1-1-2016

I-69 Thumb Region Asset Mapping of Work-Based Programs and Initiatives: Final Report

Lee Adams
W.E. Upjohn Institute for Employment Research

Bryan Bommersbach
W.E. Upjohn Institute for Employment Research

Brian Pittelko
W.E. Upjohn Institute for Employment Research

Claudette Robey
W.E. Upjohn Institute for Employment Research, robey@upjohn.org

Jim Robey
W.E. Upjohn Institute for Employment Research, jim.robey@upjohn.org

See next page for additional authors

I-69 Thumb Region Asset Mapping of Work-Based Programs and Initiatives: Final Report

Authors

Lee Adams, *W.E. Upjohn Institute for Employment Research*
Bryan Bommersbach, *W.E. Upjohn Institute for Employment Research*
Brian Pittelko, *W.E. Upjohn Institute for Employment Research*
Claudette Robey, *W.E. Upjohn Institute for Employment Research*
Jim Robey, *W.E. Upjohn Institute for Employment Research*
Bridget Timmeney, *W.E. Upjohn Institute for Employment Research*

Upjohn Author(s) ORCID Identifier

https://orcid.org/0000-0002-4668-2567

W.E. UPJOHN INSTITUTE
FOR EMPLOYMENT RESEARCH

I-69 Thumb Region Asset Mapping of Work-Based Programs and Initiatives

Final Report

Submitted to:
GLS Region V Planning and Development Commission and
the I-69 Thumb Region Education Action Team

Submitted by:
Lee Adams
Bryan Bommersbach
Brian Pittelko
Claudette Robey
Jim Robey
Bridget Timmeney

W.E. Upjohn Institute for Employment Research
300 S. Westnedge Avenue
Kalamazoo, MI 49007
269-343-5541

April 28, 2016

Table of Contents

Contents

Executive Summary

The I-69 Thumb Region, comprised of Genesee, Huron, Lapeer, Sanilac, Shiawassee, St. Clair, and Tuscola counties, collaboratively developed a shared and unified economic vision for its region as part of the state of Michigan's Regional Prosperity Initiative. The plan, titled "Accelerate: A Plan for Regional Prosperity," details six agreed-upon goals through which the I-69 Thumb Region Steering Committee will guide strategies to address education, infrastructure, regional collaboration, economic development, tourism, and quality of life opportunities and concerns. The education goal – "to develop and retain a talented workforce so regional businesses can compete on a global basis" – was ranked as the second highest priority in the region.

In an effort to begin to meet the objectives outlined in the education goal, the I-69 Thumb Region Steering Committee first needed to get a sense of what education and workforce programs and initiatives exist in the I-69 Thumb Region. The Steering Committee decided that this could be best accomplished through developing an asset map of the region's work-based programs. Once identified, an asset map demonstrating the availability and relationship of these programs would prove useful in (a) determining the effectiveness of these work-based programs, (b) acknowledging opportunities for replication and/or expansion across the region, (c) assessing any obstacles and/or gaps, and (d) developing a strategy to further integrate employer participation to resolve workforce issues across the I-69 Thumb Region.

The I-69 Thumb Region Steering Committee contracted with the W.E. Upjohn Institute for Employment Research (Upjohn Team) to create an inventory of work-based programs and conduct an analysis of the programs in the I-69 Thumb Region. Although the original scope of work for this project called for an evaluation of the region's work-based programs, through its research, the Upjohn Team found that the majority of the programs in the region lack significant individuality; a lack of local program individuality is a function uniform state standards. Thus, a traditional evaluation of many programs would have few practical implications; it is difficult to measure success relative to other programs when the programs are similar. Therefore the work-based programs were assessed based on their ability to meet the needs of the residents and businesses in the I-69 Thumb Region. The assessment consisted of a review of the number of recent graduates from work-based programs in the region and a comparison with the labor supply projections in several industries in the region. The outcomes of the assessment are noted, in detail, in the industry-by-industry review of the regional labor market. A summary of the conclusions for each industry is below:

Agriculture and Food Processing

- Work closely with industry professionals to determine the optimal level of training.

Business

- Job postings and overall employment numbers demonstrate the need to train additional students in the region.

Computer/IT

- Continue to train as many students as possible, but make the region an attractive place for them to live in order to retain that talent.

Construction

- Work-based programs are training an appropriate number of students in this field.

Engineering/Engineering Technology

- Work-based programs should continue to attract students to the engineering fields while investing in related educational resources.

Healthcare

- Work-based program administrators should closely monitor the regional trends of the industry because the employment projections suggest a decrease in demand.

Mechanic/Repair

- Work-based programs in the region should work to increase the number of students trained in the field while shifting some of their focus to building maintenance and service like HVAC.

Personal/Culinary

- With higher demand in more stable industries and relatively lower wages in this industry, the work-based programs should focus their resources on other industries.

Precision Production

- With strong employment projections and a high concentration of the industries in the region, work-based programs should continue to develop well-trained students. Unfortunately, it may be hard to attract students to the industry while the wages lag behind other industries. To maintain its high concentration, the region should work to increase the wages of production occupations.

Transportation

- The region should work with transportation employers to determine if students trained in the transportation field could find other types of work in the field before they reach the required age to work in the field.

Through the Upjohn Team's conversations with education, economic, and workforce development representatives across the I-69 Thumb Region, these stakeholders revealed common concerns regarding current work-based programs and initiatives. The most resounding concern is the need for increased input and support from the region's businesses. While many stakeholders who were interviewed noted that they work with businesses frequently, they often have difficulties retaining business leaders on advisory boards.

Several current work-based programs were identified by the stakeholders as being suitable for replication across the region. One such program is an employer-based career and technical education (CTE) initiative currently operating in the St. Clair County Intermediate School District (ISD), where students engage with employers in occupational training on heavy equipment operation, natural resources management, small engine repair, and heating, ventilation, and air conditioning (HVAC). Another replicable program is the Croswell-Lexington Early College Program in Sanilac County. This program allows students to attend an additional year of high school, while completing college course work toward either an Associate of Arts or an Associate of Science degree. This program has a unique instruction delivery model; the program brings professors from St. Clair Community College to the Geiger College Center Campus in downtown Croswell.

Some stakeholders encouraged expanding and sharing CTE programs across the region, with the region's ISDs partnering to provide programs in locations where these programs are not currently offered. For example, both Huron and Sanilac counties lack welding and machine tool programs, while Tuscola, Lapeer, and St. Clair counties offer both. Lapeer and St. Clair counties also offer robotics/mechatronics

programs that are currently not available in other counties in the region. Lapeer County additionally offers unique programs in recreational vehicle repair and residential plumbing that are not offered elsewhere. The ability of the ISDs to work together to provide students with regional access to CTE programs would assist the region's employers in fulfilling labor needs.

Research Methodology

This project represents an important step to implementing the five-year Prosperity Plan recently adopted for the I-69 Thumb Region. Understanding the landscape of the region is the first step to implementing strategies outlined the in the I-69 Thumb Region's Prosperity Plan. An understanding of current work-based conditions could help to shape the strategies needed to address workforce issues in the region. The Upjohn Team began this study by developing an inventory of the work-based programs and initiatives currently provided by the region's educational and workforce partners. The data were then analyzed by geography, graduation rates, industries in which graduates were placed, and partners involved. The Upjohn Team validated the data through key informant interviews with education, economic development, and workforce development stakeholders throughout the region. Maps created using Geographic Information Systems (GIS) software were used to demonstrate the areas of highest need relative to the availability of the region's work-based programs. The methodology applied for each element of the study is described below.

Inventory of Work-Based Programs

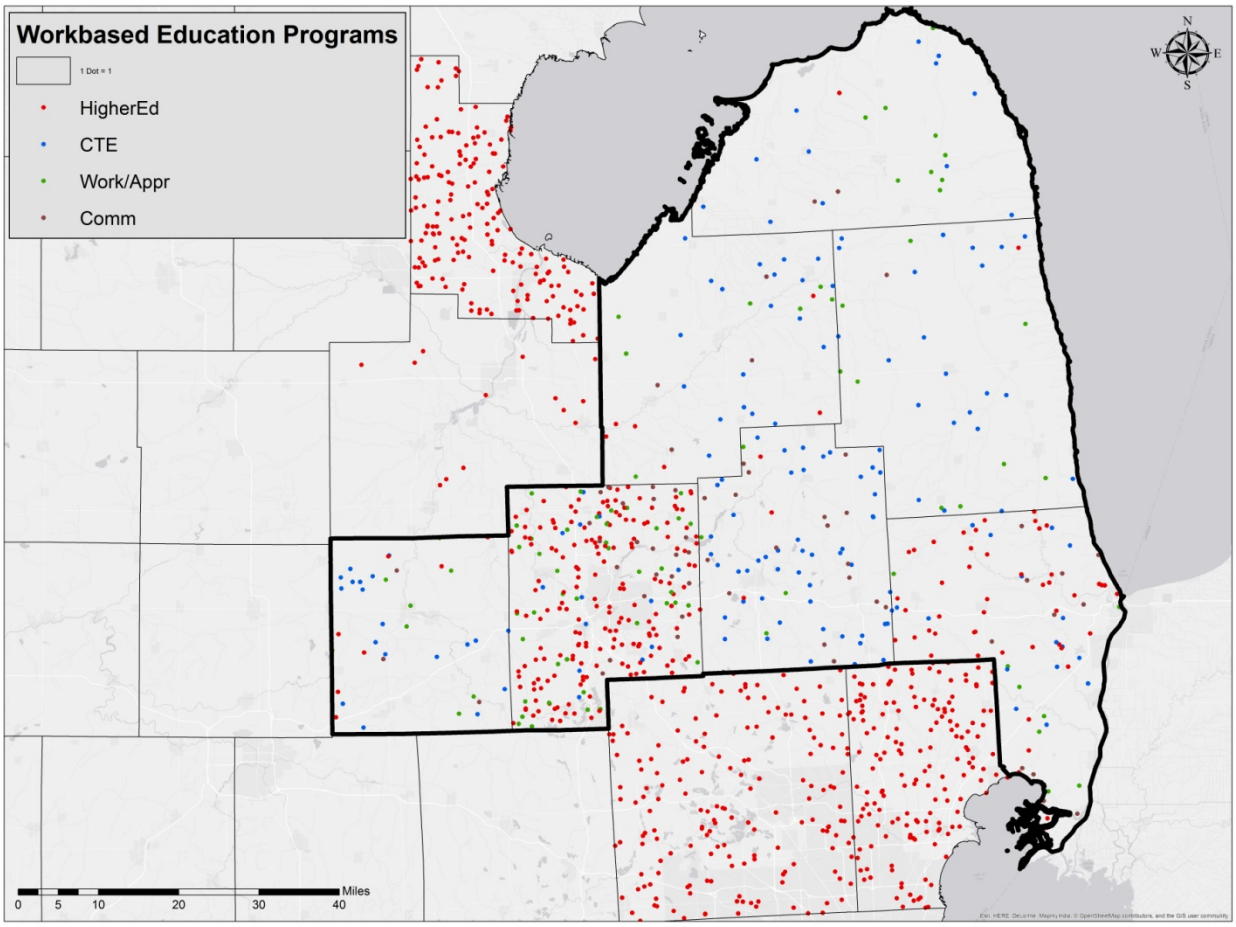
To create an inventory of the work-based programs in the I-69 Thumb Region, the Upjohn Team used both online publicly available data and qualitative resources in addition to the data previously collected during its development of the I-69 Thumb Region's Prosperity Plan, "Accelerate: A Plan for Regional Prosperity."

The Upjohn Team began by using publicly available information to assemble a spreadsheet that included information such as program type, parent organization, partners involved, certificates awarded upon completion, costs to students, enrollment, types of students served, service area, location, and other pertinent data. Data collected from the Upjohn Team's prior work with the I-69 Thumb Region's Prosperity Plan were also added to the spreadsheet.

The data were verified through interviews with the region's education, economic development, and workforce development stakeholders. The Upjohn Team conducted several key informant interviews with these stakeholders to not only verify the information in the inventory, but to also gain a better understanding of common hardships and opportunities experienced by the organizations offering work-based programs in the region. Through these interviews, the Upjohn Team was able to gain knowledge of which programs were considered successful, the demand from students and employers for the various types of programs offered, whether there are any funding or building constraints on the delivery of these programs, and the level of the business community's involvement in these programs. These conversations also revealed whether organizations were interested in replicating and/or expanding other programs from across the region or state.

The map below (Map 1) depicts all of the work-based programs in the region included in the database. The dots represent programs within four categories: Higher Education, Career and Technical Education, Workforce Development and Apprentice Programs, and Community Resources. Dots were placed on the map randomly within each county to represent the relative density of programs offered in each county. Dots were not placed at their exact location because many programs reside in the same location (tech centers, community college campuses) and therefore would not display properly on the map. Community college programs in selected neighboring counties were also mapped to demonstrate programs not currently offered in the region but within close proximity to residents in the region.

Map 1: Density of Work-based Education Programs in Region 6



Evaluating Work-Based Programs

Data from the inventory and the interviews were analyzed to assess current conditions, information-sharing opportunities, and to identify gaps in programs across the region. The Upjohn Team also examined both the supply and demand sides of employment in the I-69 Thumb Region to evaluate how well work-based programs are meeting the needs of residents and businesses in the region.

The most prevalent and important industries in the region were identified and categorized into 10 industry/employment areas. The industry groups are derived from an agglomeration of connected Classification of Instructional Programs (CIP) codes, Standard Occupation Classification (SOC) codes, and North American Industry Classification System (NAICS) codes. The groups identified are: agriculture and food processing, business, computer/information technology, construction, engineering/engineering technology, healthcare, mechanic/repair, personal/culinary, precision production, and transportation. These industry groups were selected because of their high levels of employment, number of training programs, and forecasted industry conditions. The number of students trained (by CIP Code) and location of workers in the labor force (SOC code) in each of the industry groups were compared with the number and location of job postings and industry outlook in each industry group. For example, the Upjohn Team compiled the number of healthcare-related workers in the region, the programs and

number of students that completed healthcare-related training programs, and an estimate of the number of healthcare workers anticipated for the region, and compared these figures with the number and location of job postings for healthcare-related jobs and the estimated industry performance for the healthcare field.

Profiles were created of each industry group to better understand the implications of training programs to regional employment and industries. These profiles are featured in the next section of this report.

Assessing Supply and Demand

For this study, the Upjohn Team considers the supply side of the labor market as the number of individuals entering the workforce through training programs combined with employees in the current workforce. In addition to the work-based program inventory, the Upjohn Team assembled enrollment and completion statistics for CTE programs, secondary education programs, and other workforce programs to determine the number and type of skills of people added to the labor force. Occupational data on residents in the region were examined to develop a profile of current workers by industry. These data were analyzed to identify the total number of workers in each of the region's industry groups.

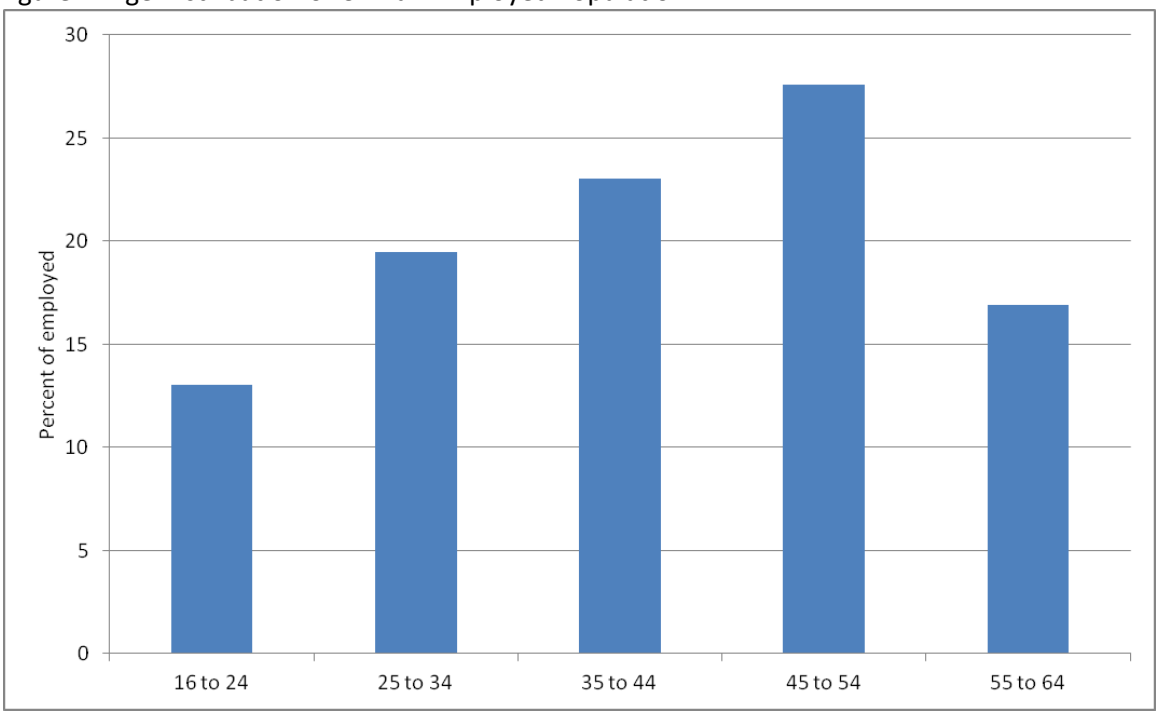
The Upjohn Team's analysis of supply and demand in the I-69 Thumb Region labor market could help to demonstrate in which industries work-based program administrators should focus their resources. The labor market conditions within industry sectors could offer insight into investments in related trainings. Regional educators should consider reducing the number of students receiving industry-specific training in industries with an oversupply of workers and/or those with a less favorable economic outlook. Likewise, educators should consider taking steps to increase the number of students receiving industry-specific training in industries with a high demand for workers or with positively projected economic performance.

To understand the current and future demand for workers in the region, the Upjohn Team conducted analyses based on the region's job postings, industry concentration, and a shift-share analysis of industries. Data were collected on the number of job openings posted in the region to gain insight into labor market conditions and to get a sense of the education requirements for positions posted in each industry. The Upjohn Team used data assembled by Burning Glass Technologies to estimate the number of job openings by industry.

Burning Glass Labor Insight is a web service that scans millions of nation-wide job postings on various websites daily and compiles the results in a database. The posting data are mined for information on occupation, industry, experience, education and skill requirements, and other factors. The results allow users to analyze the composition of employment demand by a number of factors from the national to the city level. Burning Glass Technologies data is limited to online posting so a few industries are underrepresented (most notably agriculture and production). Additionally, some posting may represent multiple openings.

Figure 1 displays the age distribution of civilian employed individuals in the region. This figure was included to demonstrate the potential portion of the workforce that may retire in the next 20 years. Nearly 50 percent of the employed labor force is 45 years or older; most of those employees will retire in the next 20 years.

Figure 1: Age Distribution of Civilian Employed Population



Source: ACS, 2010–2014

Industry Analysis

The following section examines ten key groupings of occupations and industries to match important areas for training. The sections contain tables and maps containing occupational data, industry analysis, online job posting data, career and technical education (CTE) completions, and post-secondary completions.

The occupational data are from the U.S. Census American Community Survey (ACS). These data show the percent in each county that the occupational group represents of total county employment. The data also show the percent that the combined counties occupational group employment represents as part of total regional employment.

Industry analysis shows the location quotient (LQ) and shift share analysis for the industries that best fit into the training groups. Location quotient measures the relative concentration of an industry in a region by comparing its share of employment to that industry's share of employment in the nation. If an LQ is equal to 1.0, the area has the same share of a given industry as the nation. An LQ of less than 1.0 means the region has a smaller relative share of the industry, and that it likely meets its needs for that good or service by importing the product. If the LQ is over 1.0 indicates that the industry is more highly concentrated than the nation. As part of Economic Base theory, when a region has an LQ greater than 1.0, it usually means that the region is exporting its good or service to consumers outside of the region. Exporting goods or services allow inflows of money which are essential to changing the wealth curve and so the standard of living within a region.

A shift-share analysis disaggregates employment change between two time periods based on three components. The first component, the national effect, indicates the expected change in regional employment for an industry based on national trends, whether positive or negative. The second component is the industry mix effect. This component estimates the change in employment in a region based on the trends of that industry at the national level, while controlling for the changes to the larger national economy. Finally, the share component estimates the changes in employment after controlling for the prior two components. This component indicates whether the industry is competitive within a region, with positive job growth indicating some level of competitiveness while negative employment indicates that the region is less competitive. It is important to note that the shift-share analysis does not identify the factors affecting the level of competitiveness, only that such factors exist. As an example, if an industry grows by 500 jobs, the national effect may account for 100 jobs and the industry mix effect accounts for an additional 200 jobs, the competitive share would be 200 jobs attributable to some type of competitive advantage within the region. In the following section, some industries were not included in the tables. Industries that were not included either had a location quotient of less than 0.5 and job change of less than 50 or else had a location quotient of less than 1.0 and job change of less than 25. These parameters were relaxed if the industries only contained a few sub-industries. Totals at the bottom of the tables include both the included and non-included industries.

The first map in the two-map sequence in each of the following sections shows employment data by occupation in each county along with the number of training completions. Completion data include both CTE and post-secondary completions. The second map in each section shows data from Burning Glass Labor Insight. The Burning Glass data show online job postings by occupation group for each county in 2015.

Agriculture and Food Processing

Agriculture comprises a relatively small portion of employment in the I-69 Thumb Region's economy. However, as shown in Table A2, in Huron and Sanilac counties agricultural occupations are 3.6 percent and 3.5 percent respectively of total employment. Based on the industry location quotients (LQ) in Table A2, there are certain industries that have a significant impact on the region. Farm employment had an LQ of 1.91 in 2015, nearly double the national concentration. Other highly concentrated sub-industries are: fruit and vegetable preserving and specialty food manufacturing (1.97), and sugar and confectionery product manufacturing (1.93). While all of these sub-industries are highly concentrated in the region, employment and the relative concentration in these industries are all projected to decrease by 2020.

Agriculture employment for each county is shown in Table A1 and also on Map A1. Agricultural employment ranges between 200 and 600 jobs among counties in the region. There is a larger concentration of agricultural employment in the more rural counties. Map A1 also depicts that the number of students trained in the region are not consistent with the region's employment. Shiawassee County, which has the smallest amount of agricultural employment by occupation (220), has almost as many CTE completions (164). Further highlighting the oversupply of agriculture workers are the industry projections for employment from Moody's Analytics. As a whole, employment in the industry is forecast to follow a downward trend according to Moody's.

Map A2 shows that very few agricultural jobs are posted online by employers in the region. Figure A1 shows the breakdown of agricultural employment by industry for each county. The data in Figure A1 are compiled by industry. Agriculture industry-wide data includes non-farm occupations that work in the agriculture industry. As an example an accountant that works for a farm-based business is included in the industry data but not the occupation data, his occupation is included in the business occupations. Figure A2 displays the age distribution for employees in agriculture occupations. As the figure displays, nearly 40 percent of employees are 45 years or older. However, there are a large number of younger employees in agriculture occupations.

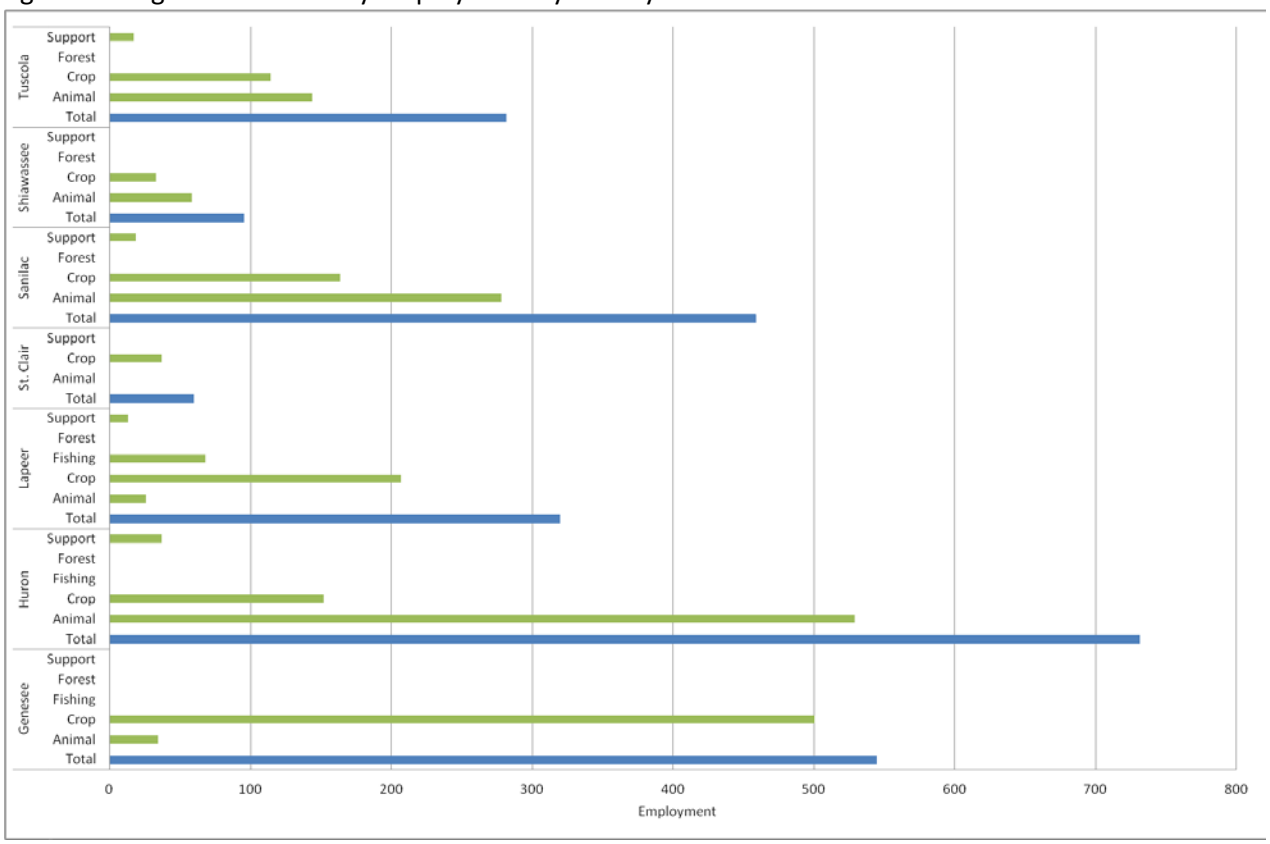
Sub-industry information displayed in the maps and tables below are on a regional basis; some of the counties within the region will experience higher or lower concentrations and employment numbers than the projection. The projections showing the need for fewer workers would suggest decreasing agricultural training in the region. Each of the work-based programs should consider the numbers in this report and the outlook expressed by industry professionals when considering funding allocations. Furthermore, the more urbanized areas should look to partner with the more rural counties for agriculture-related trainings.

Table A1: Agriculture Occupation Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($)
Genesee	533	0.3	0.2	14,219
Huron	497	3.6	0.1	23,750
Lapeer	365	1.0	0.1	12,306
St. Clair	299	0.4	0.1	17,589
Sanilac	584	3.5	0.2	20,570
Shiawassee	220	0.7	0.1	20,179
Tuscola	372	1.6	0.1	12,440
Total	2,870		0.8	

Source: Census American Community Survey 2010–2014

Figure A1: Agriculture Industry Employment by County



Source: Bureau of Labor Statistics, Quarterly Workforce Indicators

Table A2: CIP Grouping Agriculture and Food Processing

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
Animal slaughtering and processing	0.53	0.61	0.57	57	-52
Bakeries and tortilla manufacturing	0.42	0.55	0.52	71	-25
Beverage manufacturing	0.25	0.52	0.51	101	-10
Dairy product manufacturing	0.52	0.68	0.65	37	-14
Fruit and vegetable preserving and specialty food manufacturing	1.49	1.97	1.93	141	-25
Sugar and confectionery product manufacturing	1.89	1.93	1.72	-1	-30
Farm employment	1.86	1.91	1.56	-34	-2510
Total				341	-2,693

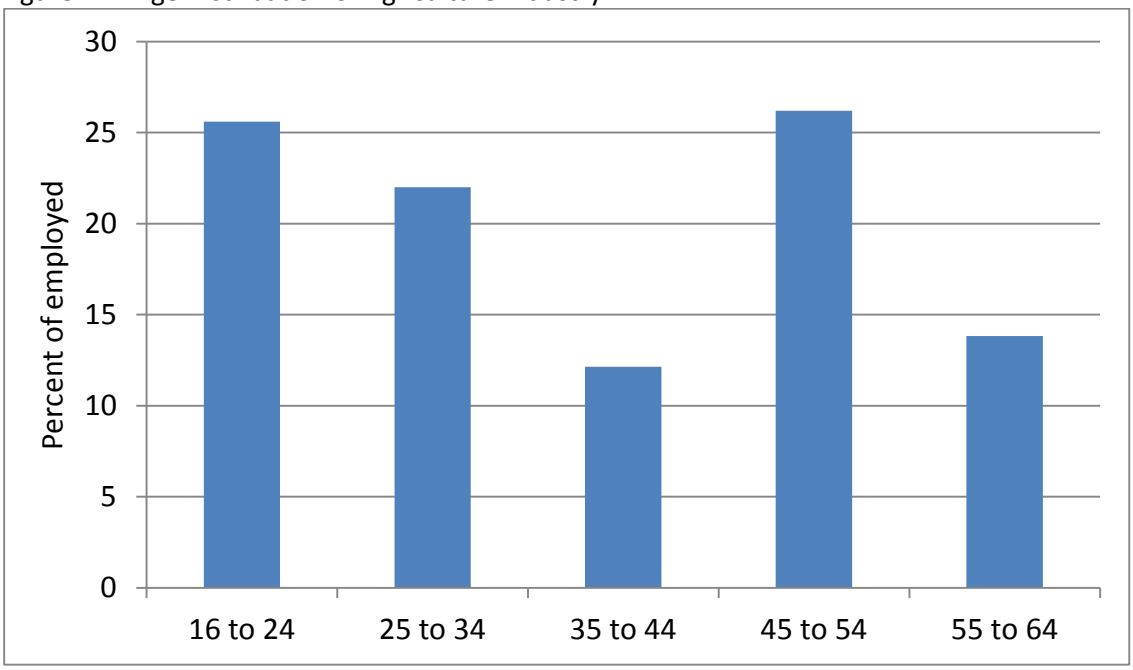
Source: Moody's Analytics

Table A3: Farming and Agriculture Occupation Data

	Number of Farms	Farming as the primary occupation for the principal operator	Principal operators who worked 200+ days off farm	Hired Farm Labor: Total Workers	Workers who worked 150+ days	Unpaid Workers
Genesee	835	418	296	1541	438	969
Huron	1205	669	399	1860	973	914
Lapeer	1133	581	494	1487	386	1339
Sanilac	1467	816	446	1766	781	1255
St. Clair	1049	587	425	751	229	956
Shiawassee	1033	529	444	868	259	1106
Tuscola	1322	643	446	1444	422	1101

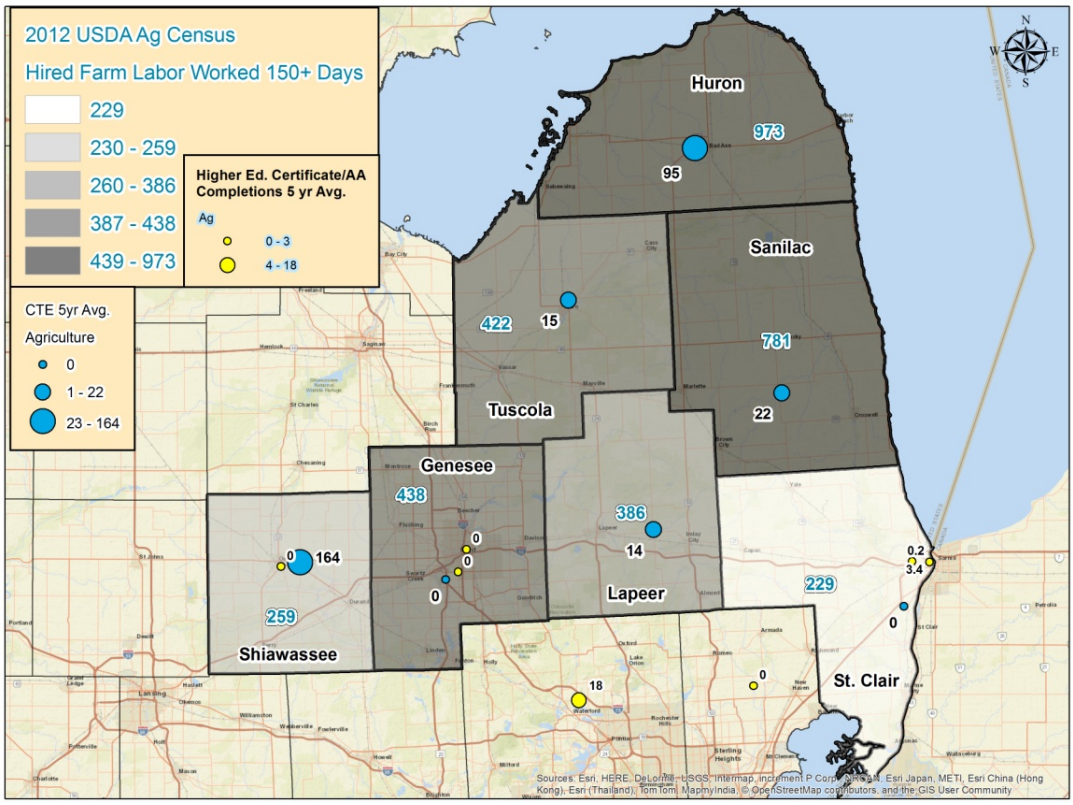
Source: 2012 USDA Agriculture Census

Figure A2: Age Distribution of Agriculture Industry

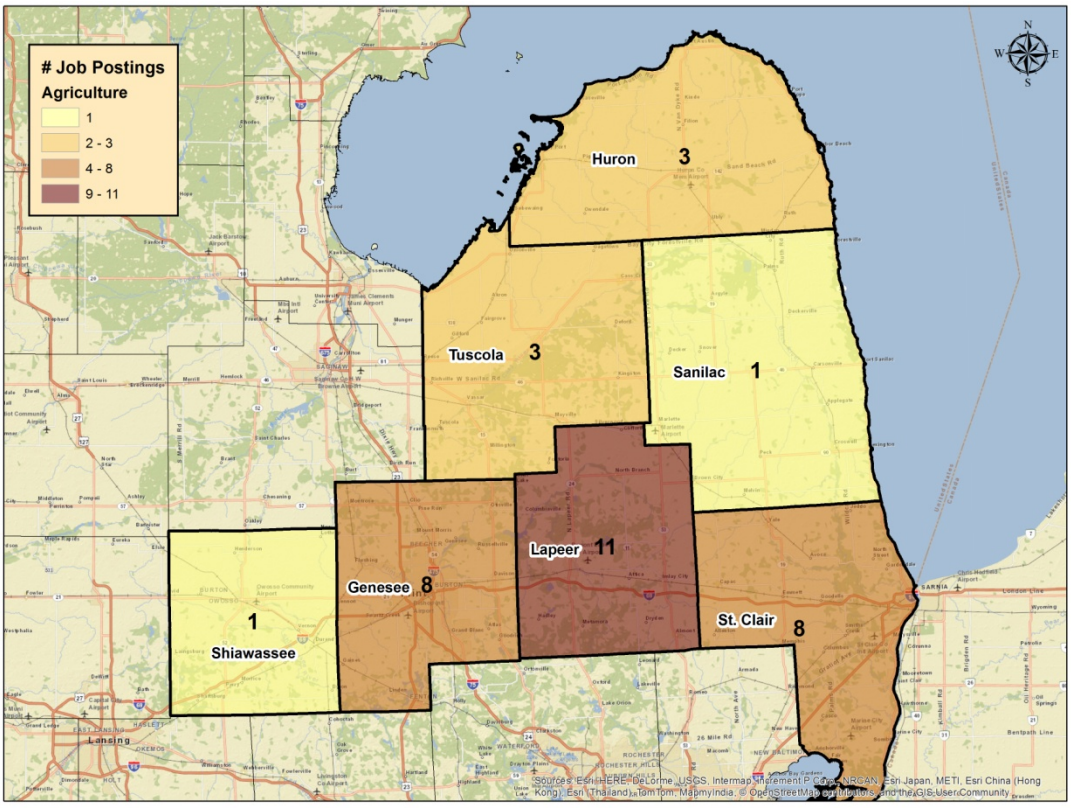


Source: IPUMS USA

Map A1: Agriculture Employment (Hired Farm Laborers who worked 150+ days - USDA)



Map A2: Online Job Posting Demand for Agriculture Occupations



Business

The industries in the business grouping contain a large variety of occupations and represents roughly one-third of total employment by occupation across the region (see Table B1). This industry analysis uses location quotients and shift share analysis shown in Table B2. It was difficult to match industries into a single "business" grouping, and so the industries that are shown are divided into two categories. The first group of sub-industries include those that are general business services, accounting, and administration. In order to incorporate sales-based employment, but exclude low-wage and low-skill retail positions, the second category in this group focuses on wholesale trade industries.

In the general business group, there is a relatively large LQ. The insurance and employee benefit funds sub-industry had an LQ of 12.69 in 2015 which means it is very highly concentrated in the region as compared to the national average. Nonetheless, the region is highly concentrated and should invest in the skills needed to perform work in this sub-industry. Likewise, farm wholesale is highly concentrated with an LQ of 2.52 in 2015, meaning over double the national concentration of employment in that industry. The farm wholesale sub-industry fit with the general culture and industry focus of some parts of the region. While farm wholesale requires different skills than agriculture production and processing, they complement each other. Therefore, the region should focus some of its resources on farm wholesale skills training.

Online job postings, as shown in Map B2, depict a similar distribution as the training distribution, though with a steeper drop-off in the rural counties. Genesee County had nearly 56,000 people employed in the business industry during 2010 through 2014 timeframe and had 6,500 postings for available jobs, while Huron County had employment of 4,694 for the same period and only 228 job postings in business-related occupations. The job postings and overall employment data reinforce the need to train additional residents of the region.

Map B1 shows CTE completions and post-secondary completions in the region, along with business related occupational employment. Completions are relatively low compared to the number of employment by occupations. It appears that there is room for the region to invest more resources into business skills.

Table B1: Business Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($) Management, etc	Annual Earnings ($) Sales, Admin
Genesee	55,989	35.4	16.2	51,803	22,723
Huron	4,694	34.2	1.4	40,556	21,014
Lapeer	12,051	32.7	3.5	54,049	23,473
St. Clair	23,261	33.9	6.7	52,788	22,679
Sanilac	6,247	37.0	1.8	43,345	22,029
Shiawassee	10,311	34.9	3.0	50,938	25,238
Tuscola	7,342	32.6	2.1	44,392	20,284
Total	119,895		34.6		

Source: American Community Survey, 2010–2014

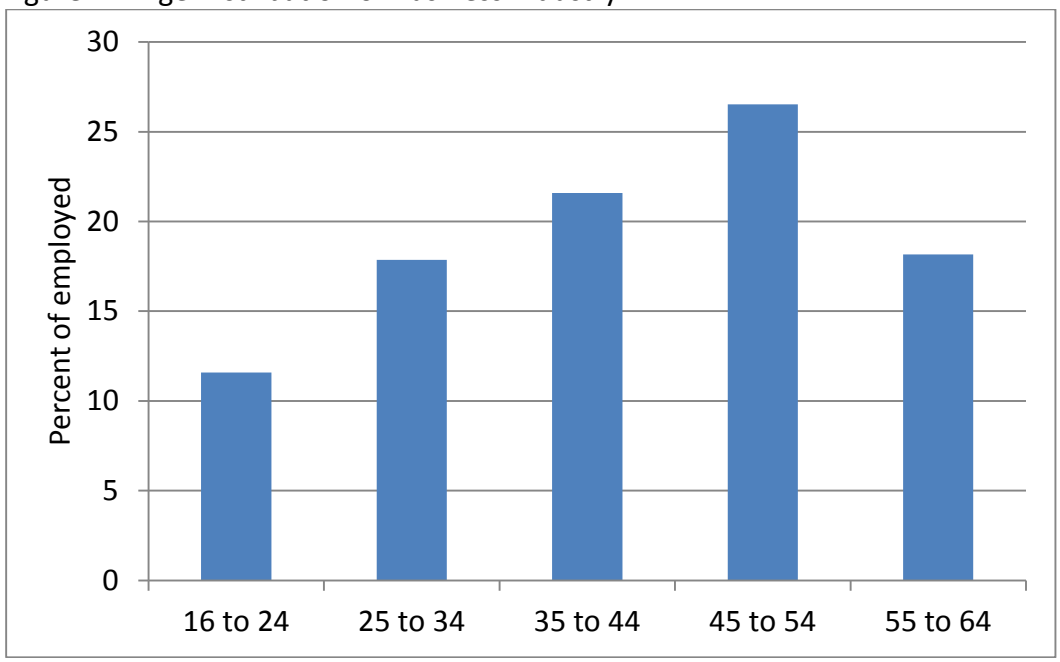
Table B2: Business Production Location Quotient and Shift Share

Category	Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
General Business Services	Accounting; tax preparation; bookkeeping; and payroll services	0.94	0.86	0.95	-195	126
	Agencies; brokerages; and other insurance related activities	0.88	0.86	0.86	-80	-48
	Business support services	0.32	0.66	0.68	566	19
	Depository credit intermediation	1.45	1.32	1.32	-503	-141
	Insurance and employee benefit funds	5.68	12.69	11.86	38	-7
	Insurance carriers	0.43	0.52	0.52	217	-44
	Lessors of real estate	0.63	0.58	0.57	-71	-19
	Office administrative services	1.00	1.16	1.25	121	64
	Employment services	1.00	0.85	0.90	-1,200	232
	Management of companies and enterprises	0.45	0.49	0.52	124	74
	Building material and supplies dealers	1.54	1.56	1.55	-41	-100
Wholesale Trade	Chemical and allied products merchant wholesalers	0.96	1.35	1.41	90	7
	Drugs and druggists' sundries merchant wholesalers	1.10	1.51	1.59	137	14
	Electrical and electronic goods merchant wholesalers	0.69	0.60	0.61	-65	-8
	Farm product raw material merchant wholesalers	2.18	2.52	2.68	41	14
	Grocery and related product merchant wholesalers	0.43	0.34	0.33	-141	-23
	Hardware; and plumbing and heating equipment and supplies merchant wholesalers	0.89	1.08	1.08	79	-15
	Lumber and other construction materials merchant wholesalers	0.97	0.85	0.86	-57	-5
	Machinery; equipment; and supplies merchant wholesalers	1.09	1.11	1.13	-9	-16
	Miscellaneous durable goods merchant wholesalers	1.16	1.44	1.47	135	-3
	Miscellaneous nondurable goods merchant wholesalers	1.01	1.02	1.02	-8	-13

Category	Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	1.84	2.55	2.57	419	-27
	Paper and paper product merchant wholesalers	0.88	1.21	1.19	74	-12
	Petroleum and petroleum products merchant wholesalers	1.12	1.29	1.33	27	2
	Professional and commercial equipment and supplies merchant wholesalers	0.61	0.82	0.82	228	-35
	Total				-74	36

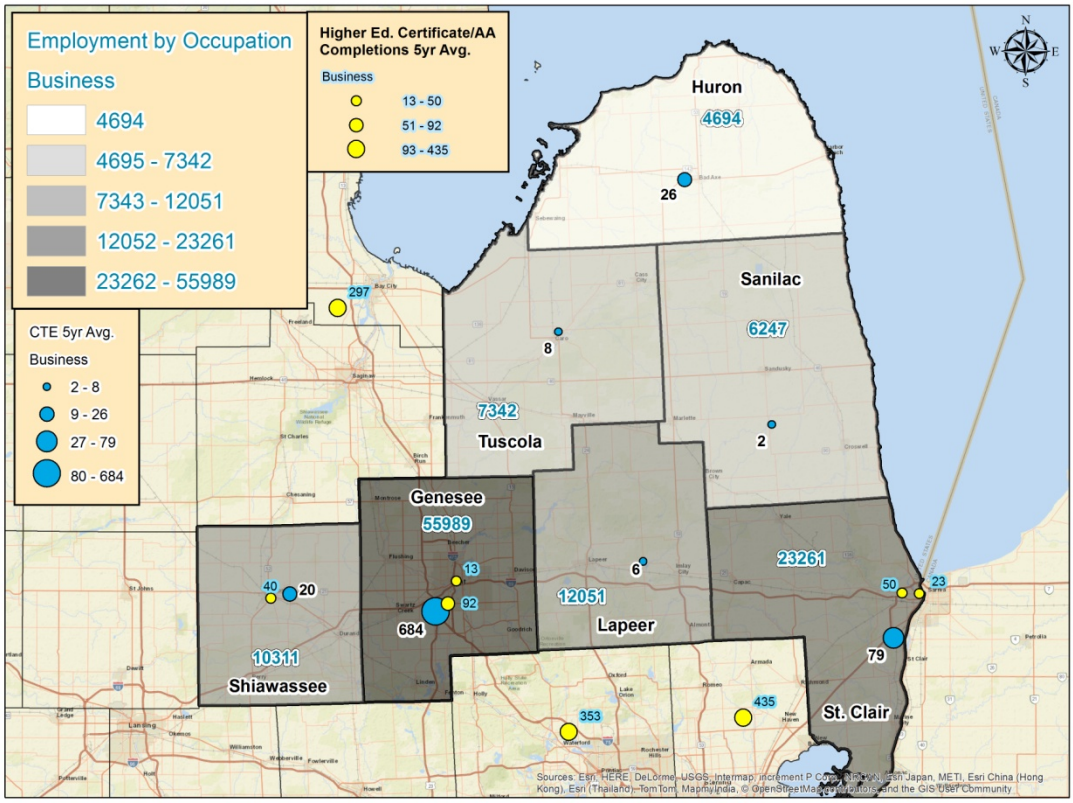
Source: Moody's Analytics

Figure B1: Age Distribution of Business Industry

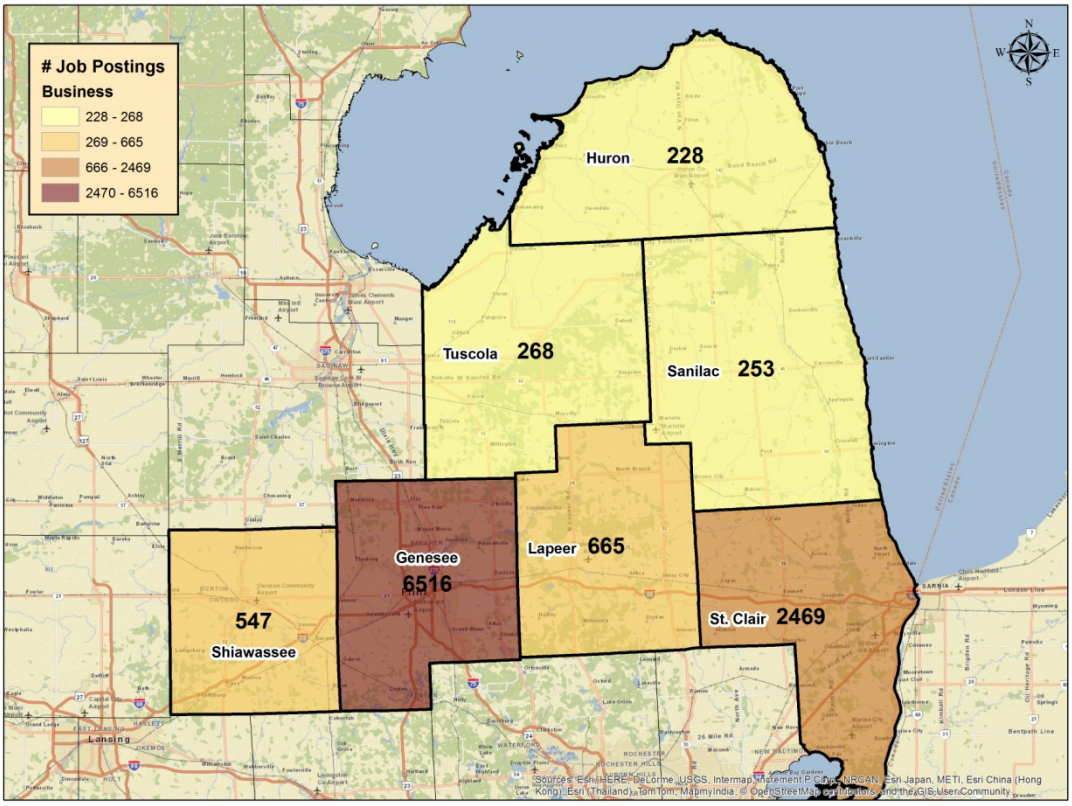


Source: IPUMS USA

Map B1: Employment, CTE and Post-Secondary Completions



Map B2: Online Job Posting Demand for Business Occupations



Computer/Information Technology

The computer and information technology (IT) industry group comprises a relatively small portion of the I-69 Thumb Region's total employment. As shown in Table B1, only 1.3 percent of the regional employment is in IT-related industries. Table C2 demonstrates that the location quotients for IT-related industries are relatively low. In 2015, none of the location quotients are near 1.0, which suggests that the region is likely importing services in this sector. The shift-share analysis in Table C2 shows the IT sector lost employment due to what appears to be a lack of competitiveness between 2010 through 2015.

It is important to note that workers employed in IT occupations at firms outside of the IT sector would be not included in this part of the analysis. As an example, workers in IT occupations at an accounting firm would not show up in this type of industry analysis.

Employment in computer and IT occupations is shown in Map C1, along with CTE and post-secondary completions. Training is distributed throughout the region in a similar pattern to the general population distribution.

Demand for computer and IT workers is shown in Map C2 and is concentrated primarily in Genesee County. Lapeer and St. Clair counties have comparable levels of employment, but St. Clair has five times the demand as exhibited in the open job postings. The remaining counties have few demonstrated open positions and also train a small number of students. Nonetheless, the number of students receiving training related to computers/IT is far fewer than the current job postings.

Table C1: Computer/IT Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($)
Genesee	2,313	1.5	0.7	57,593
Huron	108	0.8	0.0	45,278
Lapeer	661	1.8	0.2	60,536
St. Clair	555	0.8	0.2	69,688
Sanilac	152	0.9	0.0	30,000
Shiawassee	449	1.5	0.1	53,750
Tuscola	195	0.9	0.1	50,673
Total	4,433		1.3	

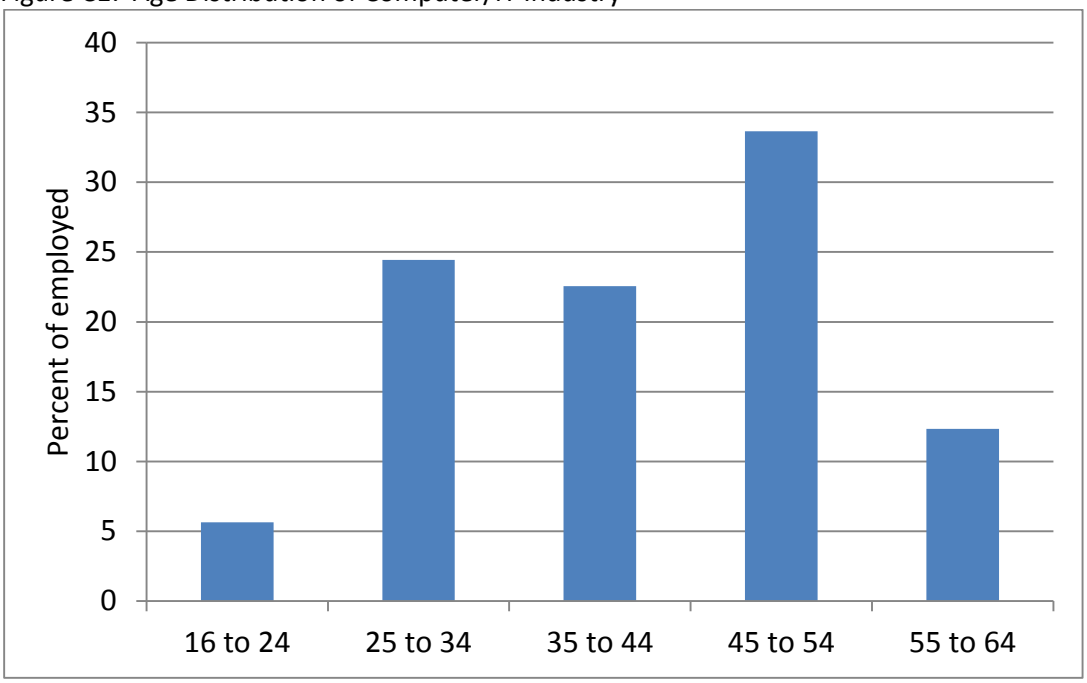
Source: Census American Community Survey 2010–2014

Table C2: Computer/IT Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
Computer systems design and related services	0.35	0.14	0.15	-760	32
Data processing; hosting; and related services	0.34	0.16	0.21	-105	28
Other information services	0.26	0.11	0.09	-67	-13
Total				-915	52

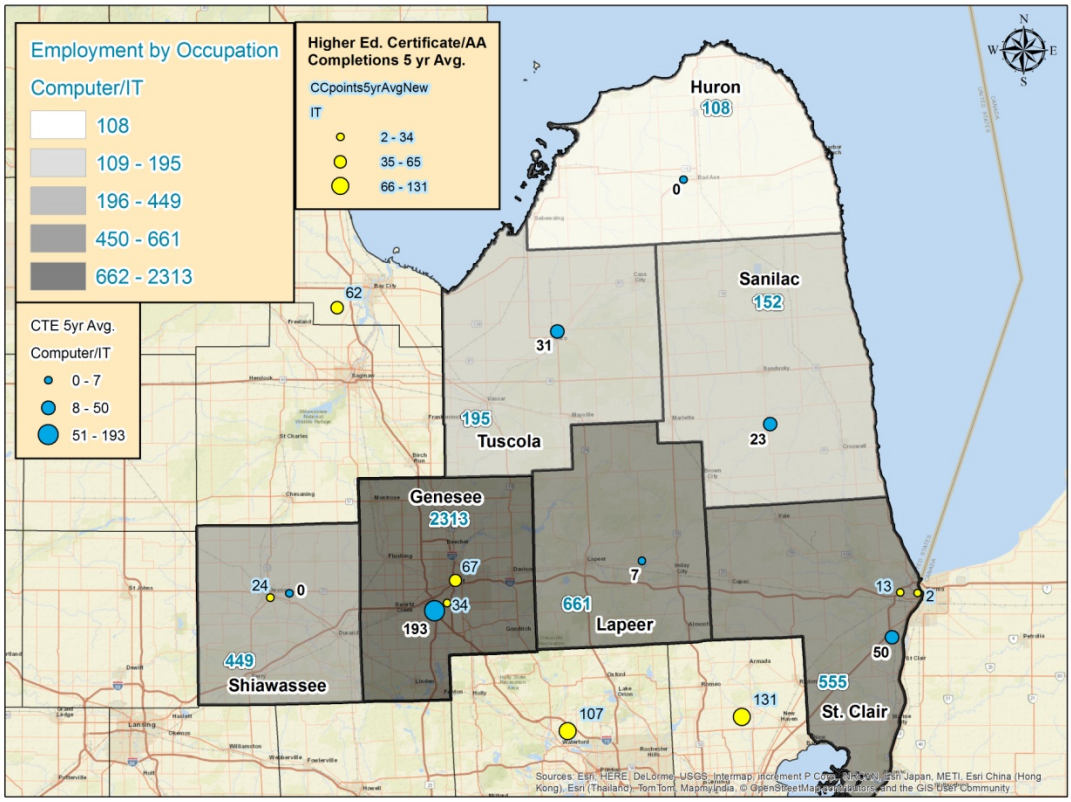
Source: Moody's Analytics

Figure C1: Age Distribution of Computer/IT Industry

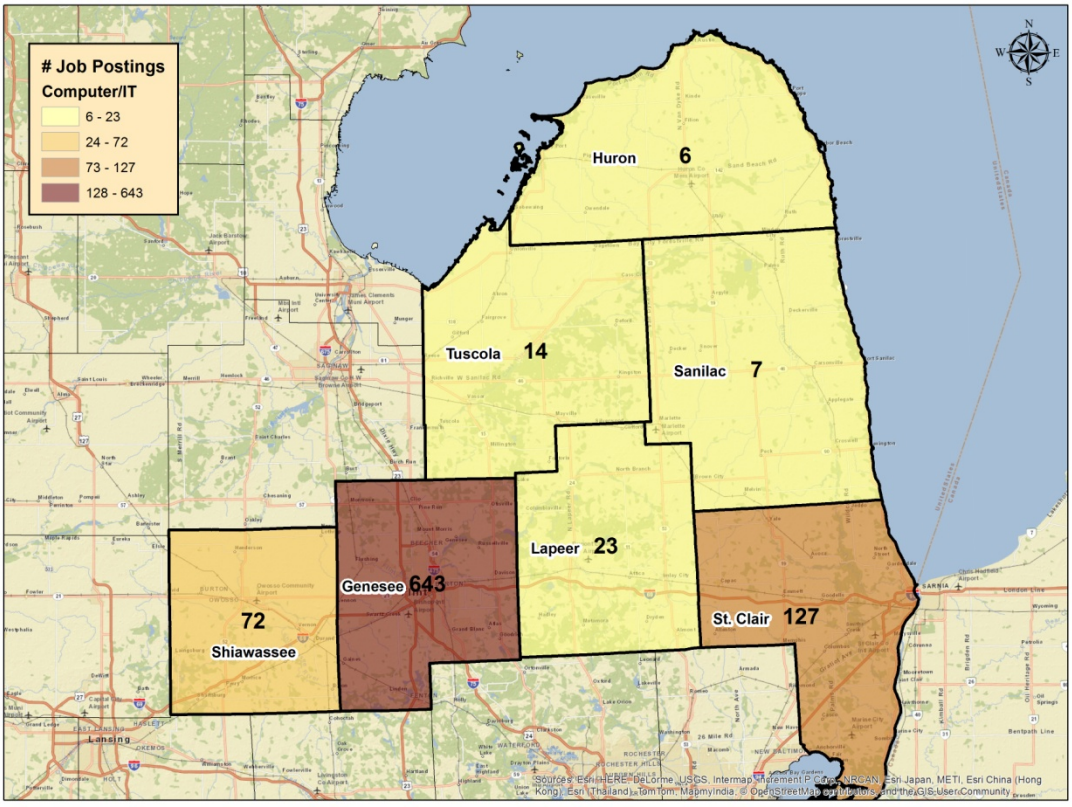


Source: IPUMS USA

Map C1: Employment, CTE and Post-Secondary Completions



Map C2: Online Job Posting Demand for Computers/IT Occupations



Construction

Table D1 shows construction employment of nearly 31,000 workers in the region during the period of 2010 through 2014. The location quotients shown in Table D2 suggest that construction industries have a relatively low concentration in the region, with the exception of other specialty trade contractors with a location quotient of 1.2 in 2015. In spite of relatively low employment concentration, the shift-share analysis shows the construction industry growing across the region above expectations from 2010 to 2015.

Employment in construction is shown in Map D1, along with CTE and post-secondary completions. There are relatively few completions at the post-secondary level in the region; however, CTE training completions are more prevalent. Like agriculture, online job postings shown in Map D1 are not well represented, suggesting online postings are not how construction trades workers obtain employment or how construction-related firms find employees.

With declining employment numbers of workers in the industry projected through 2019, work-based programs should respond by reducing the number of students trained. On the other hand, training numbers are relatively low already. Construction worker in the region are trending older (nearly 45% of the current workers are 45 years or older), so work-based programs will need to account for that future employment loss. This suggests that the CTE and post-secondary programs are training approximately the number of employees needed by the region but should take steps to prepare for the large amount of near-future retirees.

Table D1: Construction Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($)
Genesee	12,319	7.8	3.6	37,233
Huron	1,242	9.0	0.4	31,867
Lapeer	3,811	10.3	1.1	37,018
St. Clair	6,760	9.9	2.0	41,178
Sanilac	1,424	8.4	0.4	38,250
Shiawassee	2,811	9.5	0.8	39,432
Tuscola	2,563	11.4	0.7	32,321
Total	30,930		8.9	

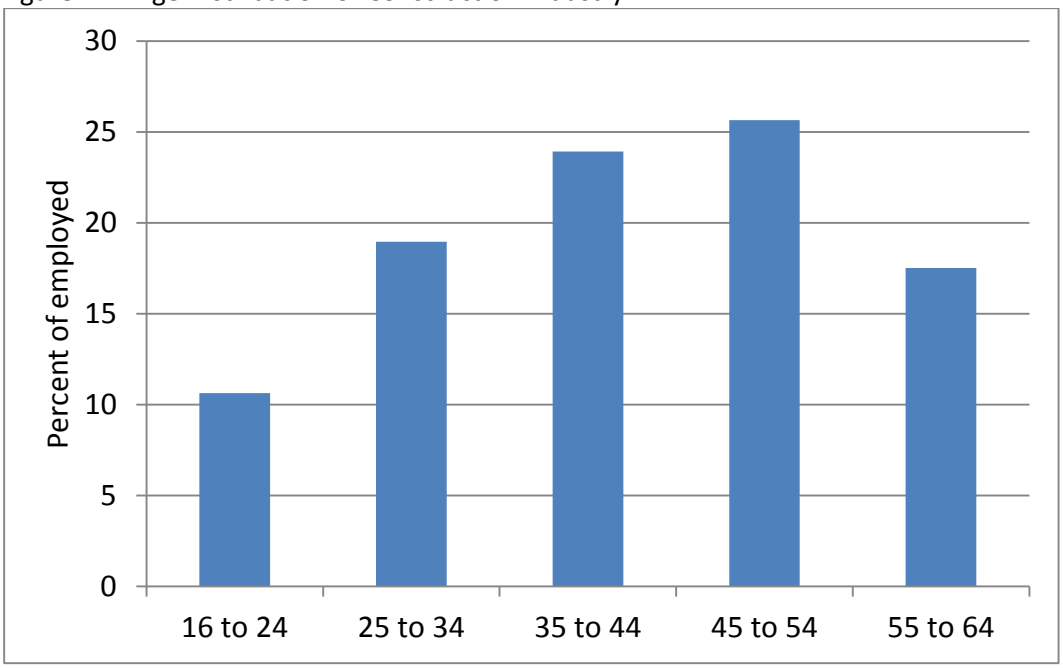
Source: Census American Community Survey 2010–2014

Table D2: Construction Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
Building equipment contractors	0.80	0.83	0.80	37	-203
Building finishing contractors	0.68	0.77	0.77	98	-37
Construction of buildings	0.57	0.72	0.72	360	-73
Foundation; structure; and building exterior contractors	0.65	0.87	0.85	297	-70
Heavy and civil engineering construction	0.47	0.52	0.53	74	-6
Other specialty trade contractors	0.97	1.20	1.23	229	-8
Total				1,094	-396

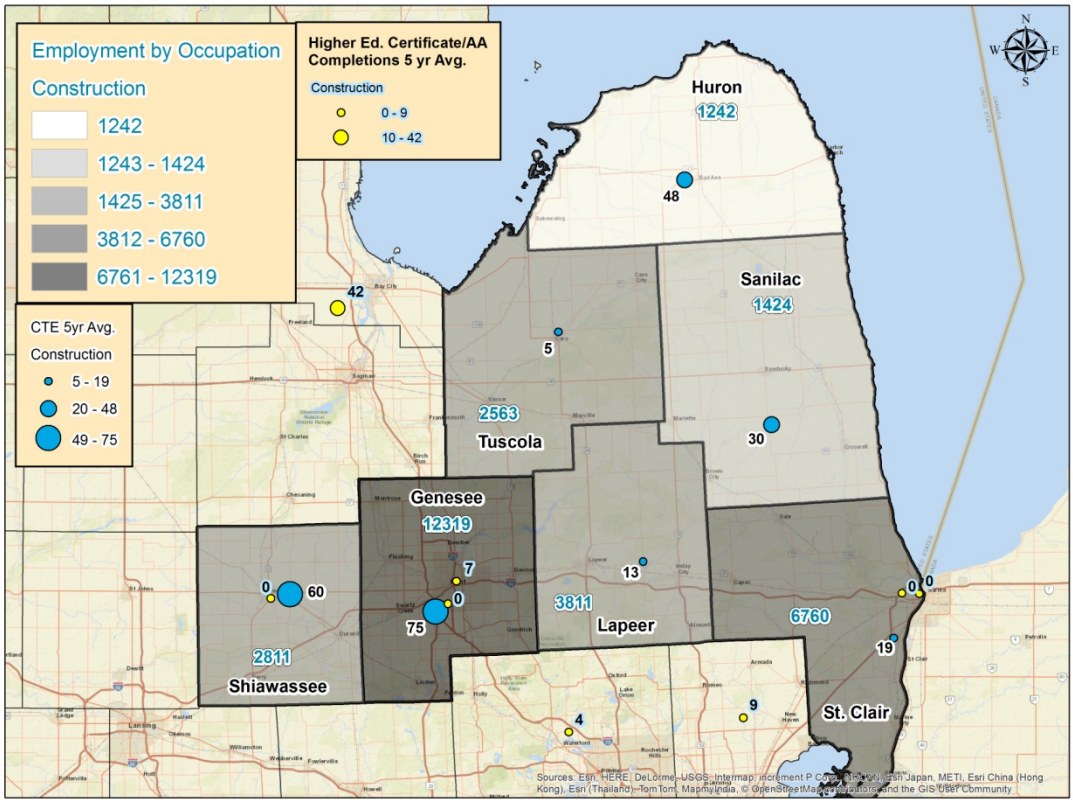
Source: Moody's Analytics

Figure D1: Age Distribution of Construction Industry

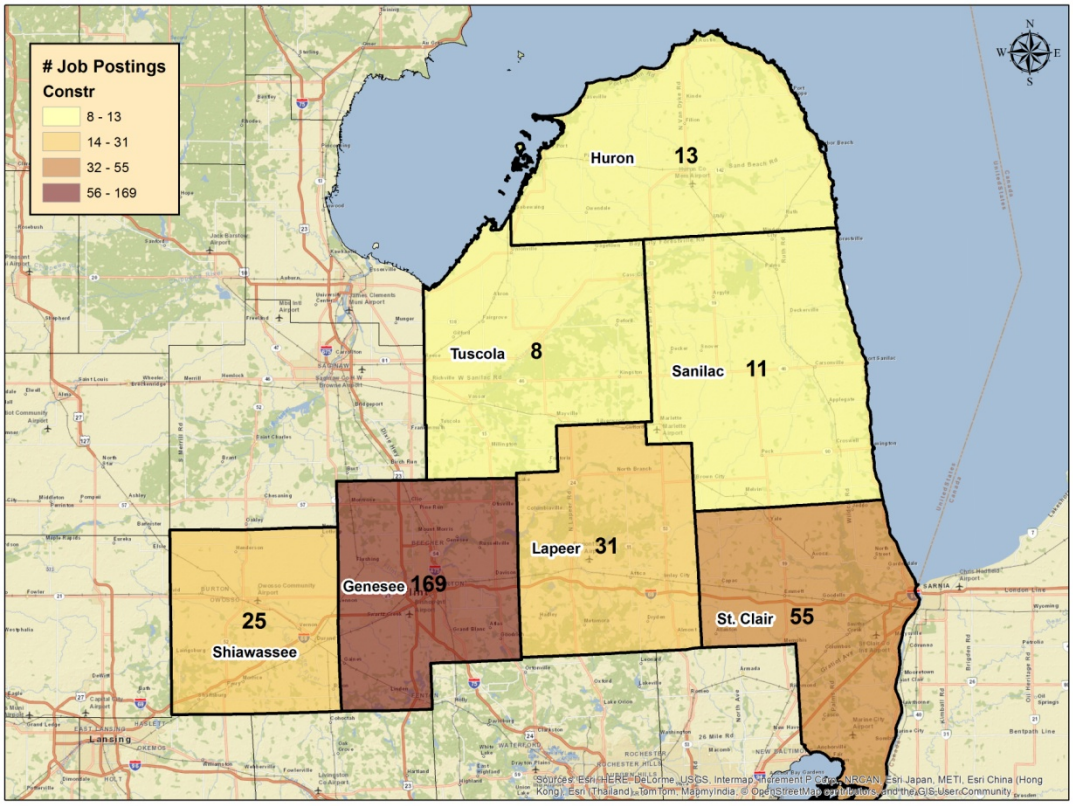


Source: IPUMS USA

Map D1: Employment, CTE, and Post-Secondary Completions



Map D2: Online Job Posting Demand for Construction Occupations



Engineering/Engineering Technology

Engineering employment accounts for between 1.1 percent and 2.9 percent of employment by county in the region. Table E2 shows the respective LQ and shift-share values for engineering and engineering technology industries. While the two industries have relatively small location quotients, both increased from 2010 to 2015. The shift-share analysis suggests that the growth was due to some form of change in competitive advantage.

Engineering and engineering technology occupations are shown in Map E1, along with CTE and post-secondary completions. Engineering CTE and post-secondary completions occurred primarily in Genesee County.

Online job postings, as shown in the amount of jobs posted by county in Map E2, match the pattern shown in the occupation data in Map E1. Online postings for engineering-related occupations are heavier in Genesee, Lapeer, and St. Clair Counties, which are also the counties with the highest engineering occupations.

Engineering occupations are in high-demand, as evidenced by the number of job postings. The job postings far outpace the number of training completions in the region. This would suggest good job prospects for those who complete training. Furthermore, the age distribution for engineering (see Figure E1) occupations is skewed older to the point that nearly 55 percent of the workforce employed in engineering occupations are 45 years or older. The younger segments of the occupation do not appear to have sufficient numbers to compensate for the near-future retirements. Work-based programs should continue to attract students to the engineering fields while investing in related educational resources.

Table E1: Engineering/Engineering Technology Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($)
Genesee	3,175	2.0	0.9	73,909
Huron	157	1.1	0.0	49,531
Lapeer	1,084	2.9	0.3	76,311
St. Clair	1,400	2.0	0.4	71,477
Sanilac	258	1.5	0.1	65,056
Shiawassee	478	1.6	0.1	67,917
Tuscola	340	1.5	0.1	67,188
Total	6,892		2.0	

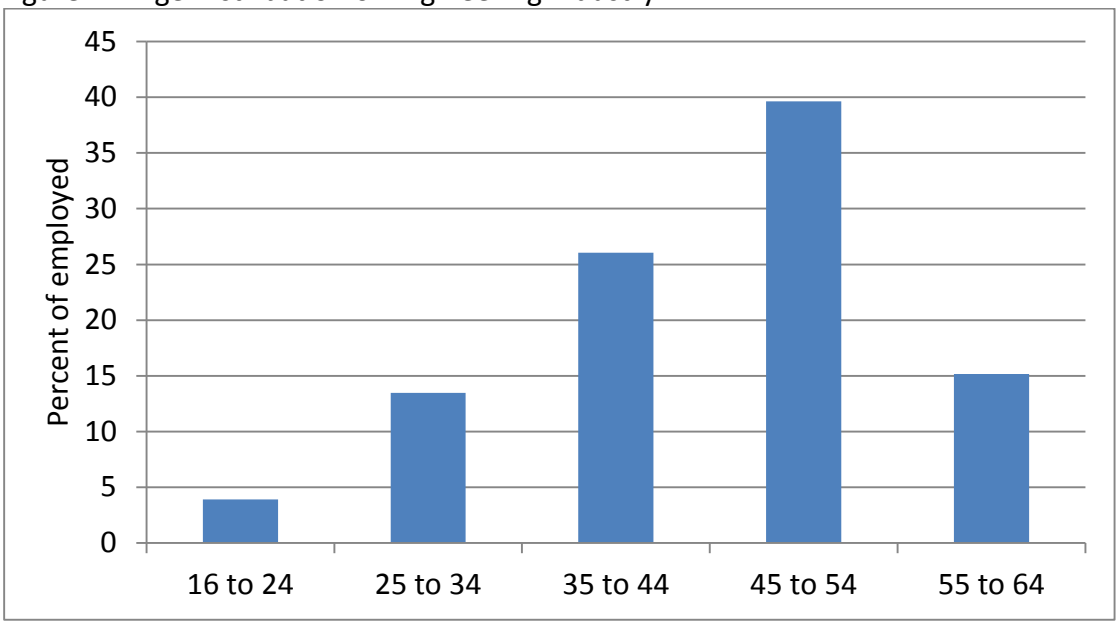
Source: Census American Community Survey 2010–2014

Table E2: Engineering/Engineering Technology Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010-15	Employment Change 2015-20
Management; scientific; and technical consulting services	0.35	0.43	0.48	195	94
Specialized design services	0.33	0.55	0.55	55	-4
Total				250	91

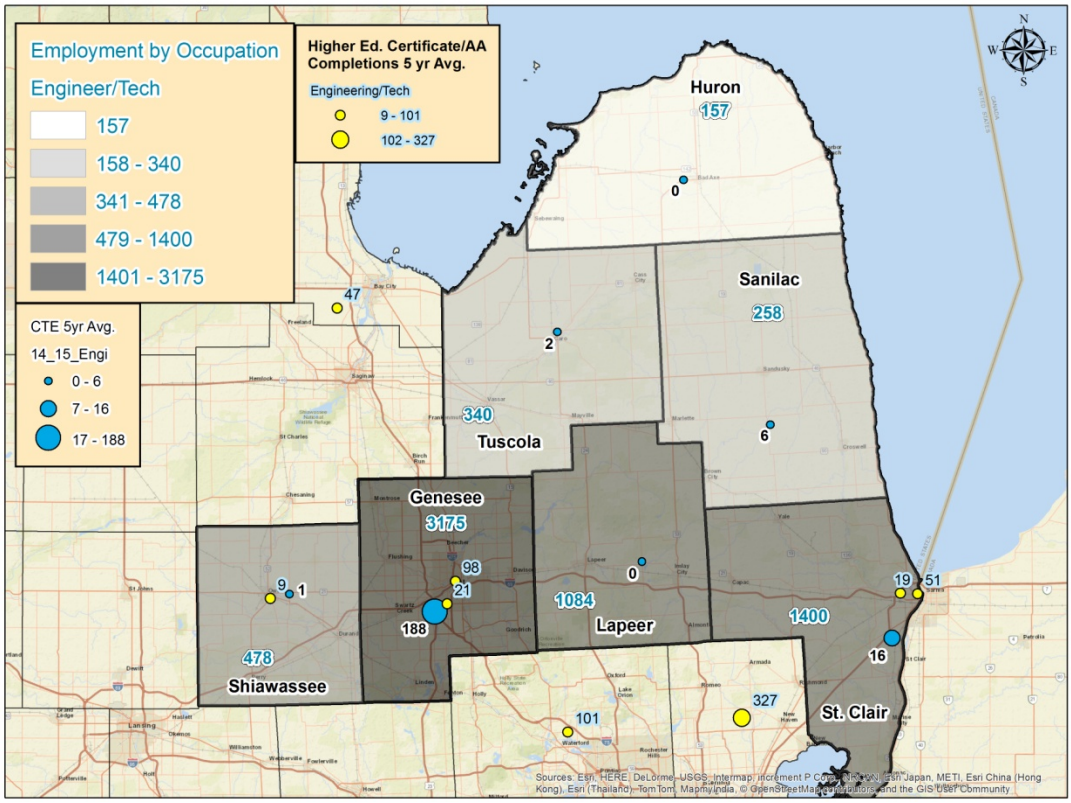
Source: Moody's Analytics

Figure E1: Age Distribution of Engineering Industry

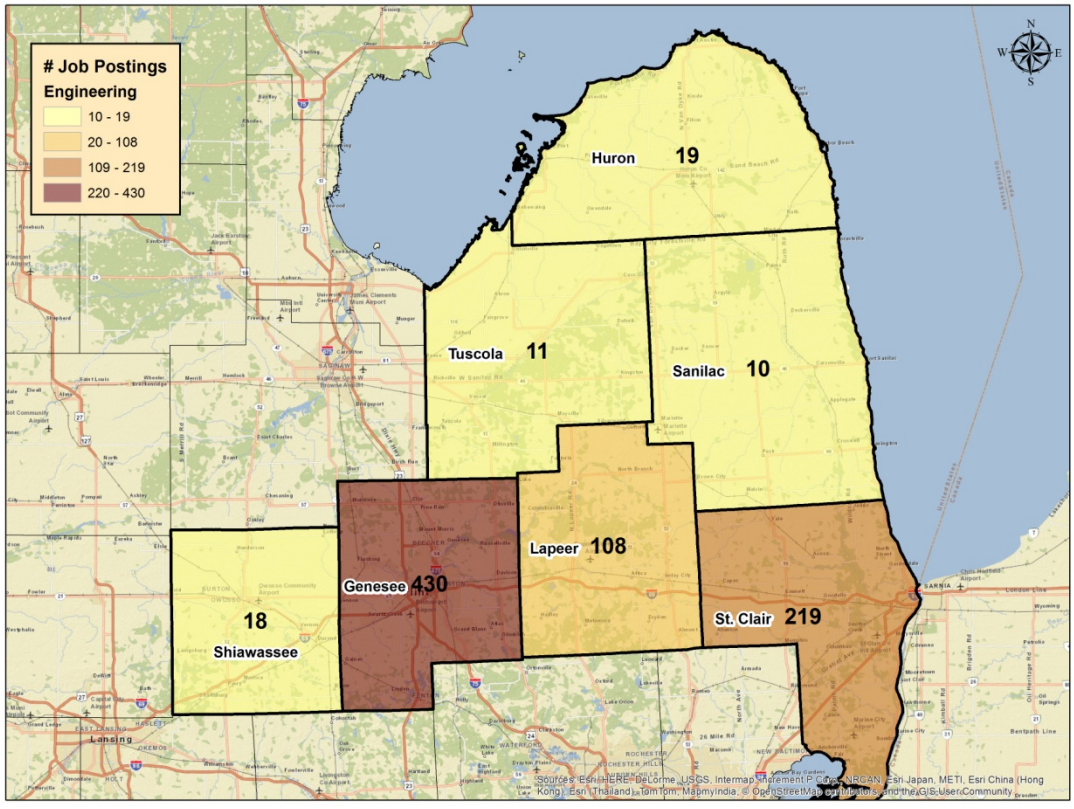


Source: IPUMS USA

Map E1: Employment, CTE and Post-Secondary Completions



Map E2: Online Job Posting Demand for Engineering/Engineering Technology Occupations



Healthcare

The healthcare industry group employs nearly 34,000 individuals throughout the region. Healthcare occupations represent from 7.5 percent to 10.8 percent of employment per county. According to regional location quotients in Table F2, only dentists, ambulatory health, and mental health have a location quotient over 1.5. The shift-share analysis shown in Table F2 suggests only the ambulatory health and vocational rehabilitation industries had some type of positive competitive advantage. While most of the other industries had a negative share in employment; this suggests that these industries had some competitive disadvantage.

Map F1 shows occupational distribution of healthcare employment, the largest pockets of employment are found in Genesee and St. Clair Counties. Training in both CTE and post-secondary education appears in nearly every county. Online available job postings, shown in Map F2, match the pattern of employment in Map F1. The amount of job postings is higher than some of the other occupational groups in this industry analysis, reflecting both higher demand and possible turnover.

Many of the healthcare industries have location quotients near 1.0 suggesting that they match the needs of the population of the region. The few industries that have location quotients higher than 1.0 may draw consumers from outside the region. The industries that have a location quotient lower than 1.0 suggests that residents of the region may need to seek those services from firms located outside the region.

The shift-share analysis suggests that the region will see decreased employment in the healthcare industry by 2020. Nonetheless, the job posting data demonstrates a high need for employees in the healthcare industry. Furthermore, local programs train a large number of students in the industry, suggesting strong interest from the student population. The programs in the region seem to train an appropriate amount of students to meet the demand of the industry. Additionally, the age distribution for this occupation has a solid outlook for near-future retirements. Nonetheless, program administrators should closely monitor the regional trends of the industry because the employment projections suggest a decrease in demand.

Table F1: Healthcare Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($) Pracitioners	Annual Earnings ($) Support
Genesee	16,880	10.7	4.9	63,812	35,974
Huron	1,361	9.9	0.4	51,540	33,438
Lapeer	3,152	8.6	0.9	66,238	37,740
St. Clair	5,880	8.6	1.7	64,576	35,724
Sanilac	1,270	7.5	0.4	54,375	26,750
Shiawassee	2,915	9.9	0.8	57,381	30,988
Tuscola	2,427	10.8	0.7	53,235	27,039
Total	33,885		9.8		

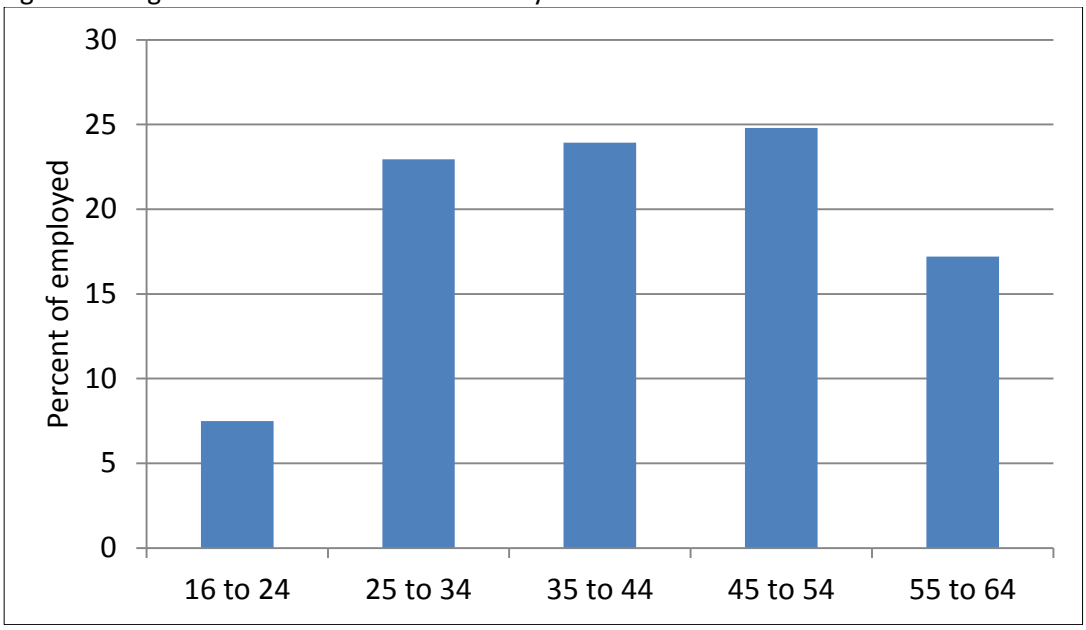
Source: American Community Survey 2010–2014

Table F2: Healthcare Production Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
General medical and surgical hospitals	1.44	1.44	1.43	-328	-454
Home healthcare services	1.36	1.17	1.15	-545	-163
Medical and diagnostic laboratories	0.57	0.51	0.49	-38	-16
Nursing care facilities	1.24	1.17	1.17	-300	-102
Offices of dentists	1.65	1.60	1.59	-141	-111
Offices of other health practitioners	1.00	0.92	0.90	-157	-70
Offices of physicians	1.35	1.32	1.31	-277	-241
Other ambulatory healthcare services	1.21	1.57	1.55	179	-36
Outpatient care centers	0.87	0.83	0.81	-80	-71
Psychiatric and substance abuse hospitals	0.82	0.65	0.63	-42	-11
Residential mental retardation; mental health, and substance abuse facilities	1.78	1.77	1.74	-52	-98
Vocational rehabilitation services	1.24	1.67	1.75	250	19
Total				-1,557	-1,364

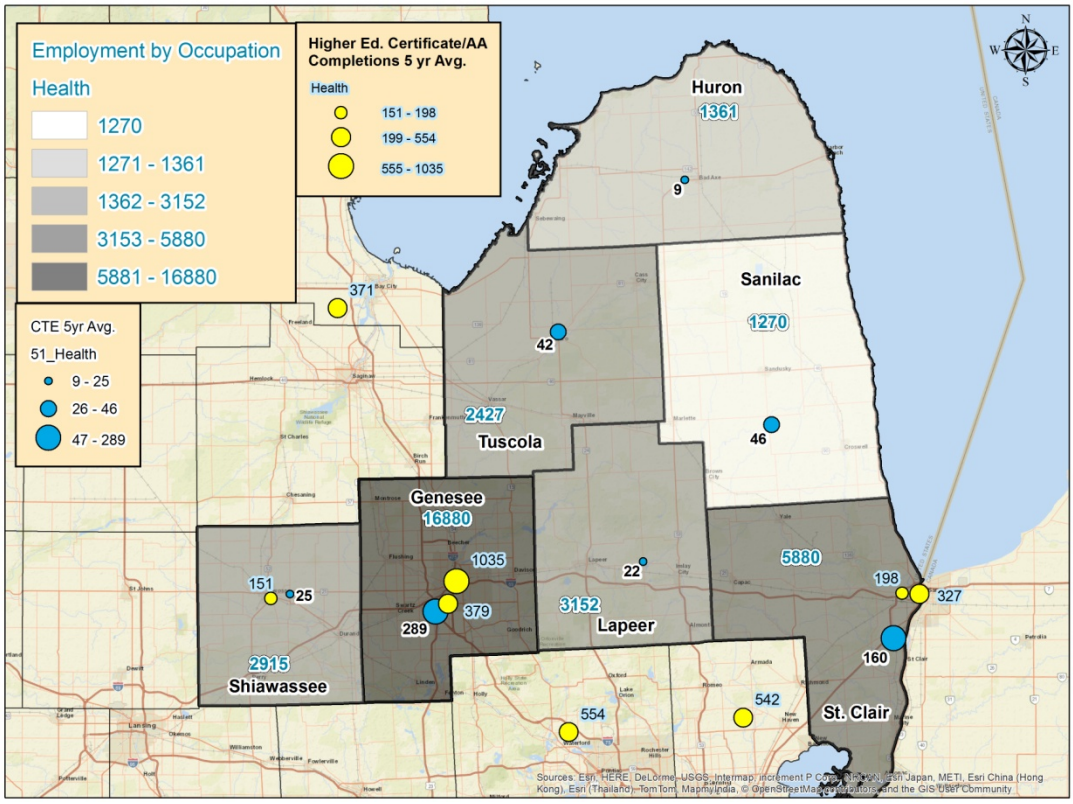
Source: Moody's Analytics

Figure F1: Age Distribution of Health Industry

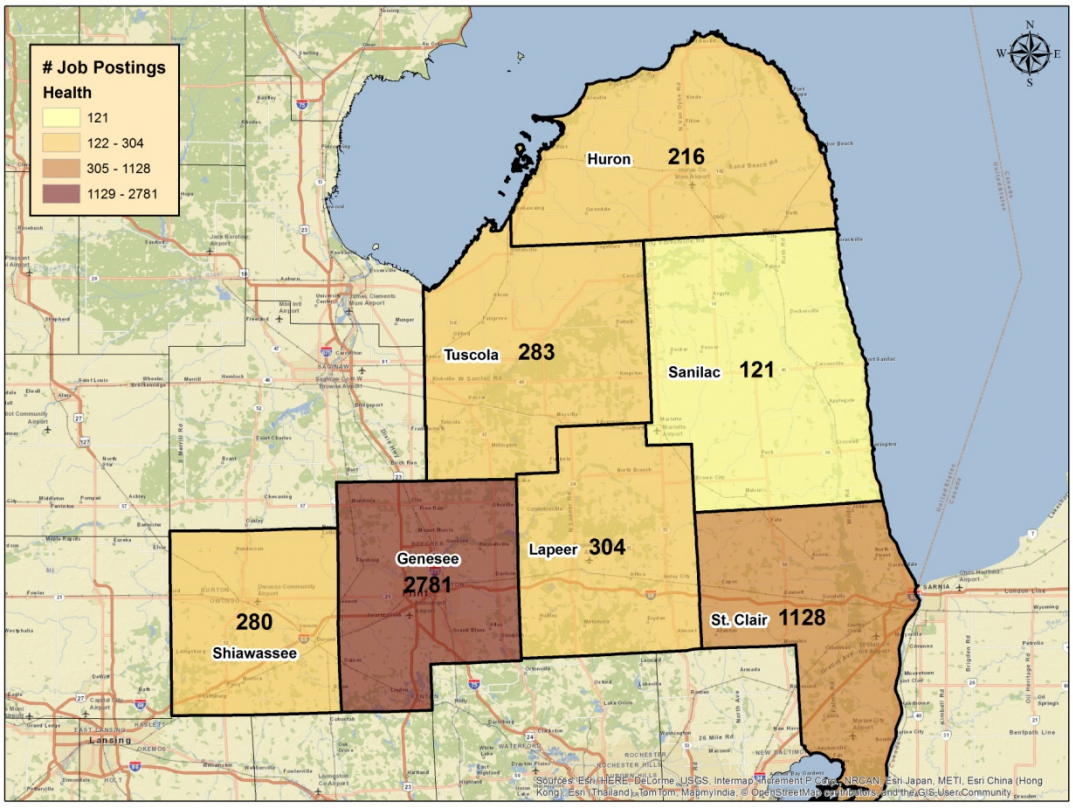


Source: IPUMS USA

Map F1: Employment, CTE and Post-Secondary Completions



Map F2: Online Job Posting Demand for Healthcare Occupations



Mechanic/Repair

Mechanic and repair-related occupations represent between 3.4 percent and 4.6 percent of county employment, as shown in Table G1. An industry analysis using location quotients and shift-share analysis is shown in Table G2. Automotive repair and maintenance and personal and household goods repair show LQs higher than 1.0, which indicates that those industries have higher concentrations in the region than nationally across the time period. The shift-share analysis shows both personal and household goods repair and maintenance and services to buildings growing from 2010 to 2015 due to regional competitive advantage.

While employment in mechanic and repair-related occupations is relatively modest, Map G2 shows both CTE and post-secondary education completions in greater number and not as constrained by population. Demand for new hires in mechanic- and repair-related occupations are reflected in online job postings in Map G2. This that shows Genesee and St. Clair are counties with the largest number of job postings.

According to the shift-share analysis, the region is projected to lose jobs in several segments of the industry. On the other hands, many segments of the industry are projected to make modest gains in employment in each segment of the industry except for services to buildings and dwellings. Nonetheless, job postings far outpace the number of students receiving training each year. The data suggests that the work-based programs in the region should work to increase the number of students trained in the field while shifting some of their focus to building maintenance and service like HVAC.

Table G1: Mechanic/Repair Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($)
Genesee	5,319	3.4	1.5	44,318
Huron	630	4.6	0.2	43,068
Lapeer	1,487	4.0	0.4	46,134
St. Clair	2,843	4.1	0.8	48,542
Sanilac	697	4.1	0.2	35,825
Shiawassee	1,377	4.7	0.4	36,042
Tuscola	946	4.2	0.3	39,246
Total	13,299		3.8	

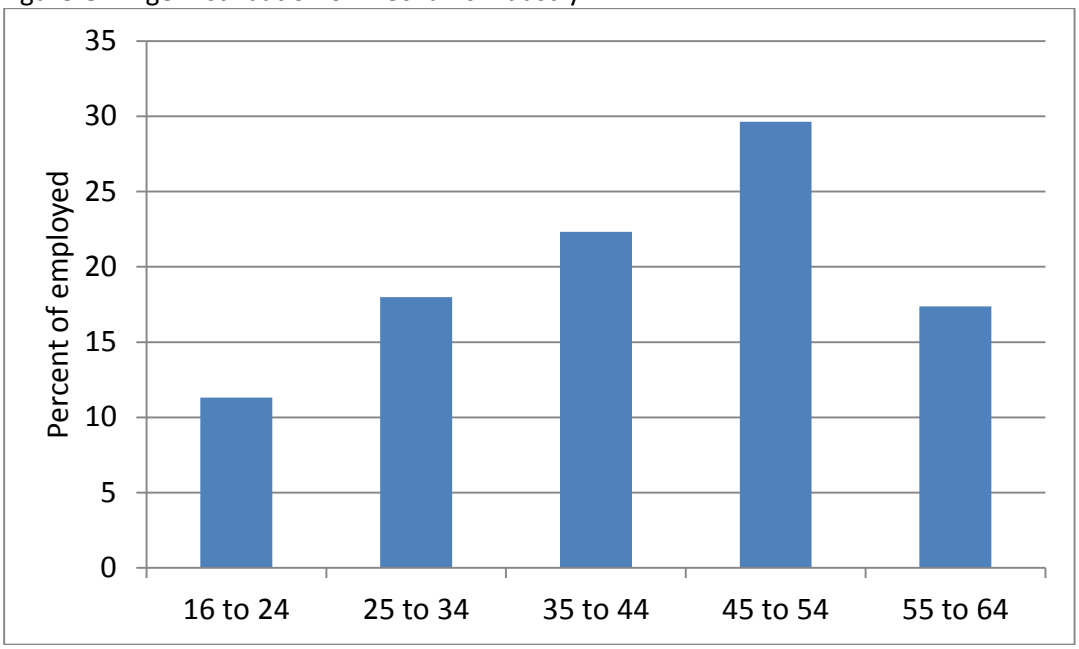
Source: American Community Survey 2010–2014

Table G2: Mechanic/Repair Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
Automotive repair and maintenance	1.89	1.91	1.92	-36	-65
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	0.94	0.93	0.98	-14	13
Personal and household goods repair and maintenance	1.78	2.65	2.65	116	-11
Services to buildings and dwellings	0.78	0.85	0.92	199	199
Total				272	142

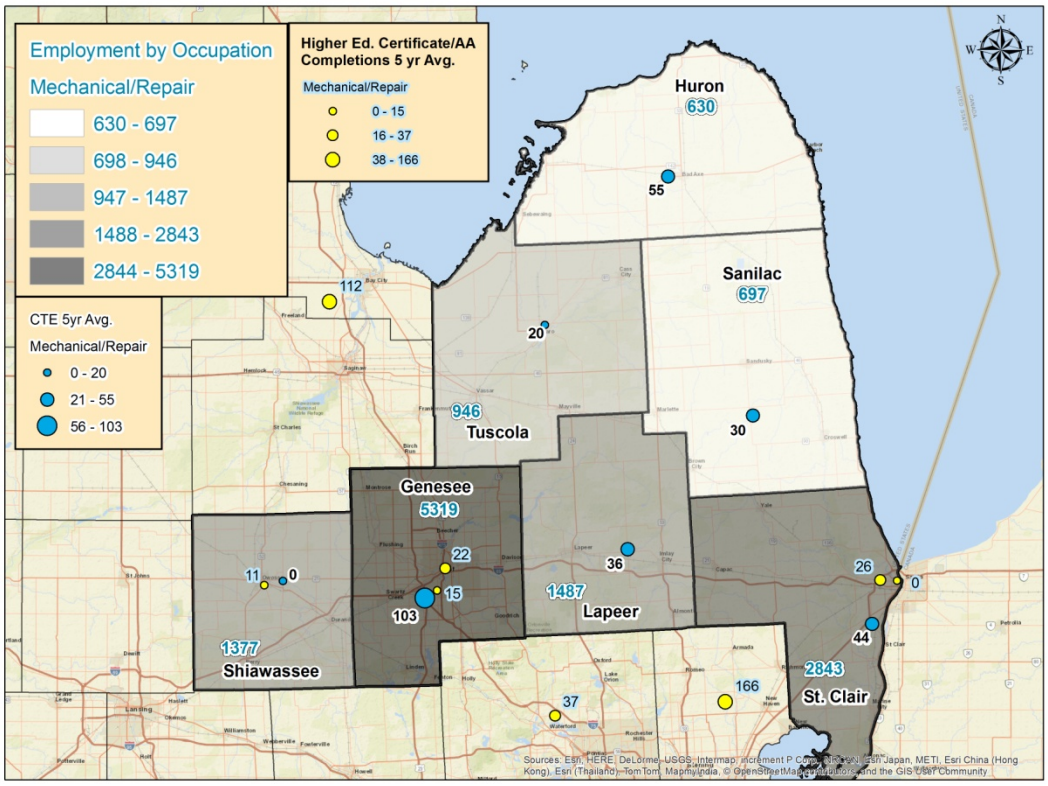
Source: Moody's Analytics

Figure G1: Age Distribution of Mechanic Industry

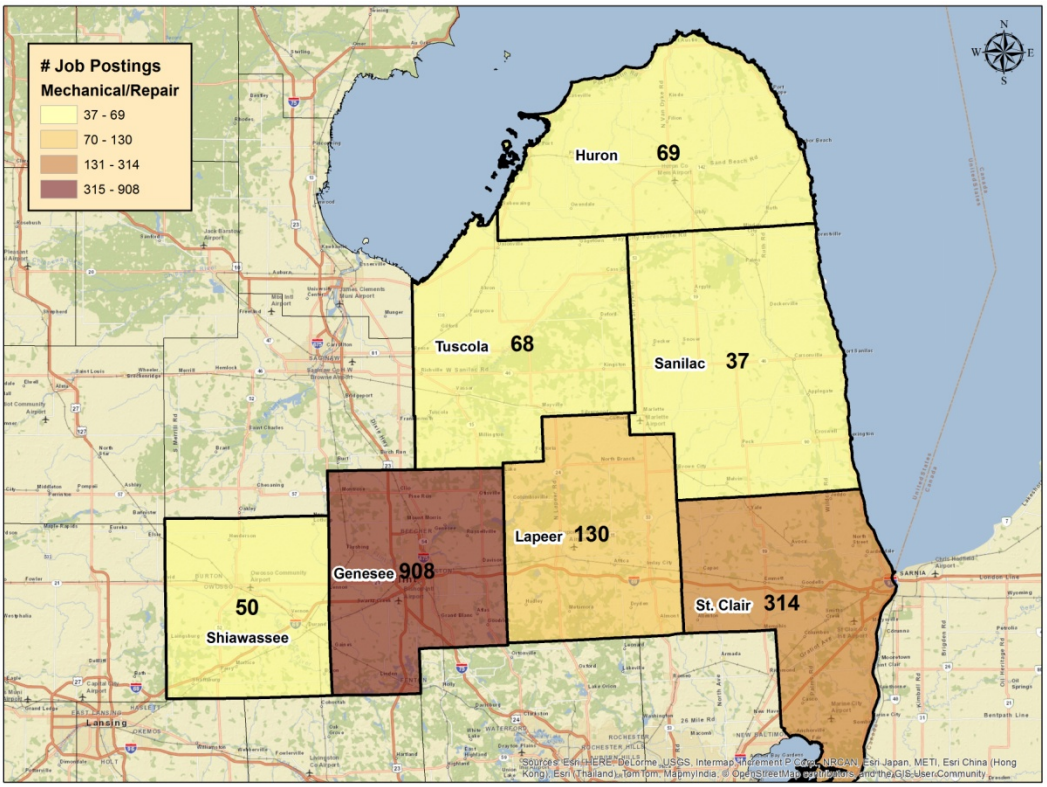


Source: IPUMS USA

Map G1: Employment, CTE and Post-Secondary Completions



Map G2: Online Job Posting Demand for Mechanical and Repair Occupations



Personal/Culinary

More than 35,000 people are employed in personal and culinary services, as shown in Table H1. The percentages of employment in each county range from 7.6 percent to 11.0 percent. Table H2 indicates that restaurants and other eating places had location quotients close to 1.0, suggesting that the concentration matches the national share; the shift share shows the industry sector grew stronger than expected. Drinking places had a location quotient of 1.9 in 2015, nearly double the national concentration. Death care services had a high LQ as well, though it is a relatively small industry.

Map H1 shows that although there are many people employed in culinary-related occupations, there are relatively few individuals who receive training through CTE programs. As was noted in our interviews with local stakeholders, many of these occupations rely on on-the-job training or businesses will try to hire experienced workers. Online job postings in Map H2 show similar patterns to employment demand. Although similar to agriculture, the number of postings are drastically below the amount of employment, suggesting that these occupations do not have a large online presence to meet demand.

This industry is generally population serving, as evidenced by location quotients near 1.0 for nearly all industry sectors. Furthermore, the majority of employment in these occupations is held by younger individuals, as seen in Figure H1. It is reasonable to assume that many employees choose other careers as they age. Nonetheless, job postings remain high. Since the shift-share analysis suggests decreases in employment over time, much of the job posting demand may be derived from turnover. With higher demand in more stable industries and relatively lower wages in this industry, the work-based programs should focus their resources on other industries.

Table H1: Personal/Culinary Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($) Personal	Annual Earnings ($) Food prep/serving
Genesee	17,322	11.0	5.0	9,531	12,025
Huron	1,151	8.4	0.3	9,398	15,273
Lapeer	3,462	9.4	1.0	8,226	11,775
St. Clair	7,168	10.5	2.1	9,582	11,281
Sanilac	1,276	7.6	0.4	10,205	11,563
Shiawassee	2,702	9.1	0.8	9,290	11,688
Tuscola	2,161	9.6	0.6	8,844	11,881
Total	35,242		10.2		

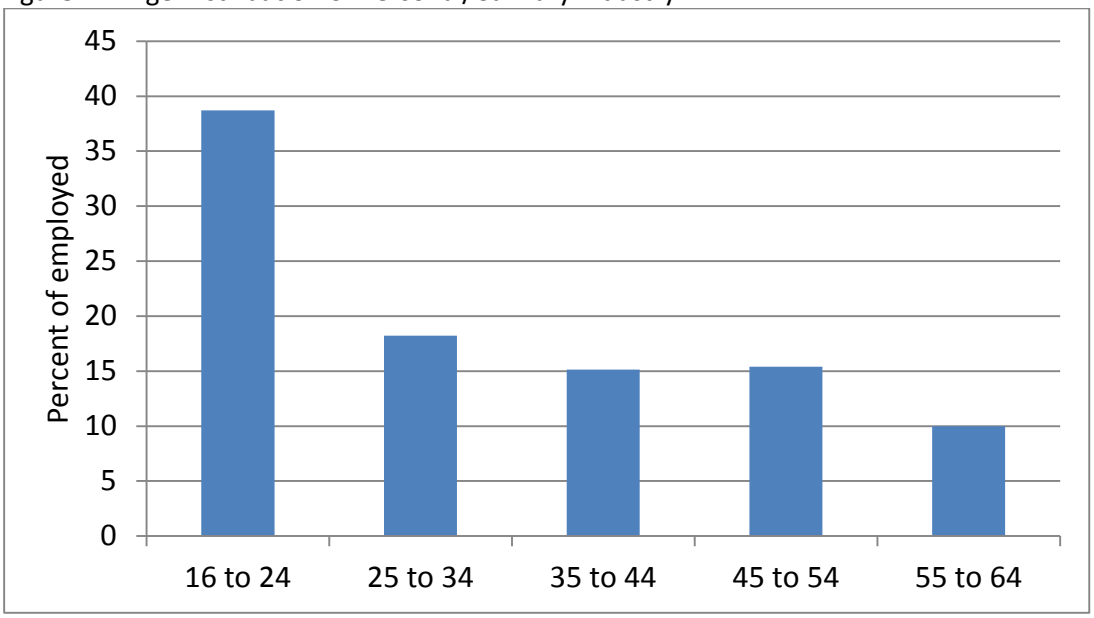
Source: Census American Community Survey 2010–2014

Table H2: Personal/Culinary Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
Death care services	3.16	3.15	3.29	-21	13
Drinking places (alcoholic beverages)	2.38	1.90	1.89	-356	-37
Dry-cleaning and laundry services	0.94	0.85	0.89	-62	9
Other personal services	0.45	0.52	0.55	31	12
Personal care services	1.47	1.01	1.03	-608	-9
Restaurants and other eating places	1.15	1.10	1.10	-1,440	-617
Special food services	1.03	0.82	0.82	-290	-17
Total				-2,748	-646

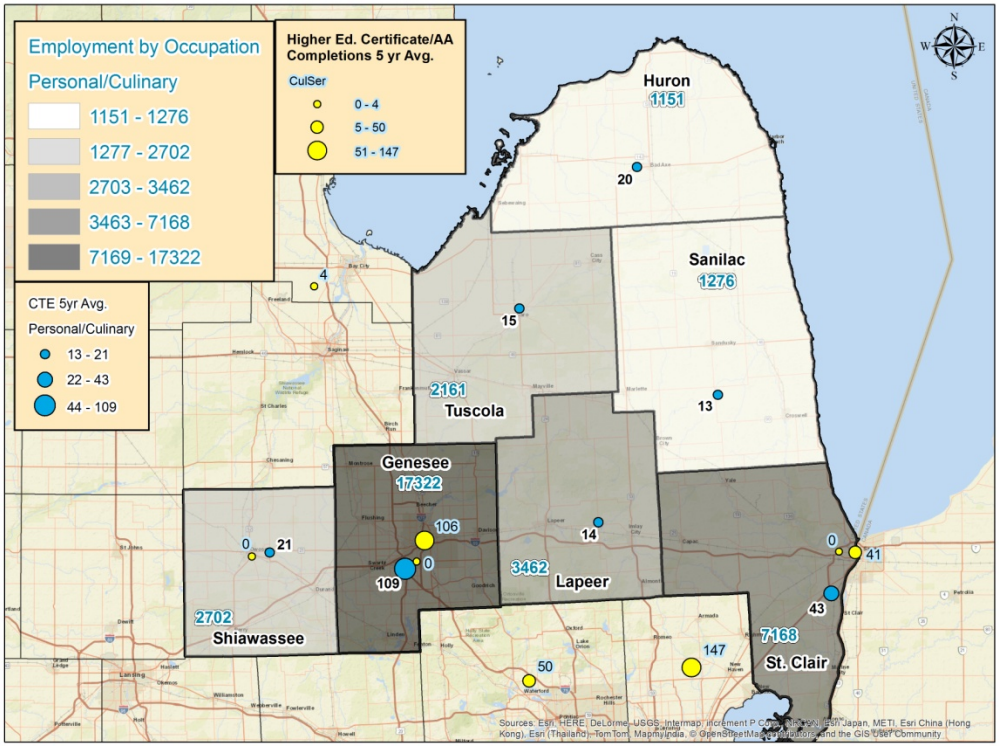
Source: Moody's Analytics

Figure H1: Age Distribution of Personal/Culinary Industry

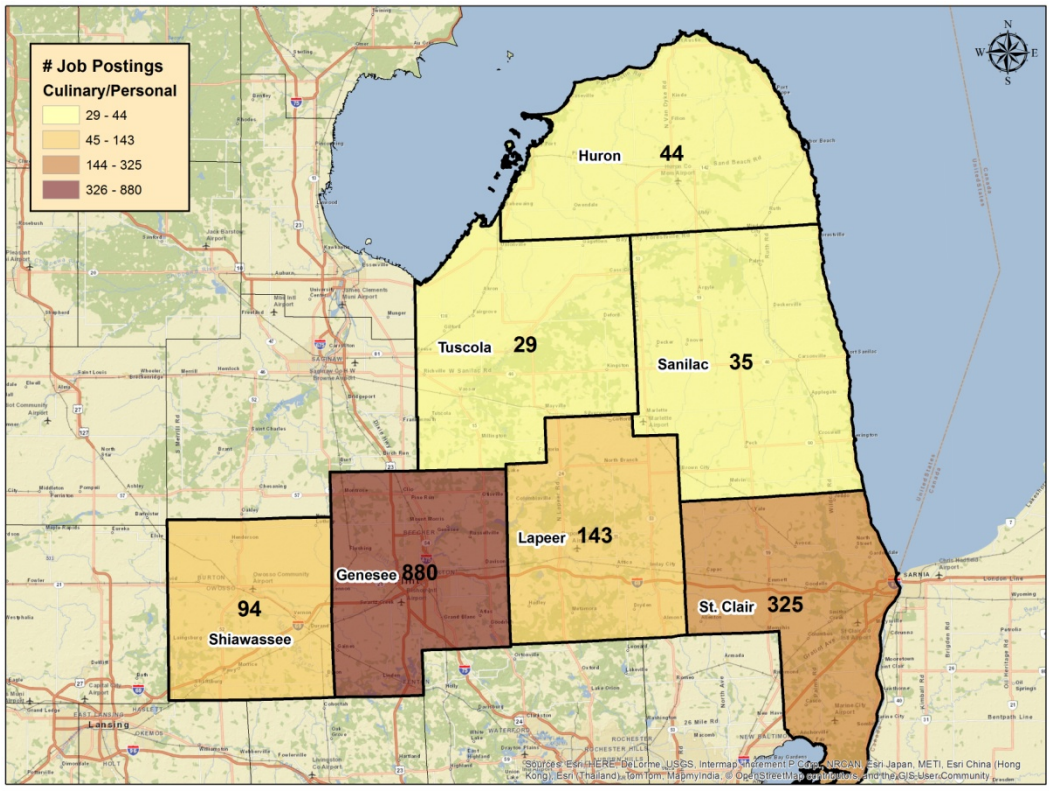


Source: IPUMS USA

Map H1: Employment, CTE, and Post-Secondary Completions



Map H2: Online Job Posting Demand for Personal/Culinary Occupations



Precision Production

Occupations in the production industry group are a vital part of the I-69 Thumb regional economy, as shown in Table I1. Production occupations represent 9.3 percent of the employment in Genesee County, but for the remainder of the counties in Region 6, production occupations are between 11.3 percent and 13.6 percent. An industry location-quotient analysis is shown in Table I2. The table is quite extensive because of the diverse range of manufacturing industries in the region. Location quotients over 1.0 indicate a percentage of industry concentration higher than the national percentage. The table shows many industries that are more than twice the national average. Motor vehicle part production was 6.62 in 2015, over six times higher than nationally. Also posting a location quotient over six was metalworking machinery manufacturing; it was 6.01 in 2015.

Map I1 shows both CTE and post-secondary education and employment levels. As expected, post-secondary completions are low compared to CTE training completions. Educators in the region noted that the completion numbers are low because many who enter the programs leave for employment opportunities before completing or complete other programs instead. Online job postings shown in Map I2 show that in spite of the high employment amounts, job postings are relatively low, suggesting employers do not typically seek new hires through online postings. Genesee County has 14,691 people employed in production occupations, but only 611 online job postings in 2015.

With strong employment projections through 2020 and a high concentration of the industries in the region, work-based programs should continue to develop well-trained students. Unfortunately, it is hard to attract students to the industry while the wages lag behind other industries. To maintain its high concentration, the region should work to increase the wages of production occupations.

Table I1: Precision Production Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($)
Genesee	14,691	9.3	4.2	32,724
Huron	1,862	13.6	0.5	30,125
Lapeer	4,907	13.3	1.4	35,146
St. Clair	9,107	13.3	2.6	35,199
Sanilac	2,328	13.8	0.7	30,144
Shiawassee	3,355	11.3	1.0	33,532
Tuscola	2,664	11.8	0.8	32,204
Total	38,914		11.2	

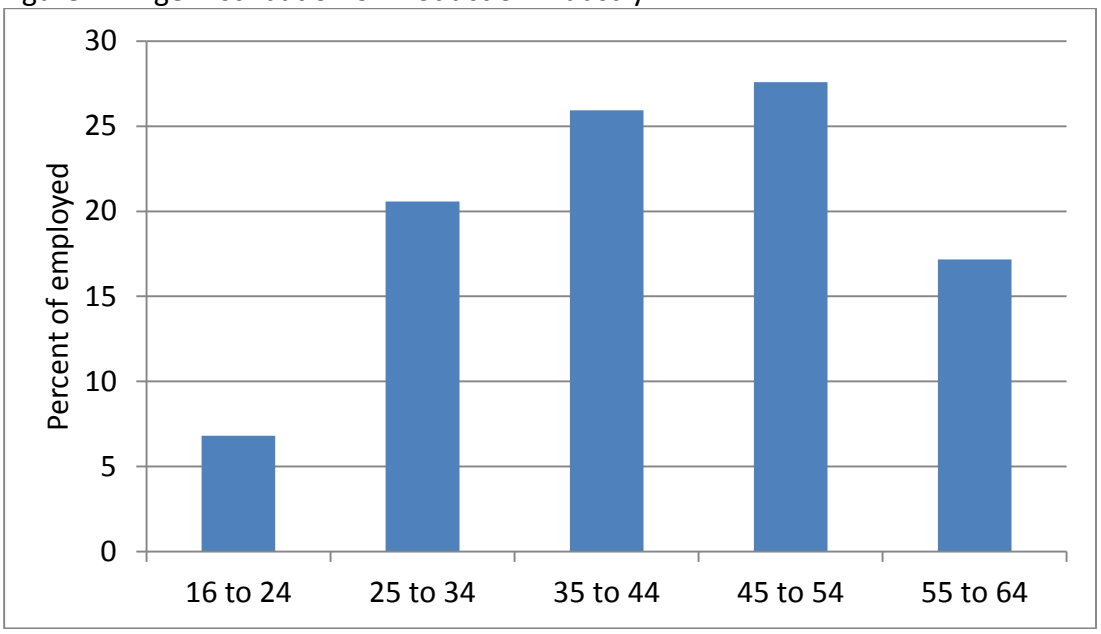
Source: American Community Survey 2010–2014

Table I2: Precision Production Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
Aerospace product and parts manufacturing	0.33	0.59	0.67	228	57
Alumina and aluminum production and processing	1.16	1.46	1.49	32	-1
Architectural and structural metals manufacturing	0.55	0.79	0.80	150	-7
Boiler; tank; and shipping container manufacturing	1.35	1.18	1.16	-37	-10
Coating; engraving; heat treating; and allied activities	3.16	4.45	4.81	318	60
Cutlery and handtool manufacturing	1.30	1.74	1.83	28	3
Electrical equipment manufacturing	1.19	1.08	1.09	-38	-5
Forging and stamping	1.35	1.83	1.91	85	5
Foundries	2.01	2.88	3.15	194	39
Hardware manufacturing	2.02	2.55	2.82	23	8
Industrial machinery manufacturing	2.11	2.38	2.56	44	21
Iron and steel mills and ferroalloy manufacturing	0.36	0.61	0.68	39	8
Machine shops; turned product; and screw; nut; and bolt manufacturing	2.22	2.49	2.63	149	45
Medical equipment and supplies manufacturing	0.64	0.82	0.75	97	-56
Metalworking machinery manufacturing	6.52	6.01	6.70	-225	162
Motor vehicle body and trailer manufacturing	3.32	3.62	4.19	60	124
Motor vehicle manufacturing	7.40	5.78	5.71	-731	-93
Motor vehicle parts manufacturing	6.73	6.62	6.71	-279	-82
Nonferrous metal (except aluminum) production and processing	1.44	1.97	2.11	58	9
Office furniture (including fixtures) manufacturing	1.02	1.50	1.48	92	-14
Other chemical product and preparation manufacturing	0.50	0.78	0.82	42	3
Other electrical equipment and component manufacturing	0.97	1.17	1.24	41	8
Other fabricated metal product manufacturing	1.02	1.34	1.44	158	30
Other general purpose machinery manufacturing	0.65	0.58	0.63	-43	19
Other miscellaneous manufacturing	0.40	0.65	0.62	127	-23
Other nonmetallic mineral product manufacturing	1.19	1.50	1.43	40	-15
Paint; coating; and adhesive manufacturing	0.65	1.58	1.57	105	-6
Pharmaceutical and medicine manufacturing	0.26	0.43	0.42	87	-11
Plastics product manufacturing	2.67	3.54	3.63	835	1

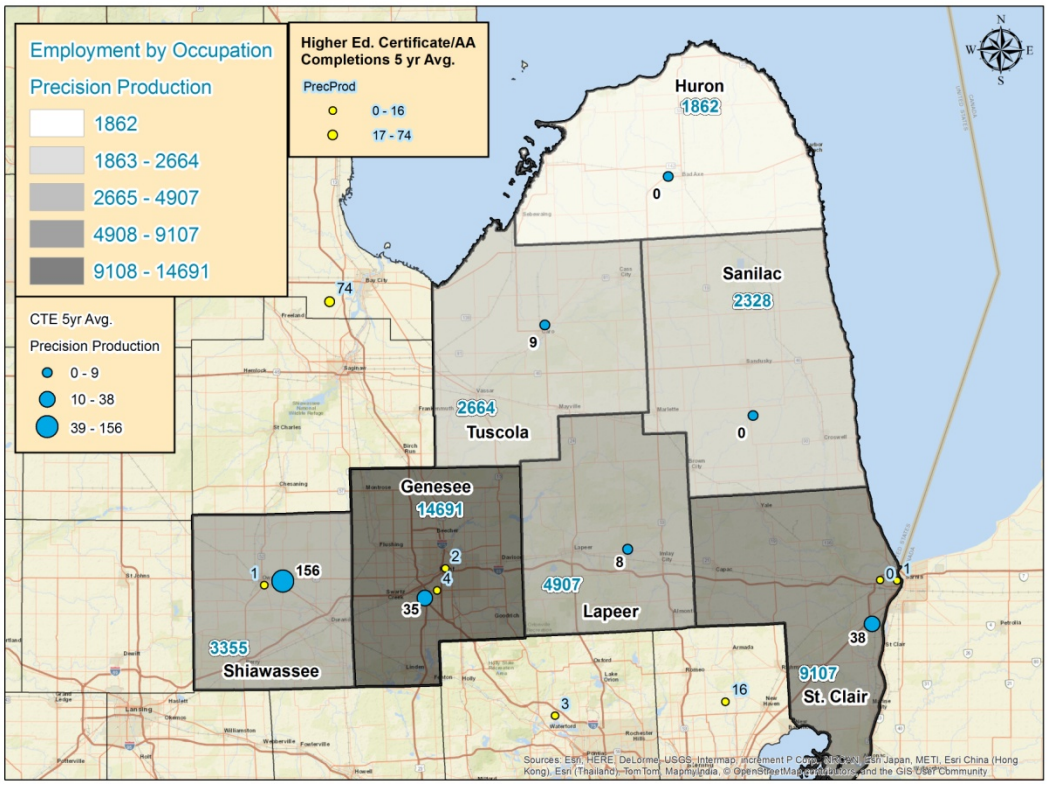
Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010–15	Employment Change 2015–20
Rubber product manufacturing	1.27	1.83	1.98	133	24
Semiconductor and other electronic component manufacturing	0.37	0.59	0.57	150	-29
Ship and boat building	0.71	0.97	0.98	64	-3
Spring and wire product manufacturing	1.52	2.02	1.79	39	-21
Ventilation; heating; air-conditioning; and commercial refrigeration equipment manufacturing	1.30	1.41	1.45	19	-1
Total				2,261	244

Figure I1: Age Distribution of Production Industry

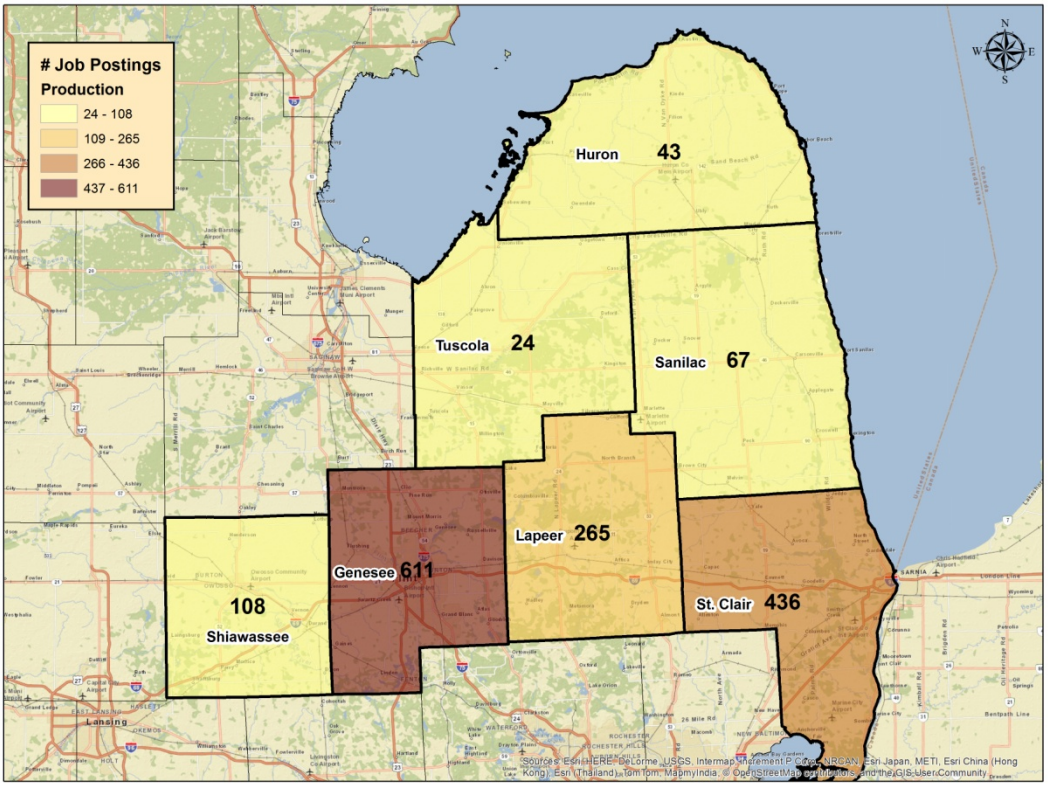


Source: IPUMS USA

Map I1: Employment, CTE, and Post-Secondary Completions



Map I2: Online Job Posting Demand for Production Occupations



Transportation

The transportation industry group occupations represent between 3.2 percent and 4.7 percent of county employment by occupation in Region 6, as shown in Table J1. Industry location quotient analysis, shown in Table J2, indicates relatively low industry concentration in transportation as most of the sub-industries are below 1.0. General freight trucking had a LQ of 1.06 in 2015, falling from 2.07 in 2010. The location quotient for warehousing and storage grew from 0.70 in 2010 to 1.09 in 2015. The shift-share analysis suggests that the industry improved by 534 due to a regional competitive advantage.

Demand for new hires in transportation-related occupations is reflected in online job postings in Map J2. This pattern shows Genesee, Lapeer, and St. Clair counties with the largest number of job postings. The demand should remain high, or even increase, since the majority of employment falls in the higher age categories (see Figure J1); large segments of employees will reach retirement age in the near future.

The transportation industry has high-demand for employees, as evidenced by the occupation and job posting numbers, but traditional education programs do not train many students. The interviews with local stakeholders revealed an age gap between graduating high school students and the trucking industry, as well as high numbers of employer-led trainings. The region should work with transportation employers to determine if students trained in the transportation field could find other types of work in the field before they reach the proper age; i.e., do jobs exists that recently trained students could occupy before they reach the proper age to fulfill more intensive occupations?

Table J1: Transportation Employment by County

	Employment	County (%)	Region (%)	Annual Earnings ($)
Genesee	6,448	4.1	1.9	30,759
Huron	581	4.2	0.2	32,694
Lapeer	1,411	3.8	0.4	28,977
St. Clair	2,188	3.2	0.6	34,256
Sanilac	791	4.7	0.2	33,911
Shiawassee	1,395	4.7	0.4	35,337
Tuscola	1,003	4.4	0.3	38,550
Total	13,817		4.0	

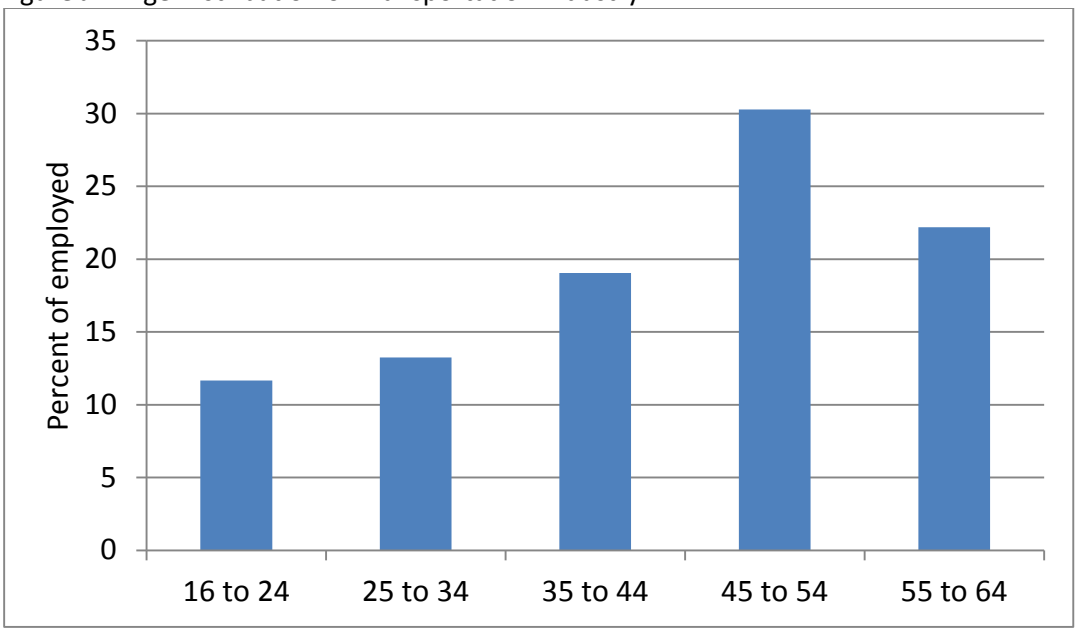
Source: American Community Survey 2010–2014

Table J2: Transportation Location Quotient and Shift Share

Description	LQ 2010	LQ 2015	LQ 2020	Employment Change 2010-15	Employment Change 2015-20
Freight transportation arrangement	2.07	1.06	1.04	-412	-18
General freight trucking	0.74	0.93	0.93	324	-45
Nonscheduled air transportation	1.38	1.39	1.50	-2	5
Other support activities for transportation	1.21	0.71	0.73	-30	0
Rail transportation	0.94	0.78	0.81	-84	6
School and employee bus transportation	0.34	0.58	0.57	84	-8
Specialized freight trucking	0.86	0.92	0.92	36	-22
Support activities for air transportation	0.64	0.47	0.43	-66	-17
Support activities for road transportation	0.65	0.93	0.97	45	3
Urban transit systems	0.36	0.66	0.63	26	-4
Warehousing and storage	0.70	1.09	1.06	534	-94
Total				509	-245

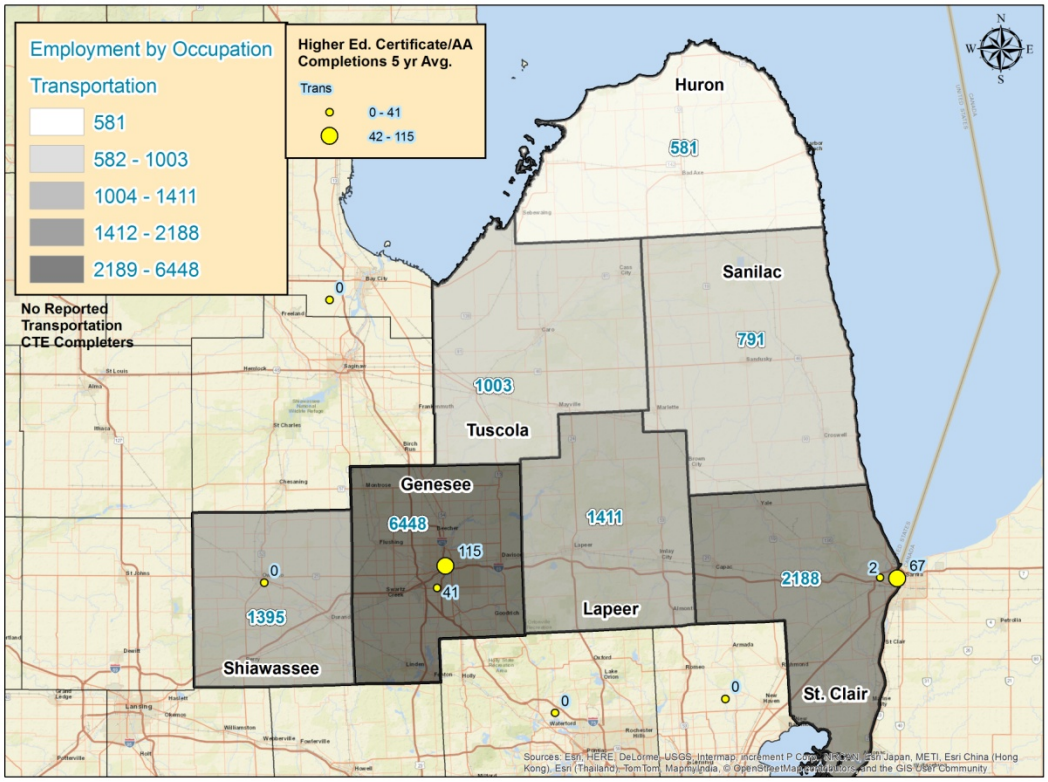
Source: Moody's Analytics

Figure J1: Age Distribution of Transportation Industry

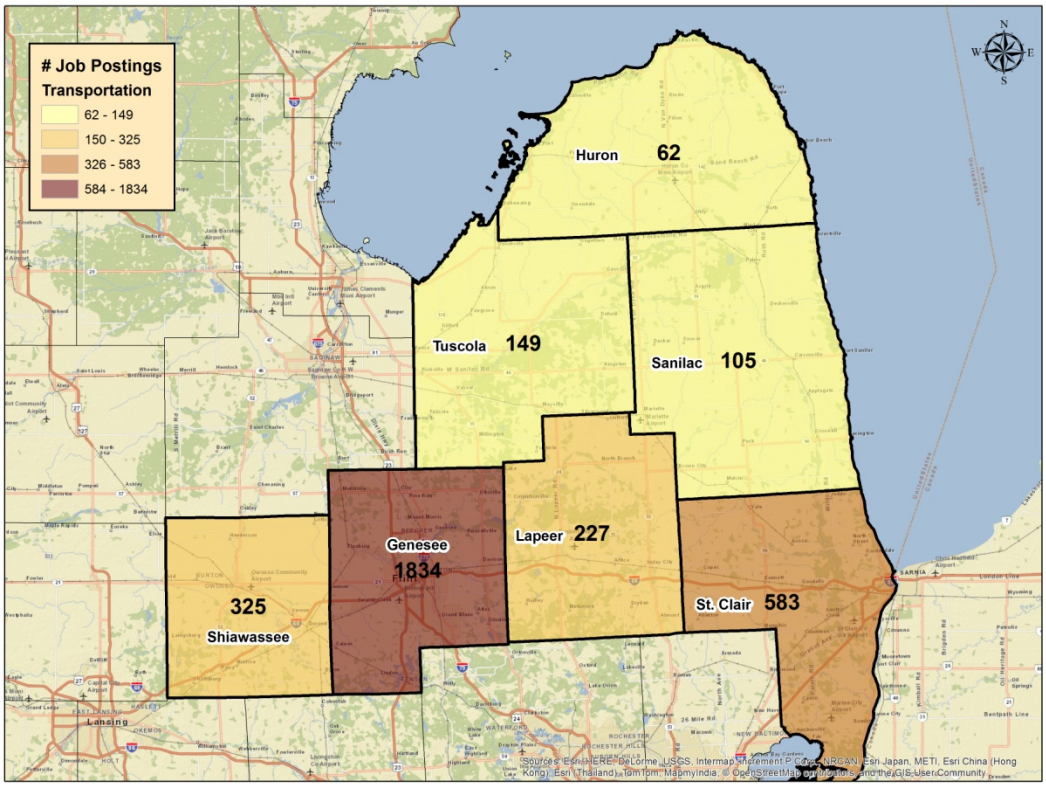


Source: IPUMS USA

Map J1: Employment, CTE, and Post-Secondary Completions



Map J2: Online Job Posting Demand for Transportation Occupations



Implementation Strategies

The Upjohn Team believes it is important to offer suggestions that could help the I-69 Thumb Region Steering Committee in its efforts to address the objectives of the education goal of its prosperity plan– "to develop and retain a talented workforce so regional businesses can compete on a global basis." Our suggestions focus on the region as a whole. The Upjohn Team offers these suggestions based upon our data analysis and our conversations with representatives of the region's work-based programs and initiatives.

Regional Business Advisory Council

Interviews were conducted with several education and workforce development stakeholders in the region. There were common concerns that emerged from these conversations regarding the current work-based programs and initiatives. Of the issues voiced by the stakeholders, none was more prevalent than the need for increased business input and support into the development and implementation of the region's work-based programs. Although a few organizations expressed satisfaction with the level of participation and support from the business community, the majority of stakeholders interviewed had the opposite experience. The creation of a regional business advisory council could help to overcome the general perception of the lack of business participation in these programs as well as to create a conduit to generate this valuable input.

This regional council could serve in an advisory capacity to the CTE and community college programs, as well as advising other work-based programs and workforce investment boards. The regional business advisory council would be comprised of leaders representing the region's businesses. The region would benefit from the creation of the regional business advisory council by reducing the number of business leaders currently needed to properly advise all of the programs in the region. Furthermore, business leaders may be more inclined to participate if they feel their participation has a tangible impact and allowed their direct input into the development and implementation of work-based programs. Rather than participating only on a local or county level, businesses would expand their impact throughout the region.

A regional business advisory council would also help to partially meet the state of Michigan's CTE program requirements. The Michigan Department of Education Program Advisory Committee Tool Kit for Secondary State-Approved Career and Technical Education Programs outlines the requirements of a local or regional meeting. Unfortunately, a regional meeting may only count as one of the two required annual advisory committee meetings; each program would still need to hold a local business advisory council meeting. The region could petition the state to allow for some flexibility regarding regional meetings as it is difficult for many CTE programs to secure the required business support. Furthermore, the I-69 Thumb Region Education Action Team should survey local business leaders to understand other ways in which business participation could be maximized. Likewise, the team could review literature regarding garnering business engagement and participation.

Replicating Programs Regionally

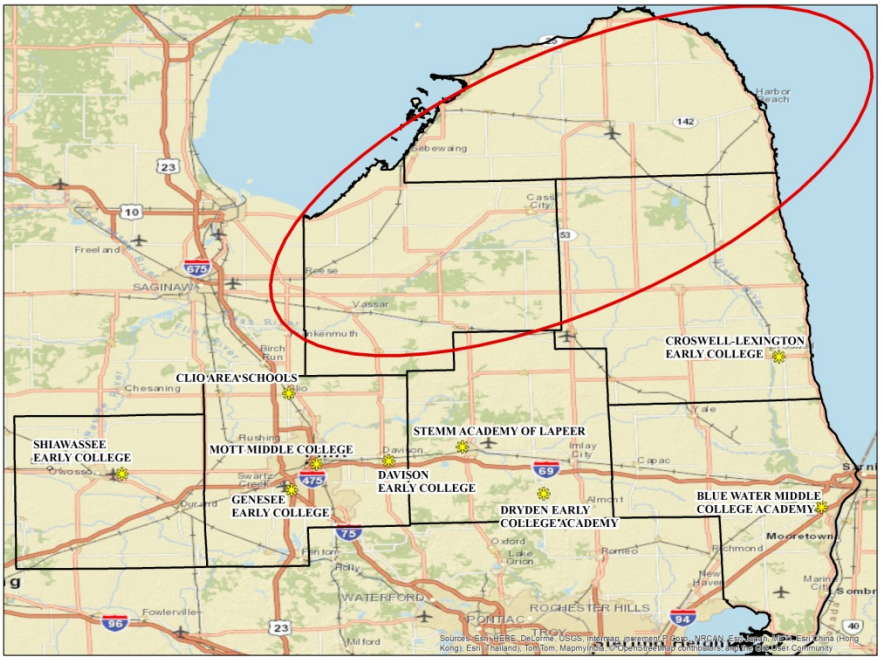
There are several programs occurring within some counties in the I-69 Thumb Region that are potentially suitable for replication across the region. One such program is an employer-based career, technical, and education (CTE) initiative currently operating in the St. Clair County Intermediate School

District (ISD), where students engage with employers in occupational training on heavy equipment operation, natural resources management, small engine repair, and heating, ventilation, and air conditioning (HVAC).

Another replicable program is the Croswell-Lexington Early College Program in Sanilac County. This program allows students to attend an additional year of high school, while completing college course work toward either an Associate of Arts or an Associate of Science degree. The interesting approach taken at Croswell-Lexington Early College is that instructors from St. Clair County Community College travel to the Croswell-Lexington local campus to teach courses. This arrangement circumvents the barriers of students traveling lengthy distances to community colleges and public transportation limitations.

While there are several examples of early and middle colleges in the region other than Croswell-Lexington, many of the other programs enjoy the benefit of proximity to a partnering community college (e.g. Genesee Early College/Mott Middle College near Mott Community College, and Blue Water Middle College Academy near St. Clair County Community College). An arrangement where instructors travel to the early and middle colleges could have a significant impact on the student population in the Thumb portion of the region, where no early and middle colleges currently exist (see Map KK1). The entirety of Huron and Tuscola counties do not have access to early/middle college programs. Similar arrangements could be implemented to provide these services to Tuscola and Huron counties. It is even possible that one program collectively offered by the Huron and Tuscola ISDs could service both counties, if issues of transportation could be resolved. Furthermore, Delta College in Bay City could serve as a partner to an early/middle college program in the Thumb area to minimize travel time and expense to the ISDs.

Map KK1: Location of Early/Middle College Programs



Regional Training Partnerships

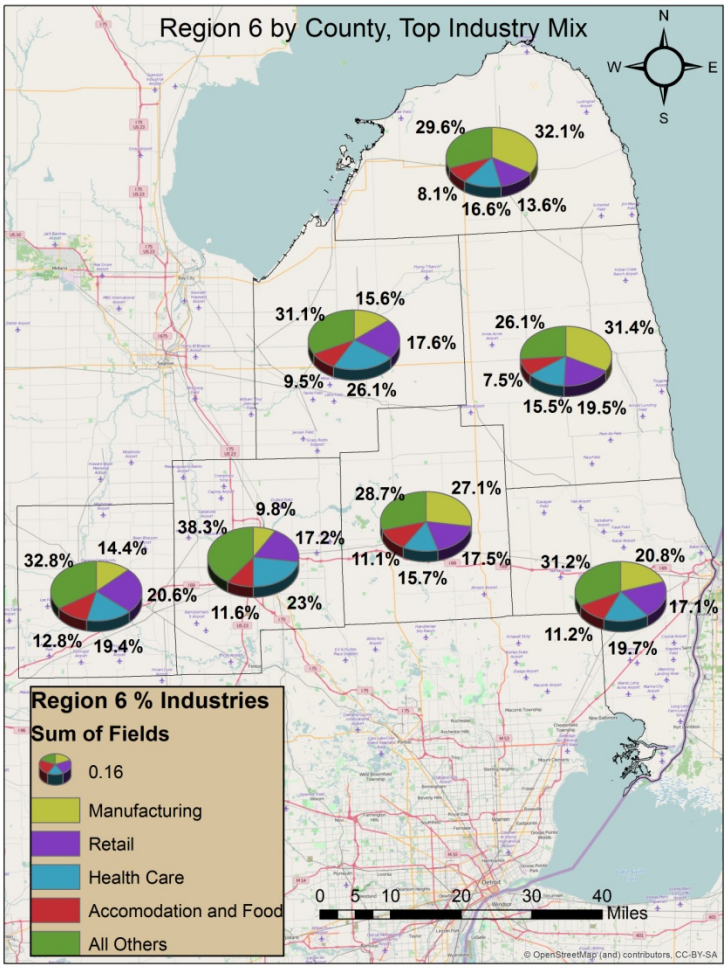
Some stakeholders encouraged expanding and sharing work-based programs across the region, with the region's ISDs partnering to provide programs in locations where these programs are not currently offered. For example, both Huron and Sanilac counties lack welding and machine tool programs, while Tuscola, Lapeer, and St. Clair counties offer both. Lapeer and St. Clair counties also offer robotics/mechatronics programs that are currently not available in other counties in the region. Lapeer County additionally offers unique programs in recreational vehicle repair and residential plumbing HVAC that are not offered elsewhere. Neighboring counties could access the equipment and technical expertise for these programs through cooperative agreements. The ability of the ISDs to work together to provide students with regional access to career, education, and technical training programs would assist the region's employers in fulfilling labor needs.

Appendix

The following items were not included in the body of the report but are important to understand the education and employment landscape of the region.

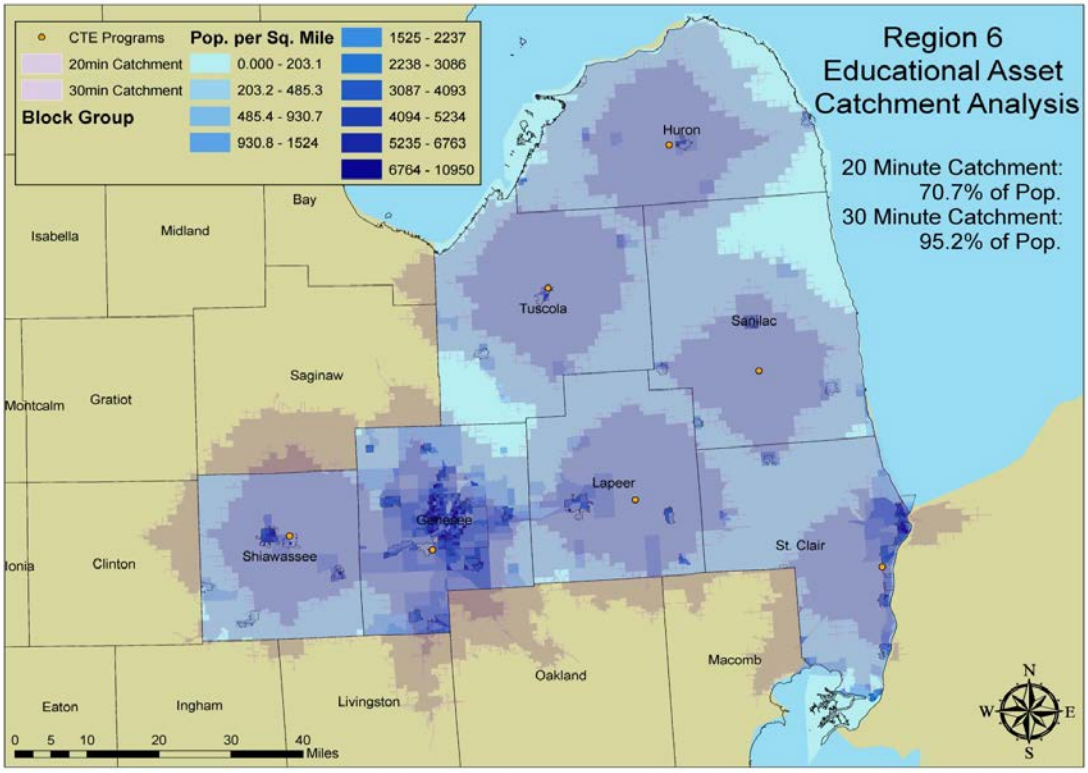
Appendix Map 1 displays the most prevalent industries in each county. The map also displays the percent of total employment by industry. Take note that the top four industries are the same in each county.

Appendix Map 1: Industry Mix by County

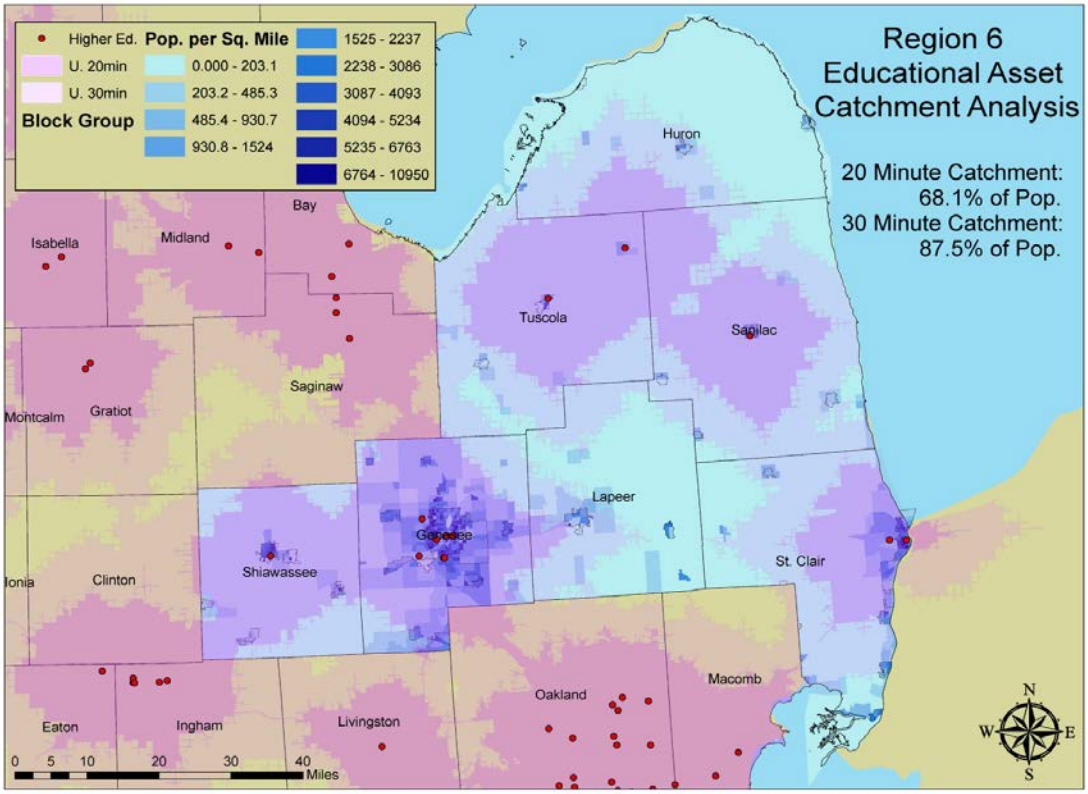


Appendix Map 2 and Appendix Map 3 show a catchment analysis for CTE and Higher Education programs. Twenty- and thirty-minute-drive-time catchment areas were generated for each location. The population by Census block was then tallied for each catchment area to determine the proportion of the population that fell within each catchment. Displayed on the map are the locations of the CTE programs and higher education campuses, the catchment areas, and an underlying map of population density by Census block group. The goal of this analysis was to determine areas of the region with limited availability of education services.

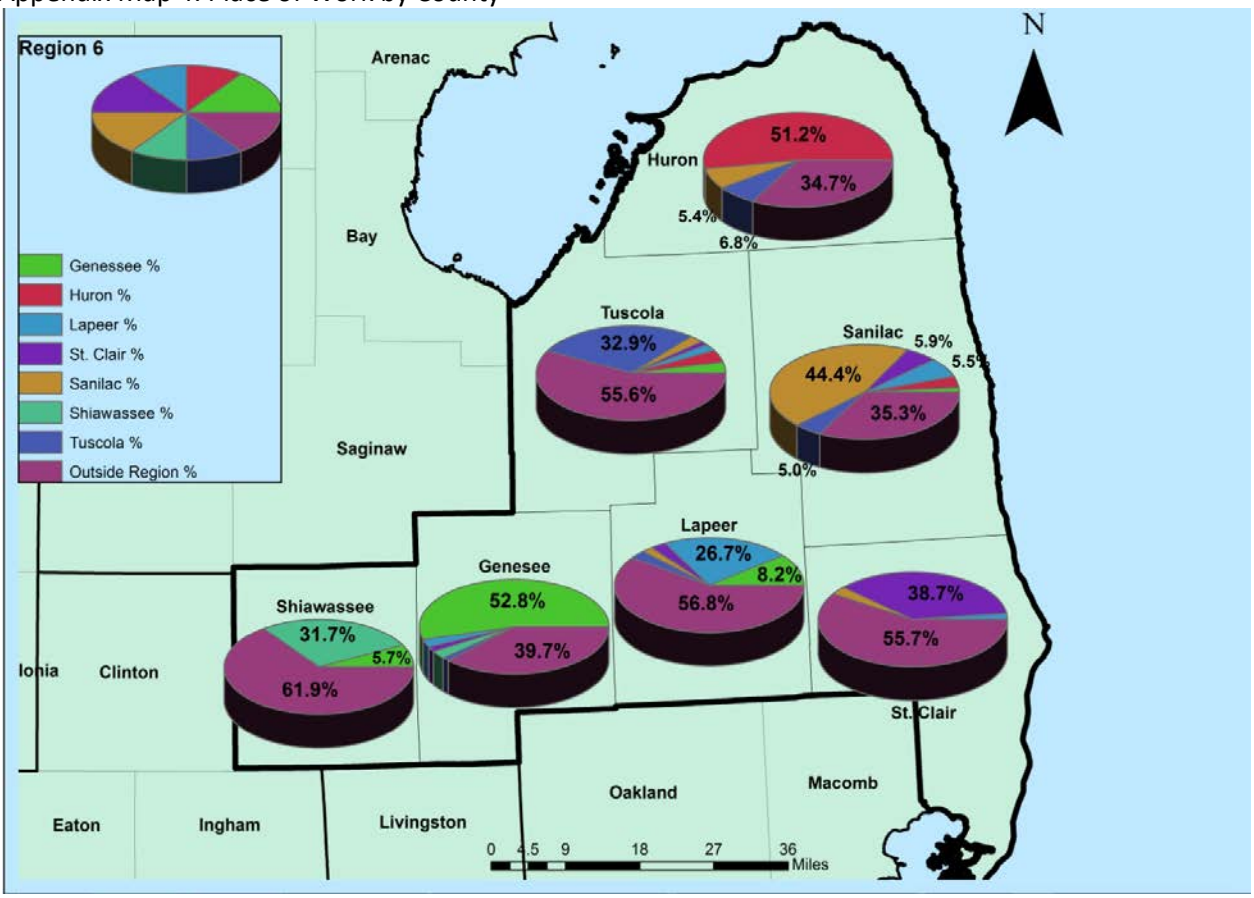
Appendix Map 2: Catchment Analysis for CTE Programs



Appendix Map 3: Catchment Analysis for Higher Education

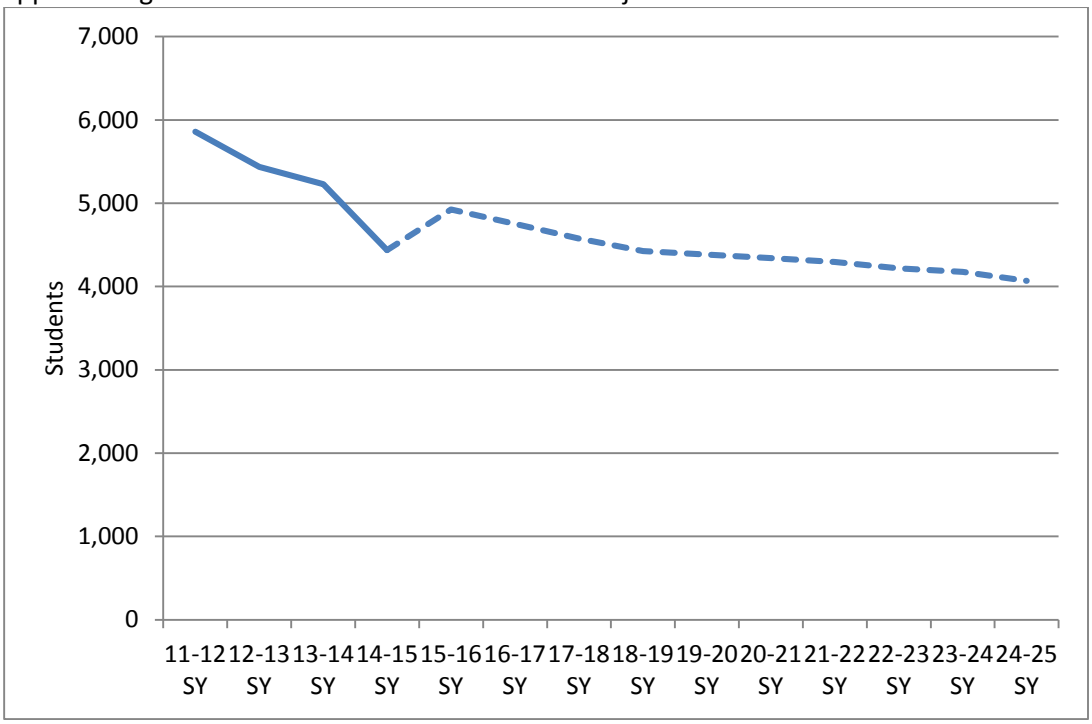


Appendix Map 4: Place of Work by County



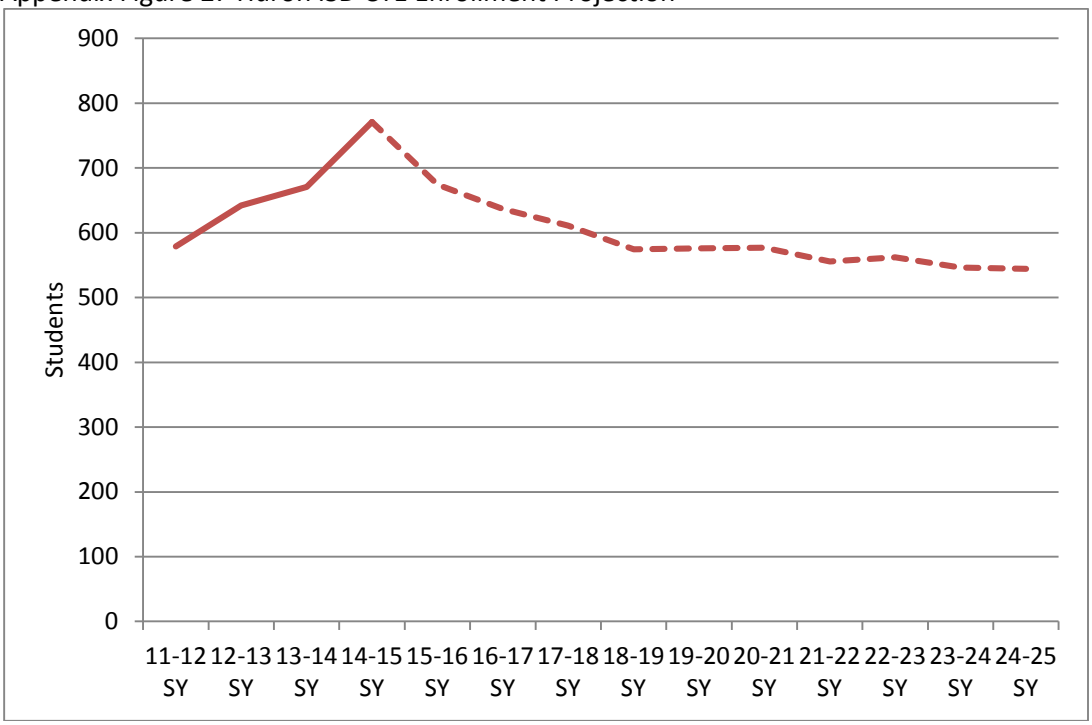
Appendix Figures 1 through 6 display career and technical education (CTE) enrollment projections. The CTE enrollment projections are based on an enrollment projection for each ISD and a three-year average of CTE enrollment by grade as a percent of overall grade enrollment. Actual enrollment is shown as the solid line and the projected enrollment is dashed. This methodology holds CTE enrollment as a percent of overall enrollment constant, meaning that increases or decreases in CTE enrollment are due to overall enrollment changes. Note that the Huron County ISD is the only projected area to dramatically reverse course. The reversal is due to enrollment as a percent of students increasing in the last three years while overall enrollment is projected to slip.

Appendix Figure 1: Genesee ISD CTE Enrollment Projection



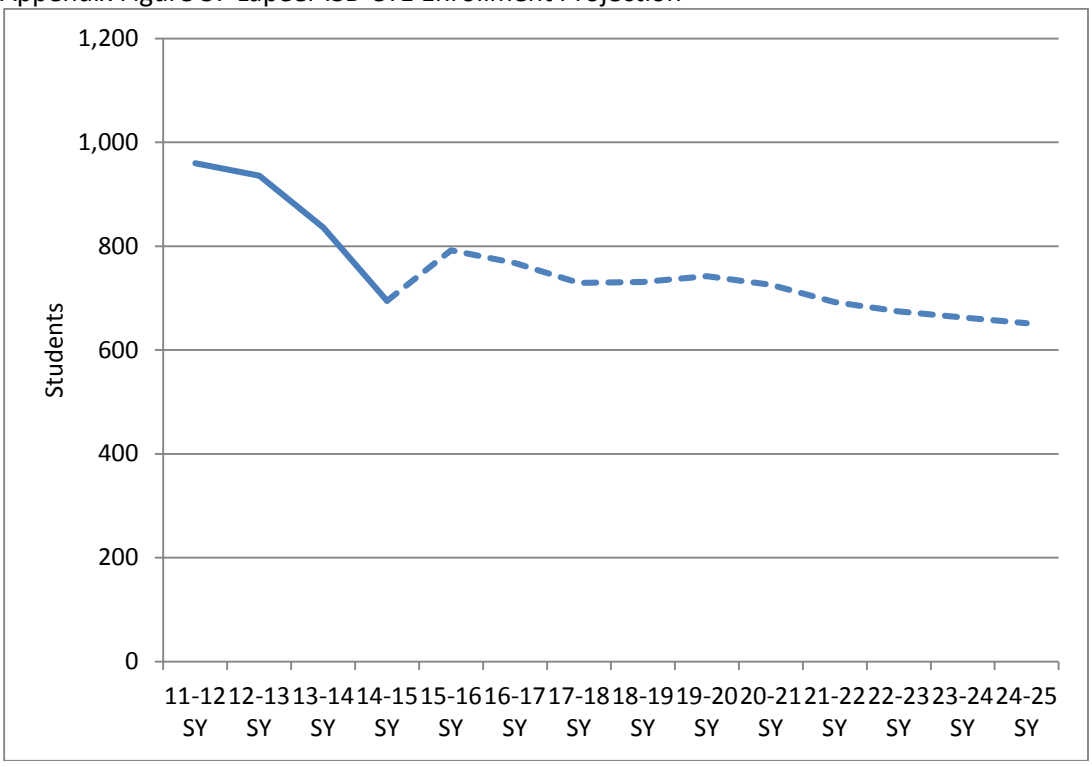
Source: MI School Data and Career and Technical Education Information Reports

Appendix Figure 2: Huron ISD CTE Enrollment Projection



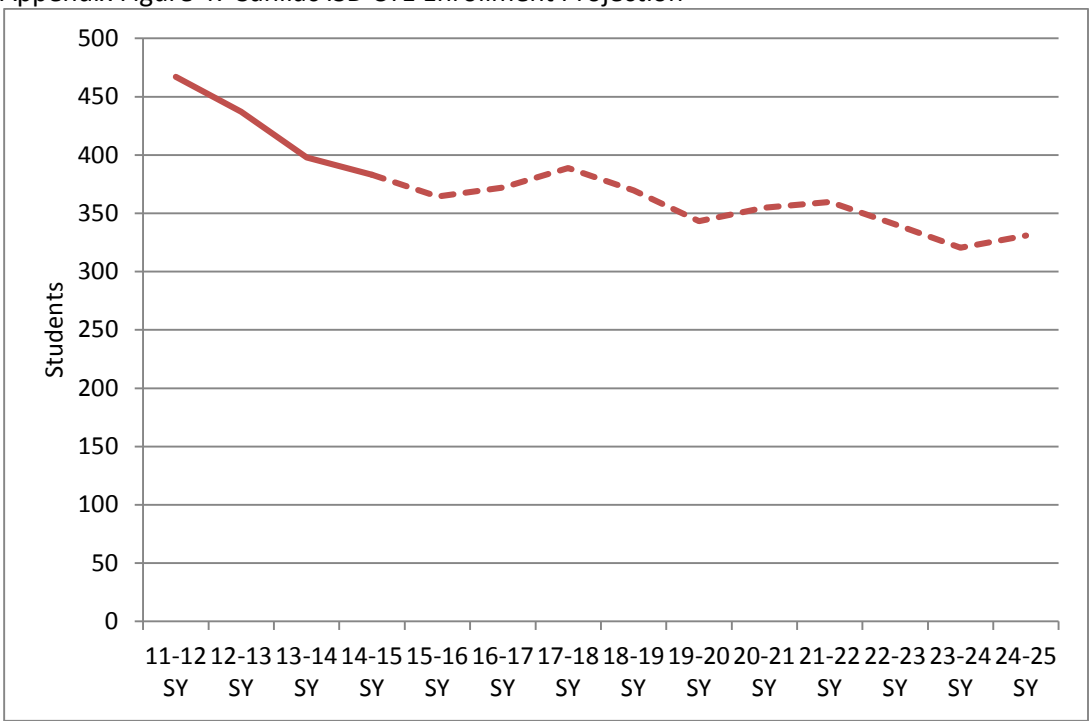
Source: MI School Data and Career and Technical Education Information Reports

Appendix Figure 3: Lapeer ISD CTE Enrollment Projection



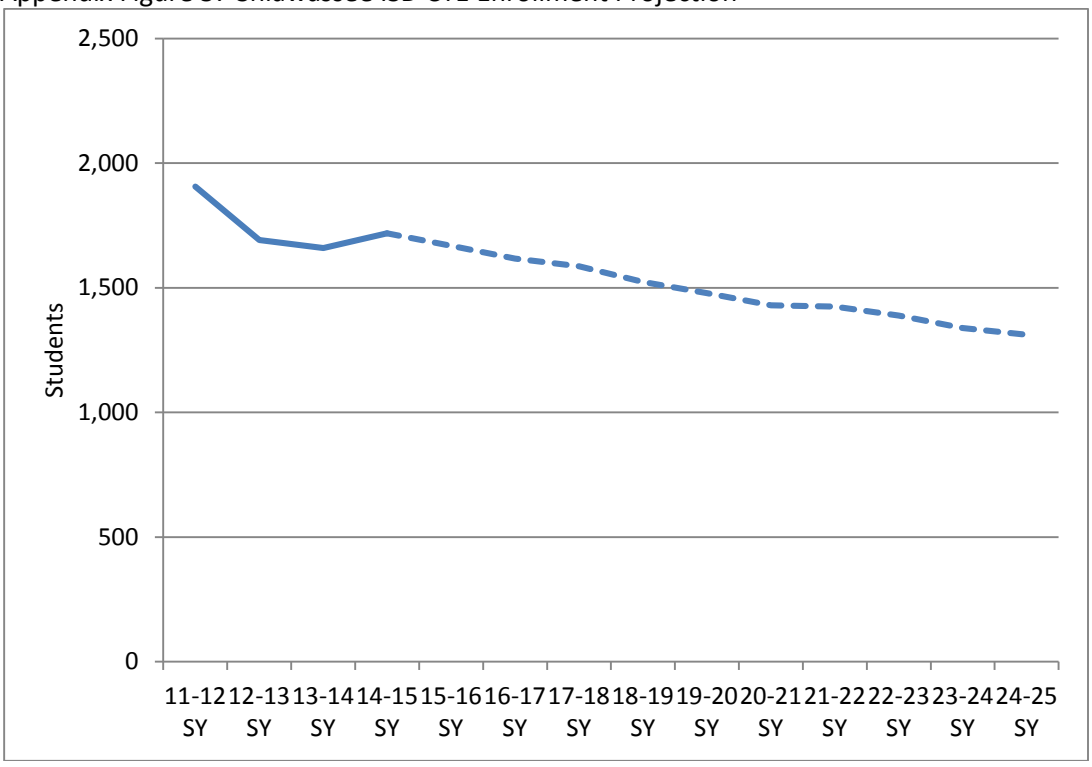
Source: MI School Data and Career and Technical Education Information Reports

Appendix Figure 4: Sanilac ISD CTE Enrollment Projection



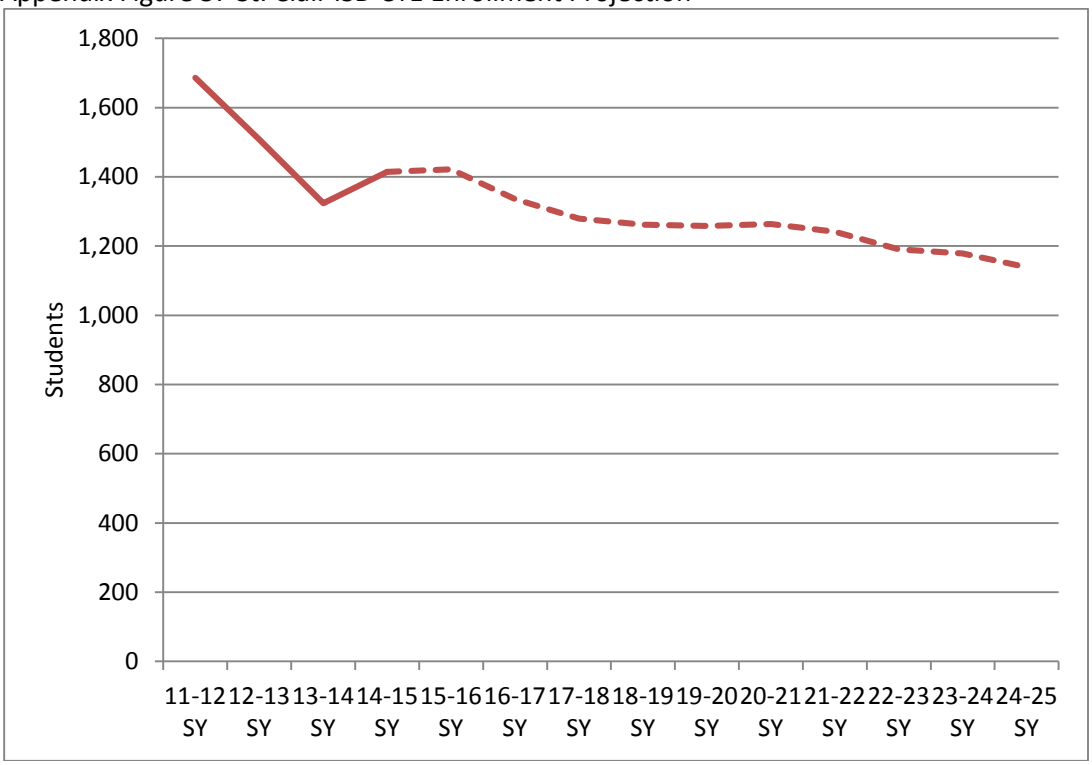
Source: MI School Data and Career and Technical Education Information Reports

Appendix Figure 5: Shiawassee ISD CTE Enrollment Projection



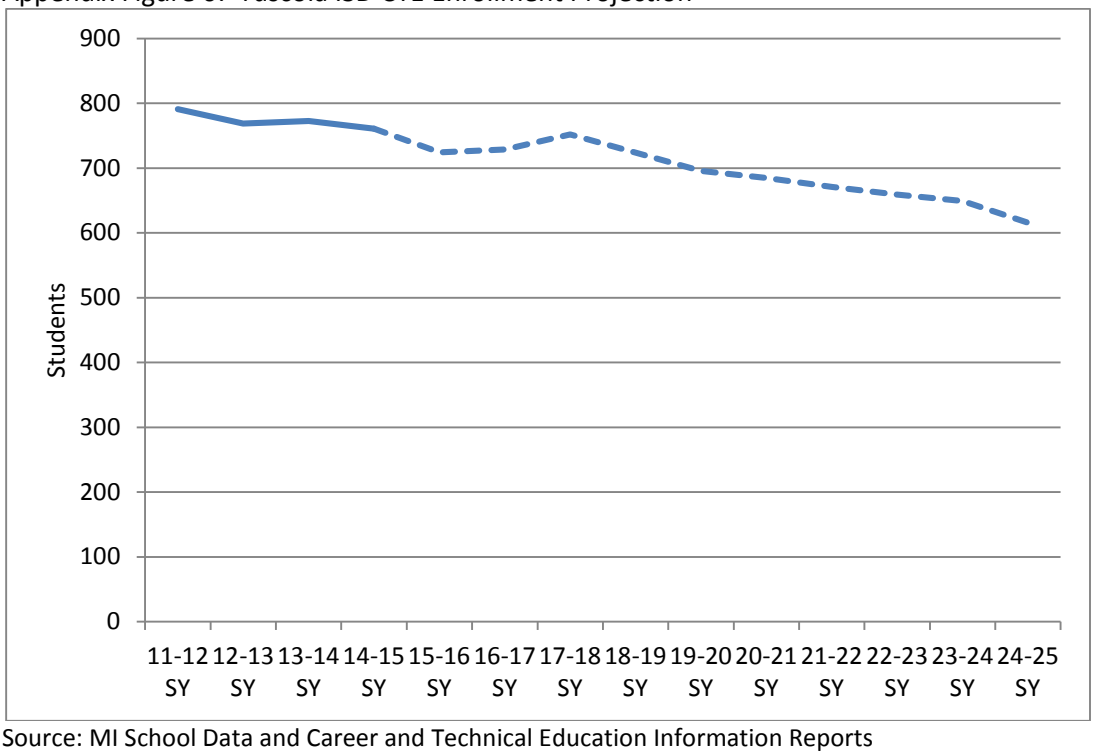
Source: MI School Data and Career and Technical Education Information Reports

Appendix Figure 5: St. Clair ISD CTE Enrollment Projection



Source: MI School Data and Career and Technical Education Information Reports

Appendix Figure 6: Tuscola ISD CTE Enrollment Projection



Source: MI School Data and Career and Technical Education Information Reports