

A construction worker wearing a blue hard hat and a high-visibility orange and yellow vest is working on a steel rebar structure. The worker is holding a green measuring tape against the rebar. The background shows a complex network of steel beams and rebar, suggesting a construction site.

# TENNESSEE'S ECONOMY

2023-2024



Department of  
**Labor & Workforce  
Development**

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# Executive Summary

The Tennessee's Economy 2023-2024 discusses the growth of the Tennessee and local economies during the past year as well as providing data on historic growth trends. In addition, the report highlights seven top industry sectors in the state, explores current and emerging trends, and focuses on factors affecting the labor force participation rate. Several collaborative initiatives being taken by the public and private sectors to increase the labor force participation rate and reduce Tennessee's significant barriers to employment are highlighted, as well as continuing challenges.

## Tennessee Employment 2022-2023

Tennessee's annual average nonfarm employment in 2022-2023 increased by 1.8 percent, creating more than 57,000 jobs. Private service-providing jobs increased by 1.9 percent, while goods-producing jobs increased by 1.2 percent, led by a more than four percent increase in construction and related jobs. Since 2018, employment in Tennessee has increased by 234,400 jobs, growing at an overall rate of 7.6 percent. Total employment in the state, including agricultural, self-employed, and private household workers, is expected to grow to 3.9 million in 2032, increasing an average of 1.3 percent annually from 2022. Healthcare support as well as computer and mathematical occupations are the occupational groups expected to show the largest yearly growth through 2032. Although office and administrative support occupations are expected to have the most employment by 2032, they will be the slowest-growing group, with technological change being an important factor. Top advertised job certifications are primarily related to health and social worker occupations. Tennessee's unemployment rate has been trending downward; in June 2024, the seasonally adjusted rate was 3 percent, lower than the 3.6 percent rate in June 2023. In contrast, the U.S. rate was 4.1 percent in June 2024.

Median hourly wage growth increased an average of 9.7 percent over the year, from \$19.20 to \$21.07 in 2023. Median wages increased for all 22 major occupational groups.

The previous Tennessee's Economy report identified seven top industry sectors in Tennessee based on employment size, jobs added, and/or higher rates of growth, including:

- Leisure and hospitality
- Health care and social assistance
- Manufacturing

- Transportation, warehousing, and utilities
- Professional, scientific, and technical services
- Mining, logging, and construction
- Information

Leisure and hospitality was the second most rapidly- growing industry during 2022-2023. The private health care and social assistance sector had the most rapid growth rate (4.9 percent) during that period. Mining, logging, and construction was the third most rapidly- growing industry sector, with construction expanding in the industrial, utility, and residential areas.

Over the five-year period from 2018 to 2023, manufacturing, the fourth largest industry sector after government, grew 3.7 percent, in contrast to its national performance. Also from 2018 to 2023, transportation, warehousing, and utilities added more than 34,000 jobs; professional, scientific, and technical services added 33,000 jobs; and information added more than 10,000 jobs, increasing in employment at nearly three times the state rate at 22.5 percent.

Detailed analysis on the advanced manufacturing and energy, health care and social assistance, construction, and information sectors follows.

- The Advanced Energy Workforce and Emerging Industries

Industry developments in the advanced manufacturing and advanced energy clusters have been driving employment and training opportunities in the state. Advanced manufacturing investment includes the production of electric vehicles, batteries, and other auto parts, electric charging stations (production, installation, and maintenance), electric vehicle repair, and training facilities to teach the skills needed to put and keep the vehicles on the road. From 2015 to 2023, Tennessee was one of the top 10 states for investment in electric vehicles, electric batteries, and battery components.

Although purchases of EV vehicles have increased, with Volkswagen sales in the U.S. up 12 percent in the first six months of 2024 and 15 of 18 EV models available since January of 2023 increasing sales notably over the last year, the pace of investments has slowed. Factors have included high vehicle costs, slower installation of charging stations, range anxiety, and lack of consumer knowledge on EV charging. Ford has announced a delay of at least a year in EV truck production in Tennessee, moving into more hybrid-electric versions of SUVs, and new plans for smaller EVs, aligning more with expected consumer preferences. The workforce system, including partnerships of employers and educators, has responded strongly to the need for advanced skill training, while supporting flexibility by including training for both current and new skills.

Energy efficiency is the largest employment in the energy sector nationally; this includes

constructing, manufacturing, and installing energy efficient appliances, heat pumps, lighting, and building materials. Through the Infrastructure Investment and Jobs Act (2021) and the Inflation Reduction Act (2022) the Tennessee Department of Environment and Conservation (TDEC) has applied for several grants relating to workforce development. A Solar for All grant was awarded; other grants may include energy auditor and residential energy contractor training, with the potential for development of apprenticeships.

- Advanced Energy Innovation in the Electric Utility Sector

The electric utility sector connects many sectors of our communities- housing, transportation, communication, industrial development, and many others which require energy to operate. Advanced energy requires an interdisciplinary workforce and a wide variety of system components, in this state largely developed by or in association with the Tennessee Valley Authority (TVA). The energy economy of the future is expected to include the clean energy components of renewable energy including wind and solar, advanced nuclear, more cybersecurity, artificial intelligence powered within data centers, and other advanced technologies, creating a range of workforce requirements depending on the pace of change.

- The Health Care and Social Assistance Workforce

In the largest industry sector in the state, in the fourth quarter of 2023, there were an average of 449,826 health care and social assistance workers in Tennessee, with 39 percent working in ambulatory care services and almost 35 percent working in hospitals; others worked in nursing and residential care facilities and social assistance agencies. Half of the employees worked in the Northern Middle and Greater Memphis LWDAs combined. The 2024 Academic Supply and Occupational Demand publication identified eight occupations found to be in demand in seven or more LWDAs: occupational safety and health specialists, speech-language pathologists, pharmacy technicians, licensed practical nurses, physical therapy assistants, medical assistants, and phlebotomists, with persistent shortages of registered nurses, mental health and medical laboratory personnel. With Tennessee having one of the lowest life expectancies in the country, filling more positions with trained personnel and expanding access to services is critical. The innovative Vanderbilt- Metro Nashville Public Schools Partnership provides a model.

- The Construction Workforce

An average of 161,408 workers were the number employed in the construction industry in Tennessee during the last quarter of 2023, engaged in industrial, commercial, and residential projects around the state. More than half of the construction workforce is currently employed in the Northern Middle and East Tennessee LWDAs combined. The Academic Supply for Occupational Demand Report in 2024 identified nine occupations in demand in more than six LWDAs in the state, including painters; heating, air conditioning and refrigeration installers and

mechanics (HVAC); plumbers, pipefitters, and steamfitters; construction and building inspectors; electricians; operating engineers; carpenters; and construction managers. Significant numbers of apprenticeship completers help to alleviate these shortages; however, even more workers are needed, especially for HVAC and even construction managers. 603 electricians completed apprenticeship and certificate programs in 2022, compared to an expected 1,892 annual openings. One model of an integrated workforce partnership is the Titans Construction Training Camp, established with the Tennessee Department of Labor and Workforce Development (TDLWD) and the Tennessee Builders Alliance (TBA) to enable paid employment and the attainment of stackable certificates with support services for youth, including justice-involved individuals.

- The Digital Technology and Communications Workforce

The state had 51,056 employees in the information industry in the fourth quarter of 2023, working in nearly 9,600 establishments. More than half of employees in information technology firms were employed in the Northern Middle LWDA. In the Academic Supply for Occupational Demand Report (2024) the most in-demand IT occupations were identified as computer network support specialists, computer systems analysts, information security analysts, and software developers. High rates of employment were also found for medical informatics and certificate programs for information security analysts and computer systems networking and telecommunications. Identification of the variety of barriers to employment for potential tech workers seeking to train for the xAI project in Memphis have included lack of secondary tech training, academic remediation, childcare, transportation, and other resources. The State of Tennessee created a Grow Your Own program to assist with recruitment and retention of digital technology workers.

## Occupations in Demand by LWDAs

For additional data on the occupations in demand in Tennessee, regions, and the LWDAs, please access the Program Providers for Demand Occupations dashboard (see link below).

- Program Providers for Demand Occupations  
[https://data.tn.gov/t/Public/views/TennesseeProvidersforDemandOccupations/TennesseeProvidersforDemandOccupations?%3AshowAppBanner=false&%3Adisplay\\_count=n&%3AshowVizHome=n&%3Aorigin=viz\\_share\\_link&%3Atoolbar=yes&%3Aembed=yes](https://data.tn.gov/t/Public/views/TennesseeProvidersforDemandOccupations/TennesseeProvidersforDemandOccupations?%3AshowAppBanner=false&%3Adisplay_count=n&%3AshowVizHome=n&%3Aorigin=viz_share_link&%3Atoolbar=yes&%3Aembed=yes)

## Labor Force Participation Rates

Whereas Tennessee's unemployment rate from September 2022 to June 2024 has only exceeded the U.S. rate in one month (January 2023), the labor force participation rate (LFPR) in the state remained lower than the U.S. during that entire time. In June 2024 the state rate (LFPR) was 59.9 percent, in contrast to the U.S. rate of 63. The governor's priority is to raise the Tennessee LFPR to 63 percent by June 2025. Currently the Northern Middle LWDA at 67.2 percent is the only LWDA

with a LFPR higher than the national rate.

National studies point to several factors which could affect the U.S. LFPR and which could be relevant for the state as well. The aging of the population, with a smaller proportion in the prime working age group, can reduce the LFPR, but measures taken by other industrialized nations have lessened the impact of this trend. Prime age working women had the highest LFPR rate ever in 2023. Lack of daycare resources, its high costs and pay inequities are factors starting to dampen participation of mothers with young children in 2024. Increasing educational attainment of low-income people, especially women, has one of the strongest effects on LFPRs. An even greater positive effect on LFPRs has been found from improving health and integrating those with health limitations into the labor market, including the promotion of vocational rehabilitation policies and employer early intervention, which countries have successfully used to increase LFPRs. The opioid crisis has increased mortality rates for males ages 45-54; but extending health insurance to low-income families has increased LFPRs. Also, immigration (generally younger individuals) has had a positive effect on LFPRs.

## West Region's Economy and Labor Force

The West Region consists of three Local Workforce Development Areas (LWDAs)- Greater Memphis, Southwest, and Northwest, encompassing 21 counties (see Appendix). Total employment in the West Region decreased from 702,007 to 701,393, a decrease of 0.1 percent, according to annual average data for 2022 and 2023 based on place of work. This is the only region where employment declined from 2022 to 2023. The Jackson MSA did increase in employment, but employment in the Memphis MSA declined by 2,500 jobs to 659,100. The average annual unemployment rate in the region decreased from 4.2 to 4.1 in 2023, as did youth unemployment in 2021-2022, but they were still above the state average rates.

On a positive note, the annual average industry wage (total payroll divided by the number of employees) increased to \$63,580 as the total payroll increased from \$43.1 billion to \$44.6 billion from 2022 to 2023. The median occupational wage also increased to \$43,080. The five largest industry sectors were health care and social assistance, transportation and warehousing, retail, manufacturing, and educational services. The industries adding the most jobs from 2018 to 2023 were health care and social assistance (more than 11,000 new jobs), transportation and warehousing (9,100 new jobs), and construction (3,700 new jobs).

The largest occupational group in 2023 was transportation and material moving occupations, with over 100,000 workers. Employment in this industry declined slightly from 2015 to 2023, as did sales and production occupations. The occupations gaining the most jobs were business and financial operations, construction, management, and protective services.

The West Region lost population from 2022 to 2023 (-4,341), due primarily due to a population

decline in Greater Memphis. However, significant improvements in the labor force participation rates were made by the Southwest and Greater Memphis LWDAs, bringing the region closer to the state rate. The percentage of the population aged 25 or more with some college or higher educational attainment in the West Region was 10 percentage points lower than the state (47.7 vs. 57.8); this is reflected in the poverty rates in the LWDAs being higher than for the state. Reducing poverty and increasing educational attainment remain key targets of workforce policy in the region.

About 27 percent of state disadvantaged youth and adults are in the West Region, and 30 percent of single parent families, yet surprisingly few are timing out of TANF. There are more than 15,000 probationers and parolees, but very few participants in recovery courts or mental health courts.

## **Middle Region's Economy and Labor Force**

The Middle Region is composed of three LWDAs- Northern Middle, Southern Middle, and Upper Cumberland- encompassing 40 counties (see Appendix). From 2022 to 2023, total employment increased by 3.3 percent, from 1,325,718 to 1,369,675. This increase in employment was fueled by the Clarksville- Hopkinsville TN-KY MSA growing by 2.5 percent and the Nashville MSA by 2.9 percent; these two MSAs together added a total of 35,400 jobs. The average annual unemployment rate in the region decreased from 3.0 to 2.9 percent, lower than the state rate; youth unemployment decreased to 8.43 percent.

The annual average industry wage (total payroll divided by the number of employees) increased to \$66,717, a 21 percent increase from the previous year. The median occupational wage also increased to \$45,406, a 9.3 percent nominal increase over the year. The five largest industry sectors were health care and social assistance, retail trade, manufacturing, accommodation and food services, and educational services. The industries adding the most jobs from 2018 to 2023 were transportation and warehousing (20,281); professional, scientific, and technical services (15,217), construction (15,033), and health care and social assistance (13,700).

The largest occupational group in 2023 was transportation and material moving occupations, with 153,600 workers. More than 60,000 jobs have been added since 2015. Other occupational groups gaining the most jobs were business and financial services, management, food preparation and serving-related, and healthcare practitioners and technical. Job losses of 1,000 or more employees since 2015 took place in architecture and engineering, production, and office and administrative services.

The Middle Region lost 11,027 people from 2022 to 2023. Population gains took place in the Southern Middle (7,887) and Upper Cumberland (6,250) LWDAs, while the Northern Middle LWDA lost 25,164 in population. Some of the population gains in the Upper Cumberland and Southern Middle LWDAs were probably those relocating from Northern Middle, but the area overall suffered a population loss. Labor force participation rates declined slightly in all three LWDAs over the year

and for the region; LFPRs in the Northern Middle LWDA (66.8) topped that of the state, while rates in the other two LWDAs were below the state average.

Educational attainment including some college or more for those ages 25 and up was about 10 percent higher than the state in the Northern Middle LWDA (67 percent), with Southern Middle and Upper Cumberland nine or more percentage points below the state rate. Consequently, although poverty rates in the Middle Region were lower than the state's 14 percent due to lower rates in the Northern Middle LWDA, the Upper Cumberland poverty rate exceeded the state's. Educational attainment at the bachelor's level or above was highest for Black and Hispanic individuals in the Middle Region.

About 35 percent of state disadvantaged youth and adults are in the Middle Region, and about the same percentage of the individuals in poverty across the state, making poverty reduction a key priority for this LWDA. More than 40 percent of youth aging out of foster care are also in this region, as are 40 percent of the state's veterans' population, due to proximity to Fort Campbell.

## **East Region's Economy and Labor Force**

Total employment in the East Region over the year increased from 1,031,985 to 1,055,216, a rate of 2.2 percent or 22, 231 jobs. Rapid employment growth in the Chattanooga MSA (4.2 percent) as well as steady growth in the Knoxville MSA (1.8) and the Kingsport-Bristol TN-VA MSA (1.6 percent) fueled the regional growth trend. Three LWDAs are included in the East Region: East Tennessee, Northeast, and Southeast, including 34 counties (see Appendix).

The annual average industry wage (total payroll divided by the number of employees) increased to \$58,545 as the total payroll increased from \$58.1 billion to \$61.8 billion from 2022 to 2023. The five largest industry sectors in 2023 were manufacturing, health care and social assistance, retail trade, accommodation and food services, and educational services. The industries adding the most workers from 2018 to 2023 were manufacturing (10,265 new jobs) and professional, scientific, and technical services (7,901 new jobs), with the health care and social assistance industry finally showing growth over the half-decade.

The largest occupational group in 2023 was the office and administrative support group, although it lost more than 16,000 jobs since 2015, aligning with national trends as the use of technology in the workplace increased. Transportation and material moving occupations, food preparation and serving, and production occupations were the next largest groups; all increased in employment since 2015, with production adding 10,660 jobs. Top employer job postings in the region in 2023 were the hospitals and health care systems, food services, and Oak Ridge National Laboratories.

The East Region gained 33,809 in population from 2022 to 2023, with population increases in all three LWDAs. Labor force participation rates decreased slightly in each LWDA, but the overall LFPR remained the same, about three percentage points lower than the state. The average

regional unemployment rate was consistent in the region from 2022 to 2023 (3.4 percent), just one percentage point above the state rate. Youth unemployment decreased in the region. The educational attainment rate for some college or higher for those in the East Tennessee LWDA (58.5) for adults 25 and over topped that of the state; the other two LWDA's had rates below the state. The educational attainment rates of bachelor's degrees or higher for the population age 25 or more were lower than state rates for White, Black, and Hispanics.

On a positive note, the poverty rate displayed a significant decrease in 2022 for the East Region. All LWDA's were had lower rates than the state rate of 14 percent, with the Northeast LWDA having the highest rate and the lowest rate of educational attainment of the population having some college or more education. Notably, the Southeast poverty rate decreased from 18.82 percent to 11.46 percent while the Chattanooga MSA employment grew more than four percent. Rates of those with disabilities remained higher than the state, possibly because of the effects of the opioid crisis in the region.

Significant barriers to employment include fewer parolees and probationers in 2023 but a larger number of individuals in the jail population in 2024 than in 2023. This region includes 29 percent of those in poverty, 37 percent of disadvantaged youth and adults, 40 percent of those with disabilities, and 35 percent of those 20-24 years old.

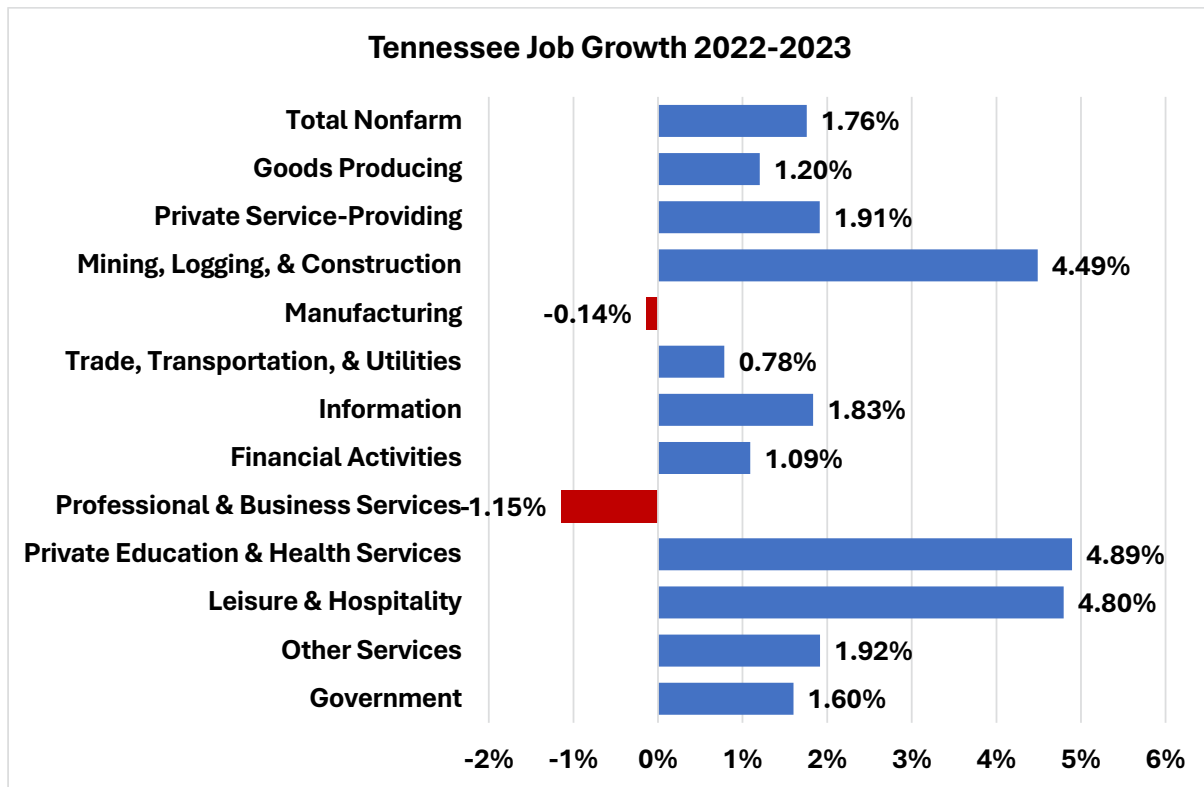
## Apprenticeships

The number of apprenticeship completers has been steadily increasing since 2019 when the apprenticeship office was established in TDLWD: from 2020 (981) to 2023 (1,174). The West Region added 45 more completers over the year. The variety of apprenticeships is also greater, with 86 different programs with apprenticeship completers in 2023. The sponsors and the number of completers in each region and LWDA are shown in this section.

The top occupations for apprenticeship completers in 2023 were electricians, pipe fitters (construction), chemical operators, sheet metal workers, and carpenters. Several new programs with more than five completers in 2023 included two in medical, two in computer science, and several in production and building maintenance occupations.

# Tennessee Employment 2023

Based on place of employment, Tennessee's annual average nonfarm employment increased by 1.76 percent from 2022 to 2023. Goods-producing jobs increased at a rate of 1.2 percent compared to 1.91 percent for private service-providing jobs. This represented a significant difference from the prior year when those sectors grew by 4.5% and 2.4% respectively. Jobs in the government sector grew by 1.60 percent.



Source: TDLWD, WIRED Division, Current Employment Statistics

Figure 1.

Tennessee's Economy 2022-2023 identified seven industry sectors as the top industries in Tennessee, based on size, jobs added, and/or higher rates of growth. These included:

- Leisure and hospitality
- Health care and social assistance
- Manufacturing
- Transportation, warehousing, and utilities
- Professional, scientific, and technical services
- Construction and
- Information

Within the **leisure and hospitality sector**, accommodation and food services was one of the top five industries adding the most jobs in 2018-2023; the arts, entertainment, and recreation industry grew more than twice as fast as the state average growth rate of 7.6 percent. Leisure and hospitality continued its growth as the second-fastest growing industry in 2022-2023.

The **private health care and social assistance sector**, as one of the largest industries in the state, was among the top five in job creation, adding more than 27,000 jobs during this half decade. It was the sector with the most rapid growth rate (4.9 percent) from 2022-2023.

**Manufacturing**, the fourth largest industry sector (excluding government), lost about 500 jobs in 2022-2023, but had 3.7 percent growth over the five-year period, in contrast to its performance at the national level. Investments in green energy have spurred the advanced manufacturing sector, especially the durable goods industry.

**Transportation, warehousing, and utilities** was one of the top-growing industries over the half decade, adding more than 34,000 jobs and growing nearly three times as fast as the average for the state. Changes in consumer purchasing patterns towards e-commerce during the pandemic spurred the warehousing and transportation sectors to significant growth; in contrast, retail trade grew at only half the rate of overall growth.

**Professional, scientific, and technical services** grew three times as fast as overall job growth, adding more than 33,000 jobs during the half decade. This is the fastest-growing sector of professional and business services, which also contains the administrative and support and waste management sectors, which declined during 2018-2023, causing professional and business services to also decline in 2022-2023.

The mining, logging, and construction industry was also one of the top job creators, adding more than 29,000 jobs and growing nearly three times as fast as overall growth. This fast pace continued in 2022-2023 as it had the third most rapid growth among industry sectors in the state, due to growth in the industrial, utility, and residential areas. This sustained rate of growth has strained workforce resources, causing shortages of workers and the need for broader workforce development.

**Table 1. Tennessee Industry Employment, 2018-2023**

Industry Employment (in thousands)	2018	2022	2023	2022-2023		2018-2023	
<b>Total Nonfarm</b>	3073.7	3250.9	3308.1	57.2	1.8%	234.4	7.6%
<b>Goods Producing</b>	480.1	515.9	522.1	6.2	1.2%	42.0	8.7%
<b>Mining, Logging, &amp; Construction</b>	129.1	151.5	158.3	6.8	4.5%	29.2	22.6%
<b>Manufacturing</b>	351.0	364.4	363.9	-0.5	-0.1%	12.9	3.7%
<b>Durable Goods Manuf.</b>	224.2	232.6	233.1	0.5	0.2%	8.9	4.0%
<b>Non Durable Goods Manufacturing</b>	126.7	131.8	130.8	-1.0	-0.8%	4.1	3.2%
<b>Private Service-Providing</b>	2157.8	2297.9	2341.8	43.9	1.9%	184.0	8.5%
<b>Trade, Transportation, &amp; Utilities</b>	623.5	676.3	681.6	5.3	0.8%	58.1	9.3%
<b>Wholesale Trade</b>	120.4	128.8	134.2	5.4	4.2%	13.8	11.5%
<b>Retail Trade</b>	333.1	341.2	343.2	2.0	0.6%	10.1	3.0%
<b>Transportation, Warehousing, &amp; Utilities</b>	170.0	206.3	204.3	-2.0	-1.0%	34.3	20.2%
<b>Information</b>	45.3	54.5	55.5	1.0	1.8%	10.2	22.5%
<b>Financial Activities</b>	174.7	183.5	185.5	2.0	1.1%	10.8	6.2%
<b>Finance &amp; Insurance</b>	134.1	140.6	141.6	1.0	0.7%	7.5	5.6%
<b>Real Estate &amp; Rental &amp; Leasing</b>	40.6	42.9	44.0	1.1	2.6%	3.4	8.4%
<b>Professional &amp; Business Services</b>	418.0	462.8	457.5	-5.3	-1.1%	39.5	9.4%
<b>Professional, Scientific &amp; Technical Services</b>	141.2	170.0	174.5	4.5	2.6%	33.3	23.6%
<b>Management of Companies &amp; Enterprises</b>	49.0	54.2	56.3	2.1	3.9%	7.3	14.9%
<b>Administrative &amp; Support &amp; Waste Mgt &amp; Remediation Services</b>	227.9	238.6	226.7	-11.9	-5.0%	-1.2	-0.5%
<b>Private Education &amp; Health Services</b>	440.1	451.5	473.6	22.1	4.9%	33.5	7.6%
<b>Private Educational Services</b>	61.0	64.6	67.3	2.7	4.2%	6.3	10.3%
<b>Health Care &amp; Social Assistance</b>	379.0	387.0	406.3	19.3	5.0%	27.3	7.2%
<b>Leisure &amp; Hospitality</b>	337.9	344.1	360.6	16.5	4.8%	22.7	6.7%
<b>Arts, Entertainment &amp; Recreation</b>	40.0	43.5	47.3	3.8	8.7%	7.3	18.3%
<b>Accommodation &amp; Food Services</b>	298.0	300.6	313.2	12.6	4.2%	15.2	5.1%
<b>Other Services</b>	118.2	125.2	127.6	2.4	1.9%	9.4	8.0%
<b>Government</b>	435.8	437.1	444.1	7.0	1.6%	8.3	1.9%
<b>Federal Government</b>	49.1	52.4	55.7	3.3	6.3%	6.6	13.4%
<b>State Government</b>	99.0	94.8	96.9	2.1	2.2%	-2.1	-2.1%
<b>Local Government</b>	287.6	289.9	291.5	1.6	0.6%	3.9	1.4%

Source: TDLWD, WIRED Division, Current Employment Statistics

The **information**, or digital technology, sector was a top growth industry at 22.5 percent, increasing in employment at nearly three times the state rate over the five years ending in 2023. Over the last year its growth slowed to about the same pace as overall growth in the Tennessee economy, with digital technology jobs spreading throughout most industries in the state.

The following sections highlight workforce issues related to several of these top industries.

## Tennessee's Advanced Energy Workforce and Emerging Industries

A variety of industry developments in the advanced manufacturing and advanced energy clusters are driving employment and training opportunities in Tennessee. The advanced manufacturing investment includes the production of electric vehicles, batteries, and other auto parts, electric charging stations (production, installation, and maintenance), electric vehicle repair, and training facilities to teach the skills needed to put and keep the vehicles on the road.

In March 2023 it was reported that Tennessee was one of the top 10 states for investment in electric vehicles, electric batteries, and battery components from 2015 to 2023.<sup>1</sup> Since 2019, the Tennessee Department of Economic and Community Development (TNECD) said that investments of nearly \$15 billion have been made by companies in Tennessee through EV-related projects, creating close to 11,000 new jobs.<sup>2</sup>

Although for the 15 of 18 EV models available since January 2023, over the last year purchases are up 73%, the pace of investments have slowed somewhat due to the higher costs of electric vehicles, the slower installation of public electric vehicle charging stations, range anxiety, and lack of consumer education on how to use and charge the vehicles.<sup>3</sup> Auto manufacturers are responding to some of these concerns by planning to expand the production of hybrid vehicles and researching the potential for lower-cost models. The state has \$88 million to implement fast charging in the state. The goal is to have fast chargers every 50 miles along the interstates and Highway 64. As with any new technology, adaption takes time and consumer education.

What has been the response of the workforce system to these new challenges? The response has been vibrant by both employers and educators, from developing new partnerships to new training programs to new institutions as learning academies for both students, teachers, and the community.

Partnerships: Since the technologies are new, and new production processes are being developed, economic and community development staff are meeting with manufacturers to identify their skill needs.<sup>4</sup> They are also working with current companies that are gas engine parts manufacturers to incentivize them to retrain their employees. The rapid pace of technological change requires interdisciplinary work and collaboration is essential.<sup>5</sup>

New Programs: In response to employer needs, a new degree program for EV has been developed including education on charging stations and mechatronics at Motlow State Community College<sup>6</sup>; an TCAT automotive technician program at Chattanooga State Community College from which individuals can transfer to an associate's degree in electrical engineering, focused on EV manufacture and repair<sup>7</sup>; and a new TCAT, opened in June 2024, was constructed in Stanton at the Blue Oval site to train individuals in skills needed to work at the EV auto manufacturing and battery plants. Existing programs in industrial electricity, mechatronics, and cybersecurity are important for EV and charging station production and maintenance. Locations of these programs can be found on the Program Providers for Demand Occupations dashboard [https://data.tn.gov/t/Public/views/TennesseeProvidersforDemandOccupations/TennesseeProvidersforDemandOccupations?%3AshowAppBanner=false&%3Adisplay\\_count=n&%3AshowVizHome=n&%3Aorigin=viz\\_share\\_link&%3Atoolbar=yes&%3Aembed=yes](https://data.tn.gov/t/Public/views/TennesseeProvidersforDemandOccupations/TennesseeProvidersforDemandOccupations?%3AshowAppBanner=false&%3Adisplay_count=n&%3AshowVizHome=n&%3Aorigin=viz_share_link&%3Atoolbar=yes&%3Aembed=yes)

Employer Training: Volkswagen has an academy in Chattanooga with Chattanooga State Community College which offers the electrical engineering associate's degree. Nissan has an internal Nissan University with college and EV technology training and is also establishing Centers of Excellence at Tullahoma and the Franklin, Giles, and Warren County High Schools<sup>8</sup> ([vimeo.com/930267326](https://vimeo.com/930267326)) for which they are paying the instructors. They also are sponsoring work-based learning programs. Apprenticeships could be developed.

Workforce and training challenges include program labeling and scope (including current and new technologies for greater employment opportunities), accessibility to training sites including for urban populations, determining alignment of military positions with EV, and outreach to those in adult education programs including the justice-involved (Ashford, Rich). At the same time, opportunities are expansive with \$16 billion in grants available with a focus on equity and economic development (Millican). Better methods for community education on EVs and the use of charging stations, as well as advances in battery technology (faster chargers, new materials, greater range), will support wider acceptance of the technology.

## Advanced - Energy Related Grants

A study released in October 2023 reported that Tennessee had the most rapidly-growing clean energy workforce in the country in 2022. The largest employment in the energy sector nationally is energy efficiency, including constructing, manufacturing, and installing energy-efficient appliances, heat pumps, lighting, and building materials.

Advanced- Energy Related Grants: Passage of the Infrastructure Investment and Jobs Act (2021) and the Inflation Reduction Act (2022) provided the Tennessee Department of Environment and Conservation (TDEC) the opportunity to apply for several grants. These grants may result in funding for workforce development opportunities in 2024 and beyond, which could include the

development of apprenticeships. These include:

- Solar for All- this grant was approved by the EPA in April 2024. TDEC will begin a planning year in September 2024 to define the program workplan and budget. TDEC is designing workforce training that will prepare individuals from low-income and disadvantaged communities for middle-class career pathways in solar energy deployment.
- Three other grants have been submitted, including Training for Residential Energy Contractors, Residential Energy Auditor Training, and Commercial Energy Auditor Training. TDEC is waiting for approval from the U.S. Department of Energy.
- TDEC will consider applying for a competitive grant for Training for Residential Energy Contractors. If the decision is made to apply to this grant, the due date is January 15, 2025.

The Training for Residential Energy Contractors and Energy Auditor Training grants will provide funding for state energy offices to train, test, and certify residential energy efficiency and electrification contractors and train individuals to conduct energy audits of commercial and residential buildings. TDEC has consulted with the Department of Labor and Workforce Development on these grants; the Deputy Commissioner of TDLWD serves on the TDEC Workforce Advisory Group that will begin further consultations on workforce issues and training opportunities when additional grants are approved.

In addition, school districts have applied for grants for electric and propane school buses, which if awarded will provide the opportunity for school district employees to learn maintenance skills for these buses. Federal and state funds are available for these competitive grants. Grants should include a plan to create good jobs (as defined by the US DOL ETA's eight recently released criteria), providing stable employment and a livable wage. The website Green Workforce Connect <https://www.greenworkforceconnect.org/> will assist grantees in implementing energy auditor and other clean energy grants received.

## **Advanced - Energy Innovation in the Electric Utility Sector**

The interdisciplinary and interconnected nature of advanced energy is nowhere more evident than in the electric utility sector, which connects the housing, transportation, communication, industrial development, and many other sectors of our communities which require energy to operate.

The Advanced Career Cluster organization has added an Energy cluster to its classification of educational programs of study. Tennessee is within the seven-state Tennessee Valley Authority (TVA) system, the largest public power provider in the United States, containing the third largest nuclear fleet in the country and with 99.99 percent electric reliability since 2000. The Tennessee Advanced Energy Business Council (TAEBC) promotes innovation, education, and opportunity in this sector, promoting partnerships and venture funding across numerous related industries.

Dr. Joe Hoagland, Vice President of Innovation and Research at TVA, and a fellow for energy policy at the University of Tennessee (UT)'s Baker School, in July 2024 identified the following parameters of electric energy system components and areas of innovation from the 2000's to the present:<sup>10</sup>

- Advanced Nuclear
- Connected Communication
- Decarbonization
- Electric Vehicles
- Energy Efficiency
- Future Grid Performance
- Gas Generation
- Regional Grid Transformation
- Renewables including wind and solar
- Storage integration

They are forecasting TVA growing two to three percent annually, especially with the growth of artificial intelligence (AI); they also have a goal to increase solar energy by 10,000 megawatts by 2030.

He identified the energy economy of the future as composed of the following components:

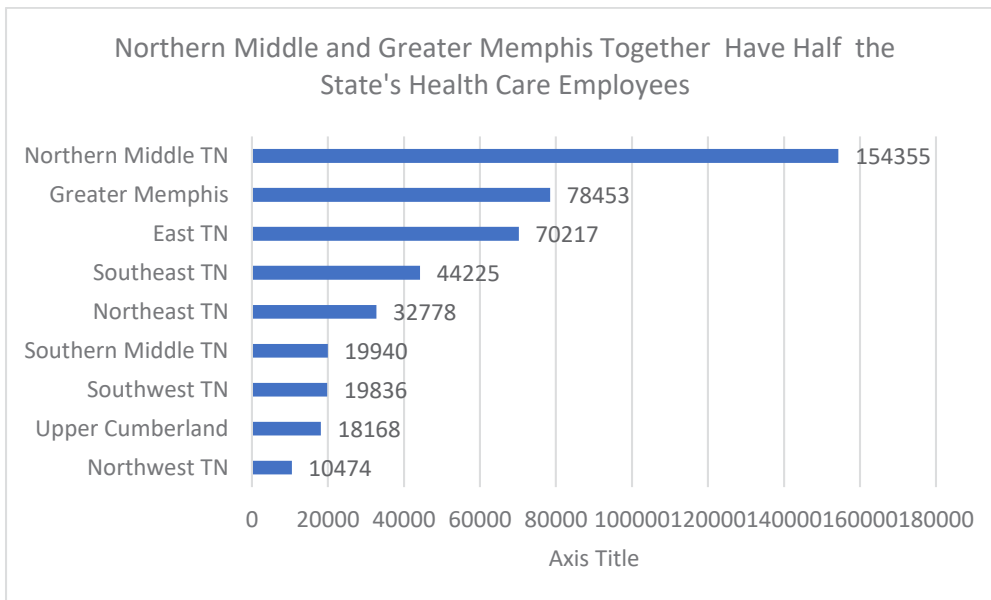
- Advanced Nuclear
- Virtual Power Plants
- Widespread Electrification
- Hydrogen Economy
- Low/no Carbon Generation
- Digitization
- Cybersecurity
- Augmented /Virtual Reality
- Artificial Intelligence
- Machine Learning (New Manufacturing Processes)

What are the workforce implications of these technologies or the introduction of any advanced technologies? Certainly constant, rapid change; how the change is led and implemented will define the workforce implications in the near term.

## The Health Care and Social Assistance Workforce

The fourth quarter of 2023 in Tennessee had an average of 449,826 health care and social assistance workers in Tennessee. The largest number of them, nearly 39 percent, worked in ambulatory care services; the next largest proportion, nearly 35 percent, worked in hospitals. The remainder worked in nursing and residential care facilities and social assistance agencies.

Currently the largest industry sector in the state, it is projected to increase to 488,370 by 2032, including private, state, local, and federal employees.



Source: TDLWD, WIRED Division, Quarterly Census of Employment and Wages (QCEW), Q4 2023, jobs4tn.gov

Figure 2

The LWDAs in the state with the lowest number of health care and social assistance employees per hundred population include the Northwest and Southern Middle LWDA<sup>11</sup>.

In the 2024 Academic Supply and Occupational Demand report, eight health sciences occupations were found to be in demand in seven or more LWDA:

- Occupational safety and health specialists ( bachelor's degree)
- Speech-language pathologist (master's degree)
- Pharmacy technicians (high school diploma or equivalent)

- Licensed practical nurses (postsecondary nondegree award)
- Physical therapy assistants (associate degree)
- Dental assistants (postsecondary nondegree award)
- Medical assistants (postsecondary nondegree award)
- Phlebotomists (postsecondary nondegree award)

Other occupations listed as unmet needs in the Health Sciences (programs with graduates' employment of 60 percent or more and median wage higher than the state median of \$39,979) included registered nurses, respiratory therapists, MRI technicians, medical laboratory personnel, physical therapists, and mental health nurses<sup>12</sup> (pp. 70-72). Data on these persistent shortages is displayed in real-time data in jobs4tn for the Tennessee for August 13, 2024, comparing the number of job openings listed and the candidates with resumes on the system.

**Table 2: Health Care Occupational Shortages**

Occupation Title	Number of Openings in Jobs4tn on 8/13/2024	Number of Candidates in Jobs4tn on 8/13/2024	Candidates as % of Available Jobs
Speech-language pathologists	262	0	0.0%
MRI technicians	90	0	0.0%
Physical therapists	1,048	1	0.1%
Advanced practice psychiatric nurses	77	1	1.3%
Registered nurses	6,335	96	1.5%
Physical therapist assistants	243	4	1.6%
Medical and clinical lab technologists	272	5	1.8%
Respiratory therapists	167	4	2.4%
Licensed practical nurses	1,491	54	3.6%
Phlebotomists	196	35	17.9%
Pharmacy technicians	328	60	18.3%
Medical and clinical lab technicians	134	28	20.9%
Dental assistants	121	33	27.3%
Medical assistants	394	164	41.6%
Occupational safety and health specialists	40	18	45.0%

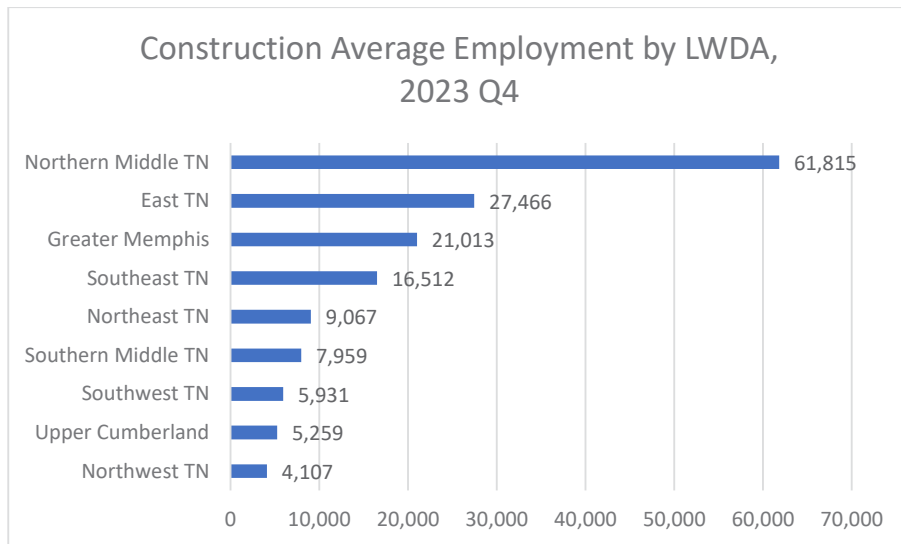
Source: Jobs4tn.gov, Occupational Profiles, job openings and candidates data.

**Partnerships to Reduce Shortages:** Novel programs to increase the number of health care personnel in Nashville include the partnership between Vanderbilt University and Metro Nashville Public Schools<sup>13</sup>. In 2023, the second year of the program, the university held an orientation at the Health Sciences Academy at Pearl-Cohn High School in North Nashville. In the program, Vanderbilt nurses mentor high school students who plan to become registered nurses by meeting with them weekly, discussing course work needed to pursue a registered nursing career, assisting them in understanding the process of applying to college, and providing encouragement.

After graduation, students may qualify for Vanderbilt's Care Partner Academy, a month long, full-time program which is tuition-free; after completion of the program, participants will be employed at VUMC as care partners. High school graduates can also be employed at VUMC as medical assistants. As full-time employees, they are then able to take advantage of Vanderbilt's nursing tuition benefit of \$8,000 for tuition annually for employees enrolled in accredited associate, bachelor's or master's degree nursing programs.

## The Construction Workforce in Tennessee

An average of 161,408 workers were employed in the construction industry in Tennessee during the final quarter of 2023. This was an increase of 5 percent over the year. Fueling this growth are projects like the building of the Titans Stadium and surrounding neighborhood in East Nashville, expected construction of more than 13,000 hotel rooms in Nashville<sup>14</sup>; the construction of Blue Oval City in Stanton, Tennessee; and other industrial, commercial, and residential projects around the state. According to Tennessee's long-term projections, the industry is projected to grow by 16.55 percent during the period 2022 to 2032.



Source: TDLWD, WIRED, QCEW 2023 Q4 Employment , Construction (NAICS code 23, all ownership codes)

Figure 3

The detailed industries within the construction sector include heavy and civil engineering construction (15.7 percent), construction of buildings (20.4 percent), and specialty trade contractors, which employed nearly 2 out of every three construction workers in the Q4 of 2023. The following table lists the construction occupations in demand in more than six LWDAs in the Academic Supply for Occupational Report 2024<sup>15</sup>. The number of recent job openings and number of active candidates in jobs4tn as of August 13, 2024 are shown. This recent supply and demand data shows continuing shortages of these key construction occupations in the state, with only construction laborers in a balanced supply and demand position.

**Table 3: Construction Workforce Occupational Shortages**

Occupation Title	Number of Openings in Jobs4tn on 8/13/2024	Number of Candidates in Jobs4tn on 8/13/2024	Candidates as % of Available Jobs
Painters, construction, and maintenance	49	1	2.0%
Heating, air conditioning, and refrigeration installers and mechanics	610	46	7.5%
Plumbers, pipefitters, etc	151	26	17.2%
Construction and building inspectors	42	12	28.6%
Electricians	137	50	36.5%
Operating engineer and other equipment operators	131	53	40.5%
Carpenters	102	43	42.2%
Construction Managers	173	75	43.4%
Construction Laborers	111	116	104.5%

Source: jobs4tn.gov, Occupational profiles, supply and demand.

Training programs to reduce shortages in these occupations produced more than 1,300 completers in 2022. These occupations have some of the highest rates of employment in Tennessee for aligned programs among all educational clusters; however, wages of many occupations remain below the average for entry-level wages for all occupations in the state. Completers for these shortage occupations included the following:

- Heating and air conditioning and refrigeration installers and mechanics: 404 certificate and 18 apprenticeship completers;
- Plumbers, pipefitters, and steamfitters: 38 certificate and 114 apprenticeship completers;
- Electricians: 262 certificate and 341 apprenticeship completers;
- Carpenters: 56 apprenticeship completers;

- Construction managers: 84 completers of bachelor's degree programs.

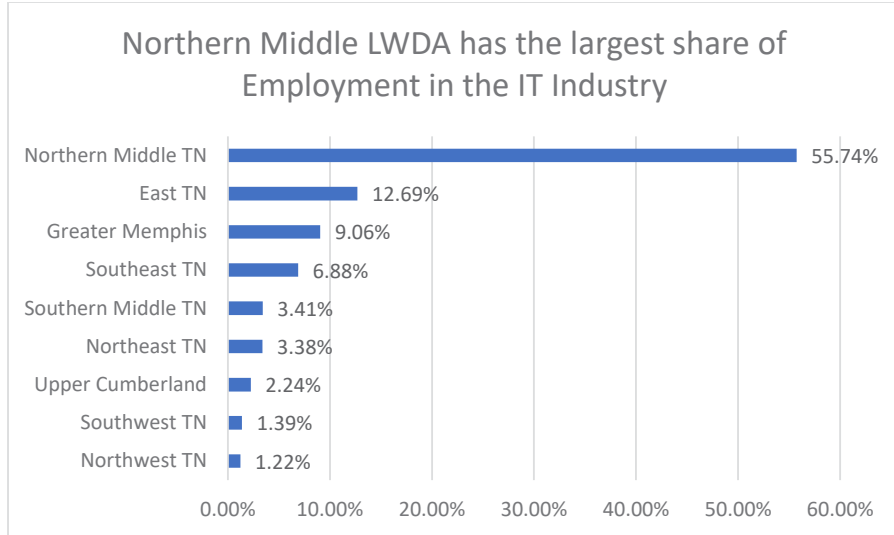
The other shortage occupations did not have programs addressing them. High school CTE programs were more generic, such as building construction technology/technician, with 891 completers; of these, 53 percent were employed in Tennessee, with average wages of \$38,497. Although the share of retirement age workers in construction is not as high as in some industries, skilled trades workers like carpenters and electricians are a higher proportion of workers near retirement age.<sup>16</sup>

**Integrated Workforce Partnerships:** The Department of Labor and the Tennessee Builders Alliance (TBA) are partnering to reduce justice-involved and other barriers to employment for 250 participants in the construction industry in the building of the new Nissan Stadium in Nashville. Through a grant to the TBA, the Titans Construction Training Camp was established, which features an onsite short course in basic training in construction skills with pay for participants, the ability to earn three credentials, supportive services such as math, childcare, and transportation assistance, a guaranteed interview for beginning construction jobs, and the formation of apprenticeships. Posting and application of construction jobs and interviewing are facilitated by TDLWD at the site; TDLWD also provides ongoing safety consultation.<sup>17</sup>

## The Digital Technology and Communications Workforce

In the fourth quarter of 2023, Tennessee had 51,056 employees in the information technology industry, working in nearly 9,600 establishments. These companies include publishing (including software publishing), broadcasting (including motion pictures), telecommunications, computing services providers, web search portals, libraries and archives, and other information services. In 2022, the largest of these included software publishers (11,460 employees), telecommunications (8,745), motion picture and video industries (8,010), and data processing and hosting (6,810), expected to add thousands of jobs through 2032.<sup>18</sup> The sound recording industry is expected to add more than 2,000 jobs during that time.

The information technology industry is concentrated primarily in four LWDA's, with more than half in the Northern Middle region; other concentrations are in the East (including Oak Ridge), Greater Memphis, and the Southeast.



Source: TDLWD, WIRED Division, Quarterly Census of Employment and Wages (QCEW), Q4 2023, jobs4tn.gov

Figure 4

Information technology occupations are more widely distributed, with some employees being found in nearly every industry in the state. The most in-demand IT occupations include computer user support specialists, computer network support specialists, computer systems analysts, information security analysts, and software developers.<sup>19</sup> Comparisons of online job listings to candidates in jobs4tn.gov for the state for August 7, 2024 showed shortages of candidates compared to job openings for computer systems analysts and software developers, and a balance of information security analysts and job openings.

The Academic Supply and Occupational Demand 2024 publication identified several academic programs as meeting the criteria of unmet needs, with graduates earning more than the state median wage in 2022 of \$39,929 and employment rates in Tennessee equal to or greater than 60 percent, including the postbaccalaureate certificate in medical informatics, the bachelor's degrees 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.<sup>20</sup>

The June 5, 2024 announcement by Elon Musk that he was bringing the world's largest supercomputer to Memphis has highlighted the need to increase training and support for potential workforce participants.<sup>21</sup> Although there is a diverse tech workforce, students in tech courses often face a variety of barriers or personal challenges to enrolling in and completing courses, including lack of tech training in the K-12 school system, those in poverty needing academic remediation, having experienced trauma, lack of childcare, lack of transportation and resources in general, and need for improved communication skills.<sup>22</sup> Overcoming these challenges and barriers can provide access to career educational opportunities leading to higher paid jobs.

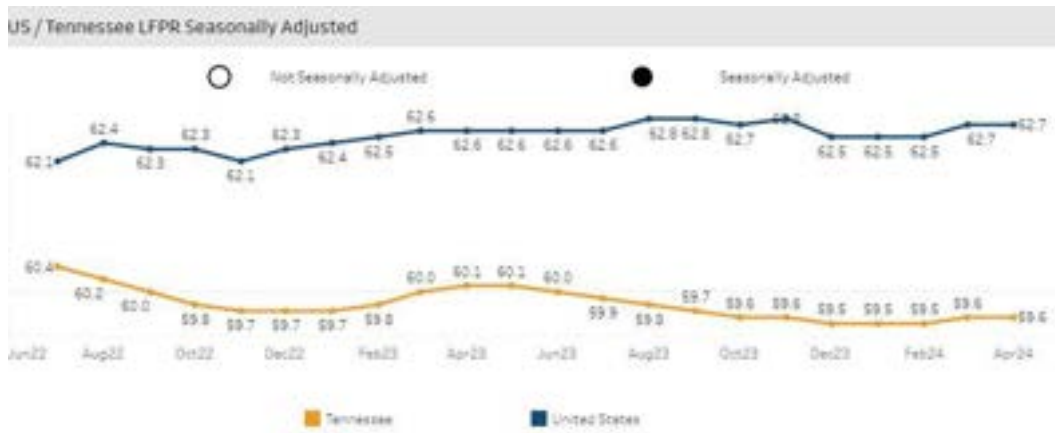
Similarly, the development of the STARS framework- a framework to promote the economic mobility of individuals Skilled Through Alternative Routes- identifies six contributors to greater mobility and workforce success- Family, Community Networks, Job Quality, Financial Resources, an Inclusive Workplace, and Employment Access,<sup>23</sup> which can be applied to increasing the tech workforce.

Another approach to reducing shortages of tech personnel and turnover in Nashville, one of the hottest IT recruiting markets in the U.S., is the Grow Your Own approach being applied by the Tennessee Department of Finance and Administration's STS for training and retaining personnel<sup>24</sup> called "Empowering the Future". This plan utilizes a variety of measures including mentoring, greater engagement, and encouraging certification attainment to achieve higher skill levels tied to higher compensation and to reduce turnover.

## Tennessee's Unemployment and Labor Force Participation

### United States and State of Tennessee Labor Force Participation Rate Comparison

US/Tennessee Labor Force Participation Rate (Seasonally Adjusted)



Data Source: Local Area Employment Statistics (LAUS) - TLDWD

Source: TN Department of Labor and Workforce Development and Bureau of Labor Statistics, April 2024.

<https://www.tn.gov/workforce/tennessee-economic-data-/labor-force-participation-analysis.html>

Figure 5

In 2024, Tennessee's unemployment rate has been trending downward. Tennessee's June 2024 seasonally adjusted unemployment rate was 3.0 percent, lower than the rate of 3.6 percent in June 2023. In contrast, the U.S rate of 4.1 percent in June 2024 increased from 3.6 percent in June 2023. Tennessee's monthly unemployment rate from September 2022 to June 2024 has only exceeded the U. S. rate in one month, January of 2023. Continuing the trend, Tennessee's annual average rate for 2023 was 3.3 percent, lower than the U.S. rate of 3.6 percent.

However, Tennessee's labor force participation rate also remained below that of the U.S. It declined in Tennessee from 61.7 percent in 2012 to 59.9 percent in June of 2024. The U.S. labor force participation rate also declined from 63.7 percent in 2012 to 63 percent in June of 2024 but it remained above the Tennessee rate of 59.9 percent.

## Factors Affecting the Labor Force Participation Rate

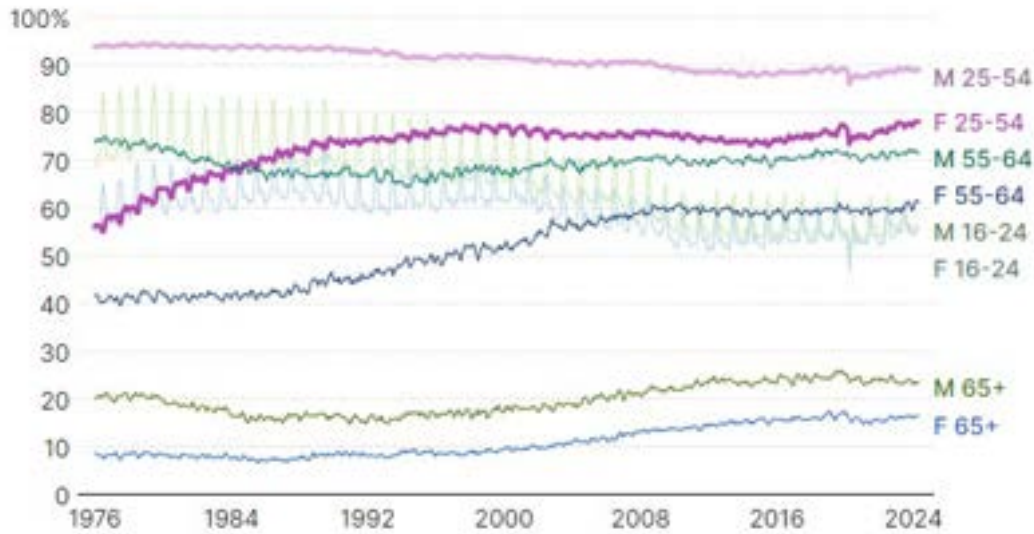
The Tennessee labor force participation rate (LFPR) has consistently been below that of the U.S. In May 2024 the U.S. rate was 62.5, holding steady over the month, while the Tennessee rate declined to 59.5 percent, a full three percentage points below the U.S. rate. The only LWDA in Tennessee which had a rate higher than the U.S. was Northern Middle at 67.2 percent; the lowest rate in the state was in the Northeast at 53 percent. National studies point to several factors which could affect the LFPR for the U.S. and which could be important in Tennessee as well, pointing to additional data which may need to be collected for the state and highlighting possibilities for improvement. These factors include:

1. **Demographic Fluctuation:** Long-running demographic patterns, such as the aging of the population, population fluctuation, and population displacement have been a large part of the explanation for the decline in the national LFPR. Changes in the shape of the "population age pyramid" over recent decades has also been a driver of LFPR. When most of the work force is of prime working age, LFPR will rise. As larger portions of the workforce age, this can negatively affect the LFPR (Abraham and Kearney, 2018).<sup>25</sup> However, measures can be taken to improve the situation.

A study by Krueger (2017) found that demographic fluctuation that is driven by long-running population patterns within demographic groups account for "between half and two thirds of the decline of the national LFPR".<sup>26</sup>

2. **Gender and Age Dynamics:** In the past, women's participation tended to negatively affect the labor supply curve; during the pandemic, parents and especially women had lower LFPRs. However, since the pandemic, nationally, prime-age women have been a powerful force in the labor force recovery. Their LFPR grew to their highest level ever in 2023. In January 2024, 78% of women between the ages of 25 and 54 were active in the labor force, a notable increase from the downturn in 2020.<sup>27</sup> However, the Brookings Institution study also noted there were differences by race and ethnicity in women's LFPRs during this time.

Availability of daycare resources and costs, as well as the gender pay gap can also affect women's participation, which started to slow among mothers with young children in mid-2024. The Women's Bureau of the U.S. Department of Labor is encouraging apprenticeship programs to provide childcare for participants to increase LFPRs of women.<sup>28</sup>



Source: Current Population Survey 1976–2024; authors' calculations.

Note: Data are not seasonally adjusted. The analysis in this figure uses "wtfinl" rather than "compwt" because "compwt" is only available starting in 1998.



Lauren Bauer and Noadia Steinmetz-Silber

Figure 6

- 3. Education and Demographic Groups:** Nationally, LFPR within different demographic groups have been identified as a main cause of decline as well. Other demographic factors such as the educational attainment of minorities can affect the labor supply curve. In the U.S., increased education is strongly related to higher LFPRs; those without a high school degree on average have LFPRs at about 60 percent; those with postsecondary education average 70 percent or higher. Increasing educational attainment of those with currently low education is a measure that has one of the largest impacts on LFPRs, especially among women.<sup>29</sup>
- 4. Social Security Disability Entitlements and Retirement:** Increases in the availability or payment levels of disability or Social Security benefits could reduce the number of people participating in the labor force. The benefit levels could affect the labor supply for specific demographic groups; for example, changes in Social Security retirement benefits could affect the labor supply of the elderly (Prados, 2019).<sup>30</sup> With an average time of 236 days for an initial disability decision, and 322 days for a hearing decision<sup>31</sup>, it is unlikely that changes in disability payment levels would affect month- to-month LFPRs.

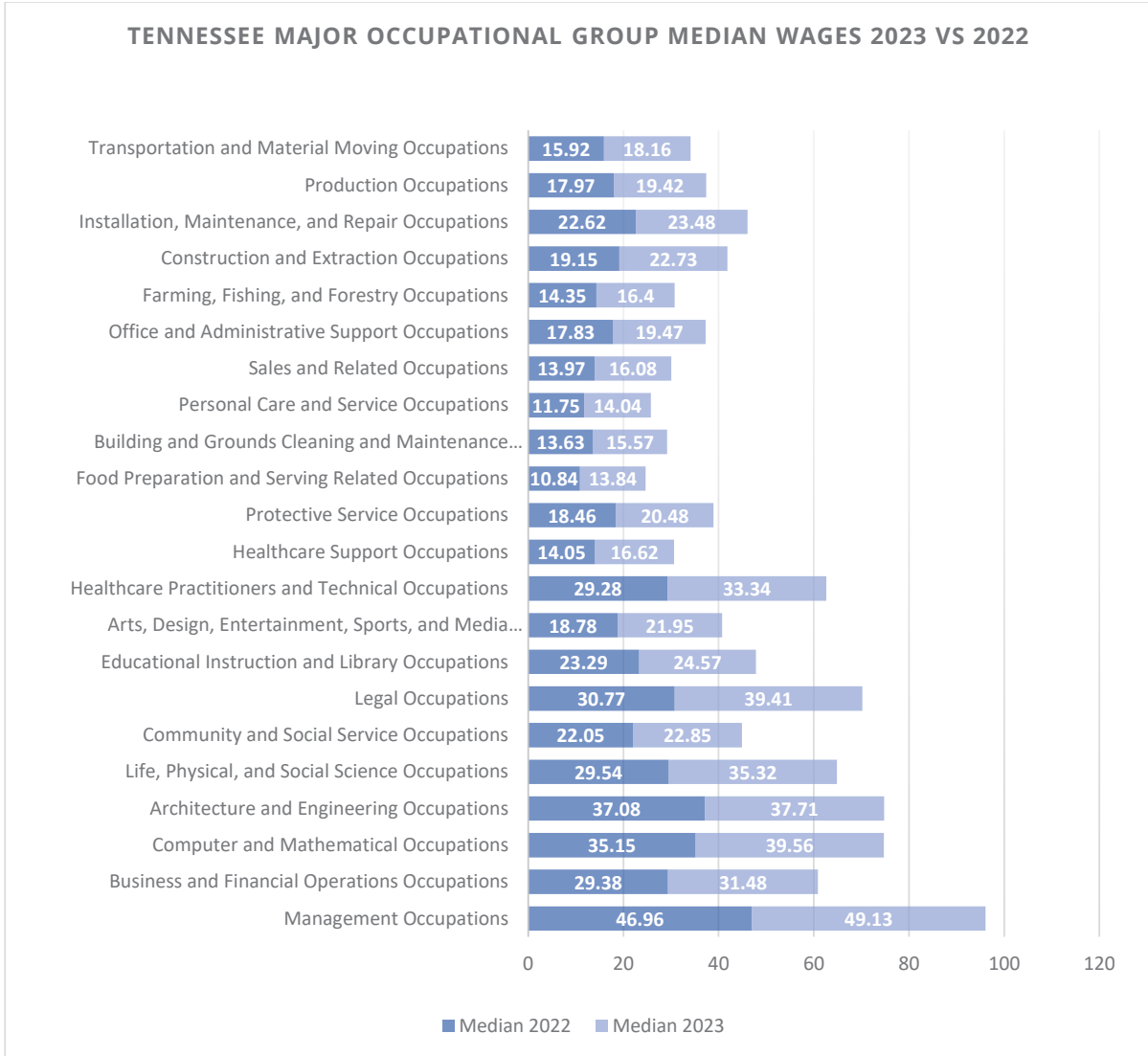
However, other industrialized countries have found that improvements in health and integrating those with health limitations into the labor market has had a greater effect on LFPRs than even increasing the education rates of those with currently lower education (Boheim et.al.).<sup>32</sup> Measures being used include early intervention programs, promoting vocational rehabilitation

policies, focusing more on what workers are able to do, and involving employers in preventing workers from permanently leaving the labor market due to illness. Even with an aging population, countries that have taken similar measures have seen LFPRs increase.

- 5. Veterans Affairs Retirements:** These benefits could theoretically affect the labor supply curve in a negative manner. This effect should be studied in Tennessee, considering that the state's middle region has a high volume of veterans that leave Fort Campbell daily. Whether veterans choose to work or not depending on the amount of their Veterans Affairs retirement could be a driver for the lower LFPR in Tennessee.
- 6. Immigration:** On a national level, immigration affects LFPR rates in direct and indirect ways. There is strong evidence of immigration having had a positive effect on overall LFPR by moderating the overall decline, whereas the sign and magnitude of the indirect effect remain uncertain.
- 7. Health and Opioid Crisis:** The increase in the health opioid crisis has resulted in increased mortality rates in males ages 45-54.<sup>33</sup> Regression analysis performed by Krueger (2017) leveraging county-level differences in opioid prescription rates show that opioid prescription rates and decreasing LFPR have become intertwined. However, studies have found that extending health insurance to low- income families can increase labor force participation.<sup>34</sup>

## Tennessee Wages 2022-2023

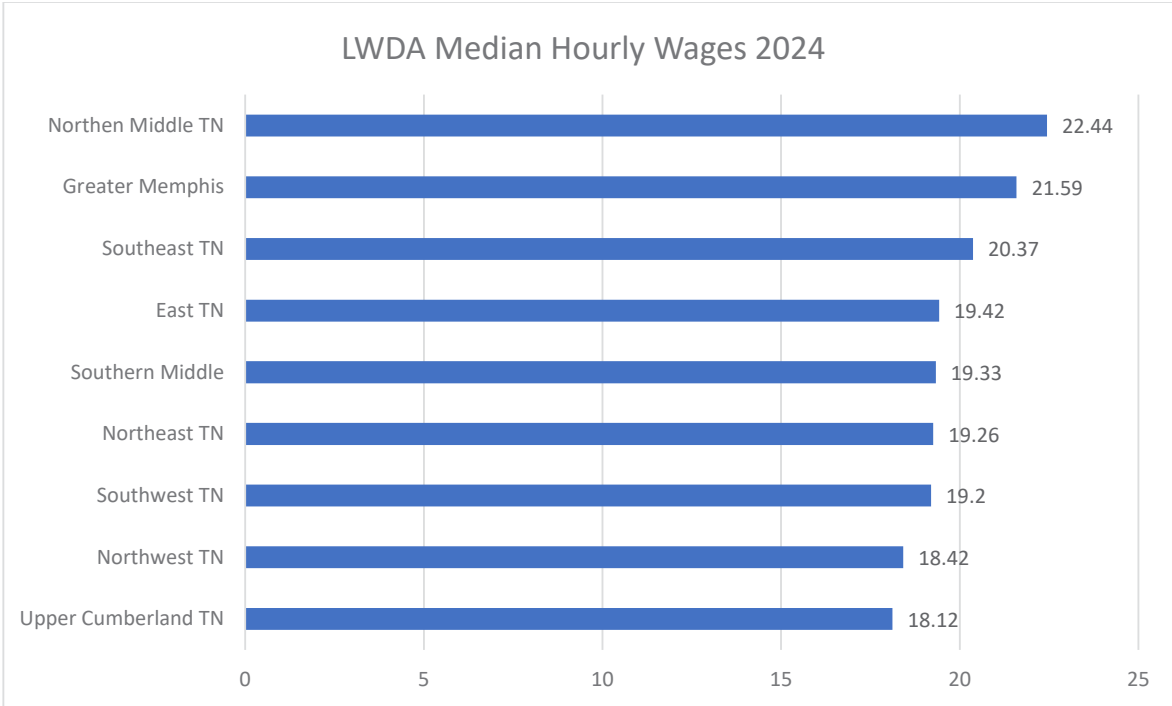
Median hourly wage growth for Tennessee from 2022 to 2023 averaged 9.7 percent, from \$19.20 in 2022 to \$21.07 in 2023. Among the 22 major occupational groups, median wages increased for all groups. The largest hourly increase was for legal occupations' pay (up \$8.64 per hour to \$39.41), followed by life, physical, and social sciences occupations (up \$5.78 per hour). Healthcare practitioners and technical occupations were up \$4.06. The post-pandemic demand for healthcare professionals could be a main driver of the wage increase.



Source: TDLWD, WIRED Division, Occupation Employment and Wages Survey

Figure 7

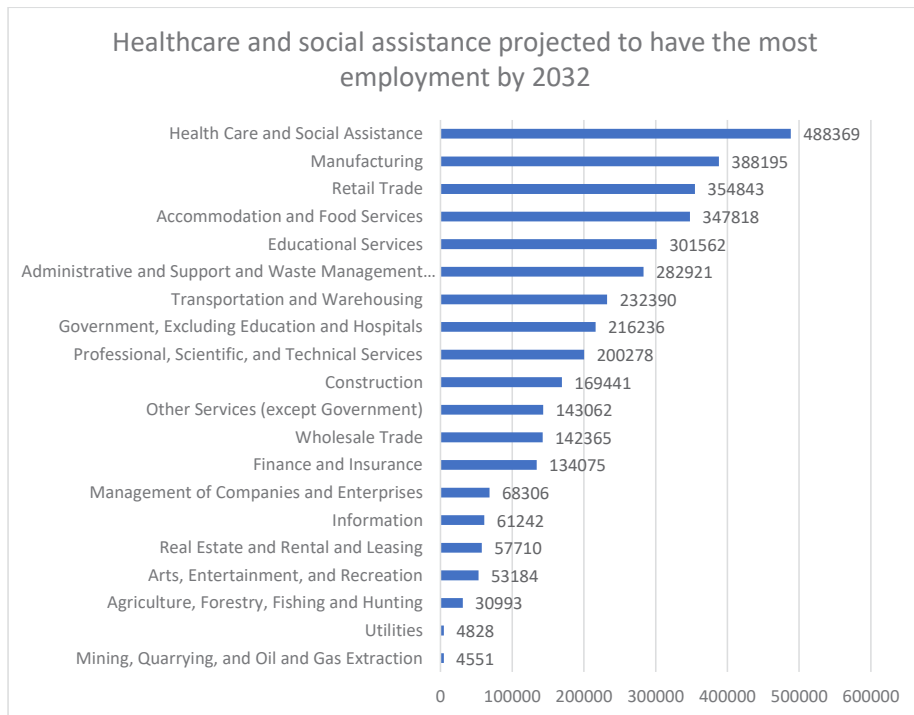
Average hourly wages differed by \$4.32 from a high of \$22.44 in the Northern Middle LWDA to \$18.12 in Upper Cumberland. As expected, average wages in the LWDA's including metropolitan areas had slightly higher wages than the more rural LWDA's. All LWDA's increased their average wages from 2022-2023.



Source: TDLWD, WIRED Division, Occupational Employment and Wages Survey, May 2023

Figure 8

## Tennessee Long Term Job Outlook to 2032



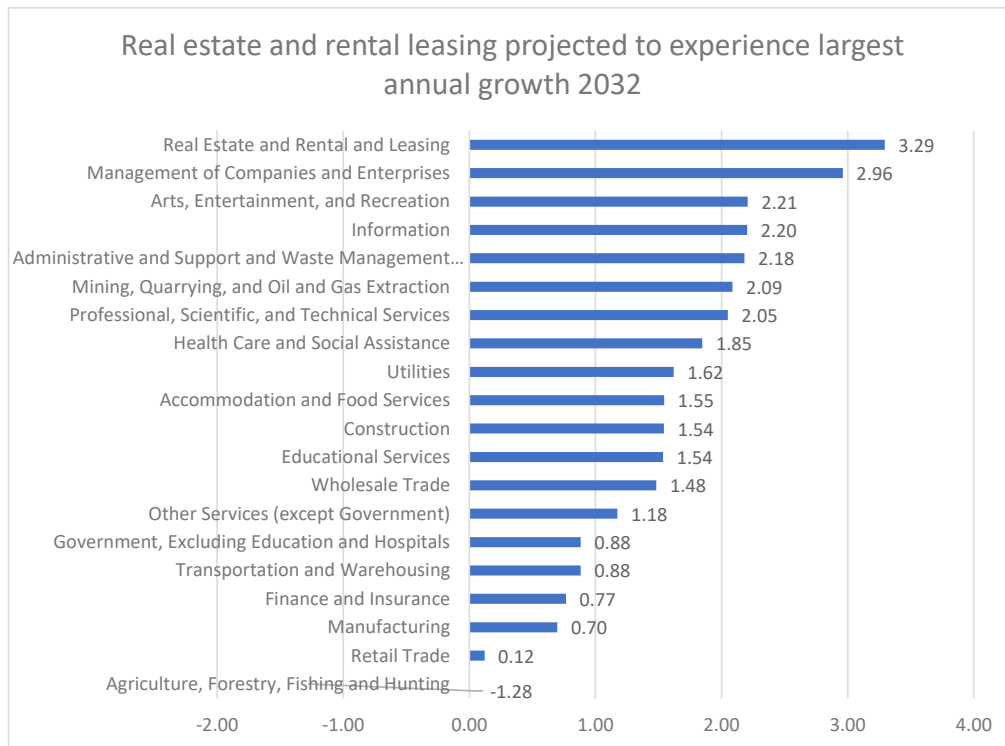
Source: TN Dept. of Labor and Workforce Development, WIRED Division, TN Long-Term Employment Projections 2022 2032, jobs4tn.gov.

Figure 9

From a base of 3.4 million jobs in 2022, total employment for Tennessee, including agricultural, self-employed, and private household workers, is expected to grow to 3.9 million by 2032. Expected to increase by 1.3 percent annually, as it recovers from lower employment in the base year of 2020 due to the pandemic, Tennessee's economy in the long run is expected to continue expansion in eleven of twelve major industry sectors, with only the agriculture, fishing and forestry sector experiencing a decline in employment. Projected employment by major industry group is shown in Figure 9.

Starting from the 2022 base, real estate and rental and leasing is expected to be the fastest-growing industry. Due to recovery from 2020, accommodation and food services as well as arts, entertainment and recreation are projected to continue steady growth as their employment continues to recover from pandemic losses. Other rapidly growing sectors include information, management of companies and enterprises, and administrative and support and waste management (Figure 10).

Tennessee's new efforts to manufacture electric vehicles and batteries, expand charging stations across the state, and other initiatives are expected to propel the manufacturing and construction industries to create over 25,000 jobs each . These sectors are expected to continue steady growth as efforts from the state of Tennessee to attract manufacturers to the state through incentives continue.



Source: TN Dept. of Labor and Workforce Development, WIRED Division, TN Long-Term Employment Projections 2022-2032, jobs4tn.gov.

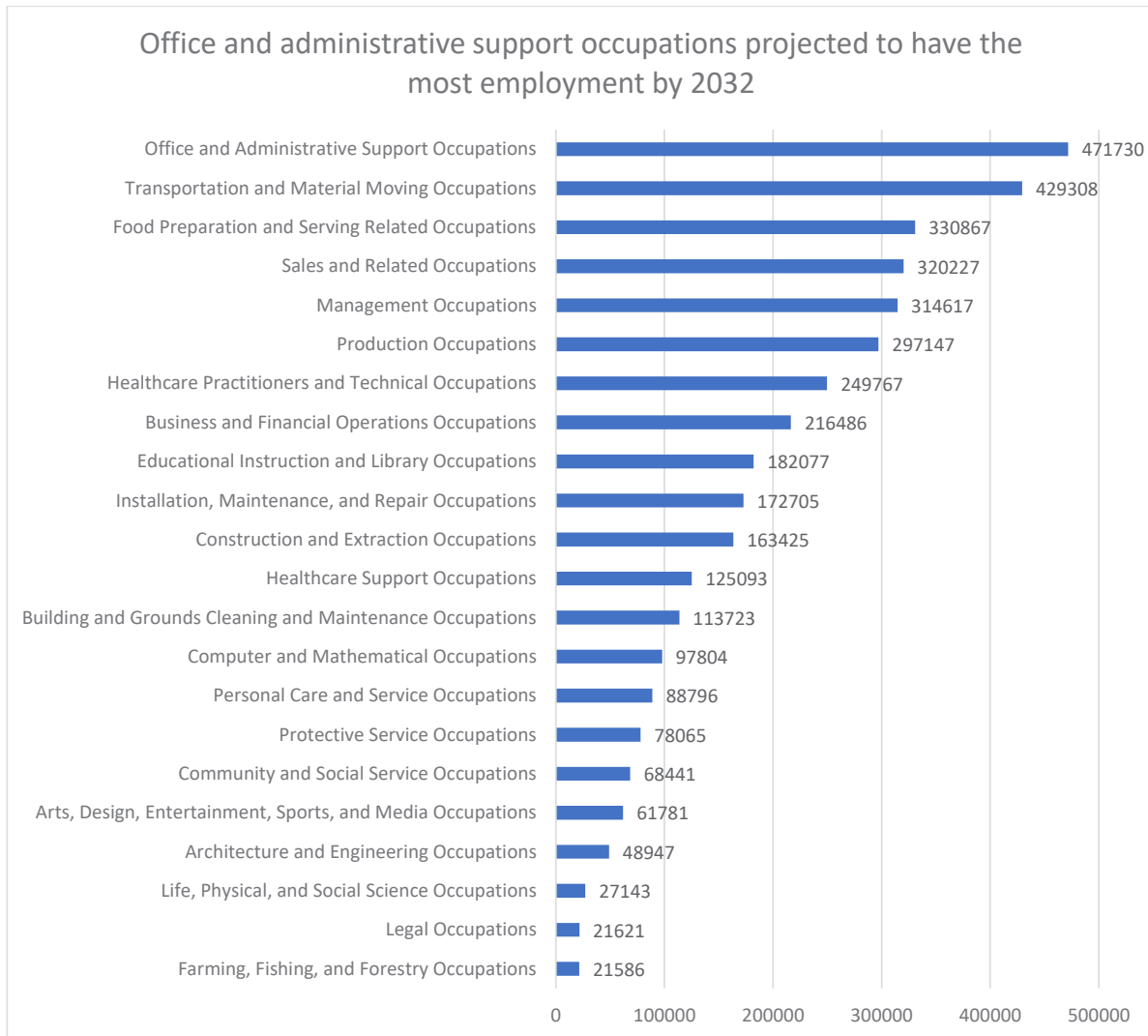
Figure 10

**Table 4: Occupational Projections by Major Occupational Group in Tennessee 2022-2032**

Major Occupation Group Title	2022 Estimated Employment	2032 Projected Employment	2022-2032 Employment Change	2023 Median Annual Wage
Total, All Occupations	3,423,768	3,901,356	477,588	43,816
Management Occupations	266,461	314,617	48,156	102,181
Business and Financial Operations Occupations	181,887	216,486	34,599	65,480
Computer and Mathematical Occupations	76,069	97,804	21,735	82,292
Architecture and Engineering Occupations	42,539	48,947	6,408	78,439
Life, Physical, and Social Science Occupations	23,459	27,143	3,684	73,469
Community and Social Service Occupations	59,872	68,441	8,569	47,527
Legal Occupations	18,734	21,621	2,887	81,972
Educational Instruction and Library Occupations	155,989	182,077	26,088	51,111
Arts, Design, Entertainment, Sports, and Media Occupations	52,977	61,781	8,804	45,650
Healthcare Practitioners and Technical Occupations	212,411	249,767	37,356	69,338
Healthcare Support Occupations	97,094	125,093	27,999	34,575
Protective Service Occupations	70,545	78,065	7,520	42,588
Food Preparation and Serving Related Occupations	284,799	330,867	46,068	28,787
Building and Grounds Cleaning and Maintenance Occupations	99,931	113,723	13,792	32,388
Personal Care and Service Occupations	74,907	88,796	13,889	29,202
Sales and Related Occupations	302,626	320,227	17,601	33,436
Office and Administrative Support Occupations	446,267	471,730	25,463	40,493
Farming, Fishing, and Forestry Occupations	24,556	21,586	-2,970	34,106
Construction and Extraction Occupations	138,939	163,425	24,486	47,269
Installation, Maintenance, and Repair Occupations	145,107	172,705	27,598	48,830
Production Occupations	272,558	297,147	24,589	40,401
Transportation and Material Moving Occupations	376,041	429,308	53,267	37,781

Source: TN Dept of Labor and Workforce, WIRED Division, OEWS 2024 and 2022-2032 Long-Term Projections

Professional, scientific, and technical services is expected to grow steadily over the next decade at a yearly rate of 2.1 percent. The state of Tennessee's diligence in encouraging education in technical and scientific fields through legislation that allows all Tennesseans access to affordable technical education could be a reason for this steady growth. Healthcare and social assistance is not only the largest industry by employment (Figure 5), but it also is expected to create the most new jobs over the decade (more than 80,000), continuing the growth trend from previous years as the population in the state increases in the percent over 65 years of age. The retail industry is expected to continue its slow growth but still is expected to be the third largest industry in the state in 2032.



Source: TN Dept. of Labor and Workforce Development, WIRED Division, TN Long-Term Employment Projections 2022-2032, jobs4tn.gov.

Figure 11

Healthcare support as well as computer and mathematical occupations are the two main occupational groups which are projected to show the largest yearly growth through 2032. These major groups are both expected to grow by more than 2 percent annually. Computer and mathematical occupations are expected to increase employment by more than 20,000. Jobs in transportation and material moving occupations are projected to increase by 50,000 by 2032, and it is also forecast to be the group with the second most job openings through 2032. Other occupational groups expected to have the most new jobs are management, food preparation and serving, and health care practitioners and technical workers. Occupational groups with median wages above the state average usually require a college education, except for construction and extraction and installation, maintenance, and repair.

Office and administrative support occupations are expected to have the most employment by 2032. Despite this, these occupations are projected to have the slowest rate of annual growth. This could be due in part to many employers planning for hybrid work, rather than completely remote work, and to the increasing use of technology. Transportation occupations are also projected to significantly increase in employment by 2032. Those occupations are projected to have a steady annual increase (over 1.3 percent annually) through 2032.

## Occupational Tools, Technology, and Certifications

A glimpse into the top tools and technologies found most frequently in advertised jobs on the jobs4tn.gov website is displayed in the following table. The top tools and technologies include computer business programs and equipment and warehouse equipment. Top certifications in advertised job listings include a variety of medical and pharmacy certifications and those for truck driving, social work, and accounting.

**Table 5: Top Advertised Tools and Technology for Tennessee**

Rank	Advertised Detailed Tool or Technology	Job Opening Match Count
1	Microsoft (MS) Office	13,506
2	Microsoft PowerPoint	4,308
3	Forklift	4,162
4	Cash Register	3,798
5	Motor vehicles	3,430
6	Personal protective equipment	3,200
7	Microsoft Word	2,617
8	Hypertext markup language (HTML)	2,367
9	Cell Phone	2,282
10	Microsoft Excel	2,153

Source: Online advertised jobs data  
Downloaded: 07/22/2024 9:24 AM

**Table 6: Top Advertised Job Certifications for Tennessee**

Rank	Advertised Certification Group	Job Opening Match Count
1	Registered Nurse (RN)	14,064
2	American Red Cross Certifications	11,728
3	American Heart Association (AHA) Certifications	8,351
4	Commercial Drivers License (CDL)	6,664
5	Licensed Practical & Licensed Vocational Nurses (LPN & LVN)	4,685
6	Certified Nursing Assistants (CNA)	2,729
7	American Institute of CPAs (AICPA) Certifications	1,248
8	National Registry of Emergency Medical Technicians (NREMT)	895
9	Social Worker Credentials & Certifications	555
10	Certified Registered Nurse Anesthetist (CRNA)	491

Source: Online advertised jobs data

**Table 7: Employers by Number of Job Openings**

Rank	Employer Name	Job Openings
1	Food City	1,533
2	Covenant Health	1,315
3	Vanderbilt University Medical Center	1,218
4	Sonic Corp.	872
5	McDonald's Corporation	869
6	The Kroger Co.	748
7	Metropolitan Nashville Public Schools	738
8	Ascension	689
9	HCA Healthcare, Inc.	654
10	National HealthCare Corporation	597

Source: Online advertised jobs data

**Table 8: Occupations by Advertised Jobs**

Rank	Occupation	Job Openings
1	Registered Nurses	6,447
2	Retail Salespersons	2,059
3	Fast Food and Counter Workers	1,453
4	Licensed Practical and Licensed Vocational Nurses	1,296
5	General and Operations Managers	1,275
6	First-Line Supervisors of Food Preparation and Serving Workers	1,256
7	First-Line Supervisors of Retail Sales Workers	1,162
8	Customer Service Representatives	1,090
9	Physicians, All Other	942
10	Physical Therapists	909

Source: Online advertised jobs data

## Endnotes

<sup>1</sup>Environmental Defense Fund, March 2023. US Electric Vehicle Manufacturing Investments and Jobs, p. 3. State-Electric-Vehicle-Policy-Landscape.pdf

<sup>2</sup>Carolyn Eggers, Tennessee secured \$7 B in clean energy business this past year- representing nearly 80% of new investments. WPLN Radio, August 29, 2023. [wpln.org/post/Tennessee-secured-7b-in-clean-energy-business-this-past-year-representing-nearly-80-of-new-investments/](https://wpln.org/post/Tennessee-secured-7b-in-clean-energy-business-this-past-year-representing-nearly-80-of-new-investments/)

<sup>3</sup>Loren McDonald, CEO, EVAdoption, Tennessee Momentum Drive Electric Summit, May 9, 2024.

<sup>4</sup>Sam Wills, Tennessee Regional Director, Tennessee Department of Economic and Community Development, Tennessee Momentum Electric Drive Summit, May 9, 2024.

<sup>5</sup>Victoria Hirschberg, Assistant Vice President of Research, Outreach and Economic Development, University of Tennessee, Tennessee Momentum Drive Electric Summit.

<sup>6</sup>Tony Millican, Executive Vice President for Workforce Development, Motlow State Community College, Tennessee Momentum Drive Electric Summit.

<sup>7</sup>Rebecca Ashford, President, Chattanooga State Community College, Tennessee Momentum Drive Electric Summit.

<sup>8</sup>Joy Rich, Manager of Workforce Development, Nissan North America, Murfreesboro, Tennessee Momentum Drive Electric Summit.

<sup>9</sup>Clean Jobs America 2023 [www.cleanjobsamerica.e2.org](http://www.cleanjobsamerica.e2.org), based on data collected for the U.S. Energy and Employment Report (USEER).

<sup>10</sup>TAEBC, "TVA's Power Systems of the Future" (video), July 24, 2024.

<sup>11</sup>WIRED calculation, 2022 population and QCEW Q4 2023 health care and social assistance employment.

<sup>12</sup>Academic Supply for Occupational Demand 2024: Tennessee Higher Education Commission, TDLWD, Tennessee Department of Education, and Tennessee Department of Economic and Community Development. <https://www.tn.gov/content/tn/thec/research/supply-and-demand.html>

<sup>13</sup><https://news.vumc.org/2023/11/09/vumc-again-collaborating-to-bring-nursing-education-to-metro-schools/>

<sup>14</sup>Davis, Molly. June 16, 2024. Nashville poised to gain 13,225 new hotel rooms. *Tennessean*, pp. 1D-2D

<sup>15</sup>Academic Supply for Occupational Demand 2024, pp. 29-30.

<sup>16</sup>Davidson, Paul. August 11, 2024. Help wanted. *Tennessean*, pp. 1W-2W.

<sup>17</sup><https://www.tn.gov/workforce/newsletter/2024/august-stadium-construction.html>

<sup>18</sup>TDLWD, WIRED Division, Tennessee Long Term Industry Employment Projections 2022-2032, jobs4tn.gov.

<sup>19</sup>Academic Supply for Occupational Demand 2024

<sup>20</sup>Ibid., p. 13.

<sup>21</sup>Rainer, Nell. (July 25, 2024). xAI project puts spotlight on Memphis' tech workforce. Tennessean, pp.9A and 11A

<sup>22</sup>Ibid., p. 11A.

<sup>23</sup>STARS Barriers and Breakthrough Report Download.pdf

<sup>24</sup>TN\_State-CIO-Office-Special-Recognition.pdf

<sup>25</sup>Abraham, K. & Kearney, M. (2018). "Explaining the Decline in the U.S. Employment – to- Population Ratio: A review of the evidence" (NBER Working Paper No 24333). Cambridge, Mass: National Bureau of Economic Research.

<sup>26</sup>Krueger, A.B., (2017). "Where Have All the Workers Gone? An Inquiry into the Decline of the U.S. Labor Force Participation Rate." Brookings Papers on Economic Activity, (Fall 2017), 1-59.

<sup>27</sup>Bauer, L. and Steinmetz-Silber, N. (July 26, 2024).Prime-age women are still driving the labor market recovery. <https://www.brookings.edu>articles>

<sup>28</sup>Remarks by Acting Secretary of Labor Julie Su on the Philadelphia Workforce Hub Commitments (As Delivered) | U.S. Department of Labor (dol.gov) <https://www.dol.gov/newsroom/speech/20240711>

<sup>29</sup>Boheim, R.,Horvath, T.,Leoni, T. and Spielauer, M. (2023). "The Impact of Health and Education on Labor Force Participation in Aging Societies: Projections for the United States and Germany from Dynamic Microsimulations." *Popul.Res.Policy. Rev* (42)3: 39. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10132801/>

<sup>30</sup>Perez-Arce, F., and Prados M. (2020). "The Decline in the U.S. Labor Force Participation Rate: A Literature in Review. USC Center for Economic and Social Research.

<sup>31</sup>Ssa.gov/security stat. August 6, 2024

<sup>32</sup>Boheim, R., et al. *Rev* (42) 3: 39.

<sup>33</sup>Case, A. and Deaton, A. (2017). "Mortality and Morbidity in the 21st Century." *Brookings Papers on Economic Activity*, 2017, 397

<sup>34</sup>Livermore, G; Nowak, M. and Stapleton, D. (2001). The Role of Health Insurance in Successful Labor Force Entry and Employment Retention. U.S. Department of Health and Human Services. <https://aspe.hhs.gov/reports/role-health-insurance-successful-labor-force-entry-employment-retention#chapII.B>