



OFFICE OF RESEARCH AND EDUCATION ACCOUNTABILITY

WORKFORCE ALIGNMENT IN TENNESSEE



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JAYMI THIBAUT
Legislative Research Analyst

LAUREN SPIRES
Principal Legislative Research Analyst



JASON E. MUMPOWER
Comptroller of the Treasury

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Introduction

Workforce alignment occurs when the supply of qualified workers matches up with employers' demands

Over the past decade, Tennessee has undertaken various initiatives to promote workforce alignment. Workforce alignment occurs when the supply of qualified workers matches up with employers' demands. In other words, workforce alignment ensures that workers across the state have the skills and qualifications that employers are looking for and can pursue meaningful careers within their chosen field. Workforce alignment is often used synonymously with the terms labor market alignment or workforce development, though it encompasses more than just education, training, and professional development.



When the workforce has strong alignment between its employers and employees, businesses are incentivized to invest or expand in Tennessee knowing their needs can be met. Further, Tennesseans are empowered to pursue postsecondary credentials or other certifications because relevant job opportunities will be available to them.

Throughout this report, it is important to note that workforce alignment varies across different fields and industries and can change rapidly in response to current events. The COVID-19 pandemic, for instance, has increased the demand for medical scientists, and the Bureau of Labor Statistics predicts that employment of medical scientists will grow 17 percent from 2020 to 2030.^A

This report is divided into three sections:

- Section 1 provides an overview of workforce alignment in Tennessee, including recent initiatives to align employer demand with the supply of labor, the various state agencies involved in this work, and some examples of how the state responds to notable events like labor shortages and major business investments.
- Section 2 contains an evaluation of workforce alignment in Tennessee, using high-demand occupation data provided by the Tennessee Department of Economic and Community Development (TNECD) and data for degrees and certificates awarded from the Tennessee Higher Education Commission (THEC).
- Section 3 includes policy options to improve workforce alignment in Tennessee.

^A Bureau of Labor Statistics, Occupational Outlook Handbook: Medical Scientists, <https://www.bls.gov/ooh/life-physical-and-social-science/medical-scientists.htm>.

Section 1: An overview of workforce alignment in Tennessee

The focus of this report is primarily state-level programs and initiatives at the postsecondary level, although some workforce alignment efforts can start in elementary or middle school with career exposure experiences for students. While Tennessee's efforts to align the workforce have been ongoing for many years, this report focuses on the state's more recent efforts, specifically those in the past decade. Further, while private employers can initiate their own workforce alignment-related efforts, this report focuses primarily on efforts initiated by the state government. Although they may be mentioned briefly in conjunction with public initiatives, private efforts fall outside of this report's scope.

Workforce alignment has been and continues to be a state priority

Workforce alignment was a key priority of the Haslam Administration. In 2013, then-Governor Bill Haslam emphasized the need to “match the skills we’re teaching students with the real-life skills that employers are looking for to fill jobs.”^B He met with various employers and educators across the state to discuss ways of improving workforce alignment. Haslam also launched the Drive to 55 initiative, which seeks to raise the number of Tennesseans with a postsecondary credential to 55 percent by 2025. In his 2014 State-of-the-State Address, Haslam stated that a key goal of the Drive to 55 is tying education directly to workforce needs.

Governor Bill Lee has continued to focus on workforce development as one of his administration's priorities. In 2019, he announced several initiatives related to workforce alignment and career readiness, including the Governor's Investment in Vocational Education (GIVE) and the Future Workforce Initiative. These initiatives provide K-12 students with early postsecondary opportunities, such as new programs that allow students to explore science, technology, engineering, and math fields; increase access to Advanced Placement courses and dual enrollment; and provide more training to increase the number of teachers qualified to teach work-based learning courses. GIVE also provides opportunities for institutions to offer work-based learning experiences, purchase industry-caliber equipment, and award industry-recognized certifications. In 2020, Governor Lee announced the launch of 28 new work-based learning programs, an apprenticeship program called ApprenticeshipTN, and enhanced incentive packages for companies planning to locate in Tennessee's distressed and at-risk counties. See Appendix A for a list of initiatives related to workforce alignment that the state has implemented over the past decade.

“Tennessee must deliver a world class education and that education must be aligned with the needs of the job creators of today and tomorrow.”

- Governor Bill Lee
2019 State of the State Address

Multiple state agencies are involved in workforce alignment efforts

Many state agencies play a role when it comes to workforce alignment efforts in Tennessee. In 2021, OREA interviewed staff from eight state agencies and state-focused organizations to gain a better sense of each agency's workforce alignment responsibilities. The following overview of agencies is meant to highlight some of the state's leaders in the workforce alignment sphere. It is not intended to be an exhaustive list of organizations involved in workforce-related efforts.

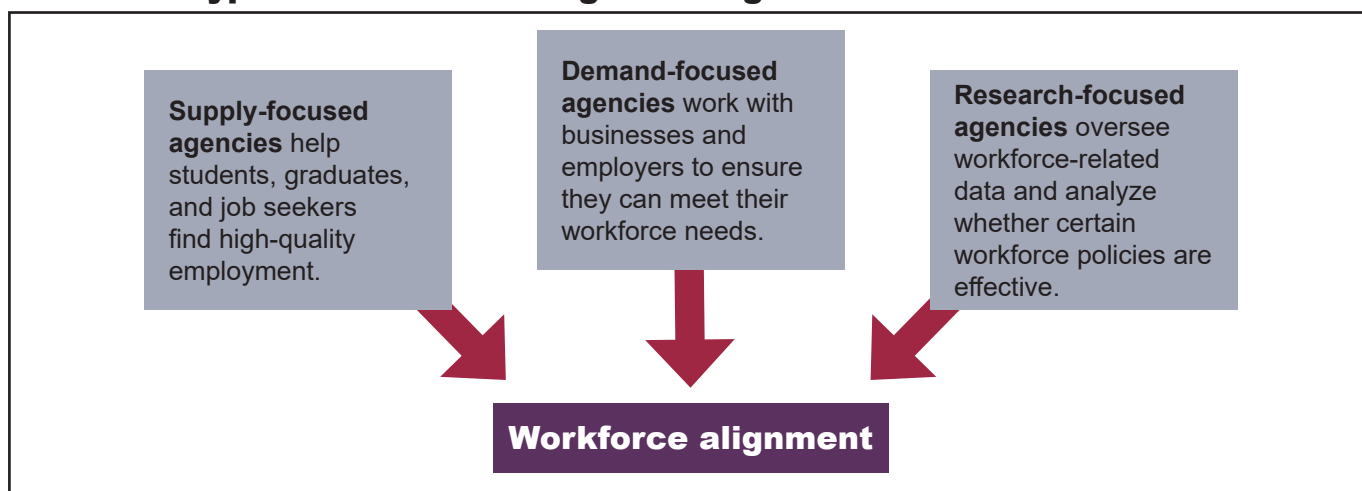
^B Gov. Bill Haslam, State of the State Address, “Why Tennessee is Different,” January 28, 2013, https://www.tn.gov/content/dam/tn/governorsoffice-documents/governorsoffice-documents/2013_State_of_the_State_Address.pdf.

The agencies in this section are organized into three distinct categories:

- **supply-focused agencies:** tend to work with students, graduates, and job seekers to ensure they find high-quality employment;
- **demand-focused agencies:** tend to work more closely with businesses and employers to ensure they can meet their workforce needs; and
- **research-focused agencies:** oversee data related to workforce alignment and analyze whether certain workforce policies are effective.

While OREA assigned agencies to the category that best fits their role within the workforce alignment sphere, there was considerable overlap across categories because agencies fulfill a variety of responsibilities. For example, while TNECD is categorized as a demand-focused agency, it also has a research-focused branch called the Center for Economic Research in Tennessee.

Exhibit 1: Types of workforce alignment agencies



Supply-focused agencies work with students, graduates, and job seekers to ensure they find high-quality employment

TDOE oversees K-12 education

The Tennessee Department of Education (TDOE) oversees 147 county, city, and special school districts. TDOE's related responsibilities include preparing students to enter the workforce (or pursue postsecondary education) after graduating from high school. TDOE seeks to accomplish this goal by providing students with meaningful early postsecondary opportunities or career exploration opportunities (such as career and technical education, apprenticeships, and work-based learning). In July 2022, TDOE announced that it would award \$2.9 million in Perkins Reserve Grants to 44 school districts to support the implementation of career and technical education programs and career pathways.

"We provide the talent. We build the capacity to prepare them, then they take the opportunities."

- OREA interview with TDOE,
August 2021

THEC coordinates the state's public higher education institutions and systems

THEC oversees and coordinates the state's public higher education institutions and systems, including the Tennessee Board of Regents (TBR), the University of Tennessee System, and the six locally governed institutions (LGIs). While THEC's mission is to increase the number of Tennesseans with a postsecondary credential, the agency is also responsible for ensuring that Tennessee's higher education system prepares

graduates for high-demand jobs. THEC works with industry leaders and other state agencies “to identify the knowledge and skills that will best support Tennessee’s economy.”^C THEC’s 2020 Master Plan established a goal of increasing the proportion of students enrolling in high-need degree programs by at least 5 percent annually over the next five years.

According to statute, THEC is responsible for approving new academic programs for all public higher education institutions, although TCAT programs are exempted by this statute and are approved instead by TBR (see the following section for more information).^D For a new program to be approved by THEC, institutions must conduct a feasibility study to demonstrate that the new program will fulfill student demand and employer need. Institutions must provide THEC with supporting documentation of program need as well as documentation that employment opportunities for graduates will exist. The process typically involves discussions with industry leaders, review of academic supply and occupational demand data, and student surveys. Newly approved academic programs are closely monitored and evaluated for a set period of time depending on the type of program (three years for pre-bachelor’s programs, five years for bachelor’s and master’s programs, and seven years for doctoral programs).^E

TBR oversees the state’s community and technical colleges

TBR oversees the operations of the state’s 13 community colleges and 26 Tennessee colleges of applied technology (TCATs). TBR institutions offer technical diplomas and certificates as well as associate degrees. TBR “seeks to raise the education and skill levels in Tennessee through quality programs and services, efficiently delivered.”^F TBR institutions serve a wide range of demographics, from students who have just graduated from high school to adults who have been out of school for decades.

“TBR is creating on-ramps for folks to get prepared for work.”

- OREA interview with TBR, September 2021

TBR is responsible for approving new academic programs for TCATs. TBR follows new academic program approval standards similar to those of THEC. Each TCAT also has its own advisory board or advisory committee; members assess the needs of students and local industry, and their goal is to help the TCAT develop new programs while also remaining current in established programs.

The Tennessee Department of Labor and Workforce Development provides services to job seekers

The Tennessee Department of Labor and Workforce Development (TDLWD) offers job seekers a variety of employment and educational services. TDLWD oversees the Jobs4TN website, Adult Education, and the state Unemployment Insurance program, among other programs and initiatives. The department also administers grant funding, including federal workforce development grants and funding for the state’s nine regional workforce boards.

“Our end goal is to make sure people can get a job. Whether it’s a traditional high school student or someone else – we make sure they are prepared and going into an opportunity that’s not a dead end... We do a lot of work with incarcerated people, military veterans, etc.”

- OREA interview with TDLWD, August 2021

^C Tennessee Higher Education Commission, *Enabling the Competitive Edge: Tennessee Higher Education in the New Economy*, Master Plan Update, 2020, <https://files.eric.ed.gov/fulltext/ED608937.pdf>.

^D Tennessee Board of Regents, “Approval of Academic Programs, Units, and Modifications: 2.01.01.00,” <https://policies.tbr.edu/policies/approval-academic-programs-units-and-modifications>.

^E Tennessee Higher Education Commission, “New Academic Programs: Approval Process,” Policy A-10, amended Jan. 25, 2019, https://www.tn.gov/content/dam/tn/the/bureau/aa/academic-programs/program-approv/aca-pol/THEC%20A1.0%20Program%20Approval%20New%20Programs%20Policy_Comm%20Amendment%20Jan%2025%202019.pdf.

^F Tennessee Board of Regents, “The TBR Syllabus,” <https://www.tbr.edu/board/tbr-syllabus>.

TDLWD oversees 32 American Job Centers across the state, which offer services, workshops, training, and free internet access to job seekers. The department also has six mobile American Job Centers that serve targeted communities with company hiring events, job fairs, and community events.

While TDLWD is categorized as a demand-focused agency for the purposes of this report, the department has a Workforce Services division that works closely with employers to assess their needs and assist in recruiting trained workers, such as for the Blue Oval project in West Tennessee. The department also has a research arm called the Workforce Insights, Research, and Reporting Engine Division (WIRED). WIRED contracts with the federal Bureau of Labor Statistics to carry out programs in Tennessee and produces industry and occupational projections.

Demand-focused agencies work with businesses and employers to ensure they can meet their workforce needs

The Tennessee Chamber of Commerce and Industry serves as a voice for businesses

The Tennessee Chamber of Commerce and Industry is a trade association that represents business and manufacturing interests on policy issues involving employment or economics.^G The chamber advocates for its members while also helping businesses understand Tennessee's regulatory environment. One of the chamber's priorities is ensuring that businesses have a well-trained workforce to meet their needs. The chamber seeks to accomplish this goal by supporting policies that "set a firm academic foundation for postsecondary success and career-ready knowledge and skills."^H The Tennessee Chamber of Commerce and Industry operates at the state level, although regions and counties throughout Tennessee have their own local chambers of commerce.

"I meet with industry leaders first, and [...] find out their specific needs. Then I meet with schools to see how they can align their programs to fulfill those needs."

- OREA interview with Tennessee Chamber of Commerce and Industry, September 2021

TNECD promotes business investment and expansion

TNECD aims to support job creation and capital investment through its FastTrack grant program. FastTrack grants are the state's primary discretionary grants awarded to eligible businesses for the creation of private sector jobs. TNECD's vision is for Tennessee to be the top-ranking state in the Southeast for high-quality jobs. To accomplish this, the FastTrack grant program provides funding for training, public infrastructure, and economic development. From 2016 through 2021, TNECD allocated, and in some cases executed and reimbursed, \$744 million in FastTrack grants to companies across the state that have committed to create jobs and investment in the private sector.^I

"Regional players and project managers [at TNECD] connect companies to different state agencies. The [Center for Economic Research in Tennessee] also has dashboards [that] help show where businesses have landed, what industry they are in, and a timeline of job commitments and when they will be filled."

- OREA interview with TNECD, August 2021

^G The organization is commonly referred to as the Tennessee Chamber of Commerce and Industry, but its full name is the Tennessee Chamber of Commerce and Industry/Tennessee Manufacturers Association.

^H Tennessee Chamber of Commerce and Industry, *Workforce & Education: Enhancing Tennessee's Workforce to Ensure Career-Readiness*, n.d., <https://tnchamber.org/work/workforce-education>.

^I Tennessee Department of Economic and Community Development, "Select Tennessee by the Numbers," 2016-2022, https://tnecd.com/wp-content/uploads/2020/11/SelectTN_One-Sheet-2.pdf.

TNECD also works with prospective businesses to inform them of an area's demographics and relevant talent. TNECD's Property Evaluation Program assesses a county's inventory of industrial sites and existing buildings from Austin Consulting, a consulting firm that specializes in site selection. These site evaluations help counties identify properties where investment may be most beneficial and what steps may be needed to address issues and shortcomings. TNECD evaluated 265 sites between 2016 and 2021. Beyond this, TNECD conducts research in collaboration with other departments related to economic development and identifying gaps in the state's workforce.

Research-focused agencies oversee workforce-related data and analyze whether certain workforce policies are effective

The Office of Evidence and Impact encourages state agencies to use data

The Office of Evidence and Impact (OEI) of the Tennessee Department of Finance and Administration was established in 2019. OEI encourages policymakers to use data and evidence when making decisions that will impact Tennesseans. Under the advisement of the Office of the Governor, OEI oversees which organizations have access to the state's longitudinal data system (often referred to as the P20 Connect TN data system), which is housed in the state's analytic data hub, TN DATA (Data Analytics for Transparency and Accountability). The data system combines K-12 data, higher education data, and employment data. In addition, OEI develops various reports and datasets to meet the needs of other state agencies and works with agencies to help them know and understand the data.¹

"We see our role as [creating] conditions for agencies to access [data] and answer questions and increase their analytical capacity."

- OREA interview with OEI,
August 2021

The Boyd Center for Business and Economic Research studies economic trends in Tennessee

The Boyd Center for Business and Economic Research (CBER) is a research organization at the University of Tennessee, Knoxville's Haslam College of Business. The Boyd Center researches and analyzes various policies related to workforce development and alignment.

The Boyd Center conducts research in several fields, including economic development, taxation, health, and education. To develop new research projects related to education, the Boyd Center collaborates with state education agencies (namely THEC and TDOE).

"The Boyd Center fits into the workforce alignment pipeline as researchers [watching] policy develop and [we] retrospectively try to understand the effect of different policies."

- OREA interview with the Boyd Center for Business and Economic Research, August 2021

¹ See the following websites for more information: <https://www.tn.gov/finance/oei/about-us.html>.

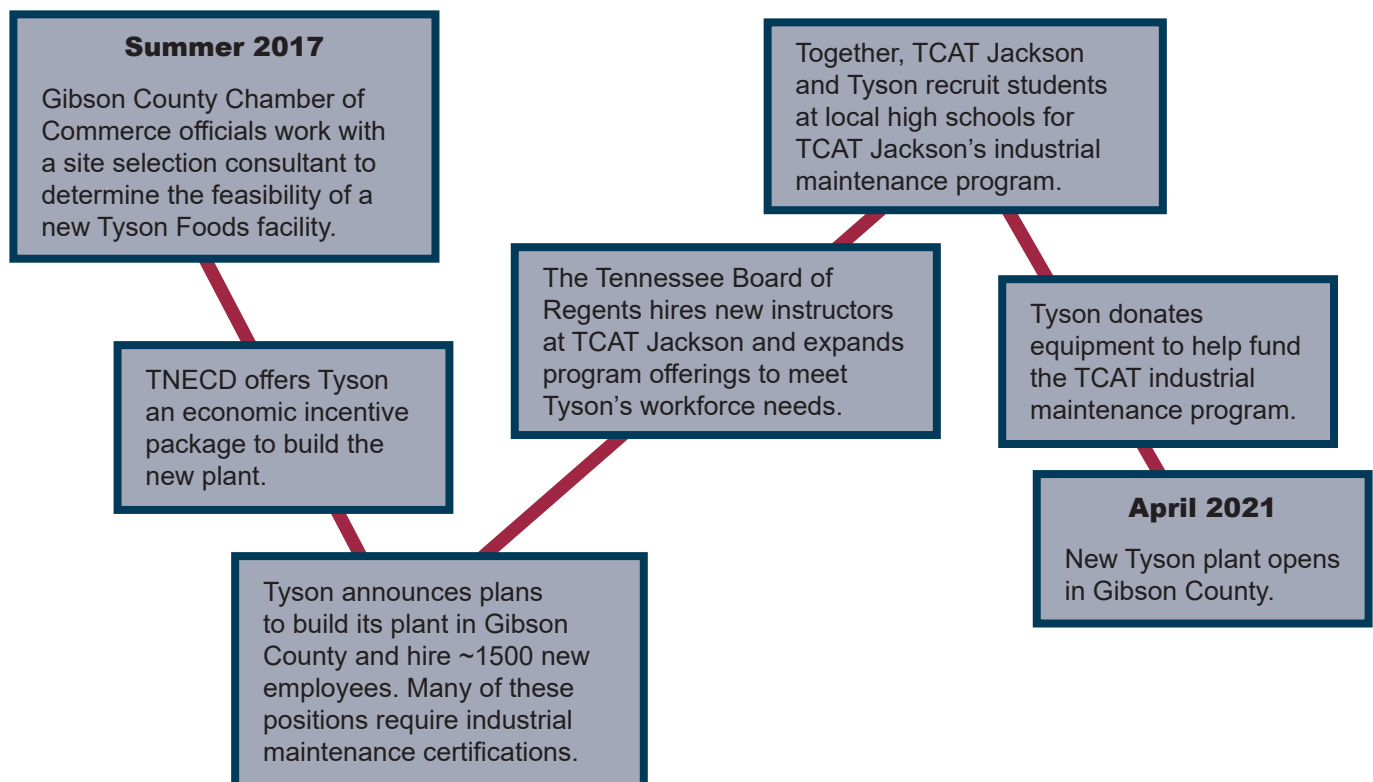
Workforce alignment agencies in practice

Workforce alignment requires strong interagency cooperation and communication. Tennessee's state agencies work together to ensure that businesses have a supply of skilled workers, while also ensuring that Tennesseans have the resources they need to find high-quality employment.

One recent example of workforce alignment in practice was the planning involved with a new Tyson Foods plant in Humboldt, Tennessee (about 100 miles northeast of Memphis). As shown in Exhibit 2, the Gibson County Chamber of Commerce, TNECD, and TBR worked together between 2017 and 2021 to ensure that Tyson's workforce needs were met.

The process began in summer 2017 when the Gibson County Chamber of Commerce studied the feasibility of building a new Tyson Foods plant in Humboldt. TNECD offered Tyson an economic incentive package of \$20 million in grant funds to build the plant. That November, Tyson announced official plans to build the plant in Humboldt and hire roughly 1,500 new employees. As the plant's anticipated opening date drew closer, Tyson worked with state agencies to ensure that the plant would have an adequate supply of qualified employees. The Tennessee Board of Regents hired new instructors at TCAT Jackson, which is roughly 30 minutes away from the Humboldt plant, and expanded the TCAT's program offerings. Meanwhile, Tyson provided equipment for the TCAT's new industrial maintenance program and helped recruit new students. The plant opened in April 2021.

Exhibit 2: Tyson Foods plant workforce alignment efforts | 2017-2021

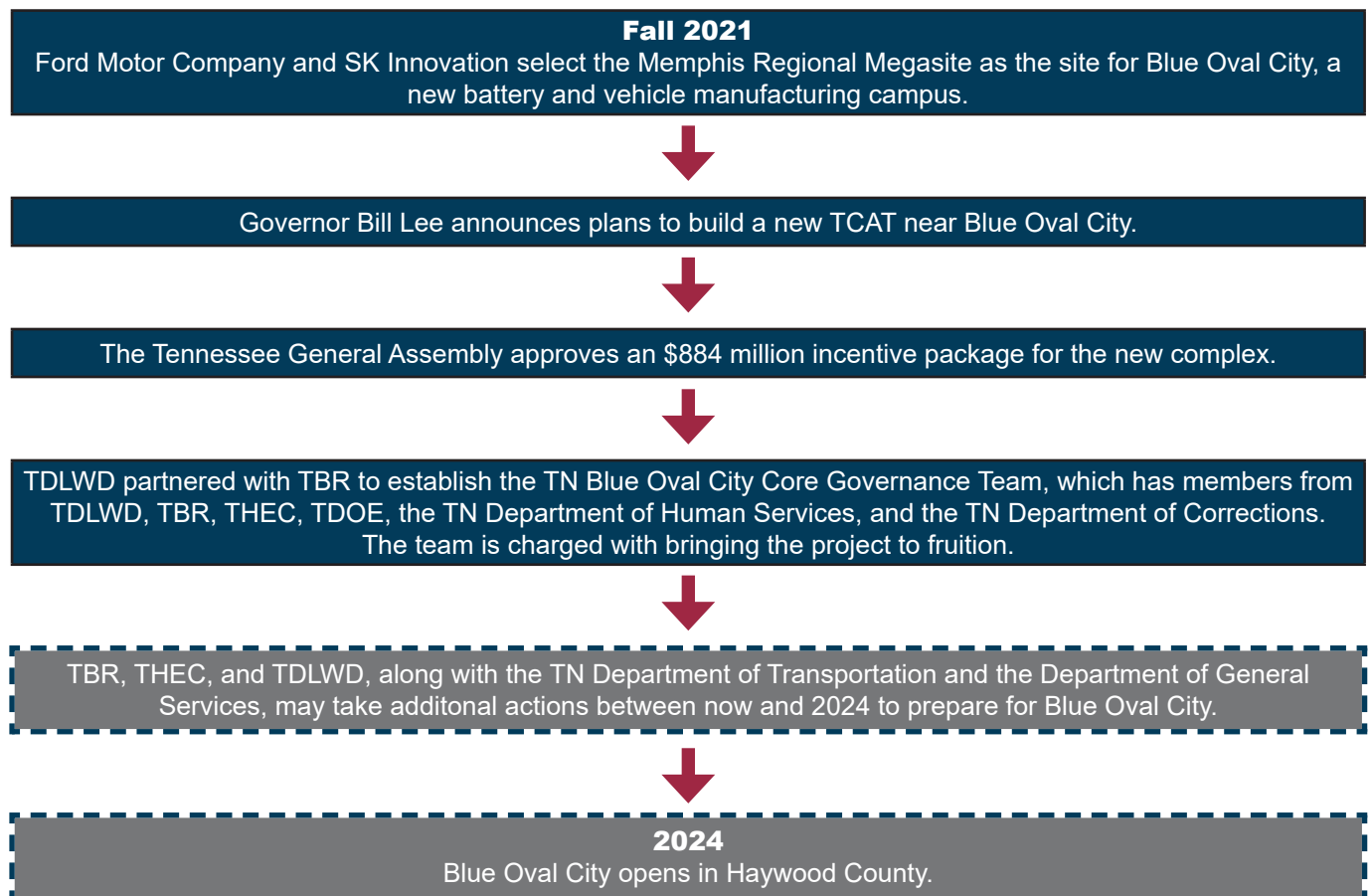


Ford Motor Company and SK Innovation are currently undergoing a similar process with the construction and planning of their automotive assembly complex known as "Blue Oval City." Exhibit 3 shows some of the preparatory steps taken by state agencies so far.

In September 2021, Governor Bill Lee announced that Ford Motor Company selected the Memphis Regional Megasite for one of the largest battery and vehicle manufacturing campuses in the U.S. A megasite is a large area of land that is as close to “shovel-ready” as possible, meaning it is at a stage where workers can be employed and construction can begin. Megasites are choice locations for economic and industrial investment. Shortly after, Governor Lee announced plans to build a new TCAT near the megasite, which was nicknamed “Blue Oval City.”^K In October 2021, the General Assembly approved an \$884 million incentive package for Ford that contains a \$500 million capital grant overseen by the State Building Commission and the Megasite Authority of West Tennessee. Following the governor’s announcement, TDLWD partnered with TBR to establish the TN Blue Oval City Core Governance Team, which will work closely with Ford to bring the project to fruition. The team includes members from the following agencies: TDLWD, TBR, THEC, TDOE, the Tennessee Department of Human Services, and the Tennessee Department of Corrections.

Since the plant is scheduled to be under construction until its opening in 2024, further workforce alignment efforts will likely be implemented later, as depicted by the dashed boxes in Exhibit 3.

Exhibit 3: Blue Oval City workforce alignment efforts | 2021-present



^K Tennessee Office of the Governor, “Gov. Lee Announces Landmark Workforce Development Partnership Between Tennessee College of Applied Technology and Ford,” September 28, 2021. <https://www.tn.gov/governor/news/2021/9/28/gov-lee-announces-landmark-workforce-development-partnership-between-tennessee-college-of-applied-technology-and-ford-.html>.

Workforce alignment initiatives can target specific fields, such as teaching and nursing

Many state-level initiatives promote the broad concept of aligning students to high-need careers without targeting one particular field. The Tennessee Pathways program, for example, was jointly administered by TDOE and TBR starting in 2018 and was intended to accelerate student progress toward an industry or postsecondary credential. The Pathways program provided students with college and career advisement throughout K-12 and early postsecondary and work-based learning opportunities in high school. While the Pathways program was discontinued in 2022, TDOE intends to continue similar collaborative efforts with TBR through its College, Career and Technical Education division.

Similarly, the Governor's Investment in Vocational Education (GIVE) Community Grants facilitate the alignment of local workforce and education partners through a competitive grant process overseen by THEC. The grants, totaling \$25 million per round, are awarded to partnerships between TCATs or community colleges, industry, economic development agencies, and K-12 districts to identify and address skills gaps in the workforce. As of 2022 there have been two rounds of GIVE Community Grants; the first round of contracts began in 2019 and will conclude in December 2022, while the second round of contracts began in 2021 and will conclude in 2024.

Exhibit 4: TN Pathways and GIVE Community Grants are examples of broad workforce alignment efforts

| Initiative | Tennessee Pathways | GIVE Community Grants |
|----------------------------|--|---|
| Overseeing agency/agencies | TDOE, TBR | THEC, Office of the Governor |
| Year established | 2018 (discontinued in 2022) | 2019 (ongoing) |
| Purpose | Accelerate student progress toward an industry or postsecondary credential | Identify and address local/regional skills gaps in the workforce |
| Function | Involves three main components: <ol style="list-style-type: none"> college and career advisement for K-12 students early postsecondary and work-based learning opportunities in high school partnerships between school districts, postsecondary institutions, employers, and community organizations | Provides funds of up to \$1 million per grant for local collaboratives, which must include: <ul style="list-style-type: none"> a TCAT or community college a local workforce/economic development agency 2+ area employers representing sectors with a labor shortage 1+ K-12 Career and Technical Education (CTE) Director |

Note: See Appendix A for a list of initiatives related to workforce alignment that the state has implemented over the past decade.
Sources: THEC and TBR.

TDOE provides apprenticeships to fill teacher shortage

Sometimes, state agencies will take action to promote alignment within a specific career field. These actions can help address labor shortages, such as the current teacher shortage facing Tennessee. As of February 2022, the state had at least 2,200 vacant teaching positions. To address this shortage, TDOE launched a registered apprenticeship program in early 2022 that trains Tennesseans to become teachers at no cost to them. In 2020, TDOE also awarded \$2 million in grant funding to seven educator preparation programs to fund their partnerships with one or more local school districts. These funds were intended to help remove barriers to the teaching profession.

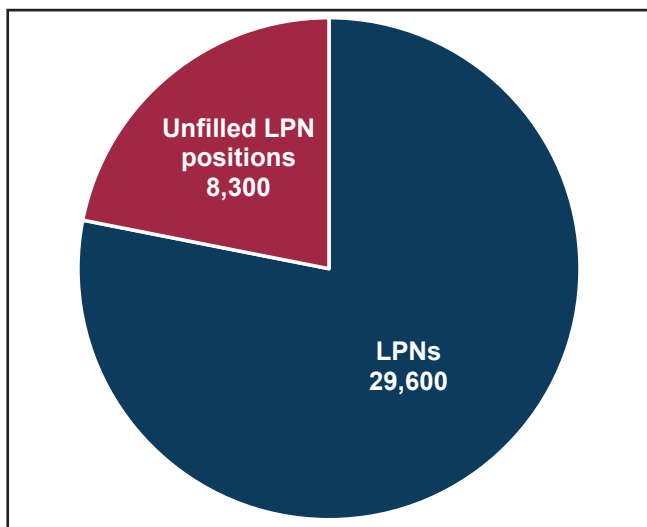
The Tennessee General Assembly and the Tennessee Department of Health have acted to address the nursing shortage

Tennessee is currently facing a nursing shortage that is projected to worsen over the next decade. While there are several types of nursing degrees, Tennessee's most severe shortage is of licensed practical nurses (LPNs). LPNs work under the supervision of doctors and registered nurses and provide routine care such as monitoring patient vitals, recordkeeping, collecting test samples, and administering medication. In Tennessee, LPNs must complete a 12-month certification program, while registered nurses must complete at least an associate degree (though a growing number of other states and employers now require a bachelor's degree).

Data from the Health Resources and Services Administration show Tennessee will have roughly 37,900 licensed practical nursing positions to fill by 2030 but only 29,600 licensed practical nurses to fill them.¹ In other words, an estimated 22 percent of nursing positions requiring an LPN certificate will go unfilled. Meanwhile, Tennessee will have 90,600 registered nurses and 82,200 registered nursing positions to fill by 2030, indicating an oversupply of 8,400 registered nurses.

The shortage of licensed practical nurses can have adverse effects on patient care. Research suggests that nursing shortages are correlated with higher rates of patient mortality, medication errors, and emergency room overcrowding.

Exhibit 5: An estimated 22 percent of LPN positions in Tennessee will be unfilled by 2030



Source: U.S. Department of Health and Human Services Health Resources and Services Administration.

Several initiatives have been implemented to address this shortage. In September 2020, the Tennessee Department of Health allocated Coronavirus Relief Funds to cover increased staffing costs related to the pandemic. This allowed hospitals across Tennessee to hire more nurses, grant hazard and overtime pay, and cover housing and travel costs for staff. In 2022, the General Assembly passed Public Chapter 885, which created the Center for Nursing Advancement at East Tennessee State University. The center will collect and analyze data on nursing turnover and recruitment practices.

Workforce alignment strategies extend beyond the actions of state agencies, as healthcare systems are also making efforts to mitigate the nursing shortage. Ballad Health, a healthcare system headquartered in East Tennessee, recently announced plans to cover all tuition, fees, and books for employees who pursue a degree in nursing, imaging, medical technology, surgical

technology, and catheterization lab technology. Ballad also announced that it would open new childcare centers for employees with children. Such efforts are intended to boost the retention rates of staff members while also drawing an increased number of nursing students to the area.

¹ U.S. Department of Health and Human Services Health Resources and Services Administration, *Supply and Demand Projections of the Nursing Workforce: 2014-2030*, 2017, <https://bhwh.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/nchwa-hrsa-nursing-report.pdf>.

Section 2: Evaluating workforce alignment in Tennessee

Workforce alignment occurs when the supply of qualified workers matches up with employers' demands. When the workforce has strong alignment between workers and employers, businesses are incentivized to invest or expand in Tennessee knowing their needs can be met. Further, Tennesseans are empowered to pursue postsecondary credentials or other certifications because relevant job opportunities will be available to them.

Ideally, workforce alignment would be measured by analyzing the number of Tennesseans working in high-demand positions as well as the number of vacancies in high-demand positions. Such an analysis is not currently possible within the state's longitudinal data system (P20 Connect TN). While the P20 Connect TN system shows high-level information about which industry a graduate goes into, it does not identify an individual's specific position or occupation because employers are not required to submit the necessary occupation data to the TDLWD. For example, the system might show a nursing graduate who is currently employed at a hospital, but she may be working in the hospital's cafeteria.

As an alternative, analyzing the types of degrees, certificates, and diplomas earned by students in Tennessee's public postsecondary institutions can be used as a proxy for measuring how closely the supply of workers aligns with workforce demand. This report uses the following questions to evaluate workforce alignment in Tennessee:

1. What percentage of students are earning credentials in high-need fields?
2. How does this percentage vary across regions, job sectors, and institutions, and how have these trends changed over time?

Research methods

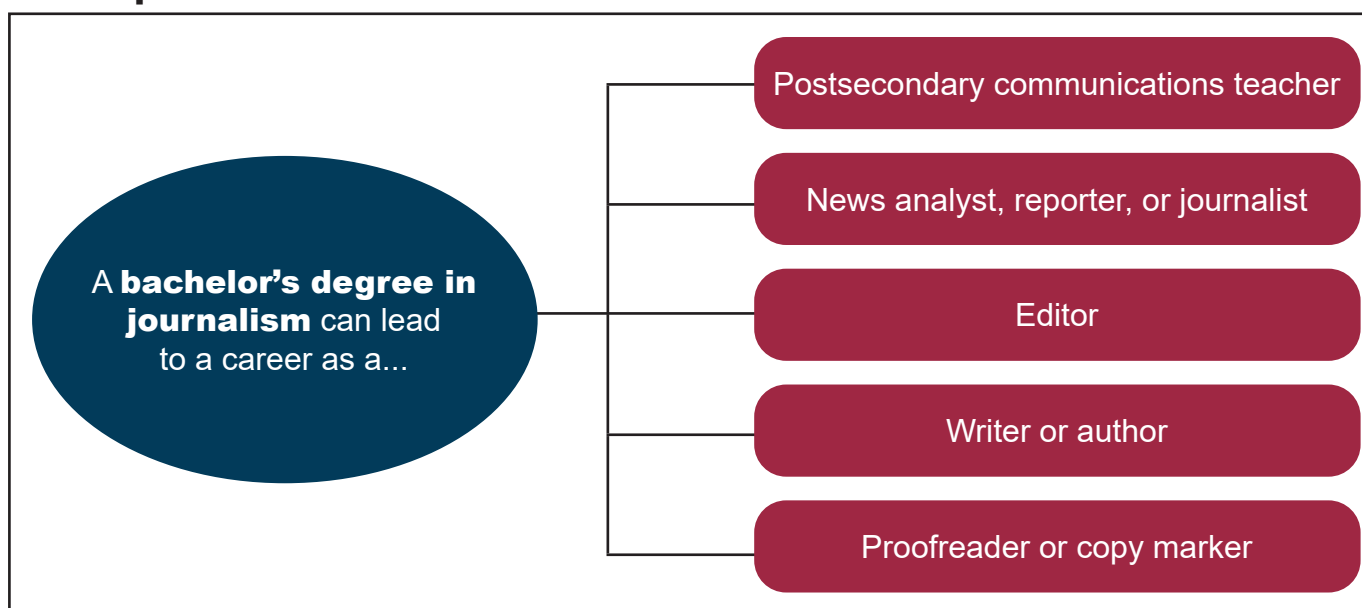
OREA analyzed credentials earned by graduates of Tennessee's public postsecondary institutions. The dataset, provided by THEC, contains degrees, certificates, and diplomas earned between academic years 2016 and 2018 at Tennessee's community and technical colleges and public universities. Credentials were organized by Classification of Instructional Programs (CIP) code, which identifies the graduate's field of study.^M

Credentials were then paired with a list of relevant occupations that the graduate would likely qualify for. These matches were made using the 2020 CIP-Standard Occupational Code Crosswalk, a tool created by the federal Bureau of Labor Statistics and the National Center for Education Statistics.^N For example, as shown in Exhibit 6, a degree in journalism would likely lead to a career as a news analyst, editor, or author, among others.

^M The Classification of Instructional Programs (CIP) is a code system of instructional programs to facilitate the organization, collection, and reporting of fields of study and program completions. Most of the CIP titles correspond to academic and occupational instructional programs offered for credit at the postsecondary level. These programs result in recognized completion points and awards, including degrees, certificates, and other formal awards. The CIP is the accepted federal government statistical standard on instructional program classifications and is used in a variety of education information surveys and databases. See <https://siccocode.com/page/what-is-a-cip-code>.

^N In 2010, the federal Bureau of Labor Statistics and the National Center for Education Statistics created the CIP-SOC Crosswalk. The Crosswalk was updated in 2020. While OREA used the updated 2020 CIP-SOC Crosswalk, the statistics referenced throughout this report would likely remain similar if the 2010 Crosswalk were used instead. Less than one percent of the awards analyzed in this report were associated with CIP codes that were either moved or deleted from the Crosswalk between 2010 and 2020.

Exhibit 6: Credentials, such as a journalism degree, can lead to a variety of career paths



Source: 2020 CIP-SOC Crosswalk developed by the federal Bureau of Labor Statistics and the National Center for Education Statistics (<https://nces.ed.gov/ipeds/cipcode/post3.aspx?y=56>).

For each credential earned, graduates were placed into one of two categories: those who were more likely to pursue a high-demand job in their field, and those who were less likely to pursue a high-demand job in their field based on their credential. OREA assigned graduates to the high-demand category if their field of study was associated with at least one high-demand occupation in the year of their graduation or the following two years. OREA's analysis is based on data aggregated and provided by the Tennessee Department of Economic and Community Development (TNECD). For example, a 2017 graduate would only be assigned to the high-demand category if their credential was associated with at least one occupation that was in high-demand in 2017, 2018, or 2019.

Exhibit 7: OREA linked graduates to occupation data from their graduation year plus the following two years

| Students who graduated in academic year: | Will be tied to high-demand occupations from: |
|--|---|
| 2015-2016 | 2016, 2017, 2018 |
| 2016-2017 | 2017, 2018, 2019 |
| 2017-2018 | 2018, 2019, 2020 |

Graduates were linked to occupational data within their region, meaning they were only assigned to the high-demand category if their field of study was associated with a high-demand occupation in the region where they graduated.^o While not all students remain in the same region post-graduation, research suggests that many do. One study conducted by labor the market data firm Emsi found that 61 percent of community college attendees stayed within 50 miles of the college.^p





^o Graduates were tied to occupational data within their region because statewide occupational data was unavailable for this study. Due to data limitations, each institution was assigned to one region based on the location of its main campus. OREA recognizes that some institutions have satellite campuses that service multiple regions across the state. Because of this data limitation, researchers and policymakers should exercise caution before drawing conclusions about regional trends.

^p Sentz, Rob. et al., *How Your School Affects Where You Live*, Emsi, 2018, <https://www.economicmodeling.com/how-your-school-affects-where-you-live/>.

Exhibit 8 demonstrates how students are assigned to the “high-demand occupation” category. Jack earned an associate degree in Production Horticulture from Walters State Community College, located in the East Tennessee region, in 2016. According to the federal Bureau of Labor Statistics, graduates with this credential are most likely to pursue four occupations, including farming, landscaping, groundskeeping, and teaching agricultural science. According to TNECD’s aggregated dataset, landscaping supervisors were in demand in East Tennessee the year Jack graduated (2016) and landscapers were in demand in both 2017 and 2018. Because Jack now has the credential necessary to pursue a high-demand occupation in his field, he is assigned to the “high-demand occupation” category.

Anna earned a Master of Science degree in Biology from Middle Tennessee State University in 2018. Her degree was affiliated with four probable careers, including natural science manager, biological and life scientist, and biological science teacher. However, none of these occupations were considered high-demand within her region (i.e., northern Middle Tennessee) in 2018, 2019, or 2020. While it is still possible that she could pursue a high-demand degree outside of these four options, Anna is not assigned to the “high-demand occupation” category.

Exhibit 8: The likelihood of pursuing a high-demand occupation varies by student

| |  Jack |  Anna |
|---|--|--|
| Degree | Production Horticulture, A.A.S. | Biology, M.S. |
| Year | 2016 | 2018 |
| Institution (Region) | Walters State Community College (East Tennessee) | Middle Tennessee State University (Northern Middle Tennessee) |
| Affiliated occupations (* indicates high-demand) | <ul style="list-style-type: none"> • Farmers, ranchers, and other agricultural managers • Agricultural sciences teachers • Supervisors of landscaping, lawn service, and groundskeeping workers* • Landscaping and groundskeeping workers* | <ul style="list-style-type: none"> • Natural sciences managers • Biological scientists • Life scientists • Biological science teachers |
| Degree could lead to a high-demand occupation? |  |  |

Source: OREA analysis of data from the Tennessee Higher Education Commission, Tennessee Department of Economic and Community Development, and Bureau of Labor Statistics/National Center for Education Statistics 2020 CIP-SOC Crosswalk (<https://nces.ed.gov/ipeds/cipcode/post3.aspx?y=56>).

OREA used this categorization system to determine the percentage of graduates in Tennessee likely to pursue high-demand occupations based on their credential. OREA then examined how this percentage varied across regions, institutions, and program fields, while also analyzing trends over time. Such analyses will be used to make observations about workforce alignment in Tennessee.

Roughly half of all 2016-2018 graduates earned credentials that could lead to a high-demand job

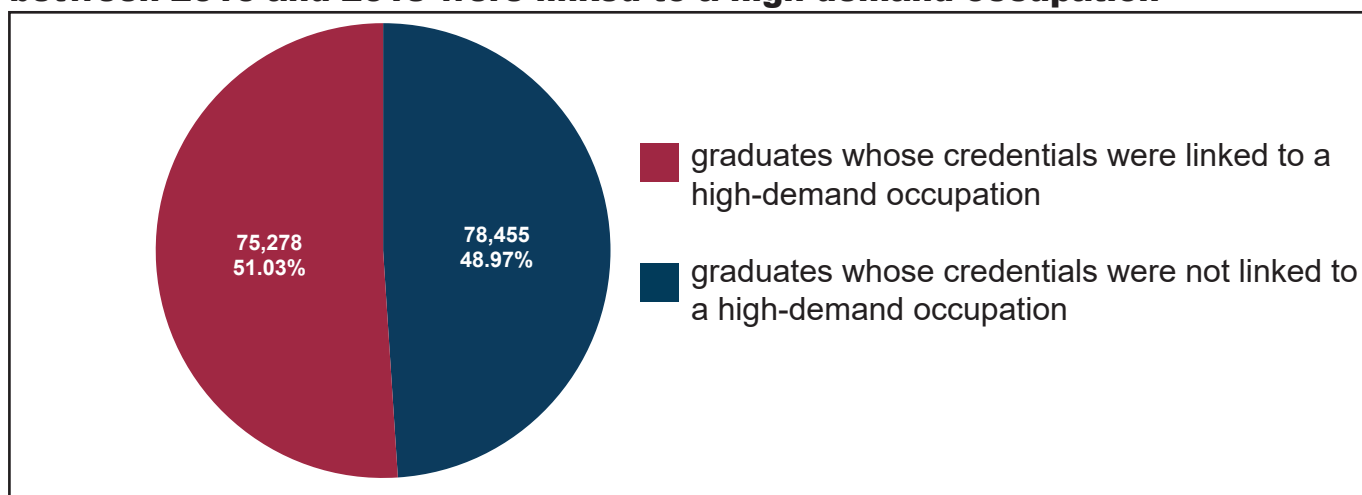
For an occupation to be considered high-demand in this report, it must meet at least two of the following criteria established by TNECD:

1. The ratio of job postings to employment is greater than or equal to the median ratio for all jobs in the region.
2. The ratio of hires to employment is greater than or equal to the median ratio for all jobs in the region.
3. The ratio of projected average annual job openings (averaged over a five-year period) to employment is greater than or equal to the median ratio for all jobs in the region.

In addition, occupations that pay less than a certain percentage of the regional median wage are excluded, though the exact percentage varies by year.^Q Occupations employing less than 0.04 percent of the region's total employment are also excluded.

Between academic years 2016 and 2018, at least 153,733 students earned a postsecondary credential from one of Tennessee's public universities or community and technical colleges.^R Of these credentials, OREA found that nearly half (49 percent) were linked to at least one occupation considered high-demand according to the above criteria.

Exhibit 9: Nearly half of the postsecondary credentials earned by students between 2016 and 2018 were linked to a high-demand occupation



Source: OREA analysis of data from the Tennessee Higher Education Commission, Tennessee Department of Economic and Community Development, and Bureau of Labor Statistics 2020 CIP-SOC Crosswalk.

The type of jobs that are considered high-demand within a given region can change rapidly, making it difficult for students (especially those enrolled in longer programs) to predict whether their academic program will lead to a high-demand career path. For example, 39 percent of high-demand jobs in 2016 were not considered high-demand jobs the following year. By 2020, the percentage was higher still: 67 percent of the occupations considered high demand in 2016 were no longer considered so by 2020. Data availability, however, can also impact whether a job is considered high-demand. For example, since high-demand jobs must meet certain median wage requirements, an occupation cannot be considered high-demand if federal privacy laws restrict data that would identify employee wages.

^Q For 2017, TNECD increased the percentage so that occupations paying less than 100 percent of the regional median wage were excluded. For 2020, occupations paying less than 80 percent of the regional median wage were excluded. For all other years, occupations paying less than 75 percent of the regional median wage were excluded.

^R OREA analyzed awards data provided by THEC. THEC suppressed the number of graduates in programs with fewer than 10 graduates. To produce conservative estimates, OREA substituted a value of 1 in these cases.

The percentage of credentials earned that were linked to high-demand jobs has increased since 2016

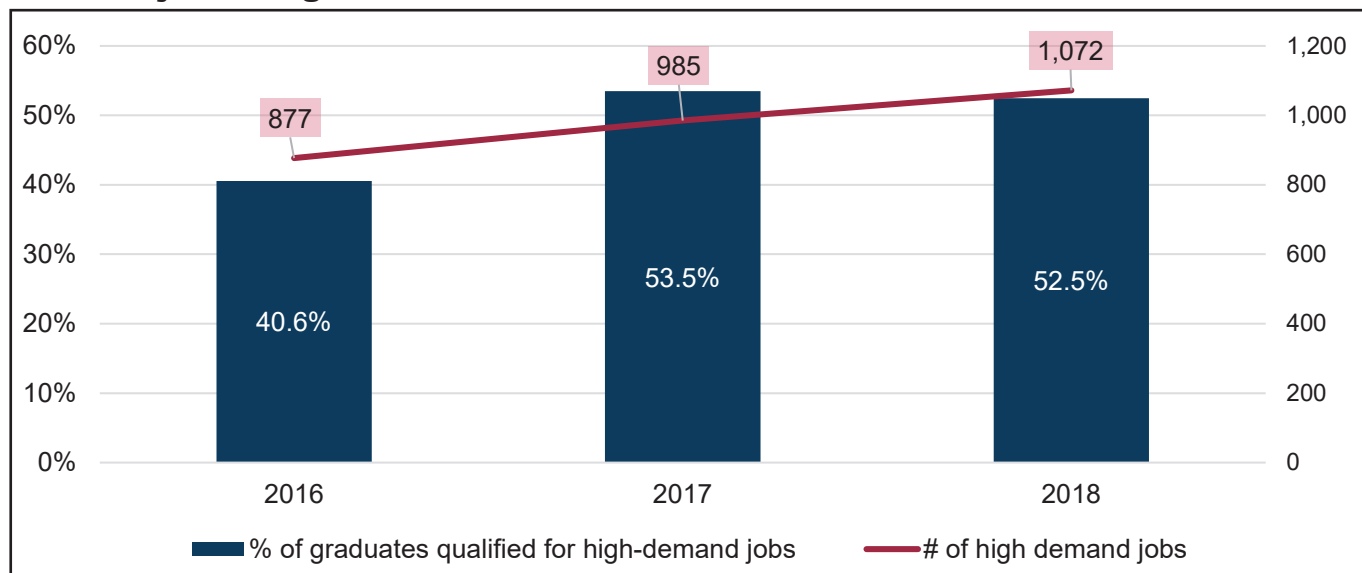
About 41 percent of credentials earned at public postsecondary institutions in academic year 2016 (roughly 20,141 credentials out of 49,645 total) were linked to a high-demand occupation. At the time, 877 SOC (job categories) across the state were considered high-demand, resulting in about 41,960 projected annual openings.⁵

Based on the above numbers, there were 7,685 more graduates than high-demand job openings in 2016. Even if there were enough high-demand positions for every graduate, complete alignment between academic supply and employer demand is a problematic goal for several reasons. Some graduates take positions outside of their field due to advantages like higher pay, benefits, or increased job stability. Some Tennessee graduates move out of state for their careers, and some out-of-state graduates move to Tennessee for their careers. Further, some graduates are sole proprietors or are self-employed and are therefore not reflected in the P20 Connect TN data system. Due to these factors (among others), determining a realistic workforce alignment goal to strive for is challenging.

By 2017, the percentage of credentials earned that were linked to high-demand jobs had increased by nearly 13 percentage points. During this time, the number of high-demand SOC (job categories) also increased by 108. This increase came after the implementation of several workforce alignment-related initiatives at the state level, such as the second round of Labor Education Alignment Program grants and the first Workforce360° meetings (see Appendix A for more information on these programs). However, attributing this increase to any particular factor is challenging because it is likely due to a combination of events, such as changing economic conditions, shifting attitudes toward higher education, and the implementation of new policies/programs.

Between 2017 and 2018, the number of high-demand job categories continued to increase, rising from 985 to 1,072. Despite this increase, the percentage of credentials earned that were linked to high-demand jobs remained relatively stable, dropping by just one percentage point.

Exhibit 10: The percentage of credentials earned that were linked to high-demand job categories increased in 2017 and remained stable in 2018



Source: OREA analysis of data from the Tennessee Higher Education Commission, Tennessee Department of Economic and Community Development, and Bureau of Labor Statistics 2020 CIP-SOC Crosswalk (<https://nces.ed.gov/ipeds/cipcode/post3.aspx?y=56>).

⁵ Beginning with its 2016 projections, the Bureau of Labor Statistics adjusted its method for estimating job openings due to statistical and conceptual issues with the previous method. Because of this change in methodology, researchers and policymakers should be cautioned against drawing bold conclusions from linear job opening trends. For more information, see <https://www.bls.gov/emp/documentation/replacements.htm>.

Occupations with varying levels of workforce demand are assigned to program fields

All occupations are grouped into one of 47 general program fields by the National Center for Education Statistics. Each program field is assigned a two-digit code, as shown in Exhibit 11. For example, a student who graduates with a bachelor's degree in political science would fall under program field 45 (social sciences), whereas someone who graduates with a bachelor's degree in music would fall under program field 50 (visual and performing arts).

Exhibit 11: Two-digit program fields

| Code | Program field |
|------|--|
| 1 | Agriculture, Agriculture Operations, and Related Sciences |
| 3 | Natural Resources and Conservation |
| 4 | Architecture and Related Services |
| 5 | Area, Ethnic, Cultural, Gender, and Group Studies |
| 9 | Communication, Journalism, and Related Programs |
| 10 | Communications Technologies/Technicians and Support Services |
| 11 | Computer and Information Sciences and Support Services |
| 12 | Personal and Culinary Services |
| 13 | Education |
| 14 | Engineering |
| 15 | Engineering Technologies and Engineering-Related Fields |
| 16 | Foreign Languages, Literatures, and Linguistics |
| 19 | Family and Consumer Sciences/Human Sciences |
| 22 | Legal Professions and Studies |
| 23 | English Language and Literature/Letters |
| 24 | Liberal Arts and Sciences, General Studies and Humanities |
| 25 | Library Science |
| 26 | Biological and Biomedical Sciences |
| 27 | Mathematics and Statistics |
| 28 | Military Science, Leadership and Operational Art |
| 29 | Military Technologies and Applied Sciences |
| 30 | Multi/Interdisciplinary Studies |
| 31 | Parks, Recreation, Leisure, and Fitness Studies |
| 32 | Basic Skills and Developmental/Remedial Education |
| 33 | Citizenship Activities |
| 34 | Health-Related Knowledge and Skills |
| 35 | Interpersonal and Social Skills |
| 36 | Leisure and Recreational Activities |
| 37 | Personal Awareness and Self-Improvement |
| 38 | Philosophy and Religious Studies |
| 39 | Theology and Religious Vocations |

| | |
|----|---|
| 40 | Physical Sciences |
| 41 | Science Technologies/Technicians |
| 42 | Psychology |
| 43 | Homeland Security, Law Enforcement, Firefighting and Related Protective Service |
| 44 | Public Administration and Social Service Professions |
| 45 | Social Sciences |
| 46 | Construction Trades |
| 47 | Mechanic and Repair Technologies/Technicians |
| 48 | Precision Production |
| 49 | Transportation and Materials Moving |
| 50 | Visual and Performing Arts |
| 51 | Health Professions and Related Programs |
| 52 | Business, Management, Marketing, and Related Support Services |
| 53 | High School/Secondary Diplomas and Certificates |
| 54 | History |
| 60 | Residency Programs |

Source: National Center for Education Statistics (<https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55>)

Some occupations within a program field may be considered high-demand while others are not. For instance, in the computer and information science field, graphic designers were considered in-demand for some years and regions. In the same years and regions, however, web designers, animators, and developers were not in-demand, despite being part of the same field. Engineering is another example; while it is often thought of as a high-demand field, chemical and biomedical engineering were two of the most oversupplied occupations across the state, according to THEC's 2021 Academic Supply for Occupational Demand report.^T For every chemical and biomedical engineer job opening, there were between three and five qualified candidates. Thus, a graduate in a high-demand program field may earn a credential linked to an occupation that is not in demand. Because of this, agencies and individuals should exercise caution when referring to in-demand occupations in terms of broad fields rather than specific occupations.

The program field with the highest share of in-demand degrees was transportation and materials moving. While this field only accounted for about 1 percent of all graduates between 2016 and 2018, all 1,293 graduates earned credentials that could lead to a high-demand job. Most students in this category (70 percent) earned a Commercial Vehicle Operation certificate or diploma from a TCAT, which is meant to prepare students to take the commercial driver license (CDL) examination.

Four other fields (public administration and social service professions; construction trades; precision production; and business, management, and marketing) also had relatively high shares of in-demand degrees, with at least 94 percent of students in each field earning a credential that was linked to a high-demand occupation.

^T THEC, TNECD, TDOE, and TDLWD started releasing one comprehensive Academic Supply for Occupational Demand Report beginning in 2022, as required by the Skills for Jobs Act in *TCA* 49-7-112.

Exhibit 12: Five program fields had relatively high shares of graduates earning credentials linked to high-demand occupations

Program fields with high workforce alignment



Transportation and materials moving

100% of graduates earned a credential linked to a high-demand occupation.



Public administration and social service professions

98% of graduates earned a credential linked to a high-demand occupation.



Precision production

96% of graduates earned a credential linked to a high-demand occupation.



Construction trades

95% of graduates earned a credential linked to a high-demand occupation.



Business, management, and marketing

94% of graduates earned a credential linked to a high-demand occupation.

Source: OREA analysis of data from the Tennessee Higher Education Commission, Tennessee Department of Economic and Community Development, Bureau of Labor Statistics 2020 CIP-SOC Crosswalk.

One of the 47 program fields is liberal arts and sciences, general studies, and humanities. About one in six graduates between 2016 and 2018 (26,655 graduates, or 17 percent) earned a credential in this field. None of the credentials in this program field were linked to a high-demand occupation. Most of the graduates within this field (70 percent, or 18,747 students), however, earned an associate degree in either liberal arts or general studies. Liberal arts and general studies associate degree programs are specifically designed to allow students to transfer into a bachelor's degree program (see text box for more details). Under the Tennessee Transfer Pathways initiative, students are guaranteed to have all of their coursework accepted when they transfer from a community college to a Tennessee public university (or some select private college and universities.) While THEC was unable to provide the number of graduates from liberal arts and general studies programs who went on to enroll in a bachelor's degree program, some of these graduates likely pursued further education rather than directly entering the workforce.

Liberal arts and general studies associate degree program

- a two-year program available at all 13 community colleges, Austin Peay State University, and University of Tennessee Southern*
- 18,747 associate degrees earned between 2016-2018
- not explicitly linked to any high-demand occupations, although the program is specifically designed for students planning to continue their education to earn a bachelor's degree in liberal arts or related fields

*UT Southern plans to terminate its associate degree program in December 2026

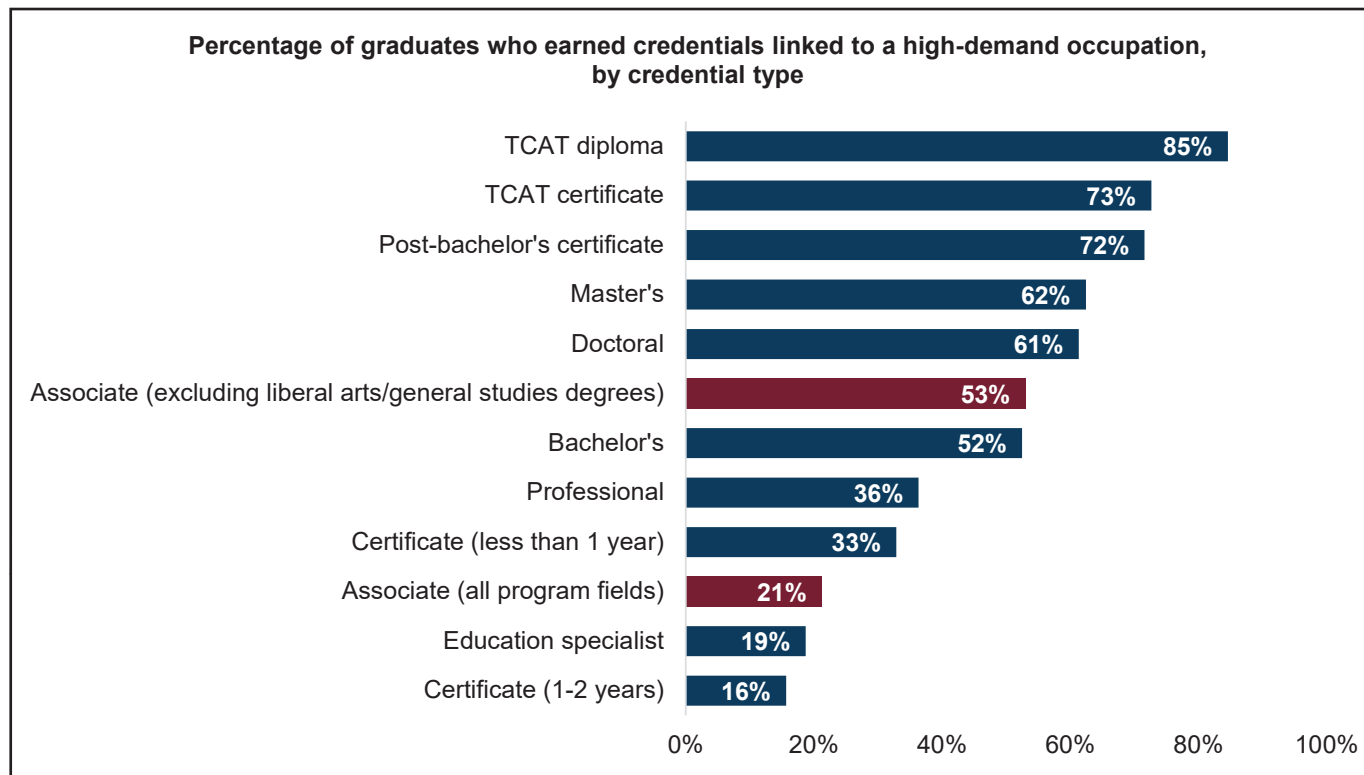
TCAT diplomas were most closely linked to high-demand occupations

Considering graduates from all public institutions, 49 percent earned credentials that were linked to a high-demand occupation. However, this percentage varied when analyzed by credential type. The highest percentage was found at TCATs, where 85 percent of diplomas were linked to a high-demand occupation. This aligns with information from OREA's interviews with state agencies and other organizations. As noted by several interviewees, TCAT programs are nimble when it comes to responding to workforce needs and can quickly adjust program offerings. Employers can work directly with the TBR to establish their own TCAT programs, and TBR offers an expedited 14-day approval process for new TCAT programs. TCAT programs can also be completed relatively quickly, with most diplomas and certificates taking about 12-16 months to complete. This means that there is relatively little time for major changes in the labor market to occur between the time a student enrolls and graduates. TBR also has a program warranty that allows employers to request retraining for completers of diplomas and certificates at no cost to the student or the employer.

Credentials beyond a bachelor's degree had a relatively high link to high-demand occupations. Seventy-two percent of post-bachelor's certificates earned were linked to a high-demand job. For doctoral graduates and master's graduates, the link was 61 percent and 62 percent, respectively.

Twenty-one percent of associate degrees earned between 2016 and 2018 were linked to a high-demand job. As shown by the red bars in Exhibit 13, however, this percentage increased to 53 percent when liberal arts and general studies degrees were excluded. Many students who pursue this degree intend to transfer into a bachelor's degree rather than go directly into the workforce.

Exhibit 13: TCAT diplomas were most closely linked to high-demand occupations between 2016 and 2018

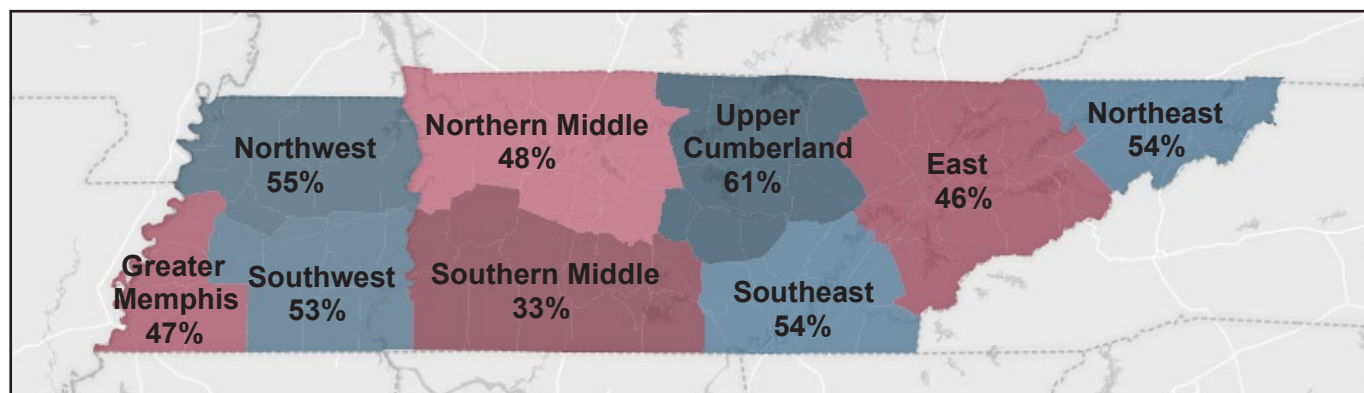


Source: OREA analysis of data from the Tennessee Higher Education Commission, Tennessee Department of Economic and Community Development, and Bureau of Labor Statistics 2020 CIP-SOC Crosswalk (<https://nces.ed.gov/ipeds/cipcode/post3.aspx?y=56>).

The percentage of credentials linked to high-demand jobs varies by region

Between 2016 and 2019, OREA found that a total of 419 distinct job categories were considered high-demand.^U These occupations were split relatively evenly across the state's nine regions, with somewhere between 10 and 13 percent of the state's high-demand occupations located within each region. Across the state, just under half of all credentials earned were linked to a high-demand occupation. However, the percentage varies by region, as shown in Exhibit 14.

Exhibit 14: Percentage of credentials linked to high-demand jobs, by region | 2016-2018



Note: Blue shaded regions indicate a percentage above the statewide average of 49 percent. Red shaded regions indicate a percentage below the statewide average.

Source: OREA analysis of data from the Tennessee Higher Education Commission, Tennessee Department of Economic and Community Development, and Bureau of Labor Statistics 2020 CIP-SOC Crosswalk (<https://nces.ed.gov/ipeds/cipcode/post3.aspx?y=56>).

Due to limited data availability, each institution was assigned to one region based on the location of its main campus. OREA recognizes that some institutions have satellite campuses that service multiple regions across the state. Columbia State, for example, has a main campus in the Southern Middle region (Maury County) and a satellite campus in the Northern Middle region (Williamson County). OREA did not have the data necessary to distinguish between awards earned at main campuses and awards earned at satellite campuses. Because of this data limitation, researchers and policymakers should note this caveat when drawing conclusions about regional trends.

Based on OREA's analysis, the Upper Cumberland region had the highest percentage of credentials linked to high-demand jobs. The region is home to Tennessee Technological University (Tennessee Tech), three TCATs (TCAT Crossville, Livingston, and McMinnville), and several community college satellite campuses (Motlow, Roane, and Volunteer State).^V The region produced at least 9,037 graduates between 2016 and 2018. Of these credentials earned, 61 percent were linked to a high-demand occupation.

The Upper Cumberland region produces a high number of graduates in the business and health fields, as does the state as a whole.^W It is unique, however, in that one of the region's institutions, Tennessee Tech, produces a high share of engineering graduates. Tennessee Tech produced nearly a quarter (24.4 percent) of the state's engineering graduates between 2016 and 2018, second only to the University of Tennessee, Knoxville. Just under three-quarters of engineering graduates from Tennessee Tech earned a credential linked to a high-demand job. Tennessee Tech also produced a relatively high share of education graduates; 37 percent of these graduates earned a credential linked to a high-demand job.

^U This number was calculated by summing the number of high-demand jobs in each region between 2016 and 2019 and then removing any duplicates.

^V Satellite campuses are physically located at a distance from an institution's main campus area. Satellite campuses typically offer fewer course options than main campuses.

^W Graduates in the health and business fields made up about 31 percent of all graduates statewide, compared to 27 percent of graduates in the Upper Cumberland region.

The Southern Middle region produced a relatively low percentage of credentials that were linked to a high-demand occupation. The Southern Middle region is home to Columbia State and Motlow State Community Colleges as well as three TCATs (TCAT Hohenwald, Pulaski, and Shelbyville).^x Roughly one-third of credentials produced in this region were linked to a high-demand occupation. This is partly because the most popular program field in this region is liberal arts and sciences, general studies, and humanities. Forty-three percent of graduates in the Southern Middle region earned a liberal arts or general studies credential. These degrees are designed for students who intend to pursue a bachelor's degree rather than directly enter the workforce, so they are not linked to any high-demand occupations.

An additional 6 percent of graduates in the Southern Middle region earned a credential as a registered nurse, with two-thirds of the total 443 credentials linked to a high-demand job. This is at least partly because Tennessee's nursing shortage is attributed to a lack of licensed practical nurses rather than registered nurses. (See p. 12 for more details about the LPN credential.)

^x University of Tennessee Southern is also located in this region but is excluded from the analysis because it did not become a public university until 2021.

Section 3: Policy options to improve workforce alignment in Tennessee

The following policy options are intended to increase the degree of alignment between the needs of Tennessee's employers and the supply of qualified workers.

Option 1: Focus on (and refine) existing workforce alignment efforts

Tennessee has multiple agencies involved in the workforce alignment policy sphere. On the academic supply side, TDOE focuses on efforts at the K-12 level, while TBR and THEC focus on efforts at the postsecondary level. TDLWD provides services to all job seekers. On the workforce demand side, TNECD, TDLWD, and private organizations such as the Tennessee Chamber of Commerce and Industry provide assistance to businesses that are expanding or relocating to Tennessee. In addition, several other agencies and organizations are involved in research related to workforce alignment in Tennessee.

Each of these agencies and organizations have taken part in workforce alignment-related initiatives, whether it be in the form of a grant program (like the Governor's Investment in Vocational Education) or an informational report (like the Academic Supply and Workforce Demand report). See Appendix A for a list of statewide initiatives.

Interviewees from three state-focused organizations noted the importance of focusing on (and in some cases refining) these existing programs. For example, one interviewee noted that THEC has "some incredible initiatives in place right now" and that the agency is likely to "accomplish most of the goals [it has] set out to accomplish regarding workforce alignment." THEC's 2020 Master Plan established a goal of increasing the proportion of students enrolling in high-need degree programs by at least 5 percent annually over the next five years.

Another interviewee mentioned that the state should increase marketing and recruitment efforts for Tennessee's existing Drive to 55 programs, especially in rural counties where students may be unaware of these programs. Other interviewees mentioned that the state could bridge the eligibility gap between Tennessee Promise (a grant program intended for recent high school graduates) and Tennessee Reconnect (a grant program for adult students), in addition to expanding program eligibility to allow these programs to cover short-term credentials.^Y

"We have some incredible initiatives in place right now...all these different agencies working from different angles. I think that, ultimately, we're going to accomplish most of the goals we've set out to accomplish regarding workforce alignment."

- OREA interview with THEC,
September 2021

Interviewees also suggested improving existing resources related to workforce alignment. For example, two interviewees called attention to Jobs4TN, a website created by TDLWD. The website includes a database of job postings, employment-related news and events, and labor market information, such as employment projections or wage statistics for different occupations. Although the website provides services to both jobseekers and employers, it is not widely utilized or promoted by other employer-facing agencies or organizations such as TNECD or the Tennessee Chamber of Commerce and Industry. One interviewee noted that the website should be promoted more.

Another interviewee noted that the Jobs4TN website could be more user-friendly. The website's homepage includes numerous dropdown menus and hyperlinks (a total of 38 hyperlinks on the homepage alone). Some jobseekers may receive help navigating the website from staff at American Job Centers across the state, but it may be difficult for an individual to navigate the website on their own.^Z

^Y Tennessee's State Budget for fiscal year 2022-2023 included funding to bridge the gap between Promise and Reconnect by lowering the minimum age requirement for Reconnect from 24 to 23.

^Z The Jobs4TN website is used at American Job Centers (AJCs), which are centers that offer services, workshops, training, and free internet access to job seekers. Jobseekers who enter one of the AJC locations across the state are directed by staff to register on the Jobs4TN website.

Option 2: Continue to research workforce alignment and expand data collection efforts

Over the past decade, state agencies have dedicated an increasing amount of attention to workforce alignment research. Since 2014, THEC has produced its Academic Supply for Occupational Demand report in collaboration with TDLWD. That same year, TNECD began producing an annual LEAP (Labor Education Alignment Program) report that outlines high-demand occupations and workforce needs in Tennessee. Beginning in 2022, these two reports have been merged into one comprehensive Academic Supply for Occupational Demand report. The 2022 iteration of this report was titled *Improving the Pipeline for Tennessee's Workforce*.^{AA}

Even though Tennessee's agencies are conducting relevant research on the subject, several interviewees mentioned the need for more cross-agency research and data collection. The following paragraphs contain options to expand data collection and analyses related to workforce alignment.

Require employers to submit more detailed occupation data to TDLWD

Analysis of the types of credentials earned by Tennesseans can be used as a proxy for measuring how closely the supply of workers aligns with workforce demand. However, it is imperfect because it does not capture the number of graduates who became employed within their field. Some graduates may have earned a high-demand credential and sought employment in a different field.

Workforce alignment could instead be evaluated by analyzing the number of Tennesseans working in high-demand positions. Such an analysis is not currently possible with the state's longitudinal data, however, because employers are not required to submit the necessary occupation data to the TDLWD.

Under current processes, employers must submit an employee's social security number and wage amount to TDLWD on a quarterly basis. While TDLWD can see a broad industry category assigned to the employer (for example, a hospital would fall under "health care"), the employer is not required to provide a standard occupational code (SOC) for each employee. The data may therefore show a nursing graduate who is currently earning wages at a hospital, but there is no way to determine whether she is employed as a nurse or as a cafeteria worker.

TDLWD could require employers to submit an occupation code for each employee. Because the wage data is collected primarily for purposes related to unemployment taxes, the department's Unemployment Insurance Tax unit would have to adjust their data collection requirements. Collecting more detailed occupation data from employers would allow researchers to see how many graduates ultimately became employed within their fields.

Similar initiatives are currently underway at the federal level. For example, the U.S. Chamber of Commerce Foundation and the T3 Innovation Network have launched an initiative called the Jobs and Employment Data Exchange, or JEDx. JEDx seeks to streamline and improve how employers report data to government agencies so that education and workforce partners can access improved information on employment and earnings. The initiative aims to form a data trust by 2024.^{AB}

^{AA} Tennessee Higher Education Commission, *2022 Academic Supply for Occupational Demand Report: Improving the Pipeline for Tennessee's Workforce*, 2022, <https://www.tn.gov/thec/research/supply-and-demand.html>.

^{AB} For more information on JEDx, see the following website: <https://www.uschamberfoundation.org/JEDx>.

Establish partnerships with other states to allow for interstate data collaboration

THEC does not collect or maintain completion data for students who leave Tennessee to attend a postsecondary institution out-of-state (though THEC staff hope to capture this data in future years). Similarly, TDLWD's employment data does not account for individuals who earned a credential in Tennessee but work in other states. These data limitations are problematic for workforce alignment given that Tennessee shares a border with eight other states, and it may be more convenient for students in border communities to earn a credential or work in a neighboring state. Agencies may find it useful to examine how many out-of-state graduates are filling high-demand positions in Tennessee and how many of Tennessee's graduates are taking jobs out-of-state.

Interviewees from two different organizations noted that cross-state data (data on out-of-state graduates coming into Tennessee for work and in-state students who leave Tennessee for work) would allow for a more comprehensive evaluation of workforce alignment. Several organizations, such as the United States Census Bureau and the Coleridge Initiative, have launched efforts to combine and house longitudinal education and employment data from various states.^{AC} TDLWD currently participates in the Coleridge Initiative's data sharing system, which allows the department to exchange wage records with other states within a secure system. THEC has engaged in discussions about taking part in cross-state initiatives but has no official plans to do so as of June 2022.

Conduct more research on students who intend to pursue further education (especially those who earn liberal arts/general studies associate degrees)

Of the 153,733 students who earned a credential between 2016 and 2018, a significant portion (17 percent, or 26,655 students) earned a credential in liberal arts, general studies, and humanities. None of these credentials were linked to a high-demand occupation. However, the liberal arts/general studies associate degree program is designed for students who plan to continue into a bachelor's degree program at a four-year college or university. Therefore, some of the students who graduated with a liberal arts credential enrolled in further education rather than entering the workforce.

Due to data limitations, OREA was unable to analyze the number of graduates who enrolled in further education rather than directly entering the workforce. Data on these graduates would be useful for future analyses of workforce alignment.

THEC is in the process of conducting more research on this topic. THEC releases an annual Articulation and Transfer Report; the 2021 report analyzed transfer patterns and demographics of first-time freshmen in the fall 2014 cohort. In addition, THEC is working on collecting and incorporating more data on Tennessee Transfer Pathway students and university parallel path students into its regular reports.^{AD} Continuing these efforts will allow for more precise evaluations of workforce alignment in Tennessee.

Promote (and measure progress toward) a workforce alignment-related goal

THEC's 2020 Master Plan established a goal of increasing the proportion of students enrolling in high-need degree programs by at least 5 percent annually over the next five years. However, none of the interviewees in any of OREA's eight interviews alluded to this goal when discussing workforce alignment, and it is not explicitly mentioned in the 2022 Academic Supply for Occupational Demand Report. THEC has not measured this goal's progress since it was established in the 2020 Master Plan.

^{AC} See the following websites for more information: United States Census Bureau, "Longitudinal Employer-Household Dynamics," https://lehd.ces.census.gov/data/pseo_experimental.html; Coleridge Initiative, "Multi-State Postsecondary Dashboard," <https://coleridgeinitiative.org/projects-and-research/multi-state-post-secondary-dashboard/>.

^{AD} Tennessee Transfer Pathways (TTPs) and University Parallel Paths are intended for students who wish to earn a two-year degree then pursue a bachelor's degree at a four-year college or university. TTP coursework is guaranteed to transfer to any public university or four-year college in Tennessee. University Parallel Path coursework is likely, but not guaranteed, to transfer to any public university or four-year college in Tennessee.

Once a workforce-alignment goal has been agreed on – whether it is the goal from THEC’s 2020 Master Plan or a different goal – the state agencies involved in workforce alignment (such as THEC, TNECD, TDOE, TBR, and TDLWD) should work together to promote the goal and see that progress is measured on a regular basis. For example, the goal could be referenced in publications like the Academic Supply for Occupational Demand Report, and agencies like THEC and TDLWD could call attention to its progress at their meetings. This goal could become recognizable like the state’s Drive to 55, which seeks to raise the number of Tennesseans with a postsecondary credential to 55 percent by 2025.

Option 3: Encourage the use of workforce alignment data when making academic and career decisions, but recognize the limitations of the data

A variety of factors can influence a prospective student’s decision about pursuing a credential. Tennessee’s state agencies provide a multitude of resources to aid individuals throughout the decision-making process. For example, prospective students can go to the Jobs4TN website and view comprehensive job listings, including the highest paying jobs in a particular region, as well as the typical education level required. Guidance counselors and advisors can use TNECD’s in-demand occupations dashboard to look at projected annual openings and current job postings for in-demand jobs. Beginning in 2022, THEC, TNECD, TDOE, and TDLWD started releasing one comprehensive Academic Supply for Occupational Demand Report, which is publicly available online.

While these resources are helpful when it comes to making informed decisions about pursuing a high-demand career path, agencies and students alike should recognize the volatility of the labor market. For example, two-thirds of the occupations that were considered high-demand in 2016 were no longer considered so by 2020 (though at least some of these changes could be due to changing methodologies rather than an unstable labor market).

Those who assist prospective students in deciding to pursue a credential (such as college admissions advisors or high school guidance counselors) should also acknowledge that high-demand jobs vary within a given field. Therefore, these individuals should be as specific and transparent as possible when communicating about the demand for certain occupations. When agencies or government officials discuss the labor force in terms of broad fields or industries, prospective students could overestimate the demand for a particular occupation.

STEM (science, technology, mathematics, and engineering) is an example of a broad job category in which many occupations are considered high-demand, but not all. When Governor Bill Lee announced the Future Workforce Initiative in 2019, his goal was to increase STEM training for K-12 students, rather than increase training for a specific set of occupations. TDLWD also released a 2019 report titled *Demand for STEM Occupations in Tennessee*, which noted that new STEM jobs are expected to grow by 21.6 percent from 2016 to 2026.^{AE} According to THEC’s 2021 Academic Supply for Occupational Demand Report, chemical and biomedical engineering (two STEM occupations) were two of the most oversupplied occupations across the state. For every chemical and biomedical engineer job opening, there were between three and five qualified candidates. Admissions advisors, guidance counselors, and other staff members who work with prospective STEM students should try to raise awareness of these differences.

^{AE} Tennessee Department of Labor and Workforce Development, *The Demand for STEM Occupations in Tennessee*, July 2019, <https://www.jobs4tn.gov/admin/gsipub/htmlarea/uploads/LMI/Publications/STEMReport2019Updated.pdf>.

Appendix A: Statewide workforce alignment initiatives

| Initiative | Responsible entity/entities | Type of initiative | Amount (if applicable) | Timeframe | Information |
|--------------------------------------|--|--------------------|------------------------|--|--|
| Academic Supply and Workforce Demand | THEC, TSAC, Department of Labor & Workforce Development | Report | n/a | Annually (January); was merged into a new report beginning in 2022 | The report highlights the connections between degrees that are being produced in Tennessee and the jobs that are available in the state. |
| ApprenticeshipTN | Department of Labor & Workforce Development | Marketing campaign | n/a | Launched February 2020 | This initiative raises awareness about the benefits of Registered Apprenticeships. A new website provides all the information needed to explore the apprenticeship process and to find out how to become involved in a program. Apprenticeship TN regional directors help organizations to understand the registered apprenticeship training model and connect with appropriate program resources. |
| Drive to 55 Alliance | Tennessee Chamber of Commerce, private sector partners and community/nonprofit leaders | Partnership | n/a | 2014 | This partnership will help to generate greater private sector awareness, ownership and support for the long-term steps needed in college entry and completion, adult education and training, and identifying and closing skills gaps to better prepare our workforce and our state for the future. |
| Future Workforce Initiative | Office of the Governor | Legislative agenda | \$4 million | Announced in February 2019 | This investment seeks to promote job creation in the technology sector by 2022 in three areas: 1. Adding new CTE programs in STEM fields with 100 new middle school programs; tripling the number of STEM-designated public schools by 2022. 2. Growing the number of teachers qualified to teach work-based learning and advanced computer science courses through STEM teacher training and implementation of K-8 computer science standards. 3. Expanding postsecondary STEM opportunities in high school through increased access to dual credit, AP courses and dual enrollment. |
| Future Workforce Initiative report | TDOE, TN STEM Innovation Network | Report | n/a | Fall 2021 | This report highlights the significant impact career and technical education, computer science, and STEM have made on students and educators across the state. |

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| GIVE Act | Office of the Governor, THEC | Grant | \$25 million | Grant first announced in November 2019; first round winners announced in January 2020; second round winners announced in November 2021 | This grant funds up to \$1 million for up to 30 months for local collaboratives, which must include a TCAT or community college, a local workforce/economic development agency, 2+ area employers representing sectors with a worker shortage, and 1+ K-12 CTE Director. |
| Innovative High School Models | TDOE | Grant | \$30 million | Announced March 2021; winning districts announced May 2021 | This grant seeks to fund partnerships between school districts, postsecondary education institutions, and local employers to boost high schoolers' postsecondary success. |
| LEAP (Labor Education Alignment Program) Report | TNECD (Center for Economic Research in Tennessee [CERT]) | Report | n/a | Annually (October/November); was merged into a new report beginning in 2022 | This report provides data to aid in local, regional, and state policy decision-making with regard to alignment of workforce, education, and industry. The report identifies in-demand occupations in Tennessee and each of its nine regions. The report's intent is to assist in the alignment of education, training, and employment in Tennessee. |
| LEAP (Labor Education Alignment Program) grants | Office of the Governor, THEC | Grant | \$10 million per round | First round awarded in 2014; second round awarded in 2016 | This grant provides funding for regional partnerships comprised of TCATs and community colleges, industry partners, workforce development professionals, and K-12 educators associated with CTE. |
| Academic Supply for Occupational Demand Report | THEC, TDOE, ECD, Department of Labor & Workforce Development | Report | n/a | Legislation passed in March 2021; reports will be released annually beginning in March 2022 | TN Public Chapter 183 combined the previous two reports (LEAP Report, Academic Supply for Occupational Demand Report) into one new joint report. |
| Tennessee Commission on Education Recovery and Innovation Report | Tennessee Commission on Education Recovery and Innovation (ERIC) | Report | n/a | Commission created June 2020; initial assessment due January 2021; reports due January and June of 2022 | In 2020, the General Assembly created the nine-member Tennessee Commission on Education Recovery and Innovation (ERIC) to examine effects of COVID-19 on the state's educational system. ERIC made recommendations "to modernize the state's educational structure from kindergarten to career." |
| TN Pathways | TBR, TDOE | Partnership | n/a | Launched in 2018; discontinued in 2022. Similar efforts will continue through TDOE's College, Career & Technical Education Division | This program was intended to accelerate student progress toward an industry or postsecondary credential. Involves three main components: 1. college and career advisement for K-12 students (primarily high school students) 2. early postsecondary and work-based learning opportunities in high school 3. vertical alignment and partnerships between school districts, higher education institutions, employers, and community organizations |

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|---------------------------|--|-------------|----------------------------|--|--|
| TNTrained | TBR, Department of Labor & Workforce Development | Training | n/a | Ongoing, began January 2018 (inaugural group graduated in April 2018) | This 40-hour cohort program provides professionals in TN's higher education system, state agencies, and private industry with a common knowledge base of practices, strategies, and skills in working with businesses interested in coming to or expanding in TN. |
| Work Based Learning Grant | TNECD (though created by Governor Haslam's Rural Task Force) | Grant | \$25,000 per grant maximum | Program announced January 2018; grant recipients ran activities from May 2018 - May 2019 | This grant funds projects that promote community led WBL to improve career awareness/readiness of students and improve local/regional talent pipeline. Projects must be based on local labor market information, clearly connecting the proposed project with occupations available/expected to be available within the region. |
| Workforce360° | ECD | Partnership | n/a | Meetings began in 2016; the initiative ended in Spring 2022. | This partnership included local representation of economic development, labor, secondary education and higher education leaders. Workforce360° meetings are held by business development regional offices and provide attendees with access to state resources, as well as an environment to discuss workforce initiatives and workforce solution processes. |

Note: The red rows in the table above indicate efforts that are no longer active.

Office of Research and Education Accountability Staff

Director

♦ Russell Moore

Assistant Director

♦ Linda Wesson

Principal Legislative Research Analysts

♦ Kim Potts

♦ Lauren Spires

Associate Legislative Research Analysts

Carley Bowers

♦ Erin Brown

Lance Iverson

Robert Quittmeyer

♦ Dana Spoonmore

Cassie Stinson

♦ Jaymi Thibault

Publication Specialist

♦ Paige Donaldson

Program Coordinator

♦ Caitlin Kaufman

♦ Indicates staff who assisted with this project



Office of Research and Education Accountability

Russell Moore | *Director*
425 Rep. John Lewis Way N.
Nashville, Tennessee 37243
615.401.7866
www.comptroller.tn.gov/OREA/