economic return.[86] This lack of information is particularly concerning as national research finds that only some industry-recognized credentials have a positive impact on postsecondary success.[87] For WBL, the public has no consistent insight into the state's offerings and whether they offer value for students. Today, there are few mechanisms to ensure that a student's early career experiences are preparing them for a career enabling economic independence in the future.



The next phase of policy improvements must go beyond simply offering opportunities and instead focus on quality. Early postsecondary and career experiences should not be offered to check a box. Each experience should be high-quality, positively impacting a students' ability to earn a degree or credential that prepares them for a career. Tennessee needs robust data to evaluate the quality of these experiences so the state can target investments to what is working and focus efforts on increasing equitable access to opportunities that are most beneficial for students.

SCORE recommends identifying and incentivizing quality early postsecondary and career experiences for students.

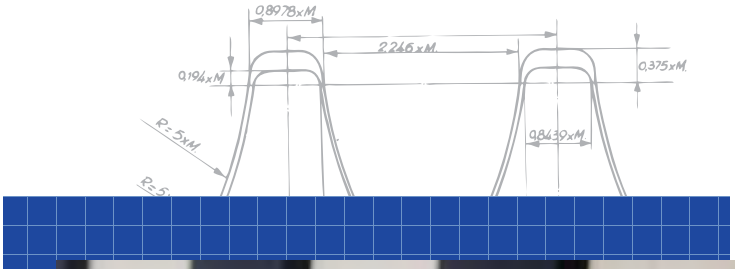
- **Identify and invest in quality EPSOs.** The Tennessee Department of Education (TDOE) should audit all EPSOs, publicly release the associated data, and create a promoted list based on which experiences result in improved college and career outcomes for students and are aligned to postsecondary program requirements. Districts should prioritize courses on that list for investments and student access, focusing on equitable access and preparation across racial and socioeconomic student groups and phasing out those not working for students.

- **Implement a rubric for evaluating quality of WBL opportunities.** TDOE, in partnership with TDLWD, should develop an evaluation rubric that identifies the detailed characteristics of high-quality WBL programs. The rubric should be completed for any WBL offering across the state, and these data should be reported publicly.

- **Support access to National Student Clearinghouse (NSC) data.** The state should dedicate funds to a statewide NSC data contract that covers districts, postsecondary institutions, and their partner organizations. Stakeholders should leverage this data access to identify areas where they need to improve equitable access, expand supports for programs that are serving students well, and sunset programs that do not align well with postsecondary opportunities. Further, TBR should start submitting TCAT data to NSC to make it a more comprehensive accounting of Tennessee's postsecondary options.

Partnerships between education and industry are a promising, though often underutilized, model to create clear pathways toward careers.

Clear and effective pathways between education and careers are characterized by strong partnerships. Partnerships facilitate employer involvement with education to ensure educational offerings prepare students with the durable and technical skills needed to fill the jobs of today and tomorrow. Simultaneously, partnerships give students a more direct path toward career opportunities.



RHODE ISLAND NURSES INSTITUTE: AN INNOVATIVE CAREER-CONNECTED SCHOOL MODEL

The Rhode Island Nurses Institute (RINI) Middle College Charter High School in Providence, Rhode Island, trains its students to become nurses through rigorous curriculum and internships at local medical institutions. RINI was founded in 2011 as the first charter school in the country dedicated to the healthcare profession in response to a critical nursing shortage, especially for nurses of color. The model stands out for supporting its students to graduate with up to 20 college credits toward healthcare majors as well as a Certified Nursing Assistant (CNA) license.

RINI infuses college preparation and health knowledge across both nursing and general education courses. All RINI students take college-level courses through institutional partnerships with the University of Rhode Island, the Community College of Rhode Island, and Nurses Middle College. Earning college credits while at RINI lessens the financial burden of a college degree and creates multiple pathways for students to choose from as they advance in the healthcare profession. To ensure learning is aligned to the skills currently needed in the healthcare profession, skilled nurses act as content experts that guide all teachers to integrate healthcare knowledge into all core content classes. Nurses from the industry also take on leadership and teaching roles within the school.

RINI serves students from across the state of Rhode Island, with 94 percent of RINI students qualifying for free or reduced-price lunch and over 80 percent identifying as students of color. Additionally, many RINI students enter ninth grade below grade level. RINI's positive impact on students is clear: 75 percent of graduates enrolled in college immediately after high school graduation and 76 percent of those enrollees returned for a second year. Additionally, every student who graduated in the Class of 2022 from RINI earned an industry credential and participated in work-based learning or an internship. Given this considerable success, RINI is planning to expand the model to other states, including Tennessee.

As Tennessee continues to invest in innovative school models, Rhode Island Nurses Institute Middle College is a clear example of how we can reimagine traditional education models to ensure more students are prepared for careers through rigorous coursework, workforce-aligned early college and career experiences, and student-focused partnerships with postsecondary institutions and industry.

For partnerships to be most impactful, they must start with data. Employers must quantify their talent needs and analyze data to uncover their employment barriers. Educational institutions must have a clear understanding not only of students and their career aspirations but also of program design requirements and staffing capacity. The information should not be considered in silos, and both parties must be engaged throughout the process.

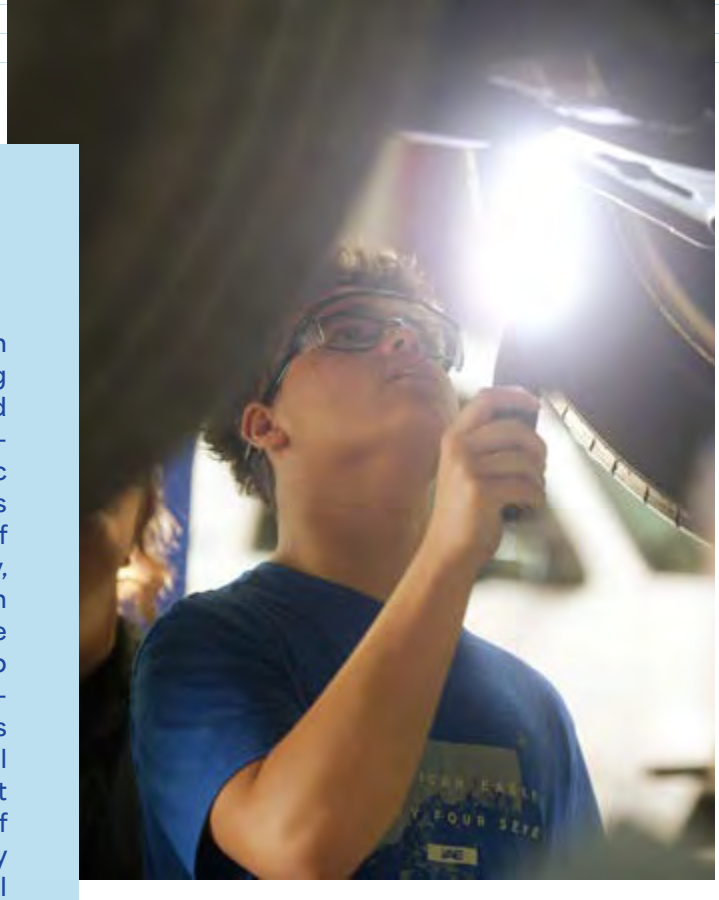
When used together, shared information across education and employers allows partnerships to maximize their impact for students. As an example, a partnership between BlueCross BlueShield of Tennessee (BCBST), East Tennessee State University (ETSU), and Hamilton County Schools emerged when BCBST identified that only about 1,000 qualified Tennessee graduates were available for 4,100 of the company's IT job openings, and Hamilton County Schools identified a diverse cohort of interested students. The resulting BlueSky Institute offers an accelerated bachelor's degree program in computing and guarantees students a job upon successful completion of the program.[88] Ultimately, data can be leveraged to inform a variety of partnership opportunities that meet urgent employer needs, ranging from postsecondary degrees to internships and apprenticeships.

HTL UNIVERSITY: A WORKFORCE-ALIGNED PARTNERSHIP

Ford Motor Company's $5.6 billion investment in BlueOval City, a sustainable vehicle manufacturing megacampus located in West Tennessee, presented local education leaders with a once-in-a-generation opportunity to transform the region's economic future. To prepare for the 3,600-acre megacampus (set to open in 2025), superintendents Amie Marsh of Haywood County, Dr. John Combs of Tipton County, and Shawn Kimble of Lauderdale County engaged in a collaborative strategic planning process to create HTL University. The districts sought to better equip students with the foundational and specialized science, technology, engineering, and math (STEM) skills needed to thrive in technical fields like those that will be in demand at BlueOval City. By forming a tridistrict collaborative, HTL University harnesses economies of scale to share expertise and maximize the efficiency of workforce-aligned investments in the educational community of the region.

To prepare for the projected 5,800 jobs that BlueOval City will bring to the region, HTL University takes a multipronged approach. For students, it expands in-demand pathways such as engineering and mechatronics, designs career exposure opportunities like preapprenticeships and work-based learning, and creates skills-based STEM learning experiences. To strengthen STEM teaching capacity, HTL University hopes to support robust educator training and invest in STEM teacher fellowships and stipends. HTL University also plans to embed family and student advising into its programming to improve access to postsecondary and industry opportunities at all levels. Lastly, industry partners will have a seat at the table through an advisory committee, keeping business voices central to key decision-making.

HTL University is unique in that it is a rural district collaborative designed to proactively respond to a large-scale regional industry investment. This innovative partnership repositions the employer as a catalyst for change in the education system to prepare students for future labor market needs. By investing in the students, teachers, and families of West Tennessee, HTL University is preparing its community to meet the needs of BlueOval City. HTL University creates a roadmap for future rural district collaboratives that hope to proactively take advantage of industry investment to create effective pathways toward careers for Tennessee students.



Apprenticeships are an education-employer partnership model that provide students with credentials aligned to workforce need. These are paid work-based learning programs that prepare apprentices with skills that lead to full-time employment, closing the work experience gap students often face.[89] There are also preapprenticeships, which integrate academic and technical training for students as early as high school.[90] Through these valuable opportunities, students are exposed to the world of work with a direct path to a career. Research shows that employers retain 94 percent of apprentices and receive an estimated return of $1.46 for every $1 invested in apprenticeships.[91] Apprenticeships are so impactful, in part, because they are characterized by extensive employer involvement, from start to finish, that ensures the experience is highly relevant and valuable.

Despite these benefits, apprenticeship programs are not common in the United States, although they are starting to grow in popularity.[92] There are 7,231 active apprentices in Tennessee – up 6 percent from the previous year and 65 percent from 10 years ago.[93] Integrating the apprenticeship model in Tennessee's education system creates opportunities for students to gain durable, portable skills that set them up for long-term career success and to earn a valuable degree or credential through paid training.

Partnerships are also a tool to offer students early career exposure. In a 2023 Gallup and Walton Family Foundation survey of students in grades 5-12, students gave their schools a C+ for teaching them about potential careers, suggesting low levels of career connectiveness in K-12.[94] Bringing experienced industry leaders into the classroom is one way to prioritize career connectiveness. However, challenges with recruitment and retention can pose barriers to bringing professionals into the classroom.[95] Schools can also commit to exploring partnership opportunities through CTE programs, preapprenticeships, and employer visits. Partnerships that start early on and prioritize employer engagement can provide valuable early workforce exposure for students, helping them recognize their passions and preparing them for a long-term career and choice-filled life.

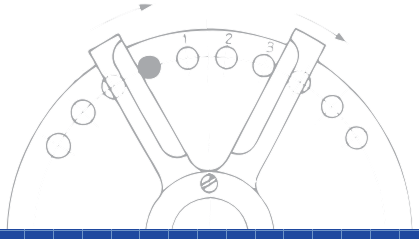
Partnerships between industry and education benefit both students and employers and should, therefore, be a pillar of education and work systems. **Bringing together systems of education and work must be of central importance as the state responds to evolving workforce needs.** By prioritizing data-driven partnerships between employers and education providers, Tennessee can create a vision of student success that spans education and industry to move the needle for employers and students alike.

SCORE recommends developing strong partnerships across education and industry to increase alignment.

- **Incubate data-driven partnerships.** Employers and educational institutions across the state should commit to using data to drive partnerships. Further, data should be leveraged to monitor progress toward goals and evaluate partnerships. To support one form of data-driven partnership, the state should launch a state-funded grant for institutions to engage employers and redesign postsecondary academic programs to better align with labor market need.

- **Incentivize apprenticeship programs that lead to degrees or credentials.** TDLWD should launch a state-funded grant for businesses to partner with colleges, universities, and other intermediaries to develop data-driven apprenticeship programs that offer students a job-embedded pathway toward a postsecondary degree or credential.

- **Identify opportunities for career partnerships in K-12 to increase early career exposure.** TDOE should support avenues for industry professionals to deliver instructional content, either through partnership with a licensed teacher or other flexible staffing approaches. For example, updating state law to allow maximum class size waivers for classrooms where industry experts are coteaching could encourage the use of career-focused innovative staffing models. Further, TDOE should identify additional opportunities for early career experiences such as preapprenticeships.




Building
A BRIGHTER FUTURE

2024 Priority
ENSURE K-12 SUPPORTS MEET STUDENT NEEDS

K-12 schools and school districts experienced several major changes over the last three years. The COVID-19 pandemic created an unexpected need for remote instruction, exacerbated existing challenges of recruiting licensed educators, and disrupted student learning at all levels. The landmark Tennessee Literacy Success Act changed the way educator preparation providers (EPPs) and educators teach literacy by centering instruction around foundational literacy skills and standards. Schools launched nationally leading high-dosage tutoring (HDT) and summer learning programs to accelerate student learning. And the state comprehensively modernized the way Tennessee school districts are funded by passing the Tennessee Investment in Student Achievement (TISA) Act, which ensures that state dollars are allocated according to student need. K-12 leaders are still navigating the implications of the pandemic and the implementation of these new important initiatives.

As the state adjusts to these shifts, it is important to maintain momentum on the path to improved student outcomes. Moving forward requires identifying the most impactful ways to prioritize student learning in the context of recent changes and supporting the most effective approaches. Educators, instruction, and learning environments are three levers the state can explore to support all students to achieve and mark the next frontier for its education system.

To ensure K-12 supports are meeting student needs, Tennessee should:

1. **Support teachers at each stage of their career to further student access to excellent educators.**
2. **Adopt a plan for instructional coherence to maximize learning for the state's lowest-performing students.**
3. **Solve Tennessee's charter school facilities challenge.**

With teachers as the leading contributor to student success, inequitable access to highly effective teachers is of greatest concern.

Teachers are the most important in-school factor impacting student achievement.[96] However, many school districts and charter management organizations struggle to find qualified teachers. In Fall 2022, there were over 1,000 vacant positions across the state (defined as unfilled teaching positions that result in the lack of course availability), with vacancies concentrated in middle grades, English as a Second Language (ESL), world language, and special education.[97] Importantly, shortages in Tennessee are highly localized and dependent on factors such as subject area, distance from EPPs, size of district salary increases, and working conditions.[98] Relatedly, there is an inequitable distribution of effective teachers across the state; **research shows that Tennessee's low-income students and students of**

color were between 5 and 15 percentage points less likely to be exposed to highly effective teachers.[99]

There are many strategies in place in Tennessee to address these teacher pipeline challenges; these include the statewide Grow Your Own teacher apprenticeship program, local residency models, and teaching as a profession programs of study for high school students.[100] But it is difficult to gauge the impact of these strategies as they are in the early stages of implementation, operate on a small scale, and/or have minimal reporting to monitor progress. We do know that overall, the total number of teacher vacancies across the state changed very little over the last two reporting periods.[101] In the coming years, continuously innovating and improving pipeline strategies and expanding their reach to the regions and subject areas most impacted by vacancies is imperative to maximize their impact.

INNOVATING TO SUPPORT TALENT PIPELINES: NASHVILLE CLASSICAL CHARTER SCHOOL

Nashville Classical Charter School (NCCS) is one of the top-performing elementary and middle schools in the state, serving a racially, economically, and geographically diverse group of students in grades K-8. NCCS is in the process of opening two new schools by 2030, while already facing staffing challenges exacerbated by the COVID-19 pandemic. To help meet its staffing demands, NCCS created the Lead Mentor Teacher program in 2022.

The NCCS Lead Mentor Teacher program intends to strengthen the school's existing resident teacher program and support highly effective teachers to stay in the classroom long term or to assume school-level leadership positions in the future. Lead mentor teachers (LMTs) receive a $10,000 annual stipend and participate in biweekly cohort meetings and school culture walkthroughs. Teacher residents receive weekly professional development and mentorship from LMTs and are given the opportunity to teach full-length classes once a week to advance their skills.

Together, the programs advance several key priorities:

- **Increasing student achievement** by bolstering staff capacity to provide students with support
- **Accelerating leadership development** by offering LMTs robust professional development and on-the-job training opportunities to equip them for future leadership roles
- **Improving teacher retention of new and veteran educators** by providing mentoring for new teachers and increased compensation, flexibility, and sense of purpose for LMTs
- **Building and sustaining a diverse school community** by creating new teaching and leadership pathways with a goal of ensuring the school's staff match the diversity of the student body

These programs have potential to prepare new teachers to be highly effective, retain highly effective veteran teachers who want to stay in the classroom long term, and develop a pipeline of future leaders. Looking forward, NCCS will focus on refining professional development, adjusting supports for teacher residents, and identifying sustainable funding in order to improve and scale the LMT and resident teacher programs and maximize their positive impact on educators and students.

In addition to Grow Your Own and teacher residencies, school districts are increasingly using permits to address pipeline challenges. Permits are emergency credentials used when districts cannot find a licensed educator to fill a position. Recent policy changes have allowed districts more flexibility in the awarding of permits.[102] These flexibilities have contributed to the number of initial permits issued more than tripling between the 2020-21 and 2021-22 school years.[103]

While permit holders have expressed an interest in teaching, barriers to them obtaining full licensure remain. Less than half of permits awarded during the 2018-19 school year were converted to licensure within the three-year time frame that permits are active, and less than one-fifth of permits issued in the 2021-22 school year were converted to full licensure after one year.[104] While many factors may contribute to this low conversion rate, financial considerations may be one of them. A study of Tennessee EPPs found that financial burdens of education costs are the primary concern for current and prospective educators – a concern which could reasonably apply for permit holders as well, alongside other factors.[105] Supporting permit holders to complete their licensure affords those staffing hard-to-fill positions the foundational training to be a highly effective teacher and is a strategy to retain interested talent in the educator workforce.

TENNESSEE MUST ENSURE TEACHING PERMITS ARE CONVERTING TO LICENSED EDUCATORS

	2018-19	2019-20*	2020-21*	2021-22*
Initial Permits Issued	447	528	462	1465
Permits Converted To Licensure (to date)	190	193	156	290
Conversation Rate (to date)	43%	37%	34%	20%

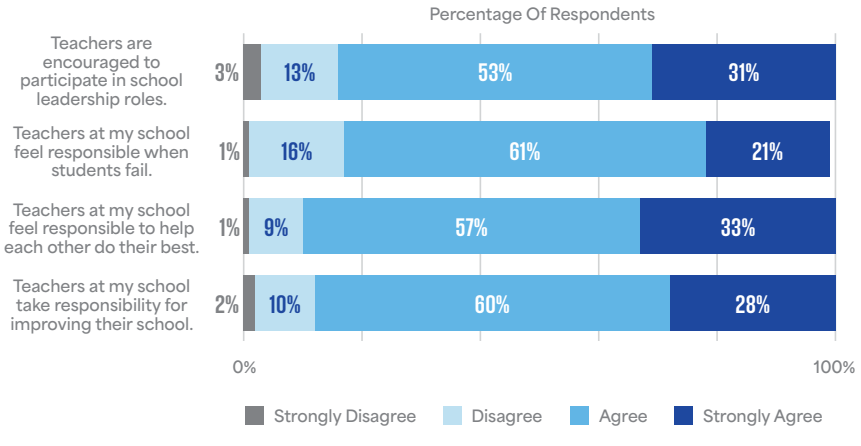
Source: TDOE teacher vacancy data presentation for SBE, 2023

Number of permits issued and converted over time (to date)

Data Note: Permit holders have three years to convert their permit to a teaching license. 2019-20 permits expired in 2022-23, 2020-21 permits expire in 2023-24, and 2021-22 permits expire in 2024-25. Permit holders have until permit expiration to convert to licensure, and therefore the conversion rate in this table (shaded cells) will require continued updates.

There is also a need to better support and leverage experienced educators. In Tennessee, teachers are viewed by their peers as leaders in the classroom and school. For instance, 90 percent of respondents to the state's 2023 educator survey believe that teachers feel responsible for helping each other do their best, and 88 percent agree that teachers take responsibility for improving their school.[106] However, these leadership roles are often not formalized or rewarded. Modifying the structure of teaching roles with a strategy known as advanced teaching roles introduces formalized leadership functions to maximize the impact of the most effective teachers while creating a system of support for other teachers.[107] An example of advanced teacher roles is the multiclassroom leader (MCL), a highly effective teacher who receives additional compensation for maintaining their own class roster while assuming mentorship and coaching responsibilities for a team of two to six teachers.[108] Research shows that in schools implementing MCLs, student achievement improves and the involved teachers become more effective.[109]

TEACHERS TRUST ONE ANOTHER AS LEADERS



Tennessee educator survey results. Full question: "Please indicate the extent to which you agree or disagree with the following statements."

Source: Tennessee Educator Survey, 2022

Data access is essential to successfully implement strategies to increase student access to highly effective educators. State and district leaders do not currently have the necessary human capital insights to make decisions related to educator effectiveness, preparation, recruitment, retention, and development – decisions that are even more important to tackle strategically in order to maximize the impact of the new TISA funding formula.[110] For example, information on aggregate educator level of effectiveness is not publicly available, making it difficult for state leaders to know which communities struggle with access to highly effective teachers and to evaluate how recent pipeline strategies impact student access to excellent educators. Additionally, district leaders could benefit from reports that identify and compare state and district trends in educator retention by race, level of effectiveness, and experience level. These actionable insights would help districts develop targeted retention strategies, use investments strategically, and monitor progress to solve educator workforce challenges. It is imperative that stakeholders have data to improve their understanding of the educator workforce and make data-driven decisions about future changes to educator policy.

Building a brighter future for Tennessee students starts with support for an expanded educator pipeline and better supported educators. As the state ensures the necessary educator supports exist, better data will allow for the evaluation of new strategies to bolster the teacher pipeline as well as the implementation of innovative strategies to further student access to highly effective educators.

SCORE recommends supporting teachers at each stage of their career to further student access to excellent educators.

» **Innovate to bolster the teacher pipeline.** The Tennessee Department of Education (TDOE) should evaluate teacher pipeline initiatives, such as Grow Your Own, to understand their reach and efficacy, using those data to both continuously improve

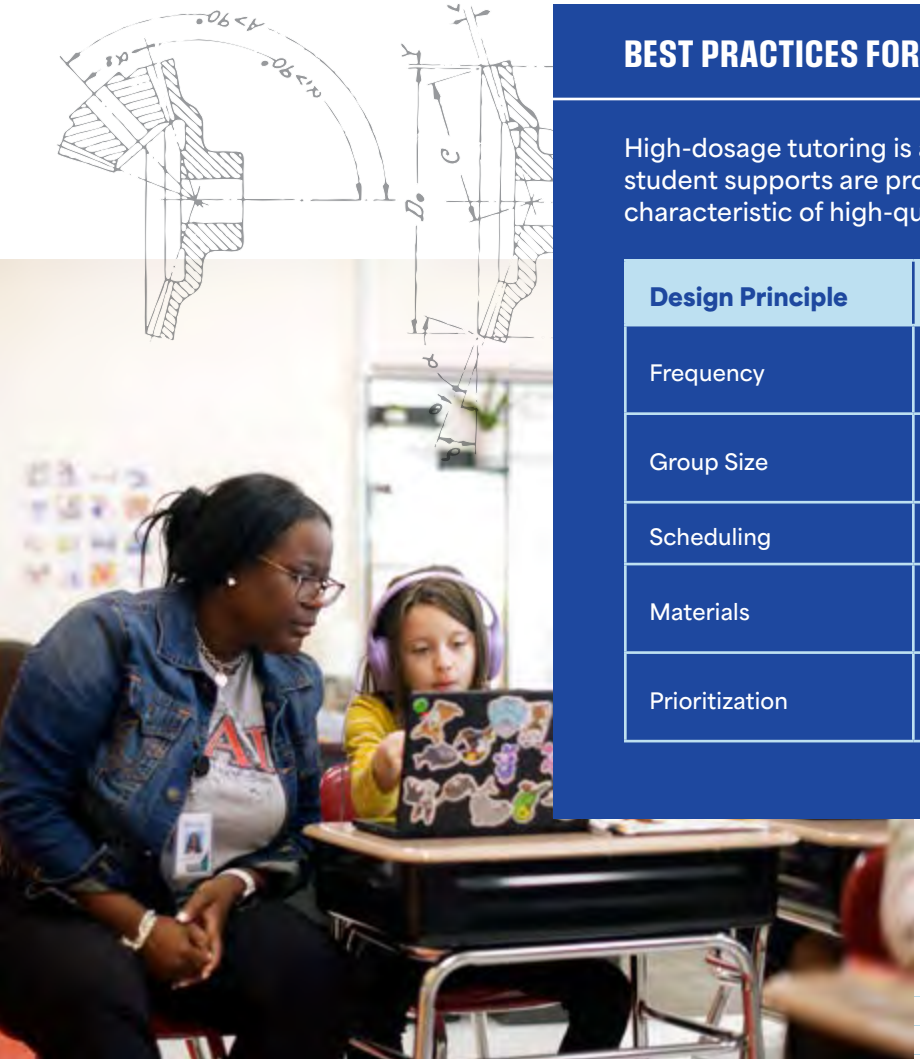
programs and to replicate what works in communities with the greatest need. Further, staffing models that leverage advanced teacher roles – such as the multiclassroom leader – should be piloted so that teachers have compensated opportunities for career advancement in the classroom and more students have access to highly effective teachers. Findings of the pilot should be publicly reported in an effort to scale effective practices.

» **Remove barriers to licensure for permit holders.** The state should invest in a grant fund for permit-holding teachers to offset the cost of completing EPP coursework toward licensure.

» **Commit to data collection and public reporting.** TDOE should publish updated educator labor market reports that include disaggregated teacher effectiveness data. The data should be used to identify areas experiencing the largest shortages, inform implementation of long-term strategies to address pipeline challenges, and make strategic decisions to increase student access to highly effective teachers.

Tennessee has shown a consistent commitment to improving K-12 instruction, but not all recent efforts seamlessly integrate into existing practice.

In 2021, the state passed and invested in two landmark policies impacting K-12 instruction. First, the Tennessee Literacy Success Act required systematic foundational literacy skills instruction in the classroom and mandated adoption and purchase of high-quality instructional materials (HQIM) in English language arts (ELA).[111] Second, the Tennessee Learning Loss Remediation and Student Acceleration Act launched the TN ALL Corps to deliver HDT, created summer learning camps to accelerate student learning, and required tutoring and/or summer learning camps for third graders not yet proficient in ELA before they could move on to fourth grade.[112] These steps reflect the state's strong commitment to improving early literacy instruction, though there was not a comprehensive discussion about how these efforts functioned alongside existing practices.



BEST PRACTICES FOR HIGH-DOSAGE TUTORING

High-dosage tutoring is an instructional structure through which student supports are provided. The following design principles are characteristic of high-quality high-dosage tutoring programs.[113]

Design Principle	Best Practice
Frequency	Three or more sessions per week, with each lasting 30-60 minutes
Group Size	Tutor ratios of 1:3 in grades K-5 and of 1:4 in grades 6-12
Scheduling	Sessions integrated into the school day
Materials	Use of high-quality instructional materials (HQIM) aligned to classroom content
Prioritization	Targeting lower-performing students who can benefit from additional instruction

The recent policy introductions and investments are not the state's first time focusing on improving instruction. In 2014, the state introduced the Response to Instruction and Intervention (RTI²) Framework to support students performing below grade level in ELA and math.[114] RTI² was intended to identify individual student needs as early as possible and provide tiered intervention before evaluation for special education services, working to meet the instructional needs of students who needed additional supports but not necessarily special education. Additionally, a goal of RTI² was to prevent overidentification of learning disabilities. With RTI², schools are required to schedule and staff two tiers of small-group intervention based on student need (Tier 2 and Tier 3) for between 30 and 60 minutes each day. Tier 2 and Tier 3 supports are offered for students working below grade level outside of the Tier 1 core instructional time, and districts are encouraged to use different materials than those used in the classroom. Tier 3 supports are reserved for students who are furthest behind.[115] The RTI² system was further improved in 2016 when a revised framework reemphasized the importance of Tier 1 core instruction for all students in addition to the Tier 2 and 3 interventions, but recommendations around use of different materials and assessments during intervention blocks remained intact.

EARLY LITERACY CONTEXT IN TENNESSEE

Over the last decade, Tennessee has worked hard to improve early literacy instruction.

2014

Revised ELA standards and adopted the RTI² Framework

TN decided what it would teach across grade levels and how it would remediate students who were behind through tiered support.

2016

Revised the RTI² Framework to emphasize a focus on core instruction

TN created a clear focus on strong core instruction for all students alongside tiered support that was different from core instruction.

2021

Passed the Tennessee Literacy Success Act and the Tennessee Learning Loss Remediation & Student Acceleration Act

TN required adoption of HQIM for core literacy instruction, instruction grounded in foundational skills, and provided funding for HDT as another setting for student academic support.

Source: SCORE Early Literacy Success For All Students, 2023

While RTI², the Tennessee Literacy Success Act, and the Tennessee Learning Loss Remediation and Student Acceleration Act were all critical steps toward improving student learning, they do not yet seamlessly fit together. For instance, the lowest-performing students on the state's third-grade ELA assessment are statutorily required to receive HDT to be promoted to fourth grade. In the RTI² framework, those same students would likely be identified for Tier 3 instruction. Schools are left with the difficult question of how to fit both HDT and Tier 3 into a student's day. This confusion may result in students receiving tutoring misaligned to research-backed best practices in order to overcome logistical hurdles. For example, schools may provide tutoring outside of the school day, in less intensive environments (e.g. not in small groups), or at a lower frequency. When districts must dedicate limited resources to navigating logistics and compliance, it threatens the quality of student supports and takes the focus away from student needs.

To better understand the complex intersection of instructional supports, SCORE conducted a case study with four districts to monitor student growth when participating in different support structures according to the districts' reading screeners. The case study found that students who started the furthest behind grew the most in an HDT structure that leveraged HQIM aligned with the content of core instruction. Moreover, placement in RTI^2 Tier 3 instruction, where high-quality instructional materials from the classroom were not utilized, resulted in a decline in performance for most students. Placing students in two different settings with different materials – when they were already struggling – was not an effective literacy support strategy. Ultimately, the instructionally coherent HDT structure (with aligned HQIM) was more effective at improving ELA performance for students who started out further behind when compared to placing them in Tier 2 and Tier 3 structures. The case study results align with numerous studies that show HDT meaningfully increases student achievement.[116]

HIGH-DOSAGE TUTORING EFFECTIVELY DRIVES GROWTH FOR STUDENTS THE FURTHEST BEHIND

Students Without IEPs: Average Composite Score Percentile Growth From Beginning To End Of Year

Beginning-Of-Year Percentile Performance Range	Core Literacy Instruction Only	HDT + Core Instruction	RTI^2 Tier 2 + Core Instruction	RTI^2 Tier 3 + Core Instruction
1st-10th Percentile	8.6	19.3*	11.0	5.7
11th-25th Percentile	11.5	11.7	7.8*	-1.2*
26th-40th Percentile	6.5	5.7	1.6*	-1.6*
41st-99th Percentile	-0.5	-1.6	0.8*	-5.9*

Average percentile growth on the composite score of Tennessee's universal literacy screeners between the beginning and end of year administration for 15,937 1st-3rd grade students without IEPs

Data Note: Statistically significant results are displayed with an asterisk using a .05 level of significance. The trends above were also consistent when analyzing growth between the beginning and midyear administrations of universal literacy screeners as well as midyear and end-of-year administrations, separately.

Data Note: Results in this table are for students without individualized education plans (IEPs). The participation rate for students with IEPs in HDT was too low for analysis.

Source: SCORE Early Literacy Success For All Students, 2023

As this case study was limited to four districts and only inclusive of ELA, there remains more to learn. There are remaining questions about how the data look statewide, the role of summer learning, and which instructional supports are most effective at improving math instruction. Conducting additional analysis to learn which strategies best support students, and aligning funding to those strategies, is an essential next step.

BRISTOL TENNESSEE CITY SCHOOLS: AN INSTRUCTIONALLY COHERENT VISION FOR EARLY LITERACY

Throughout the 2022-23 school year, Bristol Tennessee City Schools (BTCS) engaged in a pilot to enhance their high-dosage tutoring (HDT) programs by developing and implementing a new vision for K-3 early literacy support. This new vision aims to systematically support students in meeting grade-level expectations by ensuring the students working below grade level receive additional instruction aligned with the high-quality instructional materials and assessments used for core instruction – rather than a different suite of materials used specifically for intervention.

Once this instructionally coherent vision for early literacy support was established, the district was able to break down silos between core instruction and intervention, enabling a more strategic use of staff and time. BTCS leadership reimagined the RTI^2 block with interventionists pushing into the classroom after core reading instruction, providing a second lesson a day for the students working below grade level. They also identified an opportunity to increase total staffing while minimizing costs by utilizing part-time educational assistant (EA) roles, which are paid on the district's hourly wage scale instead of the teacher salary scale. Lastly, the district used the curriculum-embedded assessment from the Tennessee Foundational Skills Curriculum Supplement to track student progress and tailor instruction across staff and settings.

With the new model, the district was able to serve more students by the end of the year, and students in the pilot showed significant growth in reading. BTCS now plans to implement this instructionally coherent model across all first- and second-grade classrooms. The BTCS example demonstrates that by strategically using existing resources aligned to a coherent academic vision, the path for all students to read on grade level is achievable, sustainable, and scalable.

Early skills in reading and math set up students for long-term success, and all students deserve a strong start in elementary school that prepares them for success in education and the workforce.[117] Using data to determine which instructional practices have the greatest potential to positively impact student achievement and then prioritizing those practices is critical as the state takes the next steps in effecting transformative change for students. The data that are available suggest a need to adopt an instructionally coherent approach by intentionally aligning Tennessee's RTI^2 system with the best practices of HDT structures.

SCORE recommends adopting a plan for instructional coherence to maximize learning for the state's lowest-performing students.

- **Revise the RTI^2 framework.** TDOE should revise the framework to establish and define the elements of high-quality high-dosage tutoring as the research-based structure for small-group support beyond core instruction and RTI^2 as the process that guides decision-making. The State Board of Education should update its academic rules to reflect the new framework and emphasize the importance of instructional coherence.

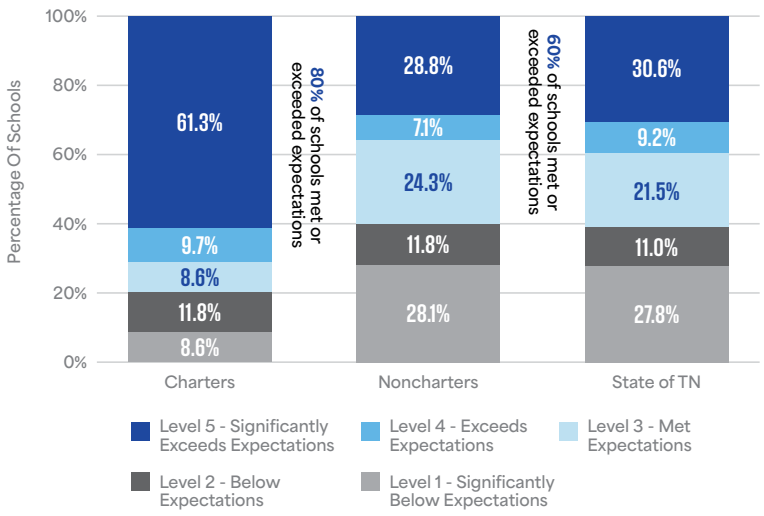
- **Improve reporting to better understand the full suite of academic supports students are receiving.** Students may be receiving high-dosage tutoring, summer learning, Tier 2 or Tier 3 supports, or any mixture of the three. It is important for TDOE to improve reporting on the services students are receiving so the state can evaluate its recent investments and illuminate which supports are driving positive impacts for students in both literacy and math.

- **Align funding to the strategies working for students.** Currently, districts are using a variety of state and federal funds for student learning supports. As TISA is implemented and Elementary and Secondary School Emergency Relief (ESSER) funds wind down, TDOE should prioritize allocating resources to support the most effective strategies for improving literacy and math performance for students.

Public charter schools contribute to improved student outcomes in Tennessee, particularly for students with the highest needs, but these schools lack access to affordable facilities where students can learn.

There are 114 public charter schools in Tennessee serving more than 43,000 students and operating under six different authorizers.[118] The state's charter schools are public schools, free to attend, operated by nonprofit organizations, and must enroll any student who applies regardless of special needs or prior academic performance.[119] Research suggests that charter schools are an effective strategy to support students from historically underserved groups – a finding that resonates with evidence from Tennessee.[120] Tennessee's public charter schools serve, on average, a higher percentage of students of color and economically disadvantaged students than their district counterparts.[121] In the 2022-23 school year, 80 percent of public charter schools met or exceeded student growth expectations (scored a TVAAS Level 3 or higher) compared to 60 percent of noncharters in the same districts.[122]

80 PERCENT OF PUBLIC CHARTER SCHOOLS MET OR EXCEEDED GROWTH EXPECTATIONS



Tennessee Value-Added Assessment System (TVAAS) ratings distribution by school type compared to the state, 2023

Data Note: Charter and noncharter data are not inclusive of the Achievement School District (ASD). Noncharter data reflect performance of noncharter schools in districts with public charter options

Source: TDOE TVAAS composites data downloads, 2023

Though public charter schools are one important way to advance student achievement, they do not do so without challenges. Tennessee's public charter schools do not have the same ability as traditional public schools to support building costs through bonds and tax revenues, creating an obstacle to get students in a physical building for learning.[123] Tennessee has made progress in addressing this challenge with the inclusion of a charter direct allocation in TISA; however, despite that improvement, charters still face a notable gap between the funds available to cover facilities costs and the actual cost of facilities.[124] An analysis of the "facility gap" for Tennessee charter schools found an unmet need of more than $700 per student – the equivalent of hiring around six additional teachers per school.[125] This gap requires charter schools to make significant tradeoffs. For example, schools may have to divert funds from other sources to cover facilities costs, taking money away from resources to support student instruction, or may have to delay opening due to inability to secure a facility.

Tennessee's public charter school students, who are primarily economically disadvantaged and students of color, deserve access to high-quality school buildings. All students should be able to attend school in a building conducive to learning without funds being diverted from student instruction. And no student should have to wait to access a high-quality public charter school because of the lack of a facility. As the next priority for advancing the state's high-quality charter sector, Tennessee should remove this obstacle to improving student achievement by comprehensively meeting the facilities needs of its public charter schools.

SCORE recommends solving Tennessee's charter school facilities challenge.

» **Recommit to the state's charter facilities fund.** The previously existing charter facilities fund is no longer in operation. By reviving the fund with at least $22 million in recurring funding, its previous balance, the state could provide public charter schools a sustainable source of financial support for ongoing facilities costs.

» **Create a revolving loan fund with philanthropic support.** A one-time $10 million state investment could be matched by philanthropic dollars to create a fully sustainable revolving low-interest loan fund to reduce the initial cost of facilities financing. This initial investment could be leveraged to create an overall fund of hundreds of millions of dollars that recycles itself every several years. This revolving fund could be a solution for the upfront hurdle of facility purchase, construction, or renovation, paving the way for the opening of additional high-quality public charter schools.

» **Increase access to existing publicly funded facilities.** The legislature should update state law to establish clear definitions for underutilized and vacant district facilities and procedures for charter schools to have priority for accessing those facilities at a fair price. While these facilities have already been financed with taxpayers' money, there is not currently a complete picture of how many exist and how public charter schools can access them. Facilitating access to properties already designed as schools that would otherwise sit empty is good stewardship of taxpayer dollars, helps remove a large burden for charter schools, and allows for more focus on what matters most – student learning.


Building
A BRIGHTER FUTURE

2024 ADVOCACY AGENDA

Expand Student Opportunity By Strengthening Foundational Policies

As a state dedicated to continuous student-centered improvement, Tennessee should consider the following in its next wave of reforms:

PRIORITIZE THE USE OF LONGITUDINAL DATA TO DRIVE STUDENT OUTCOMES.

Recommendation	Key Actor(s)
Create public-facing dashboards.	Office of Evidence and Impact (OEI)
Add career-relevant Standard Occupational Classification (SOC) codes to the TN DATA system.	Tennessee Department of Labor and Workforce Development (TDLWD) OEI
Bolster the state's TN DATA system by elevating efforts through state law and developing a model data-sharing agreement.	General Assembly OEI Tennessee Higher Education Commission (THEC) Tennessee Board of Regents (TBR) Tennessee Department of Education (TDOE) Tennessee Independent Colleges and Universities Association (TICUA)

ENHANCE THE TENNESSEE PROMISE SCHOLARSHIP AND THE COMMUNITY COLLEGE STUDENT EXPERIENCE.

Recommendation	Key Actor(s)
Incentivize on-time completion and transfer by allowing Tennessee Promise students who earn an associate degree on time to continue receiving their last-dollar scholarship for one semester of continued education.	General Assembly
Fund Tennessee Promise completion grants permanently.	General Assembly
Scale meta-majors across the state's community colleges.	TBR
Publicly report data on the postsecondary programs of study Tennessee Promise students choose to pursue.	THEC

REVISE THE POSTSECONDARY OUTCOMES-BASED FUNDING FORMULA TO PRIORITIZE LONG-TERM STUDENT SUCCESS.

Recommendation	Key Actor(s)
Refine the focus of the outcomes-based funding formula metrics.	THEC Formula review committee
Ensure all outcomes-based funding formula metrics are based on student outcomes.	
Ensure the outcomes-based funding premium structure is aligned to student opportunity.	

Review the full priority and recommendation information starting on page 14 of the report.

Build Effective Pathways Between Education And Careers

The new future of student success hinges on improved alignment across education and careers. To improve alignment and build effective pathways between education and careers, Tennessee should:

GIVE TENNESSEANS CLEAR INFORMATION ON WHICH DEGREES AND CREDENTIALS LEAD TO CAREERS.

Recommendation	Key Actor(s)
Create a statewide definition for quality postsecondary degrees and credentials.	THEC TBR TDOE TDLWD Employers Nongovernment education partners
Collect and report noncredit program data.	TBR General Assembly
Conduct an analysis of future skills needed for success in the workforce.	TDLWD Employers

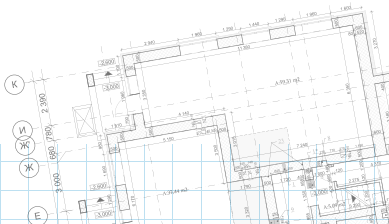
IDENTIFY AND INCENTIVIZE QUALITY EARLY POSTSECONDARY AND CAREER EXPERIENCES FOR STUDENTS.

Recommendation	Key Actor(s)
Identify and invest in quality early postsecondary opportunities (EPSOs).	TDOE Districts
Implement a rubric for evaluating quality of work-based learning opportunities.	TDOE TDLWD Districts
Support access to National Student Clearinghouse (NSC) data with a statewide contract.	General Assembly

DEVELOP STRONG PARTNERSHIPS ACROSS EDUCATION AND INDUSTRY TO INCREASE ALIGNMENT.

Recommendation	Key Actor(s)
Incubate data-driven partnerships.	Employers Postsecondary institutions General Assembly
Incentivize apprenticeship programs that lead to degrees or credentials.	TDLWD General Assembly Employers Postsecondary institutions
Identify opportunities for career partnerships in K-12 that support industry professionals to deliver instructional content to increase early career exposure.	TDOE General Assembly

*Review the full priority and recommendation information starting on **page 24** of the report.*



Ensure K-12 Supports Meet Student Needs

Educators, instruction, and learning environments are three levers the state can explore to support all students to achieve and mark the next frontier for its education system. To ensure K-12 supports are meeting student needs, Tennessee should:

SUPPORT TEACHERS AT EACH STAGE OF THEIR CAREER TO FURTHER STUDENT ACCESS TO EXCELLENT EDUCATORS.

Recommendation	Key Actor(s)
Innovate to bolster the teacher pipeline by evaluating the impact of current initiatives and piloting new initiatives such as advanced teacher roles.	TDOE
Remove barriers to licensure for permit holders by investing in a grant fund to offset the cost of completing educator preparation provider (EPP) coursework.	General Assembly
Commit to educator labor market data collection and public reporting.	TDOE

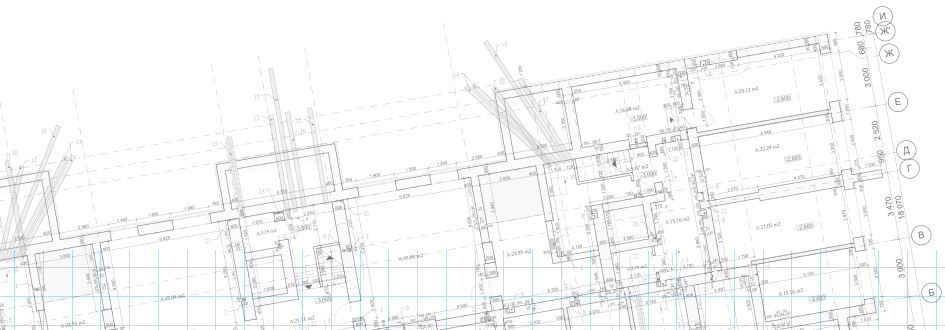
ADOPT A PLAN FOR INSTRUCTIONAL COHERENCE TO MAXIMIZE LEARNING FOR THE STATE'S LOWEST-PERFORMING STUDENTS.

Recommendation	Key Actor(s)
Revise the RTI^2 framework to establish and define the elements of high-quality high-dosage tutoring as the research-based structure for small-group support beyond core instruction and RTI^2 as the process that guides decision-making.	TDOE State Board of Education (SBE)
Improve reporting to better understand the full suite of academic supports students are receiving and which are driving positive impacts for students in both literacy and math.	TDOE
Align funding to the instructional strategies working for students.	TDOE

SOLVE TENNESSEE'S CHARTER SCHOOL FACILITIES CHALLENGE.

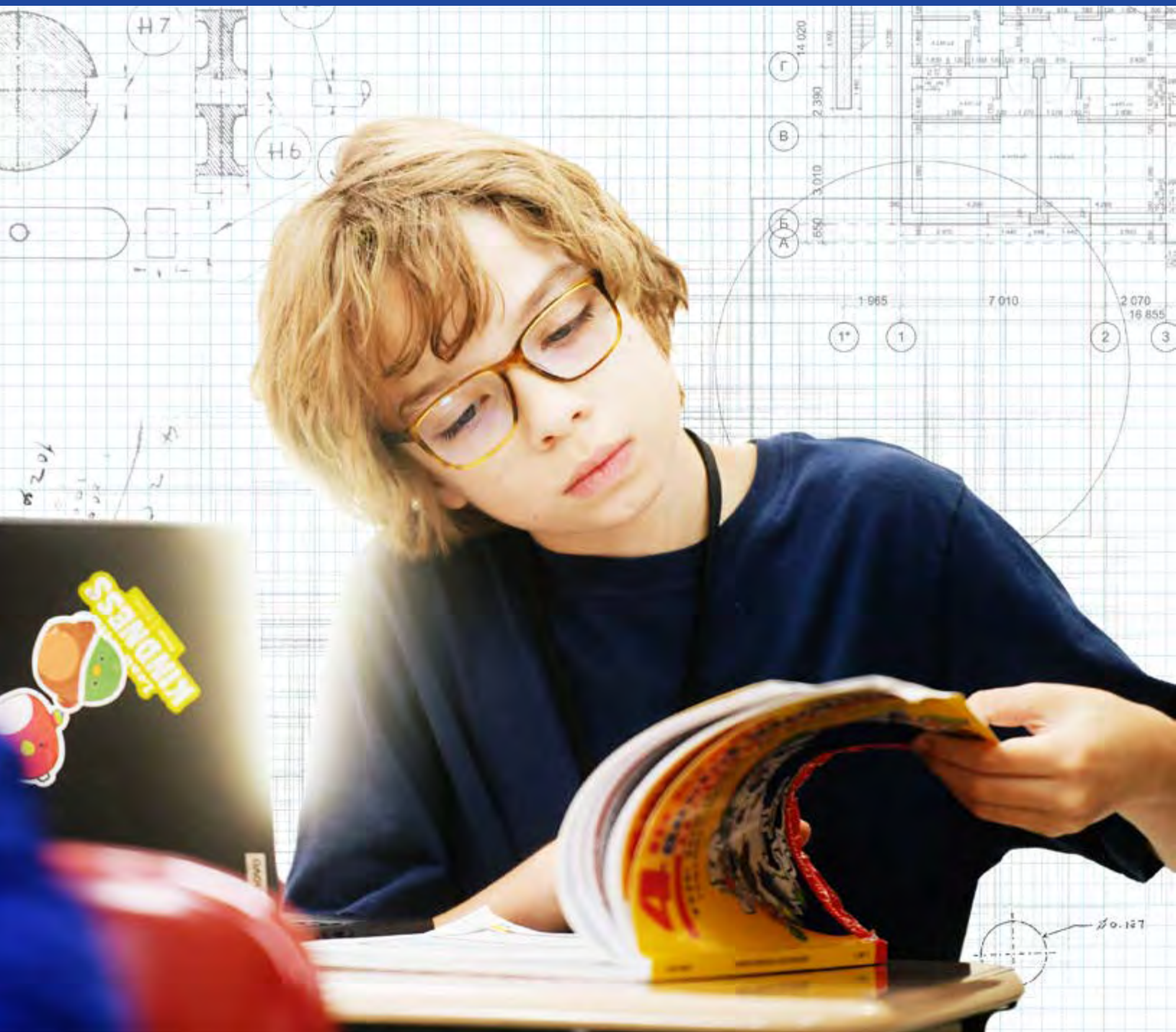
Recommendation	Key Actor(s)
Recommit to the state's charter facilities fund.	General Assembly
Create a revolving loan fund with philanthropic support.	General Assembly Philanthropy
Increase access to existing publicly funded facilities.	General Assembly

Review the full priority and recommendation information starting on page 34 of the report.



About SCORE

The State Collaborative on Reforming Education (SCORE) is a nonpartisan nonprofit education policy and advocacy organization based in Nashville, Tennessee. SCORE was founded in 2009 by Senator Bill Frist, MD, former US Senate majority leader, with a mission to catalyze transformative change in Tennessee education so all students can achieve success.



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Amanda Glover, Senior Policy Analyst

Aleah Guthrie, Vice President of Policy and Government Relations

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Diane Hughes, Communications Manager

Zachary Hyder, Graduate Fellow

Jack Jue, Graduate Fellow

Ellie Lasarow, Graduate Fellow

Mara Laverentz, Executive Assistant

Karen Lawrence, Senior Director of Networks and Partnerships

David Mansouri, President and CEO

Emma McWeeney, Director of Charter Initiatives

Mary Cypress Metz, Senior Vice President of Strategy

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Rachel Patrick, Graduate Fellow

Alexis Parker, Director of Data

Madeline Price, Director of Policy

Dr. Sharon Roberts, Chief K-12 Impact Officer

Dr. Shelby Rogers, Senior Director of Postsecondary Innovation

Henry Savich, Education and Workforce Data Specialist

Nicole Floyd Smith, Vice President of Advocacy

Dr. Jamia Stokes, Vice President of Postsecondary Programs

Peter Tang, Senior Director of Research

Bryce Warden, Director of Education-to-Work Initiatives

Ashley Warrington, Director of Advocacy

Rick Zadd, Vice President of Finance and Operations

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Appendix K: Key Phase Objectives and Measurements

Key Phase Objectives and Measurements

Objective	Performance Measurement
Phase 1 **Planning/Development Phase Objectives**	
1. GIVE 3.0 Award Announcement Ceremony **2**. Post/Interview/Hire GIVE 3.0 Positions **3.** Order Equipment and Supplies for classroom lab areas for HS and TCAT/Roane State training sites **4.** Continue to promote Dual Enrollment opportunities to high school students with aid of College & Career Navigator **5**. Create, Plan, Schedule and Promote career awareness, career exploration, and career preparation work-based learning activities at the intermediate/middle/junior high and early high school levels with aid of newly hired College & Career Navigator **6.** Create, Plan, Schedule and Promote Pre-Apprenticeship and Apprenticeship opportunities with local employers with the aid of the newly hired Apprenticeship Specialist **7.** Create, Plan, Schedule and Promote articulated pathways from TCAT Knoxville to	
Phase 2 **Full Implementation**	Performance Metrics used for Career Awareness, Career, Exploration, Career Preparation and Career opportunities will be tracked using a monthly report submitted to the grant coordinator. The College & Career Navigator and Apprenticeship Specialist will each report out each month utilizing a Microsoft form to track data that will include the number of participants attending, name of event, type of event, date of event, number of certifications awarded to students, number of dual enrolled students for given semester, number of newly acquired pre-apprentices, apprentices, and number of companies served.
1. Implement Work-based Continuum utilizing the following WBL Activities: **a.**Tammy and Tommy TCAT Summer Camps (annual participation goal = 100) **b.**Remake Learning Days Festivals (annual participation goal = 1,500 for 100 events) **c.**Lab in a Box (annual participation goal = 25 students) **d.**SkillsUSA Conferences and Competitions (annual participation goal = 10 for related programs) **e.**Increased Dual Enrollment at High School by 45 students annually in the related program **f.**Increase industry Certifications Earned by 20% for CTE Pathway Increase college-going rate for Blount County by 41 students annually **g.**Increase registered apprenticeships by 20 students annually **2.** Grant Partners to complete Monthly reimbursement requests to ensure timely grant implantation and reporting **3.** Grant Partners to complete Grant Data Reports using a Microsoft Teams form to ensure timely grant implantation and reporting **4.** Quarterly Grant Partner meetings to discuss events, scheduling, financial reporting, and grant goals being met.	
Phase 3 **Post-Grant Funding**	
1. Continue dual enrollment program with High School with TCAT and Pellissippi State **2.** TCAT Knoxville/Blount County Schools/Pellissippi State budget funding to sustain the College & Career Navigator and Apprenticeship Specialist, **3.** Continue having Grant employer partners sit on the program Advisory Committees **4.** Complete GIVE 3.0 Reporting, Accounting, and Attainment Data	

Appendix L: Articulation Agreements between TCAT Knoxville and Pellissippi State

Statewide Articulation Agreement Between
The Tennessee Community Colleges and
The Tennessee Colleges of Applied Technology
For the Period of Fall 2020 through Fall 2023
For the Program Area Welding Technology

The Tennessee community colleges hereinafter referred to as the “CC(s)" and the Tennessee colleges of applied technology hereinafter referred to as the “TCAT(s)" have entered into a statewide partnership which promotes student transfer and program articulation. The partnership is for the purpose of providing eligible TCAT students the opportunity to receive college credit upon successful completion of a qualified program at a TCAT and by earning recognized industry certification(s) as identified in "APPENDIX A."

OVERVIEW

In accordance with the guidelines set forth by the Tennessee Board of Regents (TBR), the Tennessee Higher Education Commission (THEC), and the procedures established by the individual CCs, we hereby enter into this Agreement to provide the eligible TCAT students the opportunity to receive college credit upon successful completion of a qualified program at a TCAT and by earning recognized industry certification(s) as identified in "APPENDIX A."

The CCs determine awarded credits based upon the certification earned.

1. TCATs will indicate on student transcripts the specific coursework completed and certifications taken and passed (if known).
2. When evaluating student transcripts, the CC will award credit based on certifications identified in "APPENDIX A."
3. In addition, CCs may also evaluate transcripts on a course-by-course basis. Credit for one CC course may be awarded for one TCAT course; for example, credit for completion of TCAT AWS WEL 3030 may be awarded either for Pipe welding or for Gas Metal Arc Welding – not for both.
4. Pre-requisite courses must be considered prior to accepting credit via this agreement.
5. Students must meet the standards and follow the procedures of the individual CC catalog for the year they enrolled in the articulated course/program or follow the current year CC catalog.
6. The awarding of any nontraditional credit (e.g. CLEP, AP credit-by-exam, military services, etc.) may be granted for coursework not identified in "APPENDIX A."
7. Upon an institution’s request this agreement will be reviewed.
8. This agreement will remain in effect until modified or rescinded by the duly authorized signatories.
9. The CCs and the TCATs shall:
    a. Designate a responsible party to provide oversight of details and disseminate general program information to students.
    b. Determine course(s) to award credit based upon recommendation of content faculty.
    c. Agree to review every three years the certifications/courses and/or Student Learning Outcomes for which college credit will be awarded.
    d. Appoint representatives to serve on an advisory committee at the request of TBR to provide perspective to the program regarding the effective coordination between the individual CC(s) and TCAT(s). The advisory committee shall consist of representatives from both the CC(s) and the TCAT(s). The advisory committee shall converse and report annually to the Vice Chancellor for Academic Affairs.
10. This agreement will commence the semester following the signing thereof.

Statewide Articulation Agreement Between
The Tennessee Community Colleges and
The Tennessee Colleges of Applied Technology
For the Period of Fall 2020 through Fall 2023
For the Program Area Welding Technology

APPROVAL SIGNATURES

TENNESSEE BOARD OF REGENTS:

DocuSigned by:
Allana Hamilton
Vice Chancellor for Academic Affairs, Allana Hamilton — 2020-05-26 | 1:22 PM CDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY ATHENS:

DocuSigned by:
Stewart Smith
President, Stewart Smith — 2020-05-28 | 9:29 AM PDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY CHATTANOOGA:

DocuSigned by:
James Barrott
President, James Barrott — 2020-05-28 | 11:42 AM CDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY COVINGTON:

DocuSigned by:
Youlanda Jones
President, Youlanda Jones — 2020-05-28 | 12:07 PM CDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY CROSSVILLE:

DocuSigned by:
Cliff Wightman
President, Cliff Wightman — 2020-05-28 | 6:54 PM PDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY CRUMP:

DocuSigned by:
Stephen Milligan
President, Stephen Milligan — 2020-05-29 | 6:44 AM PDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY DICKSON:

DocuSigned by:
Arrita Summers
President, Arrita Summers — 2020-05-29 | 7:22 AM PDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY ELIZABETHTON:

DocuSigned by:
Dean Blevins
President, Dean Blevins — 2020-06-02 | 7:03 AM CDT
Date

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY HARRIMAN:

DocuSigned by:
Danice Turpin
President, Danice Turpin — 2020-06-04 | 5:16 AM PDT
Date

Statewide Articulation Agreement Between
The Tennessee Community Colleges and
The Tennessee Colleges of Applied Technology

For the Period of Fall 2020 through Fall 2023
For the Program Area Welding Technology

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY HARTSVILLE:

DocuSigned by: Mae Wright — 2020-06-04 | 6:28 AM PDT

President, Mae Wright — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY HOHENWALD:

DocuSigned by: Kelli Kea-Carroll — 2020-06-08 | 6:34 AM PDT

President, Kelli Kea-Carroll — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY JACKSBORO:

DocuSigned by: Debbie Petree — 2020-06-08 | 7:01 AM PDT

President, Debbie Petree — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY JACKSON:

DocuSigned by: Jeff Sisk — 2020-06-08 | 9:09 AM CDT

President, Jeff Sisk — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE:

DocuSigned by: Kelli Chaney — 2020-06-12 | 5:05 AM PDT

President, Kelli Chaney — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY LIVINGSTON:

DocuSigned by: Myra West — 2020-06-12 | 8:46 AM CDT

President, Myra West — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY MCKENZIE:

DocuSigned by: Brad White — 2020-06-12 | 7:11 AM PDT

President, Brad White — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY MCMINNVILLE:

DocuSigned by: Warren Laux — 2020-06-12 | 8:00 AM PDT

President, Warren Laux — **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY MEMPHIS:

DocuSigned by: Roland Rayner — 2020-06-12 | 9:21 PM PDT

President, Roland Rayner — **Date**

Statewide Articulation Agreement Between
The Tennessee Community Colleges and
The Tennessee Colleges of Applied Technology

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY MORRISTOWN:

DocuSigned by:

2020-06-15 | 5:18 AM PDT

President, Jerry Young **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY MURFREESBORO:

DocuSigned by:

2020-06-15 | 5:48 AM PDT

President, Carol Puryear **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY NASHVILLE:

DocuSigned by:

2020-06-18 | 5:45 AM PDT

President, Mark Lenz **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY NEWBERN:

DocuSigned by:

2020-06-18 | 9:01 AM CDT

President, Youlanda Jones **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY ONEIDA:

DocuSigned by:

2020-06-18 | 9:16 AM CDT

President, Dwight Murphy **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY PARIS:

DocuSigned by:

2020-06-18 | 8:40 AM PDT

President, Brad White **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY PULASKI:

DocuSigned by:

2020-06-18 | 9:08 AM PDT

President, Mike Whitehead **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY SHELBYVILLE:

DocuSigned by:

2020-06-20 | 6:10 AM PDT

President, Laura Monks **Date**

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY WHITEVILLE:

DocuSigned by:

2020-06-22 | 7:30 AM CDT

President, Jeff Sisk **Date**

For the Program Area Welding Technology

APPROVAL SIGNATURES

CHATTANOOGA STATE COMMUNITY COLLEGE

DocuSigned by: Rebecca Ashford — 2020-07-14 | 9:46 AM PDT

President, Rebecca Ashford — **Date**

CLEVELAND STATE COMMUNITY COLLEGE

DocuSigned by: William Seymour — 2020-07-14 | 10:24 AM PDT

President, William Seymour — **Date**

NORTHEAST STATE COMMUNITY COLLEGE

DocuSigned by: [signature] — 2020-07-14 | 12:26 PM CDT

President, Bethany Bullock — **Date**

PELLISSIPPI STATE COMMUNITY COLLEGE

DocuSigned by: L. Anthony Wise, Jr. — 2020-07-14 | 1:49 PM CDT

President, L. Anthony Wise, Jr. — **Date**

TENNESSEE BOARD OF REGENTS:

DocuSigned by: Flora W. Tydings — DS — 2020-07-14 | 1:50 PM CDT

Chancellor, Flora W. Tydings — **Date**

Statewide Articulation Agreement Between

The Tennessee Community Colleges and The Tennessee Colleges of Applied Technology For the Period of Fall 2020 through Fall 2023

Program Area: Welding Technology

APPENDIX A

Awarding of College Credit to Welding Technology graduates of Tennessee Colleges of Technology into the A.A.S. Welding Technology Program

Community College Course Title	Credit Hours	TCAT Course Title
WELD 1381 PRINCICPLES OF WELDING **OR** WELD 1060 GENERAL WELDING	3-4	**NCCER** WEL 1070- ORIENTATION AND SAFETY, AND WEL 1080- ENTRY SHIELD METAL ARC WELD I, AND WEL 2050- ENTRY GAS METAL ARC WELDING, AND WEL 2060- ENTRY GAS TUNGSTEN ARC WELDING, **AND** WEL 2070- ENTRY SHIELD METAL ARC WELD II **AWS** WEL 1020-SHOP ORIENTATION & SAFETY, AND WEL 1030-CUTTING PROCESSES, 1040- AND WEL BASIC SHIELDED METAL ARC WELDING, AND WEL 1050- BASIC GAS METAL ARC WELDING, **AND** WEL 2040- ADVANCED GAS METAL ARC WELDING
WELD 1383 WELDING SYMBOLOGY & BLUEPRINT READING **OR** ENST 1381- Engineering Technical Communication	3	**AWS** WEL 2010- BLUE PRINT THEORY **AND** WEL 3010- BLUE PRINT READING
WELD 1380 WELDING SAFETY **OR** ENST 1350 INDUSTRIAL SAFETY **OR** INTC 1020 SAFETY IN THE WORKPLACE	3	**NCCER** WEL 1070- ORIENTATION AND SAFETY **AND** OSHA 10 **AWS** WEL 1020- SHOP ORIENTATION & SAFETY **CERTIFICATIONS**: NIMS MEASUREMENT, MATERIALS, & SAFETY and OSHA 10
WELD 2370 SHEILDED METAL ARC WELDING	3	**NCCER** WEL 2080- EXPERT SHIELD METAL ZRC WELD I **AND** WEL 3050- EXPERT SHIELD METAL ARC WELD II AWS WEL 2030 – ADVANCED SHIELDED METAL ARC WELDING
WELD 2371 GAS METAL ARC WELDING	3	**NCCER** WEL 3030- EXPERT GAS METAL ARC WELDING **AWS** WEL 2040- ADVANCED GAS METAL ARC WELDING
WELD 1384 FABRICATION TECHNIQUES	3	**AWS** WEL 1010- TECHNOLOGY FOUNDATIONS **AND** WEL 1030-CUTTING PROCESSES
WELD 2372 GAS TUNGSTEN ARC WELDING	3	**NCCER WEL** 3040- EXPERT GAS TUNGSTEN ARC WELDING **AWS** 3020- ADVANCED GAS TUNGSTEN ARC PIPE

WELD 2120 PIPE WELDING	3	**NCCER** WEL 3030- EXPERT GAS METAL ARC WELDING, **OR** WEL 3040- EXPERT GAS TUNGSTEN ARC PIPE WELD, **OR** 3050- EXPERT SHELD METAL ARC WELD II
Total articulation credit hours available to earn	24-25	

****** No TCAT equivalent for WELD 2460, but there is an AWS certification earned through the online library**.**

Appendix P: Partner Roles, Tasks, and Capabilities

Partner and Role in Carrying Out the Project and Unique Strengths and Qualifications	Assigned Tasks
Tennessee College of Applied Technology (TCAT)-Knoxville Higher education partner **Lead Entity and Fiscal Agent for GIVE 3.0** Strengths and Qualifications: TCAT Knoxville is a training facility with 1,225 full-time students. The facility offers the following Certifications, Diplomas for the following Nuclear Science Pathway related programs: Industrial Maintenance Technician Welding Technology Machine Tool Technology	Take the lead on coordinating and executing the GIVE 3.0 Initiative, including appointing a lead from the administrative team and recruiting project staff for GIVE 3.0. Spearhead the creation and ongoing management of the GIVE 3.0 Collaborative, ensuring regular meetings are held. Organize a series of Work-Based Learning (WBL) opportunities. Collaborate with partners to equip students with the necessary academic and workplace readiness skills. Engage with collaborative partners to enhance outreach efforts, encouraging student enrollment in higher education programs. Work jointly with partners to ensure educational and training curriculums align with industry standards and needs, thereby improving career pathways. Provide necessary training, establish a framework for evaluating and maintaining GIVE 3.0 project initiatives. Lead and manage Remake Learning Days and Tammy and Tommy TCAT Summer Camps, offering capstone WBL experiences for students in high school and college where feasible. Support student-led projects, create learning opportunities for educators, contribute to curriculum development, and rally colleague support for guest lectures and advisory board participation. Get involved in Remake Learning Days, Tammy and Tommy TCAT Summer Camps, and CTE Showcase Nights. Work on the creation and growth of Apprenticeship and Pre-apprenticeship programs with project partners.
Blount County Schools **K-12 Partner** Strengths and Qualifications: Blount Schools had over 10,000 students enrolled in 2023. They work with Tennessee Pathways Certifications by enhancing coursework, including early post-secondary opportunities and work-based learning experiences with at least one employer partner. They are Pathways certified in Computer Information Technology, Pipefitting and Plumbing, Machining, Welding, Industrial Maintenance, Mechatronics, HVAC, and Industrial Electricity.	Active participation in the GIVE 3.0 Collaborative; Assist with identification of local workforce needs and related skillset deficits; Assist with design of the program components that address the identified local workforce needs and skills gaps; Work with Collaborative partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs and to enhance/expand career pathways; Coordinate and document career exploration and other work-based learning opportunities for students; Support student projects; Provide time and coordinate learning opportunities to teachers; Develop and deliver curriculum and hands-on training; establish/apply laws, education code, and state/district policies; Provide technology infrastructure and space for dual enrollment programs on campus, staffing, tools and materials, and professional development for instructors; Assist with the identification and engagement of stakeholders, including marketing/recruitment of partners for identified career pathways and WBL continuum program activities/experiences. Participate/host in Remake Learning Days events, Tammy and Tommy TCAT Summer Camps, Lab in a Box, and lead CTE Showcase Nights.
Roane State Community College **Higher Education partner** Strengths and Qualifications: Roane State Community College is a training facility with an Undergraduate headcount of 4,704 The institution offers a transfer pathway in A.A.S. Welding Technology:	Active participation in the GIVE 3.0 Collaborative; Assist with identification of local workforce needs and related skillset deficits; Assist with design of the program components that address the identified local workforce needs and skills gaps; Work with Collaborative partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs and to enhance/expand career pathways; Assist with the identification and engagement of stakeholders, including marketing/recruitment of partners for identified career pathways and WBL continuum program activities/experiences; Active participation in the GIVE 2.0 Collaborative; Assist with identification of local workforce needs and related skillset deficits; Assist with design of the program components that address the identified local workforce needs and skills gaps; Work with Collaborative partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs and to enhance/expand career pathways; Assist with the identification and

Partner and Role in Carrying Out the Project and Unique Strengths and Qualifications	Assigned Tasks
	engagement of stakeholders, including marketing/recruitment of partners for identified career pathways and WBL continuum program activities/experiences; Participate/host in Remake Learning Days events, Tammy and Tommy TCAT Summer Camps, and CTE Showcase Nights
Blount Partnership **Economic Development Partners** Strengths and Qualifications: The long-term goal of the Blount Partnership is to create primary, high-value jobs and competitive annual salaries with a significant capital investment. It also plans to work towards creating more opportunities for business and family visitors as well as group travel while increasing educational and training programs for the business community	Active participation in the GIVE 3.0 Collaborative; Assist with identification of local workforce needs and related skillset deficits; Assist with design of the program components that address the identified local workforce needs and skills gaps; Work with Collaborative partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs and to enhance/expand career pathways; Assist with the identification and engagement of stakeholders, including marketing/recruitment of partners for identified career pathways and WBL continuum program activities/experiences; Participate/host in Remake Learning Days events, Tammy and Tommy TCAT Summer Camps, and CTE Showcase Nights
Arconic, Cherokee Millwright and Denso **Employer Partners** Strengths and Qualifications: Combined, these partners employ more than 5,000 employees and represent small, medium, and large businesses. The employers are active in the community and have documented needs for additional skilled workers and apprenticeship programs.	Active participation in the GIVE 3.0 Collaborative; Assist with identification of local workforce needs and related skillset deficits; Assist with design of program components that address the identified local workforce needs and skills gaps; Work with Collaborative partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs and to enhance/expand career pathways; Provide career exploration and other work-based learning opportunities for students; Work with high school and college staff to establish expectations and criteria for capstone WBL experiences and host/provide capstone WBL experiences for high school and college students, as possible and appropriate; Support student projects; Provide learning opportunities to teachers; Provide input to the curriculum; Enlist the support of colleagues to provide classroom speakers and service on program advisory boards; Participate/host in Remake Learning Days events, Tammy and Tommy TCAT Summer Camps, and CTE Showcase Nights

Appendix M: Memorandum of Understanding (MOU) outlining the partnership agreement from local and area employers and partnering postsecondary institutions

Memorandum of Understanding
Between
TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE and BLOUNT COUNTY SCHOOLS

Whereas, BLOUNT COUNTY SCHOOLS and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are developing a long-term regional collaborative that includes higher education, area employers, economic development and workforce agencies, and local/regional K-12 systems.

Whereas, higher education partners include Tennessee College of Applied Technology Knoxville and Pellissippi State Community College, henceforth collectively referred to as "Colleges"; and

Whereas, area employer partners include Cherokee Millwright, Arconic, and Denso, henceforth collectively referred to as "Company"; and

Whereas, Blount Partnership is an economic development and workforce agency; and

Whereas, K-12 partners include Blount County Schools, henceforth collectively referred to as "Schools"; and

Whereas, BLOUNT COUNTY SCHOOLS and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in working together to develop and implement a Cooperative Work Program (Co-op), Pre-Apprenticeship, or Apprenticeship Program, which is an integral part of the learning experience provided for students at the Schools and Colleges and is defined as paid or unpaid work-related training received at Company under the terms of a signed Student (Co-op) Work Program Agreement. The Program provides a method of instruction whereby the TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLEs and Company are partners in developing the workforce for tomorrow's technology.

Whereas, it is for the mutual benefit of all parties to provide Co-op, Pre-Apprenticeship, or Apprenticeship work experience for students enrolled in certain programs of the Colleges and Schools, the parties have agreed to the terms and provisions set forth below; and

Whereas, both BLOUNT COUNTY SCHOOLS and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that business engagement in the education and training of workers is key to successful labor market outcomes and that long-term sustainability planning for successful initiatives and interventions is critical and will continue to serve the community beyond the grant period; and

Whereas, BLOUNT COUNTY SCHOOLS is in the service area of TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE; and

Whereas, BLOUNT COUNTY SCHOOLS and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in signing a memorandum of understanding outlining roles and responsibilities of each organization and partnering to demonstrate interest and capacity for providing TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE students with practical work experience through a Co-op, Pre-Apprenticeship or Apprenticeship Assignment while enrolled in specific programs at TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE.

Now, Therefore, each party agrees to the following:

Tennessee College of Applied Technology Knoxville agrees to collaborate in the following ways:

1. Serve as lead entity and fiscal agent for the Industry 4.0 Apprenticeship Pathway GIVE 3.0 Grant.
2. Provide leadership for the planning, development, and implementation of the GIVE 3.0
3. Provide leadership for the development of GIVE 3.0 Collaborative partners to plan activities and monitor the achievement of measurable project outcomes.
4. Work with Industry 4.0 Apprenticeship Pathway GIVE 3.0 Grant partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs.
5. Provide a framework by which GIVE 3.0 project initiatives will be evaluated and sustained.
6. Provide a dedicated staff position to facilitate partner outreach and administer the Cooperative Work Program (Co-op), Pre-Apprenticeship, or Apprenticeship Program in the service area, to be located on-site at Anderson County Chamber Headquarters.
7. Work with partners to develop and conduct outreach services and recruit students to the apprenticeship pathway programs.
8. Maintain all pertinent records relating to this Agreement.
9. Provide leadership and guidance to Companies when setting up Apprenticeships and Pre-Apprenticeships and serve as Sponsor and/or Training partner when necessary.

Blount County Schools agrees to collaborate in the following ways:

1. Active participation in the Industry 4.0 Apprenticeship Pathway partner's committee meetings by providing representative/s to serve on the committee
2. Work with Industry 4.0 Apprenticeship Pathway GIVE 3.0 Grant partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs
3. Participate in the planning and execution of GIVE 3.0 grant project evaluation
4. Assist with the development and implementation of the GIVE 3.0 grant Work-Based Learning continuum in areas of:
    a. Career awareness: i.e. participate in a Tammy and Tommy TCAT Career Camps, Remake Learning Day events, Lab in a Box and more.
    b. Career exploration: i.e., participate in events such as Remake Learning Days, Dream it Do it, Campus Tours, and Career exploration nights by providing staff support and activities.
    c. Career preparation: i.e., assist with the development of project-based based learning activities for use in education/career training programs for students and instructors, such as ACE Bootcamps, Lab in a Box, Industry-back certifications, SkillsUSA and dual enrollment opportunities
    d. Career training: i.e., provide one of the following: job shadowing, externships, capstone work-based learning, internships, pre-apprenticeship or apprenticeship opportunities for students
5. Share student/employee data with the lead entity to be used for project evaluation and dissemination of outcomes/results of activities funded through the project
6. Provide resources to support education/training, such as facilities, subject matter experts
7. Work with GIVE 3.0 Collaborative to promote outreach services and recruit students to higher education programs, appropriate disciplines, and transfer pathways.

IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

1. Modification of roles/responsibilities and the sustainability and scalability of the program are collectively decided by the Core and the Employer partners identified in this MOU.
2. An Employer partner may terminate its relationship with the program with a 30-day written notice to the lead agency or program director. Additional employer partners may be added through an MOU between the parties of this agreement.
3. All partners commit to sustaining the work-based learning model in the proposal and partnership beyond the GIVE 3.0 grant.

EFFECTIVE DATE AND SIGNATURE

This MOU shall be effective upon the signature of the Partners authorized officials. It shall be effective for the life of the GIVE 3.0 grant: August 1, 2024 - September 30, 2028.

"Grant Name" Partners agree with this MOU by their signatures.

Tennessee College of Applied Technology Knoxville

Kelli Chaney

Kelli Chaney, President

Date: 4/4/2024

Blount County Schools

Dr. Alisa Teffeteller, CTE Director

Name, Title

Date: 4/4/24

Memorandum of Understanding
Between
TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE **and** BLOUNT PARTNERSHIP

Whereas, BLOUNT PARTNERSHIP and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are developing a long-term regional collaborative that includes higher education, area employers, economic development and workforce agencies, and local/regional K-12 systems.

Whereas, higher education partners include Tennessee College of Applied Technology Knoxville and Pellissippi State Community College, henceforth collectively referred to as "Colleges"; and

Whereas, area employer partners include Cherokee Millwright, Arconic, and Denso henceforth collectively referred to as "Company"; and

Whereas, Blount Partnership is an economic development and workforce agency; and

Whereas, K-12 partners include Blount County Schools, henceforth collectively referred to as "Schools"; and

Whereas, BLOUNT PARTNERSHIP and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in working together to develop and implement a Cooperative Work Program (Co-op), Pre-Apprenticeship, or Apprenticeship Program, which is an integral part of the learning experience provided for students at the Schools and Colleges and is defined as paid or unpaid work-related training received at Company under the terms of a signed Student (Co-op) Work Program Agreement. The Program provides a method of instruction whereby the TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLEs and Company are partners in developing the workforce for tomorrow's technology.

Whereas, it is for the mutual benefit of all parties to provide Co-op, Pre-Apprenticeship, or Apprenticeship work experience for students enrolled in certain programs of the Colleges and Schools, the parties have agreed to the terms and provisions set forth below; and

Whereas, both BLOUNT PARTNERSHIP and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that business engagement in the education and training of workers is key to successful labor market outcomes and that long-term sustainability planning for successful initiatives and interventions is critical and will continue to serve the community beyond the grant period; and

Whereas, BLOUNT PARTNERSHIP is in the service area of TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE; and

Whereas, BLOUNT PARTNERSHIP and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in signing a memorandum of understanding outlining roles and responsibilities of each organization and partnering to demonstrate interest and capacity for providing TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE students with practical work experience through a Co-op, Pre-Apprenticeship or Apprenticeship Assignment while enrolled in specific programs at TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE.

Now, Therefore, each party agrees to the following:

TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE agrees to collaborate in the following ways:

A. Serve as lead entity and fiscal agent for the GIVE Grant 3.0 Industry 4.0 Apprenticeship Pathway
B. Provide leadership for the planning, development, and implementation of the GIVE 3.0
C. Provide leadership for the development of GIVE 3.0 Collaborative partners to plan activities and monitor the achievement of measurable project outcomes.
D. Work with GIVE Grant 3.0 Industry 4.0 Apprenticeship Pathway partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs.
E. Provide a framework by which GIVE 3.0 project initiatives will be evaluated and sustained.
F. Provide a dedicated staff position to facilitate partner outreach and administer the Cooperative Work Program (Co-op), Pre-Apprenticeship, or Apprenticeship Program in the service area.
G. Work with partners to develop and conduct outreach services and recruit students to the apprenticeship pathway programs.
H. Maintain all pertinent records relating to this Agreement.
I. Provide leadership and guidance to Companies when setting up Apprenticeships and Pre-Apprenticeships and serve as Sponsor and/or Training partner when necessary.

BLOUNT PARTNERSHIP agrees to collaborate in the following ways:

A. Work with Industry 4.0 Apprenticeship Pathway GIVE 3.0 Grant partners to align and map education/training program curriculum and credentialing requirements to industry standards and needs.
B. Identify in-demand industry-recognized certifications or credentials for employment used for hiring and promotion
C. Assist with the development and implementation of the GIVE 3.0 grant Apprenticeship Pathways by facilitating communication between Colleges, Schools, and Companies.
D. Assist with the development and implementation of GIVE 3.0 grant Apprenticeship Pathways by supporting Apprenticeship Coordinator in establishing relationships with Companies with the goal of creating new Apprenticeships and Pre-Apprenticeships
E. Provide resources and meeting opportunities with partner organizations and Companies for the Apprenticeship Coordinator.
F. Provide resources to support education/training through inclusion in Blount Partnership seminars, workshops, training sessions and meetings with subject matter experts.

IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

1. Modification of roles/responsibilities and the sustainability and scalability of the program are collectively decided by the Core and the Employer partners identified in this MOU.
2. An Employer partner may terminate its relationship with the program with a 30-day written notice to the lead agency or program director. Additional employer partners may be added through signature to this agreement.
3. All partners commit to sustaining the work-based learning model in the proposal and partnership beyond the GIVE 3.0 grant.

EFFECTIVE DATE AND SIGNATURE

This MOU shall be effective upon the signature of the Partners authorized officials. It shall be effective for the duration of the life of the GIVE 3.0 grant: August 1, 2024 - September 30, 2028.

"Grant Name" Partners agree with this MOU by their signatures.

Kelli Chaney

Kelli Chaney
President
Tennessee College of Applied Technology Knoxville

Bryan F. Davis

Blount Partnership

Memorandum of Understanding
Between
TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE and ARCONIC

Whereas, ARCONIC and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are developing a long-term regional collaborative that includes higher education, area employers, economic development and workforce agencies, and local/regional K-12 systems.

Whereas, higher education partners include Tennessee College of Applied Technology Knoxville and Pellissippi State Community College, henceforth collectively referred to as "Colleges"; and

Whereas, area employer partners include Cherokee Millwright, Arconic, and Denso, henceforth collectively referred to as "Company"; and

Whereas, Blount Partnership is an economic development and workforce agency; and

Whereas, K-12 partners include Blount County Schools, henceforth referred to as "School"; and

Whereas, ARCONIC and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in working together to develop and implement a Cooperative Work Program (Co-op), Pre-Apprenticeship, or Apprenticeship Program, which is an integral part of the learning experience provided for students at the Schools and Colleges and is defined as paid or unpaid work-related training received at Company under the terms of a signed Student (Co-op) Work Program Agreement. The Program provides a method of instruction whereby the TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLEs and Company are partners in developing the workforce for tomorrow's technology.

Whereas, it is for the mutual benefit of all parties to provide Co-op, Pre-Apprenticeship, or Apprenticeship work experience for students enrolled in certain programs of the Colleges and Schools, the parties have agreed to the terms and provisions set forth below; and

Whereas, both ARCONIC and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that business engagement in the education and training of workers is key to successful labor market outcomes and that long-term sustainability planning for successful initiatives and interventions is critical and will continue to serve the community beyond the grant period; and

Whereas, ARCONIC is in the service area of TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE; and

Whereas, ARCONIC and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in signing a memorandum of understanding outlining the roles and responsibilities of each organization and partnering to demonstrate interest and capacity for providing TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE students with practical work experience through a Co-op, Pre-Apprenticeship or Apprenticeship Assignment while enrolled in specific programs at TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE.

Whereas, ARCONIC and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that the Co-op, Pre-Apprenticeship, or Apprenticeship experience shall be provided at the Company's facility located at 2300 N Wright Rd, Alcoa, TN 37701.

Now, Therefore, each party agrees to the following:

Tennessee College of Applied Technology Knoxville agrees to collaborate in the following ways:

A. Evaluate and assign credit for Co-op, Pre-Apprenticeship, or Apprenticeship work according to the official college calendar, not to exceed the maximum hours available for a regular full-time student.
B. Assist the Company in identifying Student deficiencies or employment problems.
C. Provide instructional support to correct any work deficiencies.
D. Keep the Student informed about changes in the Co-op, Pre-Apprenticeship, or Apprenticeship program plan, such as alternating training times between the College and the workplace.
E. Visit the Student on the job at periodic intervals (Once per Trimester).
F. Maintain all pertinent records relating to this Agreement in the Student's permanent record.
G. After consulting with Company, make exceptions to College's policies and work experiences that could be mutually beneficial to all parties.
H. Endeavor to establish and maintain a good working relationship with the Company.

ARCONIC agrees to collaborate in the following ways:

A. Provide work projects that will contribute to the Student's learning experience and will relate to the Student's technical area.
B. Notify the Instructor of any weaknesses or potential employment problems that the Student may have.
C. Comply with State and Federal employment laws, including Workers Compensation.
D. Allow periodic visitation by the instructor to verify Student progress and to observe the Student on the job.
E. Evaluate the Student's job performance.
F. Provide supervision for the student and provide on-the-job instruction, as needed, including necessary safety instructions.
G. Notify the College of any serious problem, illness, or accident involving the Student.
H. Sign and verify the student's monthly evaluation and work record.
I. Agree to all the terms and conditions of this agreement and other Co-op, Pre-Apprenticeship or Apprenticeship policies provided by College to Company.
J. Employer Partner Responsibilities under the Industry 4.0 Apprenticeship Pathway GIVE 3.0 Grant shall undertake one or more of the following activities (denoted by an "X).

Section 1: NEED	How many job openings will you have in the next four years, including new positions and turnover?	300
Section 2: Program Plan - Work-Based Learning	Development of apprenticeship opportunities	
	Host tours for youth and adult program participants	✓
	Participate in school career exploration events.	✓
	Host teachers in the plant to increase knowledge & Host teachers in the plant to increase knowledge & awareness	✓
	Create internships for students.	
	Donate materials, tools, or equipment to grant	✓
	Interview/hire qualified applicants completing the program	✓
	Participate in Dream it, Do it.	✓
	Participate in Re-Make Learning Days	✓
	Participate in Tommy and Tammie Career Camps	✓
	Match up $500 per Pre-Apprenticeship participant stipend.	
Section 3: Strength of Partnership	Serve on "GIVE 3.0 Industry 4.0 Apprenticeship Pathway Grant" Advisory Council	✓
	Attend Scheduled Meetings (virtually or in person)	✓
Section 4: Budget	Review budget and provide oversight on grant.	✓
Section 5: Sustainability	Employer agrees to hire and pay wages of qualified applicants if the employer has openings.	✓
	Employer agrees to assist with maintenance of training and equipment.	✓
	Upon completion of GIVE 3.0, employers continue to support TCAT Knoxville's programs by being on advisory boards, hiring students, and having a registered apprenticeship program.	✓

IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

1. Modification of roles/responsibilities and the sustainability and scalability of the program are collectively decided by the Core and the Employer partners identified in this MOU.
2. An Employer partner may terminate its relationship with the program with a 30-day written notice to the lead agency or program director. Additional employer partners may be added through signature to this agreement.
3. All partners commit to sustaining the work-based learning model in the proposal and partnership beyond the GIVE 3.0 grant.

EFFECTIVE DATE AND SIGNATURE

This MOU shall be effective upon the signature of the Partners authorized officials. It shall be effective for the duration of the life of the GIVE 3.0 grant: August 1, 2024 - September 30, 2028.

"Grant Name" Partners agree with this MOU by their signatures.

Kelli Chaney

Kelli Chaney
President
Tennessee College of Applied Technology Knoxville

Company

Memorandum of Understanding
Between
TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE and CHEROKEE MILLWRIGHT

Whereas, CHEROKEE MILLWRIGHT and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are developing a long-term regional collaborative that includes higher education, area employers, economic development and workforce agencies, and local/regional K-12 systems.

Whereas, higher education partners include Tennessee College of Applied Technology Knoxville and Pellissippi State Community College, henceforth collectively referred to as "Colleges"; and

Whereas, area employer partners include Cherokee Millwright, Arconic, and Denso, henceforth collectively referred to as "Company"; and

Whereas, Blount Partnership is an economic development and workforce agency; and

Whereas, K-12 partners include Blount County Schools, henceforth referred to as "School"; and

Whereas, CHEROKEE MILLWRIGHT and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in working together to develop and implement a Cooperative Work Program (Co-op), Pre-Apprenticeship, or Apprenticeship Program, which is an integral part of the learning experience provided for students at the Schools and Colleges and is defined as paid or unpaid work-related training received at Company under the terms of a signed Student (Co-op) Work Program Agreement. The Program provides a method of instruction whereby the TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLEs and Company are partners in developing the workforce for tomorrow's technology.

Whereas, it is for the mutual benefit of all parties to provide Co-op, Pre-Apprenticeship, or Apprenticeship work experience for students enrolled in certain programs of the Colleges and Schools, the parties have agreed to the terms and provisions set forth below; and

Whereas, both CHEROKEE MILLWRIGHT and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that business engagement in the education and training of workers is key to successful labor market outcomes and that long-term sustainability planning for successful initiatives and interventions is critical and will continue to serve the community beyond the grant period; and

Whereas, CHEROKEE MILLWRIGHT is in the service area of TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE; and

Whereas, CHEROKEE MILLWRIGHT and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in signing a memorandum of understanding outlining the roles and responsibilities of each organization and partnering to demonstrate interest and capacity for providing TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE students with practical work experience through a Co-op, Pre-Apprenticeship or Apprenticeship Assignment while enrolled in specific programs at TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE.

Whereas, CHEROKEE MILLWRIGHT and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that the Co-op, Pre-Apprenticeship, or Apprenticeship experience shall be provided at the Company's facility located at 1034 Ross Dr, Maryville, TN 37801.

Now, Therefore, each party agrees to the following:

Tennessee College of Applied Technology Knoxville agrees to collaborate in the following ways:

A. Evaluate and assign credit for Co-op, Pre-Apprenticeship, or Apprenticeship work according to the official college calendar, not to exceed the maximum hours available for a regular full-time student.
B. Assist the Company in identifying Student deficiencies or employment problems.
C. Provide instructional support to correct any work deficiencies.
D. Keep the Student informed about changes in the Co-op, Pre-Apprenticeship, or Apprenticeship program plan, such as alternating training times between the College and the workplace.
E. Visit the Student on the job at periodic intervals (Once per Trimester).
F. Maintain all pertinent records relating to this Agreement in the Student's permanent record.
G. After consulting with Company, make exceptions to College's policies and work experiences that could be mutually beneficial to all parties.
H. Endeavor to establish and maintain a good working relationship with the Company.

CHEROKEE MILLWRIGHT agrees to collaborate in the following ways:

A. Provide work projects that will contribute to the Student's learning experience and will relate to the Student's technical area.
B. Notify the Instructor of any weaknesses or potential employment problems that the Student may have.
C. Comply with State and Federal employment laws, including Workers Compensation.
D. Allow periodic visitation by the instructor to verify Student progress and to observe the Student on the job.
E. Evaluate the Student's job performance.
F. Provide supervision for the student and provide on-the-job instruction, as needed, including necessary safety instructions.
G. Notify the College of any serious problem, illness, or accident involving the Student.
H. Sign and verify the student's monthly evaluation and work record.
I. Agree to all the terms and conditions of this agreement and other Co-op, Pre-Apprenticeship or Apprenticeship policies provided by College to Company.
J. Employer Partner Responsibilities under the Industry 4.0 Apprenticeship Pathway GIVE 3.0 Grant shall undertake one or more of the following activities (denoted by an "X).

Section 1: NEED	How many job openings will you have in the next four years, including new positions and turnover?	40
Section 2: Program Plan - Work-Based Learning	Development of apprenticeship opportunities	✓
	Host tours for youth and adult program participants	✓
	Participate in school career exploration events.	✓
	Host teachers in the plant to increase knowledge & Host teachers in the plant to increase knowledge & awareness	✓
	Create internships for students.	✓
	Donate materials, tools, or equipment to grant	✓
	Interview/hire qualified applicants completing the program	✓
	Participate in Dream It, Do it	✓
	Participate in Re-Make Learning Days	✓
	Participate in Tommy and Tammie Career Camps	✓
	Match up $500 per Pre-Apprenticeship participant stipend.	
Section 3: Strength of Partnership	Serve on "GIVE 3.0 Industry 4.0 Apprenticeship Pathway Grant" Advisory Council	✓
	Attend Scheduled Meetings (virtually or in person)	✓
Section 4: Budget	Review budget and provide oversight on grant.	✓
Section 5: Sustainability	Employer agrees to hire and pay wages of qualified applicants if the employer has openings.	
	Employer agrees to assist with maintenance of training and equipment.	✓
	Upon completion of GIVE 3.0, employers continue to support TCAT Knoxville's programs by being on advisory boards, hiring students, and having a registered apprenticeship program.	✓

IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

1. Modification of roles/responsibilities and the sustainability and scalability of the program are collectively decided by the Core and the Employer partners identified in this MOU.
2. An Employer partner may terminate its relationship with the program with a 30-day written notice to the lead agency or program director. Additional employer partners may be added through signature to this agreement.
3. All partners commit to sustaining the work-based learning model in the proposal and partnership beyond the GIVE 3.0 grant.

EFFECTIVE DATE AND SIGNATURE

This MOU shall be effective upon the signature of the Partners authorized officials. It shall be effective for the duration of the life of the GIVE 3.0 grant: August 1, 2024 - September 30, 2028.

"Grant Name" Partners agree with this MOU by their signatures.

Kelli Chaney

Kelli Chaney
President
Tennessee College of Applied Technology Knoxville

DocuSigned by:
Walker, William C.
B4E2335F1A4748A...

Cherokee Millwright
Company

WORK-BASED ACTIVITY AGREEMENT

BETWEEN _____ (Company) AND THE TENNESSEE COLLEGE OF APPLIED TECHNOLOGY-KNOXVILLE

This Work-Based Activity Agreement is made this_____day of_____, by and between _____, hereinafter referred to as the "Company", the TENNESSEE COLLEGE OF APPLIED TECHNOLOGY-KNOXVILLE, hereinafter referred to as the "College" and_____herein referred to as the "Student".

WITNESSETH

Whereas, it is to the mutual benefit of all parties to provide WBA work experience for students enrolled in certain programs of the College, the parties have agreed to the terms and provisions set forth below:

1) Purpose – The purpose of this agreement shall be to provide practical work experience through a WBA assignment to the Student enrolled in the _____ Program at the College.
   a) Consideration for this agreement shall consist of the mutual promises contained herein, the parties agreeing that monetary compensation shall be paid, if appropriate, to the student at a rate commensurate with entry-level employees completing the same task.
   b) The WBA experience shall be provided at the Company's facility located at _____Hereinafter referred to as the "Facility".
2) Term and conditions – Pursuant to the above-stated purpose, the parties agree as follows:
   a) Term – This Agreement shall begin_____. Either party may terminate this agreement upon giving notice to the other party.
   b) Discipline – While participating in the WBA at the Facility, the Student will be subject to the applicable policies of the College and the Company. Each party will be responsible for enforcing all applicable policies.
   c) Specific responsibilities – The following duties shall be the specific responsibility of the designated party:

I) THE STUDENT SHALL:

(1) Complete and submit all forms and reports to the Representative in a timely manner. The signed Work-Based Activity agreement will be given to the Representative before the WBA begins. All other paperwork must be turned in to the Representative **no later than three days** after the end of the WBA or as designated by the Representative.
(2) Notify the Company and the Representative of any planned vacation of absence from work.
(3) Inform the Representative of any problem that occurs while on the WBA.
(4) Pay all fees for the upcoming trimester in accordance with school policy.
(5) Conform to the policies and regulations of the Company and the College.
(6) Notify the Representative immediately if terminated from the WBA by the Company.
(7) Submit any changes in the work schedule to the representative for approval.
(8) Purchase any supplies, tools, etc., as required by the Company.

II) THE COMPANY SHALL:

(1) Provide work projects that will contribute to the Student's learning experience and will relate to the Student's technical area.
(2) Notify the Representative of any weakness or potential employment problems that the Student may have.
(3) Comply with state and federal employment laws.
(4) Notwithstanding anything in the Agreement to the contrary, provide Workman's Compensation coverage for the Student if the Work-Based Activity is a paid experience.

(5) Allow visitation by the Representative, if needed, to verify Student progress and to observe the Student on the job.
(6) Provide supervision for the Student and provide on-the-job instruction, as needed, including necessary safety instructions.
(7) Notify the Representative of any serious problems, illness, or accident involving the Student.
(8) Verify the Student's work-based activity education summary and time record.

III) THE REPRESENTATIVE ACTING ON BEHALF OF THE COLLEGE AGREES TO:

(1) Evaluate and assign credit for WBA work according to the official College calendar, not to exceed the maximum hours available for a regular full-time student.
(2) Keep the Student informed about changes in the WBA program.
(3) Maintain contact with the Company as needed.
(4) Maintain each participating Student of the program roll until such time the Student withdraws or is separated from the college.
(5) Endeavor to establish and maintain a good working relationship with the Company.
(6) The College reserves the right to make exceptions to the WBA Policy and the Student Eligibility Policy that are mutually beneficial and agreeable to all parties.

IV) MUTUAL RESPONSIBILITIES – THE PARTIES SHALL COOPERATE TO FULFILL THE MUTUAL RESPONSIBILITIES:

(1) Each party shall comply with all federal, state, and municipal laws, advice, rules, and regulations applicable to this Agreement's performance.
(2) The Student shall be treated as a trainee who has no expectation of receiving future employment from the Company or the College.
(3) The parties agree to comply with Titles VI and VII, the Civil Rights Act of 1964, Title IX of the Education Amendment of 1972, Section 504 of the Rehabilitation Act of 1973, Executive Order 11.246, and the related regulations to each. Each party assures that it will not discriminate against any individual including, but not limited to, employees, or applications for employment and/or students because of race, religion, creed, color, sex, age, handicap, veteran's status or national origin.

3) Miscellaneous Terms – The following terms shall apply in the interpretation and performance of this Agreement.
   a) Neither party shall be responsible for personal injury or property damage or losses except that resulting from its own negligence of its employees or from others from whom the party is legally responsible.
   b) The delay or failure of performance by either party shall not constitute default under the terms of this agreement, nor shall it give rise to any claims against either party for damages. The sole remedy for breach of the Agreement shall be immediate termination.

Student_____ Date_____

Signature

College Representative_____ Date_____

Signature

Company_____ Date_____

Signature

Memorandum of Understanding
Between
TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE and DENSO MANUFACTURING TENNESSEE, INC.

Whereas, DENSO MANUFACTURING TENNESSEE, INC. and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are developing a long-term regional collaborative that includes higher education, area employers, economic development and workforce agencies, and local/regional K-12 systems.

Whereas, higher education partners include Tennessee College of Applied Technology Knoxville and Pellissippi State Community College, henceforth collectively referred to as "Colleges"; and

Whereas, area employer partners include DENSO MANUFACTURING TENNESSEE, INC. , Arconic, and Cherokee Millwright, henceforth collectively referred to as "Company"; and

Whereas, Blount Partnership is an economic development and workforce agency; and

Whereas, K-12 partners include Blount County Schools, henceforth referred to as "School"; and

Whereas, DENSO MANUFACTURING TENNESSEE, INC. and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in working together to develop and implement a Cooperative Work Program (Co-op), Pre-Apprenticeship, or Apprenticeship Program, which is an integral part of the learning experience provided for students at the Schools and Colleges and is defined as paid or unpaid work-related training received at Company under the terms of a signed Student (Co-op) Work Program Agreement. The Program provides a method of instruction whereby the TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLEs and Company are partners in developing the workforce for tomorrow's technology.

Whereas, it is for the mutual benefit of all parties to provide Co-op, Pre-Apprenticeship, or Apprenticeship work experience for students enrolled in certain programs of the Colleges and Schools, the parties have agreed to the terms and provisions set forth below; and

Whereas, both DENSO MANUFACTURING TENNESSEE, INC. and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that business engagement in the education and training of workers is key to successful labor market outcomes and that long-term sustainability planning for successful initiatives and interventions is critical and will continue to serve the community beyond the grant period; and

Whereas, DENSO MANUFACTURING TENNESSEE, INC. is in the service area of TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE; and

Whereas, DENSO MANUFACTURING TENNESSEE, INC. and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE are interested in signing a memorandum of understanding outlining the roles and responsibilities of each organization and partnering to demonstrate interest and capacity for providing TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE students with practical work experience through a Co-op, Pre-Apprenticeship or Apprenticeship Assignment while enrolled in specific programs at TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE.

Whereas, DENSO MANUFACTURING TENNESSEE, INC. and TENNESSEE COLLEGE OF APPLIED TECHNOLOGY KNOXVILLE recognize that the Co-op, Pre-Apprenticeship, or Apprenticeship experience shall be provided at the Company's facility located at 1720 Robert C. Jackson Drive, Maryville, TN 37801.

Now, Therefore, each party agrees to the following:

Tennessee College of Applied Technology Knoxville agrees to collaborate in the following ways:

A. Evaluate and assign credit for Co-op, Pre-Apprenticeship, or Apprenticeship work according to the official college calendar, not to exceed the maximum hours available for a regular full-time student.
B. Assist the Company in identifying Student deficiencies or employment problems.
C. Provide instructional support to correct any work deficiencies.
D. Keep the Student informed about changes in the Co-op, Pre-Apprenticeship, or Apprenticeship program plan, such as alternating training times between the College and the workplace.
E. Visit the Student on the job at periodic intervals (Once per Trimester).
F. Maintain all pertinent records relating to this Agreement in the Student's permanent record.
G. After consulting with Company, make exceptions to College's policies and work experiences that could be mutually beneficial to all parties.
H. Endeavor to establish and maintain a good working relationship with the Company.

DENSO MANUFACTURING TENNESSEE, INC. agrees to collaborate in the following ways:

A. Provide work projects that will contribute to the Student's learning experience and will relate to the Student's technical area.
B. Notify the Instructor of any weaknesses or potential employment problems that the Student may have.
C. Comply with State and Federal employment laws, including Workers Compensation.
D. Allow periodic visitation by the instructor to verify Student progress and to observe the Student on the job.
E. Evaluate the Student's job performance.
F. Provide supervision for the student and provide on-the-job instruction, as needed, including necessary safety instructions.
G. Notify the College of any serious problem, illness, or accident involving the Student.
H. Sign and verify the student's monthly evaluation and work record.
I. Agree to all the terms and conditions of this agreement and other Co-op, Pre-Apprenticeship or Apprenticeship policies provided by College to Company.
J. Employer Partner Responsibilities under the Industry 4.0 Apprenticeship Pathway GIVE 3.0 Grant shall undertake one or more of the following activities (denoted by an "X).

Section 1: NEED	How many job openings will you have in the next four years, including new positions and turnover?	TBD
Section 2: Program Plan - Work-Based Learning	Development of apprenticeship opportunities	
	Host tours for youth and adult program participants	✓
	Participate in school career exploration events.	✓
	Host teachers in the plant to increase knowledge & Host teachers in the plant to increase knowledge & awareness	✓
	Create internships for students.	TBD
	Donate materials, tools, or equipment to grant	
	Interview/hire qualified applicants completing the program	TBD
	Participate in Dream It, Do it	
	Participate in Re-Make Learning Days	
	Participate in Tommy and Tammie Career Camps	
	Match up $500 per Pre-Apprenticeship participant stipend.	
Section 3: Strength of Partnership	Serve on "GIVE 3.0 Industry 4.0 Apprenticeship Pathway Grant" Advisory Council	
	Attend Scheduled Meetings (virtually or in person)	
Section 4: Budget	Review budget and provide oversight on grant.	
Section 5: Sustainability	Employer agrees to hire and pay wages of qualified applicants if the employer has openings.	✓
	Employer agrees to assist with maintenance of training and equipment.	✓
	Upon completion of GIVE 3.0, employers continue to support TCAT Knoxville's programs by being on advisory boards, hiring students, and having a registered apprenticeship program.	

IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

1. Modification of roles/responsibilities and the sustainability and scalability of the program are collectively decided by the Core and the Employer partners identified in this MOU.
2. An Employer partner may terminate its relationship with the program with a 30-day written notice to the lead agency or program director. Additional employer partners may be added through signature to this agreement.
3. All partners commit to sustaining the work-based learning model in the proposal and partnership beyond the GIVE 3.0 grant.

EFFECTIVE DATE AND SIGNATURE

This MOU shall be effective upon the signature of the Partners authorized officials. It shall be effective for the duration of the life of the GIVE 3.0 grant: August 1, 2024 - September 30, 2028.

"Grant Name" Partners agree with this MOU by their signatures.

Kelli Chaney 4/30/2024

Kelli Chaney
President
Tennessee College of Applied Technology Knoxville

Bryan Smith 4/30/24

Bryan Smith
Denso Manufacturing, Inc.

WORK-BASED ACTIVITY AGREEMENT

BETWEEN _____ (Company) AND THE TENNESSEE COLLEGE OF APPLIED TECHNOLOGY-KNOXVILLE

This Work-Based Activity Agreement is made this_____day of_____, by and between _____, hereinafter referred to as the "Company", the TENNESSEE COLLEGE OF APPLIED TECHNOLOGY-KNOXVILLE, hereinafter referred to as the "College" and_____herein referred to as the "Student".

WITNESSETH

Whereas, it is to the mutual benefit of all parties to provide WBA work experience for students enrolled in certain programs of the College, the parties have agreed to the terms and provisions set forth below:

1) Purpose – The purpose of this agreement shall be to provide practical work experience through a WBA assignment to the Student enrolled in the _____ Program at the College.
   a) Consideration for this agreement shall consist of the mutual promises contained herein, the parties agreeing that monetary compensation shall be paid, if appropriate, to the student at a rate commensurate with entry-level employees completing the same task.
   b) The WBA experience shall be provided at the Company's facility located at _____Hereinafter referred to as the "Facility".
2) Term and conditions – Pursuant to the above-stated purpose, the parties agree as follows:
   a) Term – This Agreement shall begin_____. Either party may terminate this agreement upon giving notice to the other party.
   b) Discipline – While participating in the WBA at the Facility, the Student will be subject to the applicable policies of the College and the Company. Each party will be responsible for enforcing all applicable policies.
   c) Specific responsibilities – The following duties shall be the specific responsibility of the designated party:

I) THE STUDENT SHALL:

(1) Complete and submit all forms and reports to the Representative in a timely manner. The signed Work-Based Activity agreement will be given to the Representative before the WBA begins. All other paperwork must be turned in to the Representative **no later than three days** after the end of the WBA or as designated by the Representative.
(2) Notify the Company and the Representative of any planned vacation of absence from work.
(3) Inform the Representative of any problem that occurs while on the WBA.
(4) Pay all fees for the upcoming trimester in accordance with school policy.
(5) Conform to the policies and regulations of the Company and the College.
(6) Notify the Representative immediately if terminated from the WBA by the Company.
(7) Submit any changes in the work schedule to the representative for approval.
(8) Purchase any supplies, tools, etc., as required by the Company.

II) THE COMPANY SHALL:

(1) Provide work projects that will contribute to the Student's learning experience and will relate to the Student's technical area.
(2) Notify the Representative of any weakness or potential employment problems that the Student may have.
(3) Comply with state and federal employment laws.
(4) Notwithstanding anything in the Agreement to the contrary, provide Workman's Compensation coverage for the Student if the Work-Based Activity is a paid experience.

(5) Allow visitation by the Representative, if needed, to verify Student progress and to observe the Student on the job.
(6) Provide supervision for the Student and provide on-the-job instruction, as needed, including necessary safety instructions.
(7) Notify the Representative of any serious problems, illness, or accident involving the Student.
(8) Verify the Student's work-based activity education summary and time record.

III) THE REPRESENTATIVE ACTING ON BEHALF OF THE COLLEGE AGREES TO:

(1) Evaluate and assign credit for WBA work according to the official College calendar, not to exceed the maximum hours available for a regular full-time student.
(2) Keep the Student informed about changes in the WBA program.
(3) Maintain contact with the Company as needed.
(4) Maintain each participating Student of the program roll until such time the Student withdraws or is separated from the college.
(5) Endeavor to establish and maintain a good working relationship with the Company.
(6) The College reserves the right to make exceptions to the WBA Policy and the Student Eligibility Policy that are mutually beneficial and agreeable to all parties.

IV) MUTUAL RESPONSIBILITIES – THE PARTIES SHALL COOPERATE TO FULFILL THE MUTUAL RESPONSIBILITIES:

(1) Each party shall comply with all federal, state, and municipal laws, advice, rules, and regulations applicable to this Agreement's performance.
(2) The Student shall be treated as a trainee who has no expectation of receiving future employment from the Company or the College.
(3) The parties agree to comply with Titles VI and VII, the Civil Rights Act of 1964, Title IX of the Education Amendment of 1972, Section 504 of the Rehabilitation Act of 1973, Executive Order 11.246, and the related regulations to each. Each party assures that it will not discriminate against any individual including, but not limited to, employees, or applications for employment and/or students because of race, religion, creed, color, sex, age, handicap, veteran's status or national origin.

3) Miscellaneous Terms – The following terms shall apply in the interpretation and performance of this Agreement.
   a) Neither party shall be responsible for personal injury or property damage or losses except that resulting from its own negligence of its employees or from others from whom the party is legally responsible.
   b) The delay or failure of performance by either party shall not constitute default under the terms of this agreement, nor shall it give rise to any claims against either party for damages. The sole remedy for breach of the Agreement shall be immediate termination.

Student_____ Date_____

Signature

College Representative_____ Date_____

Signature

Company_____ Date_____

Signature