

# The CTE Equation in Tennessee

A Research Study

October 2015





# The CTE Equation in Tennessee

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October 2015



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**Approved by:**

**October 2015**

A handwritten signature in black ink, appearing to read 'Stacey Jordan'.

Stacey Jordan, Vice President  
CNA Education  
Institute for Public Research

## Executive Summary

This report uses data from the Tennessee Department of Labor and Workforce Development, the U.S. Census Bureau, and the U.S. Department of Labor's Standard Occupational Classification (SOC) system to identify high-growth and high-wage occupations in the state of Tennessee, and the associated career and technical education (CTE) Career Clusters. This information can be used to assist educational and private industry CTE stakeholders in identifying whether the CTE Programs of Study that high schools and postsecondary institutions offer are well aligned with current and projected local labor market needs.

The report finds that:

- Across the state of Tennessee, employment is projected to increase by 13 percent between 2012 and 2022, with an average of 38,848 job openings per year.
- The median wage in Tennessee in 2014 statewide was \$31,251; for purposes of this analysis, a “high-wage” occupation in Tennessee is one paying 20 percent above that (approximately \$37,500 statewide). However, by region, the dollar amount that defines an occupation as high-wage varied: from less than \$35,000 in four regions to more than \$39,000 in two regions.
- Business Management & Administration; Health Science; Education & Training; Transportation, Distribution, & Logistics; and Advanced Manufacturing are the five CTE Career Clusters associated with the greatest number of projected annual high-growth, high-wage job openings statewide between 2012 and 2022.
- Projected growth in employment, average median wages, and CTE Career Clusters most associated with high-growth, high-wage occupations vary considerably by workforce region. Thus, the need for education/training in various industries will differ significantly around the state.
- While over half of the high schools in Tennessee had at least one student who concentrated in Health Science and/or Business Management & Administration, there were relatively few high schools with students who concentrated in several other high-growth, high-wage Career Clusters. However, the state recently transitioned to the new CTE Career Cluster framework and some new CTE Programs of Study had not been implemented prior to the 2013/14 school year. Tennessee's work on Programs of Study and course standards is designed to increase alignment of offerings with high-growth, high-wage occupations.

- Among students who concentrated in one of the 16 Career Clusters, the most common was Health Science (22 percent). This Career Cluster is also among the top 5 high-growth, high-wage career clusters so the large percentage of student who concentrate is well-aligned with the labor market. Alignment is weaker for other Career Clusters with the largest projected increase in high-growth, high-wage jobs, such as Education & Training and Advanced Manufacturing.

The extent to which CTE programs correspond to labor market demands has important implications both for students and for employers. Students want to be prepared for good careers, while employers seek skilled workers to fill jobs in high-demand areas. Recent high school and postsecondary graduates make an important contribution to Tennessee's ability to respond to economic growth needs.

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## Introduction

Career and technical education (CTE) programs play a vital role in preparing high school students for life after graduation. The Carl D. Perkins Act of 2006 (Perkins) requires states that receive federal CTE funding to align their secondary and postsecondary programs, so that students can transition seamlessly from a high school CTE program to a certificate, associate's degree, or bachelor's degree program in their chosen field of study. How well career and technical education programs correspond to labor market needs is important for both students and employers. Students want good careers, and employers want skilled workers who can fill jobs in high-demand areas.

Research shows that many states struggle to align education and training with workforce trends (Dougherty, 2003; Grubb et al., 1999; Leigh & Gill, 2007; Mokher, 2011). Many states have a history of local control over CTE programs, and increasing alignment requires a cultural shift. Strong leadership is needed to promote change, and states may have difficulties sustaining efforts if there is turnover of key staff involved in alignment efforts. Different departments and agencies typically oversee K-12 education, postsecondary education, and workforce development, which makes collaboration challenging. In addition, there are often insufficient fiscal and human resources to implement new CTE programs. Even if resources are available, there may be a lack of technical assistance from state agencies to local providers to support implementation.

The state of Tennessee has undertaken many efforts to foster collaboration between CTE and the workforce. For example:

- Professional development has been provided to all CTE directors in local school districts to assist them in identifying whether their Programs of Study are well aligned with local labor market needs.
- The Tennessee Department of Education monitors school districts and examines their Programs of Study to ensure that they align with workforce needs and postsecondary options.
- Pathways Tennessee (Pathways to Prosperity Network) is a collaborative initiative between multiple state agencies and the organizations which aims to ensure that students are prepared to enter the workforce.<sup>1</sup> This work began with intensive asset mapping to specifically identify areas of focus in

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<sup>1</sup> <https://www.tn.gov/education/section/pathwaystn>

each region by aligning education and industry. Each Pathways Tennessee region is led by an intermediary who facilitates ongoing partnerships between regional stakeholders to develop and implement seamless pathways (grades 7-16), braided with industry engagement and experience, in the region's identified industry areas.

- The Tennessee Department of Labor and Workforce Development maintains a website with local labor market information ([www.jobs4tn.gov](http://www.jobs4tn.gov)). Training on this website has been provided to CTE directors, and links to reports from this site are sent to the directors for their use.

This report aims to provide another a resource for the state of Tennessee. School, district, and postsecondary staff, as well as state policymakers and local Workforce Investment Boards,<sup>2</sup> can use the report in conjunction with other resources to inform the development and expansion of CTE programs as well as decisions to modify or eliminate programs no longer aligned with labor market needs.

## Career Clusters, Career Pathways, and Programs of Study

The National Career Clusters<sup>®</sup> Framework, developed by the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), organizes CTE educational programs into 16 broad career areas, or “clusters.”<sup>3</sup> The Career Clusters originated in recognition of a national need to raise the content standards of CTE instructional programs and to better align CTE with the needs of employers (Ruffing, 2006). The National Career Clusters<sup>®</sup> organize 79 different “Career Pathways,” defined as more specific groups of occupations.

Tennessee has adopted the 16 National Career Clusters<sup>®</sup> as follows:<sup>4</sup>

- Advanced Manufacturing
- Agriculture, Food, & Natural Resources
- Architecture & Construction

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<sup>2</sup> Local Workforce Investment Boards (WIBs) plan and oversee workforce development activities in each of Tennessee's 13 Local Workforce Investment Areas.

<sup>3</sup> The NASDCTEc represents state heads of secondary, postsecondary, and adult career and technical education programs across the nation.

<sup>4</sup> The National Career Clusters<sup>®</sup> list includes “Manufacturing” and “Health Sciences” (rather than Tennessee's “Advanced Manufacturing” and “Health Science,” respectively).

- Arts, A/V Technology, & Communications
- Business Management & Administration
- Education & Training
- Finance
- Government & Public Administration
- Health Science
- Hospitality & Tourism
- Human Services
- Information Technology
- Law, Public Safety, Corrections, & Security
- Marketing
- STEM (Science, Technology, Engineering, & Mathematics)
- Transportation, Distribution, & Logistics

The Tennessee Department of Education (TDOE) used the Career Clusters and Career Pathways as a basis for developing its own “Programs of Study”— the secondary CTE course sequences aligned with postsecondary offerings and labor market opportunities as required under Perkins. School districts select which CTE courses and programs of study to offer to students from TDOE’s promoted programs of study. There is a requirement that each district must have at least one Program of Study which is aligned to postsecondary education with a postsecondary partner institution (Tennessee Department of Education, 2008).

## Reporting on Tennessee

This is not the first analysis of Tennessee job projections organized by Career Cluster. In 2011, researchers at the Georgetown University Center on Education and the Workforce, the National Research Center for Career and Technical Education, and NASDCTEc used national data to project job growth by Career Cluster in each of the 50 states. Their study projected that in 2018, the largest number of jobs in Tennessee would be within the Business Management & Administration cluster, while Health Science would experience the largest percentage growth (Carnevale et al., 2011). The Georgetown report was somewhat limited, in that it did not disaggregate data by region. It also did not include supply-side data on graduates who are concentrators in corresponding Career Clusters.

By contrast, this CNA report includes both, and covers an additional four years. That is, we map Tennessee’s 16 Career Clusters with projections from the Tennessee

Department of Labor and Workforce Development for high-growth, high-wage jobs between 2012 and 2022. We do this statewide and for each of Tennessee's 13 Local Workforce Investment Areas (LWIAs).<sup>5</sup> The Career Cluster associated with each job is also identified. The report also includes the share of high schools in each LWIA region that offer one or more CTE Programs of Study in each Career Cluster and the number of high school students scheduled to graduate in 2014 who concentrate in each career cluster by LWIA region (*participation rate*).<sup>6</sup>

## Method

The Tennessee Department of Labor and Workforce Development projects job growth/reduction<sup>7</sup> for all occupations listed in the U.S. Department of Labor's Standard Occupational Classification (SOC) system.<sup>8</sup> SOCs are standardized job descriptions and cover practically every occupation.

At the time of this report, Tennessee's projections are available for the period 2012 through 2022, with the caveat that occupational projections are always subject to uncertainty. (It is difficult to predict the introduction of new industries into a region or account for every factor affecting the economic environment.)

The Tennessee Department of Labor and Workforce Development provides its occupational projections for the state as a whole and by Local Workforce Investment Area. Table 1 identifies the counties and school districts located within each of these 13 LWIA regions.

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<sup>5</sup> Local Workforce Investment Areas are clusters of neighboring counties with similar economic development and labor market characteristics.

<sup>6</sup> A student who concentrates in CTE is a high school student who earns three or more course credits within a Program of Study or career cluster.

<sup>7</sup> *Growth* includes the total number of annual openings due to both new jobs and replacements for retirement or other attrition.

<sup>8</sup> Standard Occupational Classification (SOC) system developed by the U.S. Bureau of Labor Statistics groups occupations with similar skills or work activities to ease comparisons. The 2000 SOC system classifies occupations using a four-level hierarchy: *major group*, *minor group*, *broad occupation*, and *detailed occupation*. Each occupation has a six-digit code: digits 1 and 2 are the major group, digit 3 is the minor group, digits 4 and 5 are the broad occupation, and digit 6 is the detailed occupation. More information about SOCs can be found at <http://data.bls.gov/cgi-bin/print.pl/soc/socguide.htm>.

Table 1. Counties and school districts in each of the Tennessee Local Workforce Investment Areas.

LWIA	Counties	Districts
<b>1</b>	<ul style="list-style-type: none"> <li>• Carter</li> <li>• Johnson</li> <li>• Sullivan</li> <li>• Unicoi</li> <li>• Washington</li> </ul>	<ul style="list-style-type: none"> <li>• Carter County, Elizabethton City</li> <li>• Johnson County</li> <li>• Bristol City, Kingsport City, Sullivan County</li> <li>• Unicoi County</li> <li>• Johnson City, Washington County</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• Claiborne</li> <li>• Cocke</li> <li>• Grainger</li> <li>• Greene</li> <li>• Hamblen</li> <li>• Hancock</li> <li>• Hawkins</li> <li>• Jefferson</li> <li>• Sevier</li> <li>• Union</li> </ul>	<ul style="list-style-type: none"> <li>• Claiborne County</li> <li>• Cocke County</li> <li>• Grainger County</li> <li>• Greene County, Greeneville City</li> <li>• Hamblen County</li> <li>• Hancock County</li> <li>• Hawkins County</li> <li>• Jefferson County</li> <li>• Sevier County</li> <li>• Union County</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• Knox</li> </ul>	<ul style="list-style-type: none"> <li>• Knox County, Tennessee High School for the Deaf</li> </ul>
<b>4</b>	<ul style="list-style-type: none"> <li>• Anderson</li> <li>• Blount</li> <li>• Campbell</li> <li>• Cumberland</li> <li>• Loudon</li> <li>• Monroe</li> <li>• Morgan</li> <li>• Roane</li> <li>• Scott</li> </ul>	<ul style="list-style-type: none"> <li>• Anderson County, Oak Ridge City</li> <li>• Alcoa City, Blount County, Maryville City</li> <li>• Campbell County</li> <li>• Cumberland County</li> <li>• Lenoir City, Loudon County</li> <li>• Monroe County</li> <li>• Morgan County</li> <li>• Roane County</li> <li>• Oneida City, Scott County</li> </ul>
<b>5</b>	<ul style="list-style-type: none"> <li>• Bledsoe</li> <li>• Bradley</li> <li>• Hamilton</li> <li>• Marion</li> <li>• McMinn</li> <li>• Meigs</li> <li>• Polk</li> <li>• Rhea</li> <li>• Sequatchie</li> </ul>	<ul style="list-style-type: none"> <li>• Bledsoe County</li> <li>• Bradley County, Cleveland City</li> <li>• Hamilton County</li> <li>• Marion County</li> <li>• McMinn County</li> <li>• Meigs County</li> <li>• Polk County</li> <li>• Rhea County</li> <li>• Sequatchie County</li> </ul>
<b>6</b>	<ul style="list-style-type: none"> <li>• Bedford</li> <li>• Coffee</li> <li>• Franklin</li> <li>• Grundy</li> <li>• Lincoln</li> <li>• Moore</li> <li>• Warren</li> </ul>	<ul style="list-style-type: none"> <li>• Bedford County</li> <li>• Coffee County, Tullahoma City</li> <li>• Franklin County</li> <li>• Grundy County</li> <li>• Lincoln County</li> <li>• Moore County</li> <li>• Warren County</li> </ul>

LWIA	Counties	Districts
<b>7</b>	<ul style="list-style-type: none"> <li>• Cannon</li> <li>• Clay</li> <li>• DeKalb</li> <li>• Fentress</li> <li>• Jackson</li> <li>• Macon</li> <li>• Overton</li> <li>• Pickett</li> <li>• Putnam</li> <li>• Smith</li> <li>• Van Buren</li> <li>• White</li> </ul>	<ul style="list-style-type: none"> <li>• Cannon County</li> <li>• Clay County</li> <li>• DeKalb County</li> <li>• Fentress County, Alvin C. York Institute</li> <li>• Jackson County</li> <li>• Macon County</li> <li>• Overton County</li> <li>• Pickett County</li> <li>• Putnam County</li> <li>• Smith County</li> <li>• Van Buren County</li> <li>• White County</li> </ul>
<b>8</b>	<ul style="list-style-type: none"> <li>• Cheatham</li> <li>• Dickson</li> <li>• Houston</li> <li>• Humphreys</li> <li>• Montgomery</li> <li>• Robertson</li> <li>• Stewart</li> <li>• Sumner</li> <li>• Williamson</li> </ul>	<ul style="list-style-type: none"> <li>• Cheatham County</li> <li>• Dickson County</li> <li>• Houston County</li> <li>• Humphreys County</li> <li>• Montgomery County</li> <li>• Robertson County</li> <li>• Stewart County</li> <li>• Sumner County</li> <li>• Williamson County</li> </ul>
<b>9</b>	<ul style="list-style-type: none"> <li>• Davidson</li> <li>• Rutherford</li> <li>• Trousdale</li> <li>• Wilson</li> </ul>	<ul style="list-style-type: none"> <li>• Metropolitan Nashville Public Schools</li> <li>• Rutherford County</li> <li>• Trousdale County</li> <li>• Wilson County</li> </ul>
<b>10</b>	<ul style="list-style-type: none"> <li>• Giles</li> <li>• Hickman</li> <li>• Lawrence</li> <li>• Lewis</li> <li>• Marshall</li> <li>• Maury</li> <li>• Perry</li> <li>• Wayne</li> </ul>	<ul style="list-style-type: none"> <li>• Giles County</li> <li>• Hickman County</li> <li>• Lawrence County</li> <li>• Lewis County</li> <li>• Marshall County</li> <li>• Maury County</li> <li>• Perry County</li> <li>• Wayne County</li> </ul>
<b>11</b>	<ul style="list-style-type: none"> <li>• Chester</li> <li>• Decatur</li> <li>• Hardeman</li> <li>• Hardin</li> <li>• Haywood</li> <li>• Henderson</li> <li>• McNairy</li> <li>• Madison</li> </ul>	<ul style="list-style-type: none"> <li>• Chester County</li> <li>• Decatur County</li> <li>• Hardeman County</li> <li>• Hardin County</li> <li>• Haywood County</li> <li>• Henderson County</li> <li>• McNairy County</li> <li>• Jackson-Madison Consolidated</li> </ul>

LWIA	Counties	Districts
12	<ul style="list-style-type: none"> <li>Benton</li> <li>Carroll</li> <li>Crockett</li> <li>Dyer</li> <li>Gibson</li> <li>Henry</li> <li>Lake</li> <li>Lauderdale</li> <li>Obion</li> <li>Tipton</li> <li>Weakley</li> </ul>	<ul style="list-style-type: none"> <li>Benton County</li> <li>Hollow Rock-Bruceton, Huntington Special, McKenzie Special, South Carroll Special, West Carroll Special</li> <li>Crockett County</li> <li>Dyer County, Dyersburg City</li> <li>Bradford Special, Gibson Special, Humboldt City, Milan City Special, Trenton City</li> <li>Henry County</li> <li>Lake County</li> <li>Lauderdale County</li> <li>Obion County, Union City</li> <li>Tipton County</li> <li>Weakley County</li> </ul>
13	<ul style="list-style-type: none"> <li>Fayette</li> <li>Shelby</li> </ul>	<ul style="list-style-type: none"> <li>Fayette County</li> <li>Shelby Municipalities, Shelby County, and the Achievement School District</li> </ul>

Note: This table excludes districts that do not have a high school because they do not have any high school CTE Programs of Study.

## “High-growth, high-wage” defined

We used employment projections as well as data from the Federal-state Occupational Employment Statistics (OES) wage survey from the Tennessee Department of Labor and Workforce Development (2014a; 2014b; 2014c) to identify high-growth, high-wage jobs. Data were provided and analyzed separately for the state as a whole and for each LWIA.

**High-growth occupations.** For this analysis, we classified an occupation as “high-growth” if it met the following requirements in the Tennessee employment projection data:

- Is in demand (i.e., more job openings than workers to fill them) between 2012 and 2022
- Is projected to continue to have positive growth through 2022
- For a specific LWIA, is projected to have at least 40 total openings between 2012 and 2022, or an average of 5 or more per year

For each occupation, we looked separately at data statewide (all regions added together) and at data for each LWIA individually. This means that an occupation might be classified as high-growth in one region of the state but not in another, or in one or more regions but not statewide or vice versa.

**High-growth *and* high-wage occupations.** Among these high-growth occupations, we then classified an occupation as “high-wage” if it also met the following requirement in the Tennessee wage data:

- Pays 20 percent or more above the median wage (using 2014 Federal-state Occupational Employment Statistics (OES) wage survey data)

This method of identifying high-wage occupations was used in a report by CNA for the Regional Educational Laboratory (REL) Appalachia to identify and link high-wage jobs in Tennessee with CTE Career Clusters (Mokher, 2011).

For each occupation, we looked at data statewide (compared with the statewide 2014 median wage) and at data for each LWIA alone (compared with each region’s 2014 median wage). As before, the same high-growth occupation might be classified as high-wage in one region of the state but not in another, or in one or more regions but not statewide or vice versa.

There is a limitation to our approach. Single criterion for whether an occupation is high-wage is that it masks variability within a career Cluster. That is, an occupation might not get an overall classification of high-wage because most of its jobs pay salaries below the 20 percent cutoff, while within that occupation there still could be opportunities for high-wage jobs, particularly for students with higher levels of education. For example, most occupations in the Cluster Agriculture, Food, & Natural Resources are not high-wage; however, the occupation *Veterinarian* is.

To highlight this, we report for each SOC occupational code the minimum level of training/education most commonly needed to enter that high-growth, high-wage occupation, as observed by the Tennessee Department of Labor and Workforce Development. We use the following classifications:

- On-the-job training or work experience (varying lengths)
- Postsecondary certification/ training
- Associate’s degree
- Bachelor’s degree
- Master’s degree or first professional degree
- Doctoral degree

## CTE Career Clusters mapping

Finally, we mapped the Tennessee occupations that we identified as being high-growth, high-wage, both statewide and by individual LWIA, to the 16 Career Clusters. To do this, we used the crosswalk between the SOC system and the National Career

Clusters<sup>®</sup> developed for the U.S. Department of Education (DTI Associates, 2007). This allows for any SOC occupation to be linked to a Career Cluster. Each SOC code can only be matched to a single Career Cluster to avoid double-counting. However, this may underestimate the actual number of high-wage and high-growth occupations within each Career Cluster if some occupations are related to multiple Career Clusters. For example, the SOC code for “Accountants and Auditors” is matched with the “Business Management & Administration” Career Cluster, yet this occupation may also be relevant for students who concentrate in the “Finance” Career Cluster

We then linked this projected growth in particular Career Clusters with the supply of high school students scheduled to graduate in 2014 who concentrated in that Cluster, using TDOE school-level data.<sup>9</sup> This linkage allows us to see whether projected demand for jobs in a LWIA matches the supply of concentrators being produced by high schools in the area.

A limitation of this analysis is that the data on secondary CTE concentrators cannot be linked to postsecondary education enrollment and completion. Many high-growth, high-wage occupations require students to complete postsecondary degrees or credential. Future research may expand upon this study to examine the relationship between training and employment across multiple levels of education.

## Findings

The first part of this section presents statewide information on occupational projections and median wages averaged across occupations, and describes variation by Local Workforce Investment Area. Next, we provide the total number of projected annual high-growth, high-wage job openings in Tennessee for 2012–2022, and the corresponding CTE Career Clusters. Lastly, student-level data from the Tennessee Department of Education (2015) is used to calculate the number of schools in each LWIA region that offer one or more Programs of Study in each Career Cluster, as well as the number of high school students scheduled to graduate in 2014 who concentrate in each Career Cluster. This information can be used for identifying the extent to which CTE concentrators are aligned with labor market demands.

The appendix includes supplemental tables that disaggregate the statewide results for each of the 13 Local Workforce Investment Areas.

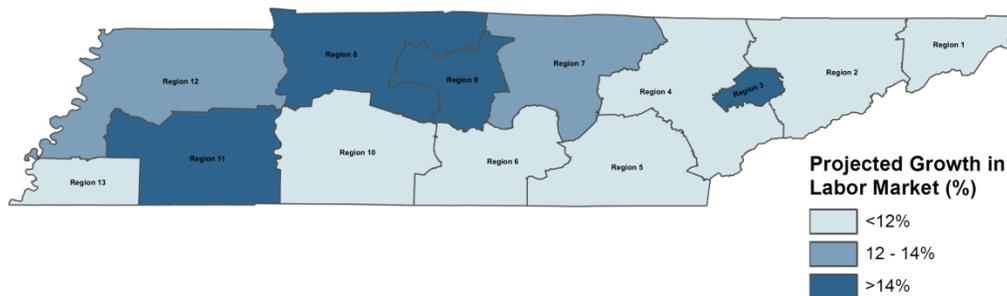
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<sup>9</sup> The data provided included graduation cohort data (all students who were scheduled to graduate in 2014 when they started 9th grade). However, not all of the students in this cohort data file graduated.

## Workforce projections

Across the state of Tennessee, the total number of people employed in all occupations is projected to increase by 13 percent between 2012 and 2022 (Tennessee Department of Labor and Workforce Development, 2014b; 2014c). This is equivalent to an average increase of 38,848 new job openings per year for a total of 388,480 new jobs over the 10-year period. However, the amount of growth projected varies in different regions of the state (Figure 1 below). The projected change in employment ranges from a low of 5.9 percent in LWIA 1, located in northeast Tennessee, to a high of 17.1 percent in LWIA 3, which includes Knoxville. In Figure 1 (on page 10), regions are classified into three rate-of-growth categories relative to the statewide average of projected growth: those regions within 1 percentage point of the statewide average and those above and below that.

Figure 1. Projected growth in employment between 2012 and 2022, by Tennessee Local Workforce Investment Area region (2014).



Source: Tennessee Department of Labor and Workforce Development, 2014b, c.

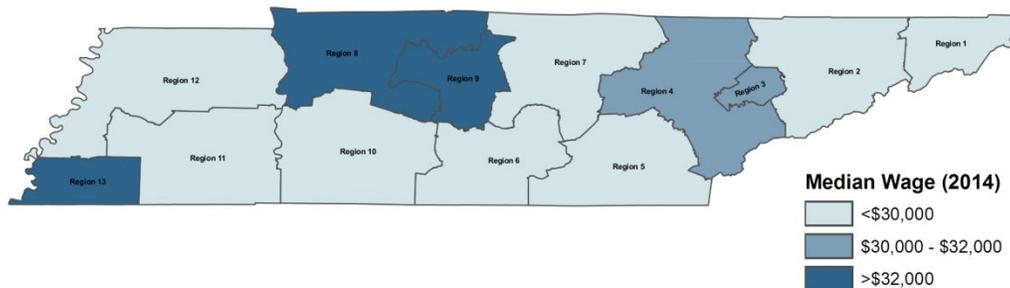
## High-wage occupations

For this report, we classified occupations as high-wage if they paid 20 percent or more above the statewide median wage. One important consideration when examining the results for specific occupations is not only whether an occupation is classified as high-wage, but whether further education in the field can contribute to a lifetime career pathway that leads to higher wages. Tables A2-A14 in the appendix indicate the minimum experience or education most commonly needed to enter the high-growth, high-wage occupations in each region.

According to the most recent OES survey (2014), the median yearly wage in Tennessee was \$31,251 statewide. For purposes of this analysis, this means that statewide, a high-wage occupation in Tennessee pays at least \$37,501 annually.

Looking at the average 2014 median yearly wage by individual Local Workforce Investment Area, however, the dollar amount that defines an occupation as high-wage varies: from \$35,000 or less in four regions to more than \$39,000 in two regions (Figure 2 on page 11).

Figure 2. Median yearly wages averaged across all occupations (2014), by Tennessee Local Workforce Investment Area region.



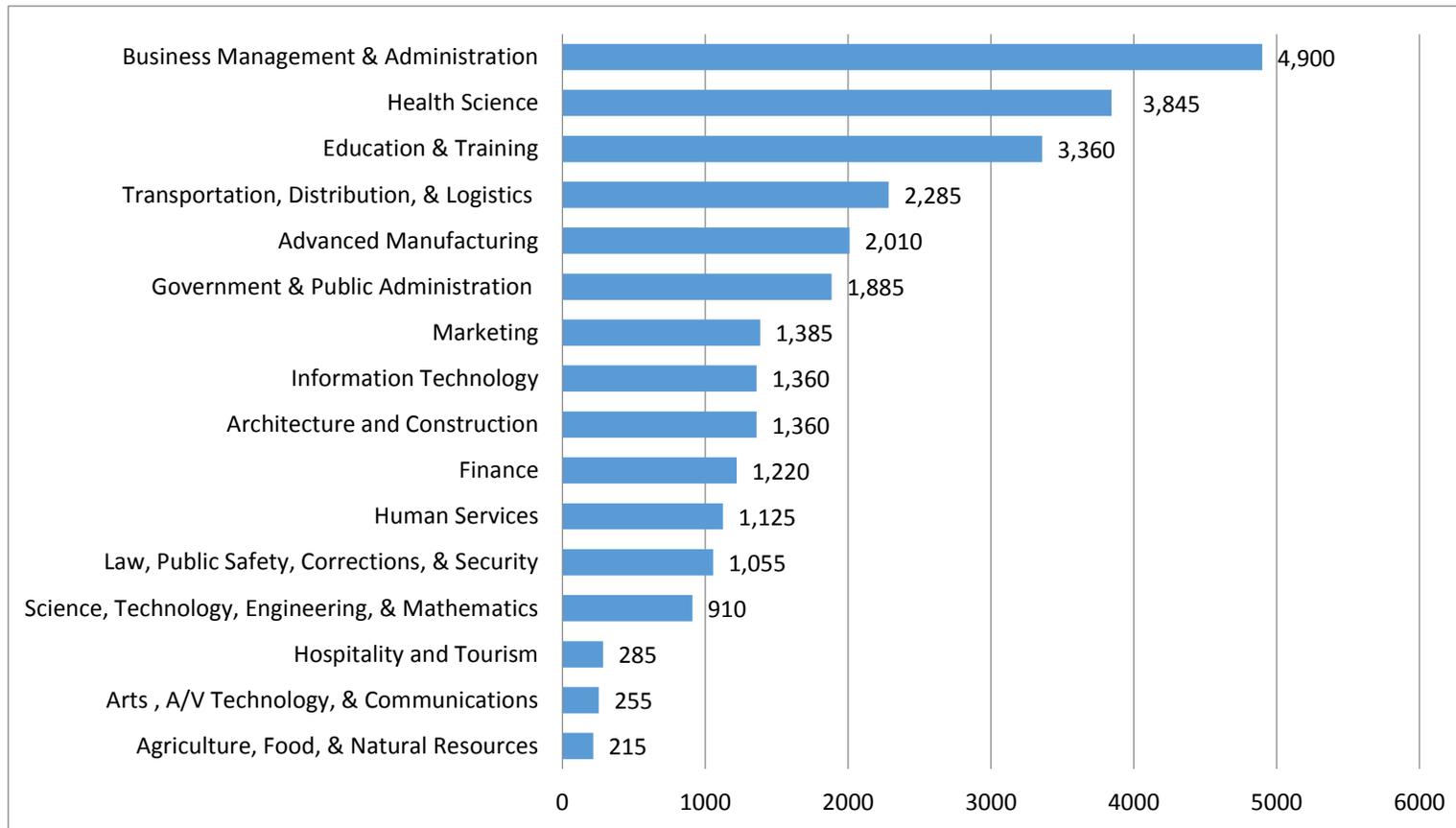
Source: Tennessee Department of Labor and Workforce Development, 2014b, c.

## CTE Career Clusters associated with high-growth, high-wage occupations

As shown in Figure 3 (page 12), Business Management & Administration is the CTE Career Cluster associated with the greatest number of projected annual high-growth, high-wage job openings statewide between 2012 and 2022 (4,900 projected openings annually). This is followed by the Health Science and Education & Training clusters, with 3,845 and 3,360 annual job openings, respectively. Note that Figure 3 includes the annual projected openings for only high-growth, high-wage occupations by career cluster instead of all jobs in the state.

Other CTE Career Clusters with relatively large numbers of projected high-growth, high-wage job openings are Transportation, Distribution, & Logistics; Advanced Manufacturing; and Government & Public Administration. Each of these Clusters is projected to see 1,500 or more high-growth, high-wage job openings annually.

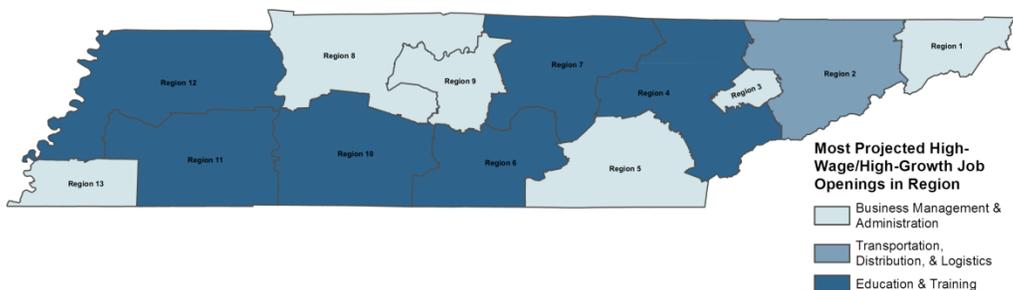
Figure 3. Total number of projected annual high-growth/high-wage job openings in Tennessee between 2012 and 2022, by CTE Career Cluster (2014)



Source: Tennessee Department of Labor and Workforce Development, 2014c.

Which CTE Career Cluster is associated with the most high-growth, high-wage job openings varies by Local Workforce Investment Area. As Figure 4 indicates, the Career Cluster most commonly associated with the most new high-growth, high-wage jobs is Business Management & Administration in six regions, and Education & Training in six regions. In the one remaining LWIA region, the top Cluster is Transportation, Distribution, & Logistics.

Figure 4. CTE Career Clusters with the most projected high-growth, high-wage job openings between 2012 and 2022, by Tennessee Local Workforce Investment Area region (2014).



Source: Tennessee Department of Labor and Workforce Development, 2014b, c.

Appendix Tables A2-A14 provide more detailed information on which occupations are high-growth and high-wage in each LWIA region between 2012 and 2022, along with the projected annual openings (averaged across all years), 2014 median wage, minimum experience or education needed, and associated CTE Career Cluster. Additionally, Table A1 summarizes the information included in all of the preceding maps (Figures 1, 2, and 4).

## High school CTE concentrators by Career Cluster

The first part of this report mapped Career Clusters to high-growth, high-wage jobs for the entire state of Tennessee. To this *demand-side* data, we now add *supply-side data*—that is, how many high school students scheduled to graduate in 2014 concentrate in each Career Cluster. This sample of high school students in this report includes all students scheduled to graduate in 2014, 40 percent of whom concentrated within one of the 16 Career Clusters. To be a concentrator, a student must earn three credits in a Program of Study or Career Cluster. The data includes students who concentrate in CTE in any grade level.

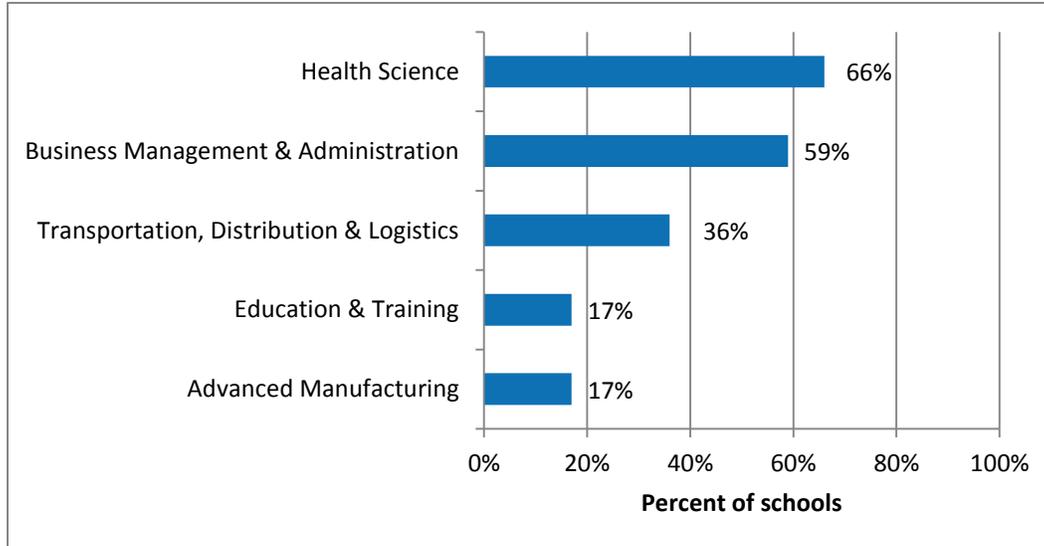
As Figure 3 indicates, there are five Career Clusters projected to have 2,000 or more annual high-growth, high-wage job openings statewide between 2012 and 2022. Figure 4 displays these Clusters, the percentage of high schools statewide offering one or more CTE Programs of Study in each Cluster, and the percentage of high school students scheduled to graduate in 2014 who concentrated in the Cluster statewide.

The 2013/14 school year was the first year that high schools in Tennessee offered CTE Programs of Study organized by Career Clusters. Previously, Tennessee organized programs into seven program areas. New CTE Programs of Study in Finance and in Government & Public Administration had not been implemented before the 2013/14 school year. Therefore, there were no students from this cohort who concentrated in either of these Clusters.

The data on students who concentrate in CTE includes 4,156 students scheduled to graduate in 2014 but completed a Program of Study in the legacy Trade and Industrial Education program area. This program area was associated with a broad range of industries such as architecture and construction, manufacturing technology, transportation, and law. These students were excluded in the disaggregated results by Career Cluster, since their Trade and Industry coursework cannot be mapped to a specific Career Cluster. As a result, the report underestimates the number of students who concentrated in some of the related Career Clusters, particularly Transportation, Distribution, & Logistics; and Advanced Manufacturing which are both among the top 5 high-growth/high-wage Career Clusters in this report.

Statewide, the percentage of schools that offer Programs of Study in the high-growth, high-wage career clusters varies. Figure 5 displays the percentage of schools statewide with at least one concentrator in one of the five Career Clusters with the highest projected growth. The data includes all high schools, not just those that offer CTE or have students who concentrate in CTE. While over half of the high schools in Tennessee had at least one concentrator in Health Science and Business Management & Administration, there were relatively few high schools with concentrators in the other three high-growth, high-wage Career Clusters. However, the low percentage of high schools with students who concentrate in these Career Clusters may be due to the transition to the new CTE Career Cluster framework.

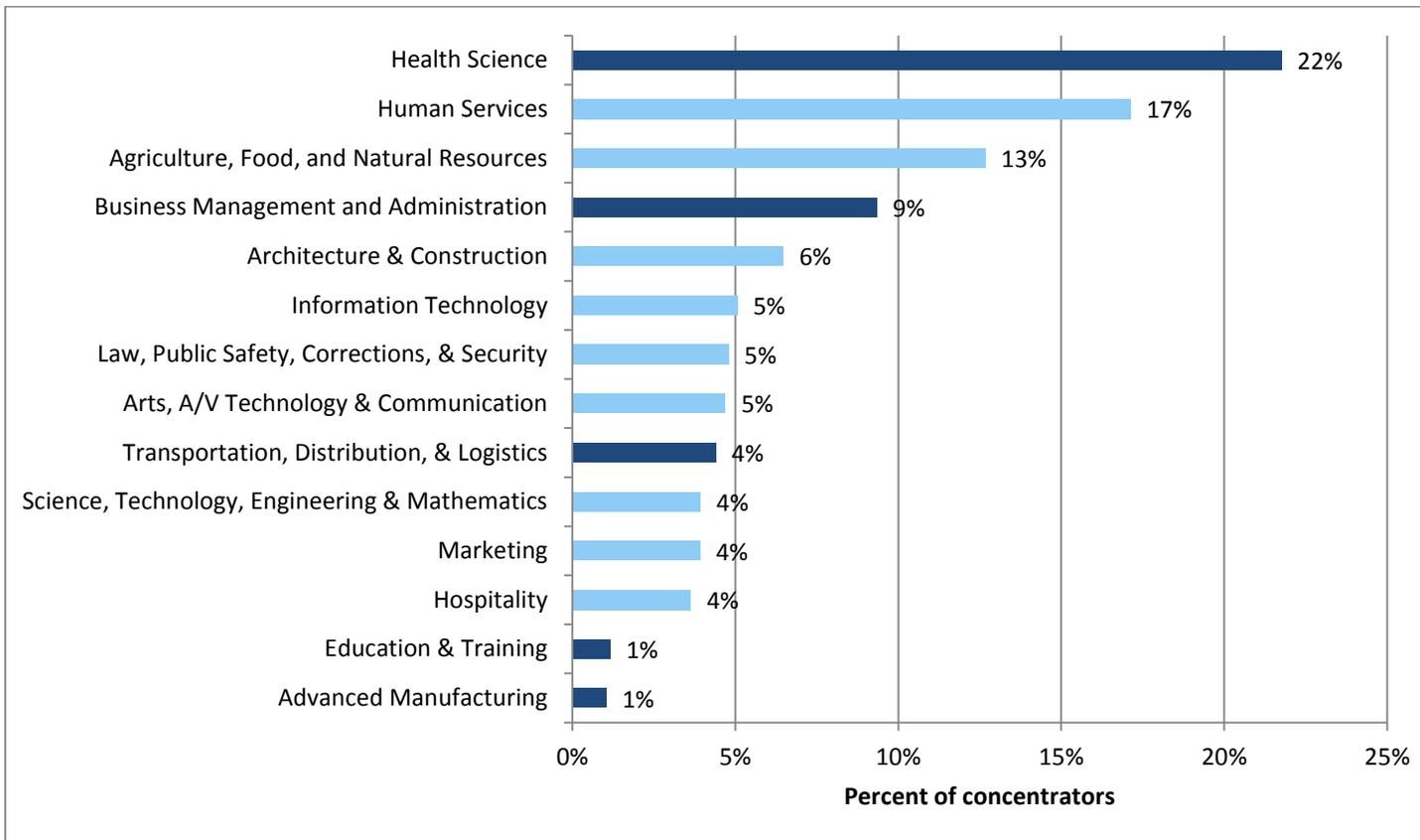
Figure 5. Percent of high schools with at least one concentrator in one of the five Career Clusters with the most projected high-growth, high-wage job openings between 2012 and 2022.



Source: Author's calculations based on data from the Tennessee Department of Education (2015).

We also examined the extent to which students who concentrate in CTE were distributed among the Career Clusters at the student-level, and found a similar trend in the extent of alignment with the workforce projections (Figure 6). Among students who concentrated in one of the 16 Career Clusters, the most common Cluster was Health Science (22 percent). This Career Cluster is also among the top 5 high-growth, high-wage career clusters so the concentrators are well-aligned with the labor market. Alignment is weaker for the other Career Clusters with the largest projected increase in high-growth, high-wage jobs. For example, only one percent of students who concentrate are in the Career Clusters of Education & Training or Advanced Manufacturing, which are projected to experience the third-highest and fifth-highest largest gains in high growth, high-wage job openings respectively. However, these Career Clusters were both new in 2013/14, and had previously been included in other program areas.

Figure 6. Distribution of Career Clusters for students scheduled to graduate in 2014 who are CTE concentrators. (Dark blue indicates the five Career Clusters with the most projected high-growth, high-wage job openings between 2012 and 2022.)



Source: Author's calculations based on data from the Tennessee Department of Education (2015).

As shown earlier, the Career Cluster with the highest number of projected annual high-growth, high-wage jobs varies by LWIA region. This is important to consider when making regional comparisons among the percent of schools offering CTE Programs of Study and the percent of students scheduled to graduate in 2014 who are concentrators in each Career Cluster. Appendix Table A15 provides details for each of the 16 Career Clusters (excluding Finance and Government & Public Administration) in each of the 13 LWIA regions, including the percentage of schools offering one or more Programs of Study in each Career Cluster, as well as the number and percentage of students scheduled to graduate in 2014 who concentrated in each Career Cluster.

## Conclusions

The findings from this report identify what occupations are projected to be high-growth, high-wage in each of Tennessee's 13 Local Workforce Investment Areas, along with the corresponding CTE Career Cluster for each occupation. It also provides the percentage of high schools offering one or more Programs of Study within each Career Cluster and the percentage of high school students scheduled to graduate in 2014 who are a CTE concentrator in Career Clusters associated with high-growth, high-wage jobs.

The findings from this report should be used in conjunction with resources provided by local agencies such as the Tennessee Department of Education and the Tennessee Department of Labor and Workforce Development, as well as national resources from the U.S. Bureau of Labor Statistics. This information can be used by educators to identify which Career Clusters and programs of study they should be offering, expanding, or otherwise modifying in order to ensure that students are prepared for opportunities in high-wage, high-growth careers. This is important because one of the primary purposes of career and technical education according to the Perkins Act is to prepare students for "high wage, or high demand occupations in current or emerging professions" (Perkins, Sec. 2-1). The results also may be of interest to K-12 and postsecondary administrators as they prioritize CTE Career Clusters to add or expand in their CTE programs.

## Appendix

The first table in the appendix provides summary information for the maps presented in Figures 1, 2, and 4 in the report. Next, tables are included for Tennessee's 13 Local Workforce Investment Areas on the occupations in each area that are classified as high-growth and high-wage. Lastly, tables are provided with the number and percentage of high school students scheduled to graduate in 2014 who concentrated, and the distribution of students who concentrated in each Career Clusters by LWIA region.

Table A1. Summary of information presented in maps (Figures 1, 2, and 4), by Local Workforce Investment Area (LWIA).

LWIA	Projected Growth in Employment, 2012–2022	Median Wage, All Occupations Average, 2014	CTE Career Cluster with Most Projected High-Growth, High-Wage Job Openings, 2012–2022
1	5.9%	\$29,908	Business Management & Administration
2	11.0%	\$25,876	Transportation, Distribution, & Logistics
3	17.1%	\$30,532	Business Management & Administration
4	7.7%	\$30,920	Education & Training
5	11.9%	\$29,912	Business Management & Administration
6	9.8%	\$29,403	Education & Training
7	12.1%	\$27,313	Education & Training
8	17.0%	\$32,060	Business Management & Administration
9	11.4%	\$34,750	Business Management & Administration
10	15.5%	\$28,191	Education & Training
11	12.6%	\$29,755	Education & Training
12	8.8%	\$28,383	Education & Training
13	13.0%	\$33,167	Business Management & Administration

Table A2. High-Growth, High-Wage Jobs in Local Workforce Investment Area 1, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 1					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
431011	First-Line Supervisors of Office and Administrative Support Workers	105	\$43,198	Work experience in a related occupation	Business Management & Administration
533032	Heavy and Tractor-Trailer Truck Drivers	85	\$40,886	Moderate-term on-the-job training	Transportation, Distribution, & Logistics
252021	Elementary School Teachers, Except Special Education	55	\$51,098	Bachelor's degree	Education & Training
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	45	\$49,425	Moderate-term on-the-job training	Marketing
111021	General and Operations Managers	40	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	35	\$68,435	Moderate-term on-the-job training	Marketing
493023	Automotive Service Technicians and Mechanics	35	\$39,042	Post-secondary vocational training	Transportation, Distribution, & Logistics
252031	Secondary School Teachers, Except Special and Career/Technical Education	30	\$50,355	Bachelor's degree	Education & Training
333051	Police and Sheriff's Patrol Officers	30	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
514121	Welders, Cutters, Solderers, and Brazers	25	\$39,002	Long-term on-the-job training	Architecture & Construction <sup>1</sup>

Local Workforce Investment Area 1					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
436011	Executive Secretaries and Executive Administrative Assistants	25	\$37,012	Moderate-term on-the-job training	Business Management & Administration
111011	Chief Executives	25	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
132011	Accountants and Auditors	25	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
291051	Pharmacists	25	\$114,258	First professional degree	Health Science
119111	Medical and Health Services Managers	20	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration
119199	Managers, All Other	20	\$99,763	Work experience in a related occupation	Business Management & Administration
131199	Business Operations Specialists, All Other	20	\$72,844	Bachelor's degree	Business Management & Administration
252022	Middle School Teachers, Except Special and Career/Technical Education	20	\$48,592	Bachelor's degree	Education & Training
212011	Clergy	20	\$46,380	First professional degree	Human Services
511011	First-Line Supervisors of Production and Operating Workers	20	\$46,697	Work experience in a related occupation	Advanced Manufacturing
151151	Computer User Support Specialists	20	\$37,708	Associate's degree	Information Technology
499041	Industrial Machinery Mechanics	20	\$43,807	Long-term on-the-job training	Advanced Manufacturing
172072	Electronics Engineers, Except Computer	20	\$77,320	Bachelor's degree	Science, Technology, Engineering, & Mathematics

### Local Workforce Investment Area 1

SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
113031	Financial Managers	15	\$83,756	Work experience, plus bachelor's degree	Finance
132072	Loan Officers	15	\$45,591	Bachelor's degree	Finance
251071	Health Specialties Teachers, Postsecondary	15	\$59,610	Master's degree	Health Science
151142	Network and Computer Systems Administrators	15	\$51,382	Bachelor's degree	Information Technology
151121	Computer Systems Analysts	15	\$47,575	Bachelor's degree	Information Technology
112022	Sales Managers	15	\$98,229	Work experience, plus bachelor's degree	Marketing

<sup>1</sup>In Tennessee, the occupation for "Welders , Cutters, Solderers, and Brazers" is classified in the "Advanced Manufacturing" Career Cluster.

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

Table A3. High-Growth, High-Wage Jobs in Local Workforce Investment Area 2, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 2					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	210	\$40,886	Moderate-term on-the-job training	Transportation, Distribution, & Logistics
252021	Elementary School Teachers, Except Special Education	60	\$51,098	Bachelor's degree	Education & Training
111021	General and Operations Managers	50	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
431011	First-Line Supervisors of Office and Administrative Support Workers	50	\$43,198	Work experience in a related occupation	Business Management & Administration
252022	Middle School Teachers, Except Special and Career/Technical Education	40	\$48,592	Bachelor's degree	Education & Training
333051	Police and Sheriff's Patrol Officers	40	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
493023	Automotive Service Technicians and Mechanics	40	\$39,042	Post-secondary vocational training	Transportation, Distribution, & Logistics
433031	Bookkeeping, Accounting, and Auditing Clerks	35	\$33,942	Moderate-term on-the-job training	Business Management & Administration <sup>3</sup>
252031	Secondary School Teachers, Except Special and Career/Technical Education	30	\$50,355	Bachelor's degree	Education & Training

Local Workforce Investment Area 2					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
292041	Emergency Medical Technicians and Paramedics	30	\$33,502	Post-secondary vocational training	Health Science
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	25	\$49,425	Moderate-term on-the-job training	Marketing
514121	Welders, Cutters, Solderers, and Brazers	20	\$39,002	Long-term on-the-job training	Architecture & Construction <sup>1</sup>
472073	Operating Engineers and Other Construction Equipment Operators	20	\$34,628	Moderate-term on-the-job training	Architecture & Construction
111011	Chief Executives	20	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
132011	Accountants and Auditors	20	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
291051	Pharmacists	20	\$114,258	First professional degree	Health Science
511011	First-Line Supervisors of Production and Operating Workers	20	\$46,697	Work experience in a related occupation	Advanced Manufacturing
435052	Postal Service Mail Carriers	20	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>
433021	Billing and Posting Clerks	15	\$31,262	Moderate-term on-the-job training	Business Management & Administration <sup>5</sup>
436011	Executive Secretaries and Executive	15	\$37,012	Moderate-term on-the-	Business Management &

Local Workforce Investment Area 2					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
	Administrative Assistants			job training	Administration
132072	Loan Officers	15	\$45,591	Bachelor's degree	Finance
332011	Firefighters	15	\$49,617	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
514041	Machinists	15	\$40,582	Long-term on-the-job training	Advanced Manufacturing
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	15	\$60,277	Work experience in a related occupation	Advanced Manufacturing
499041	Industrial Machinery Mechanics	15	\$43,807	Long-term on-the-job training	Advanced Manufacturing
112022	Sales Managers	15	\$98,229	Work experience, plus bachelor's degree	Marketing
537081	Refuse and Recyclable Material Collectors	15	\$33,780	Short-term on-the-job training	Agriculture, Food, & Natural Resources
413021	Insurance Sales Agents	10	\$52,801	Bachelor's degree	Finance

<sup>1</sup>In Tennessee, the occupation for "Welders , Cutters, Solderers, and Brazers" is classified in the "Advanced Manufacturing" Career Cluster.

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>3</sup>In Tennessee, the occupation for "Bookkeeping, Accounting, and Auditing Clerks" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

<sup>5</sup>In Tennessee, the occupation for "Billing and Posting Clerks" is classified in the "Government & Public Administration" Career Cluster.

Table A4. High-Growth, High-Wage Jobs in Local Workforce Investment Area 3, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 3					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
212011	Clergy	170	\$46,380	First professional degree	Human Services
533032	Heavy and Tractor-Trailer Truck Drivers	165	\$40,886	Moderate-term on-the-job training	Transportation, Distribution, & Logistics
431011	First-Line Supervisors of Office and Administrative Support Workers	155	\$43,198	Work experience in a related occupation	Business Management & Administration
111021	General and Operations Managers	105	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	105	\$49,425	Moderate-term on-the-job training	Marketing
132011	Accountants and Auditors	80	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
252021	Elementary School Teachers, Except Special Education	80	\$51,098	Bachelor's degree	Education & Training
493023	Automotive Service Technicians and Mechanics	60	\$39,042	Post-secondary vocational training	Transportation, Distribution, & Logistics
436011	Executive Secretaries and Executive Administrative Assistants	60	\$37,012	Moderate-term on-the-job training	Business Management & Administration

Local Workforce Investment Area 3					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
119199	Managers, All Other	60	\$99,763	Work experience in a related occupation	Business Management & Administration
111011	Chief Executives	55	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
119111	Medical and Health Services Managers	45	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration
333051	Police and Sheriff's Patrol Officers	40	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	40	\$68,435	Moderate-term on-the-job training	Marketing
252031	Secondary School Teachers, Except Special and Career/Technical Education	40	\$50,355	Bachelor's degree	Education & Training
131199	Business Operations Specialists, All Other	35	\$72,844	Bachelor's degree	Business Management & Administration
132072	Loan Officers	35	\$45,591	Bachelor's degree	Finance
113011	Administrative Services Managers	30	\$53,795	Work experience, plus bachelor's degree	Business Management & Administration
113031	Financial Managers	30	\$83,756	Work experience, plus bachelor's degree	Finance

Local Workforce Investment Area 3					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
499021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	30	\$42,891	Long-term on-the-job training	Architecture & Construction
252022	Middle School Teachers, Except Special and Career/Technical Education	30	\$48,592	Bachelor's degree	Education & Training
291071	Physician Assistants	30	\$80,952	Bachelor's degree	Health Science
291051	Pharmacists	30	\$114,258	First professional degree	Health Science
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	30	\$60,277	Work experience in a related occupation	Advanced Manufacturing
131011	Agents and Business Managers of Artists, Performers, and Athletes	25	\$43,828	Work experience, plus bachelor's degree	Business Management & Administration
413021	Insurance Sales Agents	25	\$52,801	Bachelor's degree	Finance
151142	Network and Computer Systems Administrators	25	\$55,166	Bachelor's degree	Information Technology
232011	Paralegals and Legal Assistants	25	\$37,446	Associate degree	Law, Public Safety, Corrections, & Security
112022	Sales Managers	25	\$98,229	Work experience, plus bachelor's degree	Marketing

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

Table A5. High-Growth, High-Wage Jobs in Local Workforce Investment Area 4, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 4					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
252021	Elementary School Teachers, Except Special Education	95	\$51,098	Bachelor's degree	Education & Training
533032	Heavy and Tractor-Trailer Truck Drivers	70	\$40,886	Moderate-term on-the-job training	Transportation, Distribution, & Logistics
431011	First-Line Supervisors of Office and Administrative Support Workers	65	\$43,198	Work experience in a related occupation	Business Management & Administration
252031	Secondary School Teachers, Except Special and Career/Technical Education	50	\$50,355	Bachelor's degree	Education & Training
111021	General and Operations Managers	40	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
493023	Automotive Service Technicians and Mechanics	35	\$39,042	Post-secondary vocational training	Transportation, Distribution, & Logistics
252022	Middle School Teachers, Except Special and Career/Technical Education	35	\$48,592	Bachelor's degree	Education & Training
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	35	\$49,425	Moderate-term on-the-job training	Marketing

Local Workforce Investment Area 4					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
132011	Accountants and Auditors	30	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
333051	Police and Sheriff's Patrol Officers	30	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
111011	Chief Executives	25	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
151151	Computer User Support Specialists	20	\$45,301	Associate's degree	Information Technology
333012	Correctional Officers and Jailers	20	\$42,180	Moderate-term on-the-job training	Law, Public Safety, Corrections, & Security
499051	Electrical Power-Line Installers and Repairers	20	\$56,411	Long-term on-the-job training	Architecture & Construction
151142	Network and Computer Systems Administrators	20	\$59,596	Bachelor's degree	Information Technology
332011	Firefighters	20	\$49,617	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	20	\$60,277	Work experience in a related occupation	Advanced Manufacturing
172199	Engineers, All Other	20	\$84,211	Bachelor's degree	Science, Technology, Engineering, & Mathematics
435052	Postal Service Mail Carriers	20	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>

Local Workforce Investment Area 4					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
514121	Welders, Cutters, Solderers, and Brazers	20	\$39,002	Long-term on-the-job training	Architecture & Construction <sup>1</sup>
119199	Managers, All Other	15	\$99,763	Work experience in a related occupation	Business Management & Administration
131151	Training and Development Specialists	15	\$53,247	Bachelor's degree	Business Management & Administration
131199	Business Operations Specialists, All Other	15	\$72,844	Bachelor's degree	Business Management & Administration
119032	Education Administrators, Elementary and Secondary School	15	\$76,188	Work experience, plus bachelor's degree	Education & Training
291051	Pharmacists	15	\$114,258	First professional degree	Health Science
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	15	\$68,435	Moderate-term on-the-job training	Marketing
194051	Nuclear Technicians	15	\$92,369	Associate degree	Science, Technology, Engineering & Mathematics

<sup>1</sup>In Tennessee, the occupation for "Welders, Cutters, Solderers, and Brazers" is classified in the "Advanced Manufacturing" Career Cluster.

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

Table A6. High-Growth, High-Wage Jobs in Local Workforce Investment Area 5, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 5					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	385	\$40,886	Moderate-term on-the-job training	Transportation, Distribution, & Logistics
431011	First-Line Supervisors of Office and Administrative Support Workers	135	\$43,198	Work experience in a related occupation	Business Management & Administration
252021	Elementary School Teachers, Except Special Education	105	\$51,098	Bachelor's degree	Education & Training
111021	General and Operations Managers	95	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	90	\$49,425	Moderate-term on-the-job training	Marketing
132011	Accountants and Auditors	75	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
212011	Clergy	60	\$46,380	First professional degree	Human Services
151121	Computer Systems Analysts	60	\$63,447	Bachelor's degree	Information Technology
436011	Executive Secretaries and Executive Administrative Assistants	60	\$37,012	Moderate-term on-the-job training	Business Management & Administration
514121	Welders, Cutters, Solderers, and Brazers	60	\$39,002	Long-term on-the-job training	Architecture & Construction <sup>1</sup>

Local Workforce Investment Area 5					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
252031	Secondary School Teachers, Except Special and Career/Technical Education	55	\$50,355	Bachelor's degree	Education & Training
493023	Automotive Service Technicians and Mechanics	50	\$39,042	Post-secondary vocational training	Transportation, Distribution, & Logistics
111011	Chief Executives	50	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
333051	Police and Sheriff's Patrol Officers	50	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections & Security
119199	Managers, All Other	40	\$99,763	Work experience in a related occupation	Business Management & Administration
252022	Middle School Teachers, Except Special and Career/Technical Education	40	\$48,592	Bachelor's degree	Education & Training
132072	Loan Officers	40	\$45,591	Bachelor's degree	Finance
113031	Financial Managers	35	\$83,756	Work experience, plus bachelor's degree	Finance
291123	Physical Therapists	35	\$77,769	Master's degree	Health Science
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	35	\$60,277	Work experience in a related occupation	Advanced Manufacturing
499041	Industrial Machinery Mechanics	35	\$43,807	Long-term on-the-job training	Advanced Manufacturing

Local Workforce Investment Area 5					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
112022	Sales Managers	35	\$98,229	Work experience, plus bachelor's degree	Marketing
151151	Computer User Support Specialists	30	\$38,817	Associate's degree	Information Technology
119111	Medical and Health Services Managers	30	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration
291051	Pharmacists	30	\$114,258	First professional degree	Health Science
511011	First-Line Supervisors of Production and Operating Workers	30	\$46,697	Work experience in a related occupation	Advanced Manufacturing
435052	Postal Service Mail Carriers	30	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>
499051	Electrical Power-Line Installers and Repairers	25	\$56,411	Long-term on-the-job training	Architecture & Construction
514041	Machinists	25	\$40,582	Long-term on-the-job training	Advanced Manufacturing

<sup>1</sup>In Tennessee, the occupation for "Welders , Cutters, Solderers, and Brazers" is classified in the "Advanced Manufacturing" Career Cluster.

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

Table A7. High-Growth, High-Wage Jobs in Local Workforce Investment Area 6, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 6					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	75	\$40,886	Moderate-term on-the-job training	Transportation, Distribution, & Logistics
252021	Elementary School Teachers, Except Special Education	50	\$51,098	Bachelor's degree	Education & Training
431011	First-Line Supervisors of Office and Administrative Support Workers	35	\$43,198	Work experience in a related occupation	Business Management & Administration
333051	Police and Sheriff's Patrol Officers	25	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	25	\$49,425	Moderate-term on-the-job training	Marketing
514041	Machinists	20	\$40,582	Long-term on-the-job training	Advanced Manufacturing
252031	Secondary School Teachers, Except Special and Career/Technical Education	20	\$50,355	Bachelor's degree	Education & Training
392011	Animal Trainers	15	\$38,774	Moderate-term on-the-job training	Agriculture, Food & Natural Resources
493023	Automotive Service Technicians and Mechanics	15	\$39,042	Post-secondary vocational training	Transportation, Distribution, & Logistics

Local Workforce Investment Area 6					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
111011	Chief Executives	15	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
132011	Accountants and Auditors	15	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
252022	Middle School Teachers, Except Special and Career/Technical Education	15	\$48,592	Bachelor's degree	Education & Training
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	15	\$68,435	Moderate-term on-the-job training	Marketing
252032	Career/Technical Education Teachers, Secondary School	10	\$50,056	Work experience, plus bachelor's degree	Education & Training
436011	Executive Secretaries and Executive Administrative Assistants	10	\$37,012	Moderate-term on-the-job training	Business Management & Administration
132072	Loan Officers	10	\$45,591	Bachelor's degree	Finance
291051	Pharmacists	10	\$114,258	First professional degree	Health Science
332011	Firefighters	10	\$49,617	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
172011	Aerospace Engineers	10	\$87,523	Bachelor's degree	Science, Technology, Engineering, & Mathematics

**Local Workforce Investment Area 6**

<b>SOC</b>	<b>Occupation</b>	<b>Projected Annual Job Openings (Ave.)</b>	<b>Median Wage (2014)</b>	<b>Minimum Experience or Education</b>	<b>Associated CTE Career Cluster</b>
435052	Postal Service Mail Carriers	10	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

Table A8. High-Growth, High-Wage Jobs in Local Workforce Investment Area 7, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 7					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	45	\$40,886	Moderate-term on-the-job training	Transportation, Distribution, & Logistics
431011	First-Line Supervisors of Office and Administrative Support Workers	35	\$43,198	Work experience in a related occupation	Business Management & Administration
252021	Elementary School Teachers, Except Special Education	35	\$51,098	Bachelor's degree	Education & Training
333051	Police and Sheriff's Patrol Officers	25	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
292041	Emergency Medical Technicians and Paramedics	20	\$33,502	Post-secondary vocational training	Health Science
252031	Secondary School Teachers, Except Special and Career/Technical Education	20	\$50,355	Bachelor's degree	Education & Training
433031	Bookkeeping, Accounting, and Auditing Clerks	15	\$33,942	Moderate-term on-the-job training	Business Management & Administration <sup>3</sup>
499071	Maintenance and Repair Workers, General	15	\$32,916	Moderate-term on-the-job training	Advanced Manufacturing

<b>Local Workforce Investment Area 7</b>					
<b>SOC</b>	<b>Occupation</b>	<b>Projected Annual Job Openings (Ave.)</b>	<b>Median Wage (2014)</b>	<b>Minimum Experience or Education</b>	<b>Associated CTE Career Cluster</b>
499021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	15	\$42,891	Long-term on-the-job training	Architecture & Construction
252022	Middle School Teachers, Except Special and Career/Technical Education	15	\$48,592	Bachelor's degree	Education & Training
435031	Police, Fire, and Ambulance Dispatchers	10	\$38,426	Moderate-term on-the-job training	Law, Public Safety, Corrections, & Security
493023	Automotive Service Technicians and Mechanics	10	\$39,042	Post-secondary vocational training	Transportation, Distribution & Logistics
537081	Refuse and Recyclable Material Collectors	10	\$33,780	Short-term on-the-job training	Agriculture, Food & Natural Resources
518031	Water and Wastewater Treatment Plant and System Operators	10	\$39,639	Long-term on-the-job training	Agriculture, Food & Natural Resources
111011	Chief Executives	10	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
132011	Accountants and Auditors	10	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
132072	Loan Officers	10	\$45,591	Bachelor's degree	Finance
514011	Computer-Controlled Machine Tool Operators, Metal and Plastic	10	\$41,236	Moderate-term on-the-job training	Advanced Manufacturing

### Local Workforce Investment Area 7

SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
435052	Postal Service Mail Carriers	10	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>
211021	Child, Family, and School Social Workers	5	\$35,423	Bachelor's degree	Human Services
211023	Mental Health and Substance Abuse Social Workers	5	\$34,637	Master's degree	Human Services
113011	Administrative Services Managers	5	\$53,795	Work experience, plus bachelor's degree	Business Management & Administration
119032	Education Administrators, Elementary and Secondary School	5	\$76,188	Work experience, plus bachelor's degree	Education & Training
113031	Financial Managers	5	\$83,756	Work experience, plus bachelor's degree	Finance
211012	Educational, Guidance, School, and Vocational Counselors	5	\$50,181	Master's degree	Human Services
151142	Network and Computer Systems Administrators	5	\$40,123	Bachelor's degree	Information Technology
151121	Computer Systems Analysts	5	\$41,410	Bachelor's degree	Information Technology

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>3</sup>In Tennessee, the occupation for "Bookkeeping, Accounting, and Auditing Clerks" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

Table A9. High-Growth, High-Wage Jobs in Local Workforce Investment Area 8, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 8					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
132011	Accountants and Auditors	165	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
431011	First-Line Supervisors of Office and Administrative Support Workers	165	\$43,198	Work experience in a related occupation	Business Management & Administration
252021	Elementary School Teachers, Except Special Education	145	\$51,098	Bachelor's degree	Education & Training
111021	General and Operations Managers	135	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
252022	Middle School Teachers, Except Special and Career/Technical Education	80	\$48,592	Bachelor's degree	Education & Training
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	80	\$68,435	Moderate-term on-the-job training	Marketing
252031	Secondary School Teachers, Except Special and Career/Technical Education	75	\$50,355	Bachelor's degree	Education & Training

Local Workforce Investment Area 8					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	70	\$49,425	Moderate-term on-the-job training	Marketing
131199	Business Operations Specialists, All Other	70	\$72,844	Bachelor's degree	Business Management & Administration
111011	Chief Executives	65	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
333051	Police and Sheriff's Patrol Officers	55	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections & Security
113031	Financial Managers	55	\$83,756	Work experience, plus bachelor's degree	Finance
499021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	50	\$42,891	Long-term on-the-job training	Architecture & Construction
119199	Managers, All Other	50	\$99,763	Work experience in a related occupation	Business Management & Administration
291051	Pharmacists	50	\$114,258	First professional degree	Health Science
413021	Insurance Sales Agents	45	\$52,801	Bachelor's degree	Finance
151121	Computer Systems Analysts	45	\$56,847	Bachelor's degree	Information Technology

Local Workforce Investment Area 8					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
493023	Automotive Service Technicians and Mechanics	45	\$39,042	Post-secondary vocational training	Transportation, Distribution & Logistics
131031	Claims Adjusters, Examiners, and Investigators	45	\$59,637	Long-term on-the-job training	Finance
112022	Sales Managers	45	\$98,229	Work experience, plus bachelor's degree	Marketing
151151	Computer User Support Specialists	40	\$42,182	Associate's degree	Information Technology
151131	Computer Programmers	35	\$71,497	Bachelor's degree	Information Technology
131151	Training and Development Specialists	30	\$46,400	Bachelor's degree	Business Management & Administration
212011	Clergy	30	\$46,380	First professional degree	Human Services
435052	Postal Service Mail Carriers	30	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

Table A10. High-Growth, High-Wage Jobs in Local Workforce Investment Area 9, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 9					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
132011	Accountants and Auditors	355	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
431011	First-Line Supervisors of Office and Administrative Support Workers	345	\$43,198	Work experience in a related occupation	Business Management & Administration
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	260	\$49,425	Moderate-term on-the-job training	Marketing
111021	General and Operations Managers	250	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
252021	Elementary School Teachers, Except Special Education	235	\$51,098	Bachelor's degree	Education & Training
252031	Secondary School Teachers, Except Special and Career/Technical Education	175	\$50,355	Bachelor's degree	Education & Training
111011	Chief Executives	140	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
151121	Computer Systems Analysts	115	\$58,817	Bachelor's degree	Information Technology
333051	Police and Sheriff's Patrol Officers	110	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections & Security

Local Workforce Investment Area 9					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
131199	Business Operations Specialists, All Other	100	\$72,844	Bachelor's degree	Business Management & Administration
113031	Financial Managers	95	\$83,756	Work experience, plus bachelor's degree	Finance
151142	Network and Computer Systems Administrators	95	\$59,300	Bachelor's degree	Information Technology
119199	Managers, All Other	90	\$99,763	Work experience in a related occupation	Business Management & Administration
113011	Administrative Services Managers	85	\$53,795	Work experience, plus bachelor's degree	Business Management & Administration
119111	Medical and Health Services Managers	85	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	85	\$60,277	Work experience in a related occupation	Advanced Manufacturing
499021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	80	\$42,891	Long-term on-the-job training	Architecture & Construction
252022	Middle School Teachers, Except Special and Career/Technical Education	80	\$48,592	Bachelor's degree	Education & Training

Local Workforce Investment Area 9					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	75	\$68,435	Moderate-term on-the-job training	Marketing
112022	Sales Managers	75	\$98,229	Work experience, plus bachelor's degree	Marketing
251121	Art, Drama, and Music Teachers, Postsecondary	70	\$50,728	Master's degree	Arts, A/V Technology & Communications
413021	Insurance Sales Agents	70	\$52,801	Bachelor's degree	Finance
131031	Claims Adjusters, Examiners, and Investigators	60	\$59,637	Long-term on-the-job training	Finance
131151	Training and Development Specialists	55	\$44,783	Bachelor's degree	Business Management & Administration
211012	Educational, Guidance, School, and Vocational Counselors	55	\$50,181	Master's degree	Human Services
113021	Computer and Information Systems Managers	55	\$93,205	Work experience, plus bachelor's degree	Information Technology

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

Table A11. High-Growth, High-Wage Jobs in Local Workforce Investment Area 10, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 10					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	50	\$40,886	Moderate-term on-the-job training	Transportation, Distribution & Logistics
252021	Elementary School Teachers, Except Special Education	40	\$51,098	Bachelor's degree	Education & Training
431011	First-Line Supervisors of Office and Administrative Support Workers	30	\$43,198	Work experience in a related occupation	Business Management & Administration
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	30	\$49,425	Moderate-term on-the-job training	Marketing
499071	Maintenance and Repair Workers, General	25	\$34,209	Moderate-term on-the-job training	Advanced Manufacturing
493023	Automotive Service Technicians and Mechanics	25	\$39,042	Post-secondary vocational training	Transportation, Distribution & Logistics
514041	Machinists	20	\$40,582	Long-term on-the-job training	Advanced Manufacturing
252022	Middle School Teachers, Except Special and Career/Technical Education	20	\$48,592	Bachelor's degree	Education & Training

Local Workforce Investment Area 10					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
252031	Secondary School Teachers, Except Special and Career/Technical Education	20	\$50,355	Bachelor's degree	Education & Training
212011	Clergy	20	\$46,380	First professional degree	Human Services
132011	Accountants and Auditors	15	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
291051	Pharmacists	15	\$114,258	First professional degree	Health Science
333051	Police and Sheriff's Patrol Officers	15	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
433031	Bookkeeping, Accounting, and Auditing Clerks	15	\$33,942	Moderate-term on-the-job training	Business Management & Administration <sup>3</sup>
518031	Water and Wastewater Treatment Plant and System Operators	10	\$39,639	Long-term on-the-job training	Agriculture, Food & Natural Resources
436011	Executive Secretaries and Executive Administrative Assistants	10	\$37,012	Moderate-term on-the-job training	Business Management & Administration
151151	Computer User Support Specialists	10	\$34,494	Associate's degree	Information Technology
119111	Medical and Health Services Managers	10	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration

Local Workforce Investment Area 10					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
131199	Business Operations Specialists, All Other	10	\$72,844	Bachelor's degree	Business Management & Administration
113031	Financial Managers	10	\$83,756	Work experience, plus bachelor's degree	Finance
413021	Insurance Sales Agents	10	\$52,801	Bachelor's degree	Finance
435052	Postal Service Mail Carriers	10	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>
371012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	5	\$38,198	Work experience in a related occupation	Agriculture, Food & Natural Resources
435031	Police, Fire, and Ambulance Dispatchers	5	\$38,426	Moderate-term on-the-job training	Law, Public Safety, Corrections & Security

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>3</sup>In Tennessee, the occupation for "Bookkeeping, Accounting, and Auditing Clerks" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

Table A12. High-Growth, High-Wage Jobs in Local Workforce Investment Area 11, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 11					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	105	\$40,886	Moderate-term on-the-job training	Transportation, Distribution & Logistics
252021	Elementary School Teachers, Except Special Education	70	\$51,098	Bachelor's degree	Education & Training
431011	First-Line Supervisors of Office and Administrative Support Workers	65	\$43,198	Work experience in a related occupation	Business Management & Administration
252031	Secondary School Teachers, Except Special and Career/Technical Education	45	\$50,355	Bachelor's degree	Education & Training
333012	Correctional Officers and Jailers	40	\$42,180	Moderate-term on-the-job training	Law, Public Safety, Corrections, & Security
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	40	\$49,425	Moderate-term on-the-job training	Marketing
252022	Middle School Teachers, Except Special and Career/Technical Education	35	\$48,592	Bachelor's degree	Education & Training
333051	Police and Sheriff's Patrol Officers	35	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security

Local Workforce Investment Area 11					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
514121	Welders, Cutters, Solderers, and Brazers	30	\$39,002	Long-term on-the-job training	Architecture & Construction <sup>1</sup>
433051	Payroll and Timekeeping Clerks	25	\$36,766	Moderate-term on-the-job training	Business Management & Administration
493023	Automotive Service Technicians and Mechanics	25	\$39,042	Post-secondary vocational training	Transportation, Distribution & Logistics
436011	Executive Secretaries and Executive Administrative Assistants	20	\$37,012	Moderate-term on-the-job training	Business Management & Administration
499021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	20	\$42,891	Long-term on-the-job training	Architecture & Construction
111011	Chief Executives	20	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
119111	Medical and Health Services Managers	20	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration
132011	Accountants and Auditors	20	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
211012	Educational, Guidance, School, and Vocational Counselors	20	\$50,181	Master's degree	Human Services
435052	Postal Service Mail Carriers	20	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>

Local Workforce Investment Area 11					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
119032	Education Administrators, Elementary and Secondary School	15	\$76,188	Work experience, plus bachelor's degree	Education & Training
132072	Loan Officers	15	\$45,591	Bachelor's degree	Finance
413021	Insurance Sales Agents	15	\$52,801	Bachelor's degree	Finance
291051	Pharmacists	15	\$114,258	First professional degree	Health Science
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	15	\$60,277	Work experience in a related occupation	Advanced Manufacturing
499041	Industrial Machinery Mechanics	15	\$43,807	Long-term on-the-job training	Advanced Manufacturing
518031	Water and Wastewater Treatment Plant and System Operators	10	\$39,639	Long-term on-the-job training	Agriculture, Food & Natural Resources
537032	Excavating and Loading Machine and Dragline Operators	10	\$52,043	Moderate-term on-the-job training	Architecture & Construction
531021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	10	\$43,508	Work experience in a related occupation	Transportation, Distribution, & Logistics

<sup>1</sup>In Tennessee, the occupation for “Welders , Cutters, Solderers, and Brazers” is classified in the “Advanced Manufacturing” Career Cluster.

<sup>2</sup>In Tennessee, the occupation for “Accountants and Auditors” is classified in the “Finance” Career Cluster.

<sup>4</sup>In Tennessee, the occupation for “Postal Service Mail Carriers” is classified in the “Government & Public Administration” Career Cluster.

Table A13. High-Growth, High-Wage Jobs in Local Workforce Investment Area 12, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 12					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	75	\$40,886	Moderate-term on-the-job training	Transportation, Distribution & Logistics
252021	Elementary School Teachers, Except Special Education	55	\$51,098	Bachelor's degree	Education & Training
431011	First-Line Supervisors of Office and Administrative Support Workers	40	\$43,198	Work experience in a related occupation	Business Management & Administration
252031	Secondary School Teachers, Except Special and Career/Technical Education	40	\$50,355	Bachelor's degree	Education & Training
333012	Correctional Officers and Jailers	35	\$42,180	Moderate-term on-the-job training	Law, Public Safety, Corrections & Security
252022	Middle School Teachers, Except Special and Career/Technical Education	25	\$48,592	Bachelor's degree	Education & Training
493023	Automotive Service Technicians and Mechanics	20	\$39,042	Post-secondary vocational training	Transportation, Distribution & Logistics
514041	Machinists	15	\$40,582	Long-term on-the-job training	Advanced Manufacturing

Local Workforce Investment Area 12					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
499041	Industrial Machinery Mechanics	15	\$43,807	Long-term on-the-job training	Advanced Manufacturing
333051	Police and Sheriff's Patrol Officers	15	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	15	\$49,425	Moderate-term on-the-job training	Marketing
435052	Postal Service Mail Carriers	15	\$52,455	Short-term on-the-job training	Business Management & Administration <sup>4</sup>
472073	Operating Engineers and Other Construction Equipment Operators	10	\$34,628	Moderate-term on-the-job training	Architecture & Construction
119111	Medical and Health Services Managers	10	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration
132011	Accountants and Auditors	10	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>
119032	Education Administrators, Elementary and Secondary School	10	\$76,188	Work experience, plus bachelor's degree	Education & Training
413021	Insurance Sales Agents	10	\$52,801	Bachelor's degree	Finance
291051	Pharmacists	10	\$114,258	First professional degree	Health Science

**Local Workforce Investment Area 12**

<b>SOC</b>	<b>Occupation</b>	<b>Projected Annual Job Openings (Ave.)</b>	<b>Median Wage (2014)</b>	<b>Minimum Experience or Education</b>	<b>Associated CTE Career Cluster</b>
332011	Firefighters	10	\$49,617	Long-term on-the-job training	Law, Public Safety, Corrections, & Security
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	10	\$60,277	Work experience in a related occupation	Advanced Manufacturing
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	10	\$68,435	Moderate-term on-the-job training	Marketing

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

<sup>4</sup>In Tennessee, the occupation for "Postal Service Mail Carriers" is classified in the "Government & Public Administration" Career Cluster.

Table A14. High-Growth, High-Wage Jobs in Local Workforce Investment Area 13, by Average Number of Projected Annual Job Openings, 2012–2022.

Local Workforce Investment Area 13					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
533032	Heavy and Tractor-Trailer Truck Drivers	460	\$40,886	Moderate-term on-the-job training	Transportation, Distribution & Logistics
131199	Business Operations Specialists, All Other	370	\$72,844	Bachelor's degree	Business Management & Administration
431011	First-Line Supervisors of Office and Administrative Support Workers	245	\$43,198	Work experience in a related occupation	Business Management & Administration
252021	Elementary School Teachers, Except Special Education	200	\$51,098	Bachelor's degree	Education & Training
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	175	\$49,425	Moderate-term on-the-job training	Marketing
111021	General and Operations Managers	175	\$80,442	Work experience, plus bachelor's degree	Business Management & Administration
119199	Managers, All Other	160	\$99,763	Work experience in a related occupation	Business Management & Administration
333051	Police and Sheriff's Patrol Officers	155	\$49,608	Long-term on-the-job training	Law, Public Safety, Corrections & Security
132011	Accountants and Auditors	135	\$56,403	Bachelor's degree	Business Management & Administration <sup>2</sup>

<b>Local Workforce Investment Area 13</b>					
<b>SOC</b>	<b>Occupation</b>	<b>Projected Annual Job Openings (Ave.)</b>	<b>Median Wage (2014)</b>	<b>Minimum Experience or Education</b>	<b>Associated CTE Career Cluster</b>
252031	Secondary School Teachers, Except Special and Career/Technical Education	110	\$50,355	Bachelor's degree	Education & Training
252022	Middle School Teachers, Except Special and Career/Technical Education	90	\$48,592	Bachelor's degree	Education & Training
151133	Software Developers, Systems Software	90	\$72,439	Bachelor's degree	Information Technology
111011	Chief Executives	85	\$165,330	Work experience, plus bachelor's degree	Business Management & Administration
151131	Computer Programmers	80	\$70,319	Bachelor's degree	Information Technology
151151	Computer User Support Specialists	75	\$44,161	Associate's degree	Information Technology
531021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	75	\$43,508	Work experience in a related occupation	Transportation, Distribution & Logistics
212011	Clergy	65	\$46,380	First professional degree	Human Services
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	65	\$68,435	Moderate-term on-the-job training	Marketing
413021	Insurance Sales Agents	60	\$52,801	Bachelor's degree	Finance

Local Workforce Investment Area 13					
SOC	Occupation	Projected Annual Job Openings (Ave.)	Median Wage (2014)	Minimum Experience or Education	Associated CTE Career Cluster
119111	Medical and Health Services Managers	60	\$75,318	Work experience, plus bachelor's degree	Business Management & Administration
291051	Pharmacists	60	\$114,258	First professional degree	Health Science
491011	First-Line Supervisors of Mechanics, Installers, and Repairers	60	\$60,277	Work experience in a related occupation	Advanced Manufacturing
112022	Sales Managers	60	\$98,229	Work experience, plus bachelor's degree	Marketing
113011	Administrative Services Managers	55	\$53,795	Work experience, plus bachelor's degree	Business Management & Administration
332011	Firefighters	55	\$49,617	Long-term on-the-job training	Law, Public Safety, Corrections & Security
151142	Network and Computer Systems Administrators	50	\$67,819	Bachelor's degree	Information Technology
151121	Computer Systems Analysts	50	\$70,350	Bachelor's degree	Information Technology

<sup>2</sup>In Tennessee, the occupation for "Accountants and Auditors" is classified in the "Finance" Career Cluster.

Table A15. Total number and percentage of students scheduled to graduate in 2014 who concentrate in CTE

LWIA	Total Students Scheduled to Graduate in 2014	Total Concentrators Across All Career Clusters	Percentage of Students Scheduled to Graduate in 2014 Who Concentrated in at Least One Career Cluster
1	3,744	1,677	45
2	4,880	1,775	36
3	4,105	1,442	35
4	5,124	2,368	46
5	5,903	2,138	36
6	2,687	1,527	57
7	2,682	1,387	52
8	8,922	3,344	37
9	10,046	4,827	48
10	2,607	1,467	56
11	2,653	1,601	60
12	3,930	2,035	52
13	12,213	2,548	21
<b>Statewide</b>	<b>69,507</b>	<b>28,136</b>	<b>40</b>

Note: There were 11 non-concentrators in the dataset who were not associated with a district or LWIA. Therefore, the sum of the total students scheduled to graduate in 2014 for all LWIA is not equal to the statewide total. Students who were CTE concentrators in multiple clusters are counted only one time.

Table A16. Distribution of Career Clusters by students scheduled to graduate in 2014 who concentrate in CTE, by Local Workforce Investment Area (LWIA).

LWIA	Advanced Manufacturing (%)	Agriculture, Food & Natural Resources (%)	Architecture & Construction (%)	Arts, A/V Technology, & Communications (%)
1	1 (N=18)	8 (N=137)	13 (N=215)	3 (N=53)
2	2 (N=36)	18 (N=310)	7 (N=110)	2 (N=28)
3	1 (N=7)	1 (N=9)	9 (N=121)	4 (N=54)
4	1 (N=33)	14 (N=327)	9 (N=214)	5 (N=115)
5	1 (N=24)	8 (N=166)	11 (N=226)	5 (N=107)
6	3 (N=40)	15 (N=247)	7 (N=105)	1 (N=14)
7	1 (N=18)	25 (N=360)	8 (N=114)	3 (N=49)
8	<1 (N=10)	12 (N=385)	8 (N=263)	7 (N=244)

LWIA	Advanced Manufacturing (%)	Agriculture, Food & Natural Resources (%)	Architecture & Construction (%)	Arts, A/V Technology, & Communications (%)
9	0	8 (N=377)	2 (N=82)	9 (N=449)
10	1 (N=13)	21 (N=317)	10 (N=149)	2 (N=29)
11	<1 (N=5)	16 (N=255)	5 (N=85)	3 (N=51)
12	3 (N=74)	24 (N=551)	2 (N=54)	2 (N=47)
13	<1 (N=9)	3 (N=61)	2 (N=51)	3 (N=58)

LWIA	Business Management & Administration (%)	Education & Training (%)	Health Science (%)	Hospitality & Tourism (%)
1	6 (N=107)	<1 (N=4)	32 (N=527)	8 (N=134)
2	6 (N=99)	<1 (N=8)	15 (N=258)	2 (N=37)
3	14 (N=191)	1 (N=11)	21 (N=283)	2 (N=32)
4	9 (N=210)	1 (N=19)	19 (N=448)	3 (N=76)
5	10 (N=201)	2 (N=33)	21 (N=438)	2 (N=44)
6	11 (N=179)	<1 (N=6)	22 (N=353)	2 (N=29)
7	8 (N=110)	2 (N=26)	17 (N=243)	2 (N=30)
8	6 (N=192)	<1 (N=9)	25 (N=825)	2 (N=58)
9	9 (N=429)	2 (N=90)	22 (N=1060)	7 (N=345)
10	12 (N=178)	1 (N=14)	24 (N=366)	0
11	7 (N=115)	1 (N=16)	27 (N=419)	4 (N=60)
12	8 (N=185)	1 (N=30)	25 (N=555)	3 (N=62)
13	18 (N=388)	3 (N=55)	11 (N=239)	5 (N=97)

LWIA	Human Services (%)	Information Technology (%)	Law, Public Safety, Corrections, & Security (%)
1	11 (N=181)	5 (N=77)	4 (N=73)
2	22 (N=369)	5 (N=89)	5 (N=86)
3	21 (N=280)	10 (N=130)	2 (N=34)
4	19 (N=439)	4 (N=91)	4 (N=82)
5	12 (N=251)	8 (N=160)	5 (N=96)
6	16 (N=251)	7 (N=116)	3 (N=48)
7	22 (N=320)	3 (N=47)	1 (N=10)
8	16 (N=543)	5 (N=162)	6 (N=207)
9	10 (N=487)	5 (N=250)	9 (N=421)
10	19 (N=282)	3 (N=40)	2 (N=27)

LWIA	Human Services (%)	Information Technology (%)	Law, Public Safety, Corrections, & Security (%)
11	22 (N=336)	2 (N=34)	5 (N=78)
12	13 (N=296)	5 (N=111)	4 (N=95)
13	33 (N=700)	4 (N=92)	3 (N=68)

LWIA	Marketing (%)	STEM (%)	Transportation, Distribution, & Logistics (%)
1	3 (N=51)	2 (N=40)	3 (N=55)
2	5 (N=90)	6 (N=97)	4 (N=73)
3	4 (N=53)	7 (N=93)	5 (N=63)
4	2 (N=57)	4 (N=85)	5 (N=117)
5	4 (N=82)	5 (N=100)	6 (N=117)
6	3 (N=42)	4 (N=66)	6 (N=98)
7	<1 (N=2)	3 (N=39)	4 (N=59)
8	6 (N=195)	4 (N=123)	3 (N=115)
9	5 (N=243)	6 (N=295)	5 (N=262)
10	1 (N=18)	3 (N=38)	2 (N=26)
11	4 (N=62)	1 (N=14)	1 (N=17)
12	4 (N=94)	<1 (N=9)	4 (N=94)
13	4 (N=95)	4 (N=89)	6 (N=120)

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