

CONNECTED AND AUTOMATED VEHICLE Workforce Training Guide

Hillsdale, Jackson, Lenawee, Livingston, and Washtenaw Counties

In partnership with



A Letter from the Director



Bill Sleight

The automotive industry in the midst of a huge transition and with the American Center for Mobility located right in our backyard in Ypsilanti, our region is at the center of that transition. The cars we drive today already have more computing power than the spaceships that went to the moon. The autonomous cars that will drive us tomorrow will be infinitely more complex. What impact will these changes have on our jobs and our workers? How do we prepare today's workers for these changes? How do we prepare the next generation to have the skills and knowledge they will need to succeed? These are some of the questions we hope to address in the Connected and Automated Vehicle Workforce Training Guide.

The Michigan Works! Southeast Workforce Development Board commissioned this study as part of its role as a local workforce leader. We asked the research team at the Workforce Intelligence Network to analyze this emerging industry and to prepare a document that will give students, educators, counselors, parents and career seekers the information they need to make better decisions.

The Guide highlights the many career pathways that will provide tens of thousands employment opportunities in Hillsdale, Jackson, Lenawee, Livingston and Washtenaw Counties. Readers will gain a better understanding of the demand for CAV related jobs, the skills and training required and the earnings potential of the jobs. They will see the companies currently recruiting for these jobs and they will also learn about the over 80 training programs currently available at all levels of education.

Thank you to our partners at the Workforce Intelligence Network, Jackson College and Washtenaw Community College, who made this report possible. It is our hope that you find this guide informative and helpful to your understanding of the workforce requirements of this industry. We also hope that it will spur additional discussion and actions that will ensure our region continues to be a leader for the connected and automated vehicle industry.

For more information on this report, please visit our website at <https://www.mwse.org/autonomous-vehicles/> or send an email to nbell@mwse.org.

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INTRODUCTION: CAV WORKFORCE TRAINING

Connected and automated vehicle (CAV) manufacturing presents an opportunity to both create new jobs and upskill the existing workforce. Given the high number of training providers in southeast Michigan, the region is poised to make the most of this opportunity. For 49 CAV-related occupations, this guide will provide information on the necessary knowledge, skills, and abilities jobseekers need to succeed in the growing industry.

CAV is the new frontier of transportation for personal vehicles, public transportation, and first responders. Not only will CAV make roadways and travel more efficient but it will also increase the safety of roads for drivers and pedestrians alike. CAV development is happening all over the nation. Thus, this analysis includes data for the entire United States.

Necessary occupations for CAV development include software developers and other computer scientists developing the code for vehicles to communicate with each other and with surrounding infrastructure; engineers and skilled trade workers designing and building the vehicles; cybersecurity workers developing safe systems for CAV and infrastructure to work safely; quality control ensuring vehicle safety; and civil engineers and planners developing new systems to make CAV most useful and efficient on roadways. The implications and possibilities for CAV are endless with many stakeholders involved in the processes.



projected jobs related to
CAVs in the region



7% projected growth over all
occupations, up to nearly **30%**



Bachelor's
or other degree preferred



Most occupations
offer **\$30** hourly
or more

Occupations Related to CAV

There are a wide variety of skillsets needed in the creation of connected and automated vehicles, ranging from production and assembly to data science. As such, the unique training needs for each stage are best discussed by occupation groups. Each group has a section detailing the preferred skills, job growth, and current workforce needs.

- **Vehicle Design and Testing** encompasses engineers involved in the ongoing research, design, and testing of CAV projects. These may include electrical engineers, mechanical engineers, and commercial and industrial designers spearheading the early development and design of vehicles, aftermarket devices, and connected infrastructure. See page 4 for details.
- **Vehicle Manufacturing** positions already exist at original equipment manufacturers (OEMs), but may require further specialization for CAVs in order for workers to understand new equipment and processes involved in manufacturing an automated vehicle. Workers in this group include industrial engineers, mechatronics and robotics engineers, and team assemblers who are already critical throughout the vehicle manufacturing process. See page 10 for details.
- **Vehicle IT Design** workers develop hardware and write software used in CAVs. Hardware may include that for created fully automated vehicles as well as after-market devices designed to retrofit the existing fleet, while the software developed governs the automation of the vehicles, with an eye toward safety. See page 16 for details.
- **Quality Control** is a small but integral group including quality control systems managers, quality control analysts, and inspectors and testers. Positions for these types of workers already exist at vehicle manufacturers, yet may require upskilling to work on connected and automated vehicle projects. See page 21 for details.
- **Data Management and Cybersecurity** includes data warehousing specialists, information security analysts, and other computer- and network-related occupations. They ensure that data being collected and communicated by connected infrastructure and automated vehicles is protected, a major concern for both owners of the new data as well as private individuals concerned for their physical safety and privacy while data is collected on their travel behavior. See page 25 for details.
- **Intelligent Transportation Systems and Infrastructure Design** workers include telecommunications specialists and civil engineers will also work closely with transportation planners and engineers and traffic technicians within this group to inform decision making on connected infrastructure and traffic management. Therefore, workers in this group may work for state and local departments of transportation or private consulting firms. See page 32 for details.

80+

types of programs
available

18

CAV training providers

Regional Training Providers

Several institutions currently offer training opportunities for occupations related to CAV. A full directory of contact information is on page 38, and specific programs are detailed within relevant occupation groups. Institutions are indicative of data available on the Integrated Postsecondary Education Data System (IPEDS) database as well as the MI Talent Connect Portal.

With so many opportunities for training and such a breadth of occupations, jobseekers can seek out an excellent fit. Associate's degrees and short-term credentials are widely available for Information Technology and Engineering Technician positions, while bachelor's programs are available for those occupations as well as Engineers and Designers and Business fields. For skilled trades occupations, credentials are offered at some community colleges, as well as specialized trainings through proprietary institutions and apprenticeship openings.



VEHICLE DESIGN AND TESTING

The connected and automated Vehicle Design and Testing group employs many engineers involved in the ongoing research, design, and testing of CAV projects. The group includes many types of engineers, including electrical engineers, mechanical engineers, and commercial and industrial designers. Each of these occupations has a hand in the early development and design of vehicles, aftermarket devices, and connected infrastructure.

In general, there are two interesting patterns for this occupation group: first, for most occupations, there are more completions than openings. This is most likely due to the high number of training providers and opportunities in the region, and may increase emphasis on building skills for these high-demand jobs. Second, the highest rates of growth in the group (often over 15 percent) are projected for jobs open to those with an Associate's degree.



417

annual openings,
5,667 jobs predicted in 2027

Projected growth: **↑ 8%**



Bachelor's or Associate's

required for entry (high growth,
high wages, no experience)



Mechanical Engineers, top
job. **3,000** projected jobs,
500 completions



TOP EARNER:
Electronics Engineers

Vehicle Design and Testing Employers and Job Titles





Occupation codes and educational programs may not appear to line up perfectly with job openings, though the functions are the same. For example, in connected and automated Vehicle production, many emerging jobs are in engineering and software areas that do not yet have O*NET codes. Design Engineer, the top job title for this group, does not have its own O*NET designation. For individuals whose job profiles match up with Design and Testing occupations, the companies doing the most hiring and the actual job titles are listed below. Individuals seeking work in this field may consider advertisements such as the following:

Company	Profiles	%	Job Title	Profiles	%
Ford Motor Company	213	5.47	Design Engineer	387	9.94
General Motors Company	128	3.29	Mechanical Engineer	350	8.99
University of Michigan	95	2.44	Controls Engineer	160	4.11
CMS Energy Corporation	83	2.13	Engineering Intern	124	3.18
Tenneco Inc.	59	1.52	Engineering Technician	97	2.49
Advanced Technology, Inc.	47	1.21	Electrical Engineer	85	2.18
Black & Veatch Corporation	45	1.16	Product Engineer	85	2.18
Commonwealth Associates, Inc.	38	0.98	Computer Aided Design (CAD) Designer	77	1.98
FCA US LLC	33	0.85	Electronics Technician	75	1.93
Chrysler	32	0.82	Project Engineer	75	1.93
Toyota Motor Corporation	32	0.82	Research Engineer	74	1.90
DTE Energy Company	28	0.72	Chief Engineer	73	1.87
Toyota Technical Center	27	0.69	Systems Engineer	73	1.87
FIAT Chrysler Automobiles N.V.	24	0.62	Electrical Test Engineer	71	1.82
Roush Industries, Inc.	24	0.62	Engineering Technologist	66	1.69




Vehicle Design and Testing Occupation Descriptions

ELECTRICAL ENGINEERS (17-2071.00)

Research, design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use.





-  64 annual openings
-  9% growth projected by 2027, 924 jobs expected
-  \$42.85 median hourly earnings; range \$25.81-\$60.28
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, CAD, development environment software
-  **Knowledge Areas:** Engineering and technology, computers and electronics, design
-  **Workplace:** Active listening, complex problem solving/ critical thinking, reading/ writing/ English

ELECTRONICS ENGINEERS, EXCEPT COMPUTER (17-2072.00)

Research, design, develop, or test electronic components and systems for commercial, industrial, military, or scientific use employing knowledge of electronic theory and materials properties. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls.





-  24 annual openings
-  5% growth projected by 2027, 354 jobs expected
-  \$47.92 median hourly earnings; range \$32.88-\$69.84
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, CAD, database UI and query software
-  **Knowledge Areas:** Engineering and technology, computers and electronics, design
-  **Workplace:** Complex problem solving/ critical thinking, reading/ speaking/ English, systems analysis

MATERIALS ENGINEERS (17-2131.00)

Evaluate materials and develop machinery and processes to manufacture materials for use in products that must meet specialized design and performance specifications. Develop new uses for known materials. Includes those engineers working with composite materials or specializing in one type of material, such as graphite, metal and metal alloys, ceramics and glass, plastics and polymers, and naturally occurring materials. Includes metallurgists and metallurgical engineers, ceramic engineers, and welding engineers.





-  9 annual openings
-  8% growth projected by 2027, 111 jobs expected
-  \$36.14 median hourly earnings; range \$22.84-\$54.63
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, CAD, Computer-aided manufacturing (CAM)
-  **Knowledge Areas:** Engineering and technology, chemistry, mathematics
-  **Workplace:** Critical thinking, reading/ writing, complex problem solving

MECHANICAL ENGINEERS (17-2141.00)

Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of equipment such as centralized heat, gas, water, and steam systems.





-  202 annual openings
-  7% growth projected by 2027, 3,011 jobs expected
-  \$39.63 median hourly earnings; range \$26.74-\$58.11
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, CAD, industrial control software
-  **Knowledge Areas:** Engineering and technology, design, production, and processing
-  **Workplace:** Active listening, critical thinking, systems evaluation

MECHANICAL DRAFTERS (17-3013.00)

Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.





-  14 annual openings
-  Short-term stability expected; 164 jobs projected in 2027
-  \$25.70 median hourly earnings; range \$15.43-\$36.92
-  Associate's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** CAD, Computer-aided manufacturing (CAM), enterprise application integration software
-  **Knowledge Areas:** Design, engineering and technology, mechanical
-  **Workplace:** Active learning, critical thinking, coordination

ELECTRICAL AND ELECTRONIC ENGINEERING TECHNICIANS (17-3023.00)




Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. The occupation is divided into sub-occupations, with descriptions and preferred skills below.

-  24 annual openings
-  17% growth projected by 2027, 258 jobs expected
-  \$26.09 median hourly earnings; range \$14.42-\$39.14
-  Associate's degree preferred for entry, no experience ok

Electronics Engineering Technicians (17-3023.01)

Lay out, build, test, troubleshoot, repair, and modify developmental and production electronic components, parts, equipment, and systems, such as computer equipment, missile control instrumentation, electron tubes, test equipment, and machine tool numerical controls, applying principles and theories of electronics, electrical circuitry, engineering mathematics, electronic and electrical testing, and physics. Usually work under direction of engineering staff.




The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Analytical or scientific software, CAD, database UI and query software
-  **Knowledge Areas:** Engineering and technology, computers and electronics, design
-  **Workplace:** Complex problem solving/ critical thinking, reading/ speaking/ English, systems analysis

Electrical Engineering Technicians (17-3023.03)





Test or modify developmental or operational electrical machinery or electrical control equipment and circuitry in industrial or commercial plants or laboratories. Usually work under direction of engineers or technologists.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, CAD, database UI and query software
-  **Knowledge Areas:** Engineering and technology, computers and electronics, design
-  **Workplace:** Reading comprehension, complex problem solving, active listening

MECHANICAL ENGINEERING TECHNICIANS (17-3027.00)

Apply theory and principles of mechanical engineering to modify, develop, test, or calibrate machinery and equipment under direction of engineering staff or physical scientists.





-  28 annual openings
-  6% growth projected by 2027, 307 jobs expected
-  \$24.88 median hourly earnings; range \$12.68-\$31.67
-  Associate's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, CAD, industrial control software
-  **Knowledge Areas:** Computers and electronics, mathematics, production, and processing
-  **Workplace:** Critical thinking, reading comprehension, operation monitoring

ENGINEERING TECHNICIANS, EXCEPT DRAFTERS, ALL OTHER (17-3029.00)

All engineering technicians, except drafters, not listed separately. Includes: Non-destructive Testing Specialists (17-3029.01), Electrical Engineering Technologists (17-3029.02), Electromechanical Engineering Technologists (17-3029.03), Electronics Engineering Technologists (17-3029.04), Industrial Engineering Technologists (17-3029.05), Manufacturing Engineering Technologists (17-3029.06), Mechanical Engineering Technologists (17-3029.07), Photonics Technicians (17-3029.08), Manufacturing Production Technicians (17-3029.09), Fuel Cell Technicians (17-3029.10), Nanotechnology Engineering Technologists (17-3029.11), and Nanotechnology Engineering Technicians (17-3029.12).





-  20 annual openings
-  16% growth projected by 2027, 215 jobs expected
-  \$26.69 median hourly earnings; range \$15.45-\$38.96
-  Associate's degree preferred for entry, no experience ok

The top skills needed in this occupation, for electrical engineering technologists, defined by O*NET, include:




-  **Technology:** CAD, development environment software, object or component oriented development software
-  **Knowledge Areas:** Engineering and technology, computers and electronics, administration and management
-  **Workplace:** Critical thinking, active listening, monitoring

COMMERCIAL AND INDUSTRIAL DESIGNERS (27-1021.00)

Develop and design manufactured products, such as cars, home appliances, and children's toys. Combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design.

-  32 annual openings
-  7% growth projected by 2027, 324 jobs expected
-  \$33.19 median hourly earnings; range \$20.61-\$46.33
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** CAD, CAM, desktop publishing software
-  **Knowledge Areas:** Design, engineering and technology, production, and processing
-  **Workplace:** Complex problem solving/ critical thinking, reading comprehension, speaking

Workforce Insight

Snapshot of Current Design and Testing Employee Skills: Beyond Engineering

In addition to the occupation-specific requirements, below are data displaying the skill proficiencies and academic programs listed among the job profiles of individuals working in all designated Vehicle Design and Testing occupations, contrasted to the specified O*NET information above. X, Y, and Z providers offer the top listed programs for these occupations. For Design and Testing Occupations, employers are hiring individuals with software proficiency with programs like AutoCAD and MATLAB, in combination with the ability to manage projects and conduct independent research.

- 25% of current employees list management skills, leadership, and operations also popular (reflected in degrees—soft + hard skills)
- Computer-Aided design skills and software in nearly half of profiles
- Most of top 15 programs are engineering disciplines, but business administration and operations third most popular

Related Training Programs

Below are the specific training programs available for Design and Testing occupations in the region, with nearly 1,000 total completions in 2016. This list provides a starting point, yet may not be all-inclusive. The data here is reported to IPEDS and Pure Michigan Talent Connect and may exclude some training programs.

Program	Institution(s)	Completions (2016)
Mechanical Engineering	UM	508
Electrical and Electronics Engineering	Siena Heights, UM	280
Materials Engineering	Monroe CCC, UM	108
Electrical, Electronics and Communications Engineering, Other	UM	80
Mechanical Engineering/Mechanical Technology/Technician	EMU, Monroe CCC, Siena Heights, WCC	31
Electrical, Electronic and Communications Engineering Technology/Technician	Jackson College, Monroe CCC, Siena Heights, Baker College, EMU	27
Commercial and Advertising Art	Baker College, Siena Heights, UM, WCC	27
Manufacturing Engineering Technology/Technician	EMU, Jackson College, Monroe CCC, WCC	22
Computer Technology/Computer Systems Technology	WCC	17
Engineering Technology	EMU, Monroe CCC, Siena Heights	10
Computer Engineering Technology/Technician	Baker College, EMU, Siena Heights, WCC	10
Engineering Technologies and Engineering-Related Fields, Other	EMU, Monroe CCC, Siena Heights	8
Plastics and Polymer Engineering Technology/Technician	EMU, Siena Heights	7
Hydraulics and Fluid Power Technology/Technician	Siena Heights, WCC	6
Mechanical Drafting and Mechanical Drafting CAD/CADD	Baker College, EMU, Monroe CCC, Siena Heights	6
Industrial and Product Design	Jackson College, UM	5
Design and Visual Communications	Spring Arbor, UM	3



VEHICLE MANUFACTURING

The occupations analyzed in the connected and automated Vehicle Manufacturing group are positions that already exist at original equipment manufacturers (OEMs). Workers in this group include industrial engineers, mechatronics and robotics engineers, and team assemblers – workers needed generally throughout the vehicle manufacturing process. Additional training of existing employees may be necessary in order for workers to understand new equipment and processes involved in manufacturing an automated vehicle.

For Vehicle Manufacturing positions, occupations can be divided into engineering positions, which require a bachelor's degree, and skilled trades and assembly positions, which prefer an apprenticeship or other work-based training after high school. Though not divided along the same lines, occupations also either show continued hiring but no major growth in the next ten years, or show above-average growth between 9 and 13 percent. All occupations have openings for entry-level applicants.



For all
Manufacturing group,

1,673
annual openings



Health and Safety Engineers, Electricians
above average job growth



Occupations require either a **bachelor's or high school diploma** with an **apprenticeship or on-the-job training**



TOP JOB:

Team Assemblers, 1,215
annual openings



Engineering positions median
hourly earnings: **\$39**

Vehicle Manufacturing Employers and Job Titles





Occupation codes and educational programs may not appear to line up perfectly with job openings, though the functions are the same. For example, in connected and automated vehicle production, many emerging jobs are in engineering and software areas that do not yet have O*NET codes, such as project engineer. For individuals whose job profiles match up with Vehicle Manufacturing occupations, the companies doing the most hiring and the actual job titles are listed below. Individuals seeking work in this field may consider advertisements such as the following:

Company	Profiles	%	Job Title	Profiles	%
General Motors Company	8	8.16	Mechanical Engineer	7	7.14
Ford Motor Company	7	7.14	Project Engineer	6	6.12
Toyota Motor Corporation	5	5.10	Quality Assurance Engineer	6	6.12
Chrysler	4	4.08	Design Engineer	5	5.10
FCA US LLC	3	3.06	Quality Engineer	5	5.10
Tenneco Inc.	3	3.06	Validation Engineer	5	5.10
Crane 1 Services, Inc.	2	2.04	Engineering Co-op	4	4.08
Eberspaecher North America, Inc.	2	2.04	Industrial Engineer	4	4.08
FCA North America Holdings LLC	2	2.04	Planning Engineer	3	3.06
FIAT Chrysler Automobiles N.V.	2	2.04	Process Engineer	3	3.06
Hyundai America Technical Center, Inc.	2	2.04	Continuous Improvement Engineer	2	2.04
Nissan North America, Inc.	2	2.04	Cost Engineer	2	2.04
Olfa North America	2	2.04	Journeyman Electrician	2	2.04
Advantage	1	1.02	Performance Engineer	2	2.04
Ascentium Capital LLC	1	1.02	Quality Control Lead	2	2.04

Vehicle Manufacturing Occupation Descriptions

HEALTH AND SAFETY ENGINEERS, EXCEPT MINING SAFETY ENGINEERS AND INSPECTORS




Promote worksite or product safety by applying knowledge of industrial processes, mechanics, chemistry, psychology, and industrial health and safety laws. Includes industrial product safety engineers.

-  4 annual openings
-  Ten years: 13 percent projected job growth, 61 jobs expected by 2027
-  \$39.19 median hourly earnings; range \$26.25-\$61.33
-  Bachelor's degree preferred

Industrial Safety and Health Engineers (17-2111.01)





Plan, implement, and coordinate safety programs, requiring application of engineering principles and technology, to prevent or correct unsafe environmental working conditions.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Compliance software, Computer aided manufacturing (CAM) software, Computer based training software
-  **Knowledge Areas:** Engineering and technology, public safety and security, law and government
-  **Workplace:** Critical thinking, reading comprehension, speaking

INDUSTRIAL ENGINEERS (17-2112.00)





Design, develop, test, and evaluate integrated systems for managing industrial production processes, including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination.

-  222 annual openings
-  1% job decline projected, 3,198 jobs expected by 2027
-  \$39.06 median hourly earnings; range \$28.44-\$56.56
-  Bachelor's degree preferred

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Analytical or scientific software, compliance software, CAM
-  **Knowledge Areas:** Engineering and Technology, English Language, Public safety and security
-  **Workplace:** Critical thinking, speaking, complex problem solving




ENGINEERS, ALL OTHER (17-2199.00)

-  64 annual openings
-  10 percent projected job growth, 910 jobs expected by 2027
-  \$39.93 median hourly earnings; typical pay range \$22.86-\$58.37
-  Bachelor's degree preferred

Validation Engineers (17-2199.02)

Design or plan protocols for equipment or processes to produce products meeting internal and external purity, safety, and quality requirements.




The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Configuration management software, database management system software, development environment software
-  **Knowledge Areas:** Engineering and technology, production and processing, mathematics
-  **Workplace:** Active listening, science, critical thinking

Mechatronics Engineers (17-2199.05)

Research, design, develop, or test automation, intelligent systems, smart devices, or industrial systems control.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, CAD, CAM
-  **Knowledge Areas:** Engineering and technology, design, mechanical
-  **Workplace:** Judgment and decision making, active listening, complex problem solving



Robotics Engineers (17-2199.08)




Research, design, develop, or test robotic applications.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Application server software, CAD, Development environment software
-  **Knowledge Areas:** Engineering and technology, computers and electronics, design
-  **Workplace:** Critical thinking, reading comprehension, complex problem solving

ELECTRICIANS (47-2111.00)

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.





-  167 annual openings
-  9 percent projected job growth, 1,481 jobs expected by 2027
-  \$29.82 median hourly earnings; typical pay range \$15.78-\$39.86
-  High school diploma paired with apprenticeship preferred for entry

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Accounting software, CAD, database UI and query software
-  **Knowledge Areas:** Building and construction, mechanical, mathematics
-  **Workplace:** Critical thinking, reading comprehension, judgement and decision making

TEAM ASSEMBLERS (51-2092.00)

Work as part of a team having responsibility for assembling an entire product or component of a product. Team assemblers can perform all tasks conducted by the team in the assembly process and rotate through all or most of them rather than being assigned to a specific task on a permanent basis. May participate in making management decisions affecting the work. Includes team leaders who work as part of the team.

-  1,215 annual openings
-  Stable hiring predicted over next 10 years, 9,964 jobs expected in 2027
-  \$13.38 median hourly earnings; typical pay range \$9.09-\$21.50
-  High school diploma ok for entry with moderate on the job training

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** CAD software, Database UI and query software, enterprise resource planning software
-  **Knowledge Areas:** Production and processing
-  **Workplace:** Coordination, monitoring, quality control analysis



Workforce Insight

Snapshot of Current Vehicle Manufacturing Employee Credentials

In addition to the occupation-specific requirements, below are data displaying the skill proficiencies and academic programs listed among the job profiles of individuals working in all designated vehicle manufacturing occupations, in addition to the specified O*NET information above. Specific engineering programs are offered primarily at the University of Michigan, though general engineering and engineering technician programs are also available at Siena Heights and several community colleges. For manufacturing occupations, employers are hiring individuals with engineering knowledge paired with many specific manufacturing proficiencies, such as failure mode effects analysis, lean manufacturing, continuous improvement process, and operations

- Of the top 15 skills, management and leadership are important, and nine top skills are focused on manufacturing process and product improvement
- MATLAB and Microsoft Office are key software proficiencies
- Most of top 15 programs are engineering disciplines, but business administration and operations third most popular

Skill / Qualification	Profiles	%
Management	57	58.16
Failure Mode Effects Analysis	35	35.71
Lean Manufacturing	35	35.71
Continuous Improvement Process	34	34.69
Operations	30	30.61
Leadership	29	29.59
MATLAB	27	27.55
Six Sigma Methodology	27	27.55
FCA North America Holdings LLC	2	2.04
Microsoft Office	26	26.53
Business Process Improvement	25	25.51
Advanced Product Quality Planning	23	23.47
Production Part Approval Process	23	23.47
Prototype (Manufacturing)	23	23.47
Microsoft Excel	21	21.43
Research	21	21.43

Program	Profiles	%
Engineering	20	20.41
Mechanical Engineering	15	15.31
Business Administration, Management, and Operations	11	11.22
Engineering Technology	4	4.08
Manufacturing Engineering	3	3.06
Aerospace, Aeronautical and Astronautical Engineering	2	2.04
Chemical Engineering	2	2.04
Computer Engineering	2	2.04
Computer Software and Media Applications	1	1.02
Education	1	1.02
Civil Engineering	1	1.02
Industrial Engineering	1	1.02
Engineering-Related Fields	1	1.02
Liberal Arts and Sciences Studies, and Humanities	1	1.02
Mathematics	1	1.02

Related Training Programs

Below are the specific training programs available for Design and Testing occupations in the region, with about 600 total completions in 2016. This list provides a starting point, yet may not be all-inclusive. The data here is reported to IPEDS and Pure Michigan Talent Connect and may exclude some training programs.

Program	Institution(s)	Completions (2016)
Industrial Engineering	UM	305
Systems Engineering	UM	134
Environmental/Environmental Health Engineering	UM	43
Engineering, Other	UM, Siena Heights	23
Manufacturing Engineering Technology/Technician	Monroe CCC, WCC, Jackson College, EMU	22
Manufacturing Engineering	UM	15
Construction Engineering	UM	13
Engineering Physics/Applied Physics	UM, EMU	11
Geological/Geophysical Engineering	UM	7
Construction Trades	WCC	7
Mechatronics, Robotics, and Automation Engineering	UM	6
Engineering	Jackson College, WCC, UM, Siena Heights	4
Chemical and Biomolecular Engineering	UM	3
Electrician	Jackson College, Siena Heights	3
Engineering Science	Siena Heights, UM	2



VEHICLE IT DESIGN

Workers in the connected and automated Vehicle IT Design group are tasked with developing hardware and writing software for use in connected and automated vehicles. Computer hardware engineers working on connected and automated vehicle projects are developing hardware for fully automated vehicles as well as after-market devices designed to retrofit the existing fleet. Computer programmers and software developers write code that governs the automation of the vehicles, with an eye toward safety.

In general, there are two interesting patterns for this occupation group: first, for most occupations, there are more completions than openings. This is most likely due to the high number of training providers and opportunities in the region, and may increase emphasis on building skills for these high-demand jobs. Second, the highest rates of growth in the group (often over 10 percent) are projected for jobs open to those with an Bachelor's degree.



Computer User Support Specialists, top job,

**2,100 projected jobs,
150 completions**

Projected job growth for
occupation group: **↑ 15%**



Bachelor's
degree key for entry



TOP EARNER:
Computer Hardware Engineers

Vehicle IT Design Employers and Job Titles

Occupation codes and educational programs may not appear to line up perfectly with job openings, though the functions are the same. For example, in connected and automated vehicle production, many emerging jobs are in engineering and software areas that do not yet have O*NET codes. For individuals whose job profiles match up with IT Design occupations, the companies doing the most hiring and the actual job titles are listed below. Individuals seeking work in this field may consider advertisements such as the following:





Company	Profiles	%
General Motors Company	26	13.61
Ford Motor Company	11	5.76
Tenneco Inc.	7	3.66
Chrysler	4	4.08
University of Michigan	6	3.14
Bost North America LLC	5	2.62
FCA US LLC	4	2.09
FIAT Chrysler Automobiles N.V.	3	1.57
Toyota Motor Corporation	3	1.57
Toyota Motor Engineering & Manufacturing North America, Inc.	3	1.57
Voyomotive, LLC	3	1.57
Airborne Systems Inc	2	1.05
Bwi Group, Inc.	2	1.05
Chrysler	2	1.05
Magna Powertrain Inc	2	1.05
Thomson Reuters Corporation	2	1.05

Job Title	Profiles	%
Software Engineer	40	20.94
Design Engineer	18	9.42
Application Engineer	10	5.24
Systems Engineer	8	4.19
Integration Engineer	7	3.66
Application Developer	5	2.62
Calibration Engineer	4	2.09
Controls Engineer	4	2.09
Product Development Engineer	4	2.09
IT Support Analyst	3	1.57
Java Developer	3	1.57
Lead Engineer	3	1.57
Programmer	3	1.57
Project Engineer	3	1.57
Senior Electrical Engineer	3	1.57




Vehicle IT Design Occupation Descriptions

COMPUTER PROGRAMMERS (15-1131.00)

Create, modify, and test the code, forms, and script that allow computer applications to run. Work from specifications drawn up by software developers or other individuals. May assist software developers by analyzing user needs and designing software solutions. May develop and write computer programs to store, locate, and retrieve specific documents, data, and information.





-  33 annual openings
-  4% growth projected by 2027, 501 jobs expected
-  \$37.18 median hourly earnings; range \$19.80 - \$54.56
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Compiler and decompiler software, data base user interface (UI) and query software, enterprise application integration
-  **Knowledge Areas:** Computers and electronics, mathematics, customer and personal services
-  **Workplace:** Programming, complex problem solving/ critical thinking, reading/ writing/ English

SOFTWARE DEVELOPERS, APPLICATION (15-1132.00)

Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. May supervise computer programmers.





-  154 annual openings
-  22% growth projected by 2027, 2,032 jobs expected
-  \$42.07 median hourly earnings; range \$25.51-\$67.60
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** CAD, data base user interface (UI) and query software, development environment software
-  **Knowledge Areas:** Computers and electronics, design, engineering and technology
-  **Workplace:** Programming, system analysis/ evaluation, judgement and decision making

SOFTWARE DEVELOPERS, SYSTEMS SOFTWARE (15-1133.00)

Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. May design embedded systems software. Apply principles and techniques of computer science, engineering, and mathematical analysis.





-  119 annual openings
-  12% growth projected by 2027, 1,676 jobs expected
-  \$45.06 median hourly earnings; range \$29.38-\$65.29
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, data base user interface (UI) and query software, configuration management software
-  **Knowledge Areas:** Computers and electronics, design, engineering and technology
-  **Workplace:** Speaking, active listening, complex problem solving/ critical thinking

COMPUTER USER SUPPORT SPECIALISTS (15-1151.00)

Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, or via telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.





-  170 annual openings
-  13% growth projected by 2027, 2,137 jobs expected
-  \$21.61 median hourly earnings; range \$11.31-\$36.32
-  Some college preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Configuration management software, desktop communications software, object or component oriented development software
-  **Knowledge Areas:** Computers and electronics, engineering and technology, telecommunications
-  **Workplace:** Speaking, active listening, complex problem solving/ critical thinking

COMPUTER NETWORK SUPPORT SPECIALISTS (15-1152.00)

Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption.





-  36 annual openings
-  17% growth projected by 2027, 440 jobs expected
-  \$29.25 median hourly earnings; range \$16.52-\$48.96
-  Associate's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Backup or archival software, network monitoring software, transaction security and virus protection software
-  **Knowledge Areas:** Computers and electronics, engineering and technology, telecommunications
-  **Workplace:** System analysis, troubleshooting, complex problem solving/ critical thinking

COMPUTER HARDWARE ENGINEERS (17-2061.00)

Research, design, develop, or test computer or computer-related equipment for commercial, industrial, military, or scientific use. May supervise the manufacturing and installation of computer or computer-related equipment and components.

-  9 annual openings
-  14% growth projected by 2027, 123 jobs expected
-  \$46.14 median hourly earnings; range \$29.54-\$72.91
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Analytical or scientific software, CAD, graphic or photo imaging software
-  **Knowledge Areas:** Computers and electronics, engineering and technology, physics
-  **Workplace:** Operations analysis, active listening, complex problem solving/ critical thinking

Workforce Insight

Snapshot of Current IT Design Employee Credentials

In addition to the occupation-specific requirements, below are data displaying the skill proficiencies and academic programs listed among the job profiles of individuals working in all designated Information Technology Design occupations, contrasted to the specified O*NET information above. The top two listed programs for this occupation group are only obtainable from four-year institutions, though many other programs related to this occupation group are offered at community colleges in this region. For Information Technology Design Occupations, employers are hiring individuals with software proficiency with programs like C++ and MATLAB, in combination with the ability to manage projects and conduct independent research.

- 42% of current employees list management skills, leadership and research also popular
- MATLAB, C++, Simulink, and Java are among the top listed software proficiencies for vehicle-focused IT design occupations
- Most of top 15 programs are engineering and computer science disciplines, but business administration, management and operations third most popular

Related Training Programs

To suit the full range of occupations included in the IT Design group, training providers in the region offer a wide variety of computer science and information technology degrees and programs. This list provides a starting point, yet may not be all-inclusive. The data here is reported to IPEDS and Pure Michigan Talent Connect and may exclude some training programs. In 2016, there were over 500 completions in related programs throughout the region.

Program	Institution(s)	Completions (2016)
Information Science/Studies	UM, EMU, Siena Heights	218
Computer Engineering	UM	197
Management Information Systems	Monroe CCC, EMU, Spring Arbor University, Cleary University, Concordia, Baker	78
Computer Systems Networking and Telecommunications	WCC, Jackson College, Monroe CCC, Baker College	56
Computer Science	Monroe CCC, Siena Heights, EMU, Spring Arbor University, Baker College	47
Informatics	UM	46
Computer Programming, Specific Applications	WCC, Jackson College	45
Medical Informatics	UM	32
Computer Programming/Programmer	WCC, Monroe CCC, Siena Heights, Baker College, Cleary University	29
Computer Graphics	WCC	22
Bioinformatics	UM, EMU	22
Computer and Information Systems Security/Information Assurance	WCC, Monroe CCC, Jackson College, Baker College, EMU	12
Information Technology	WCC, Cleary University, Jackson College, Monroe CCC, Siena Heights	5
System, Networking, and LAN/WAN Management/Manager	Monroe CCC	4



QUALITY CONTROL

The Quality Control group is a small one made up of quality control systems managers, quality control analysts, and inspectors and testers. The workers employed in this group are integral to the vehicle manufacturing process. Positions for these types of workers already exist at vehicle manufacturers, however, some upskilling may be necessary for employees to work on connected and automated vehicle projects.

In the quality control occupation group, occupations with high education requirements typically have more regional completions than openings. This is likely due to the high number of post-secondary training providers and opportunities in the region, and may increase emphasis on building skills for these high-demand jobs. However, the same is not true for Quality Control analysts; though an Associate's is preferred, no programs are available. The group as a whole has opportunities across educational and experience levels for those with a keen eye for detail and software skills.



HS and AA degree openings available, BA leads to higher wage



Computer User Support Specialists, top job,

**2,100 projected jobs,
150 completions**

Projected job growth across occupation group: **↑ 6%**



**839 annual openings,
7,615 jobs projected
in 2027**



Career growth opportunity:

Industrial Production Managers need BA and 5+ years' experience, median hourly earnings \$52.83

Quality Control Employers and Job Titles

Occupation codes and educational programs may not appear to line up perfectly with job openings, though the functions are the same. For example, in connected and automated vehicle production, many emerging jobs are in engineering and software areas that do not yet have O*NET codes. For individuals whose job profiles match up with Quality Control occupations, the companies doing the most hiring and the actual job titles are listed below. Individuals seeking work in this field may consider advertisements such as the following:

Company	Profiles	%
Ford Motor Company	42	2.55
University of Michigan	28	1.70
General Motors Company	21	1.28
Pic Group, Inc.	20	1.22
Matrix Quality Services, Inc.	11	0.67
Johnson Controls, Inc.	10	0.61
Tenneco Inc.	10	0.61
Terumo Cardiovascular Systems Corporation	10	0.61
FCA North America Holdings LLC	2	2.04
CMS Energy Corporation	9	0.55
Centurion Medical Products Corporation	9	0.55
United States Dept of Treasury	9	0.55
Chrysler	8	0.49
DTE Energy Company	8	0.49
Dawn Food Products, Inc.	8	0.49
Eaton Corp.	8	0.49

Job Title	Profiles	%
Quality Inspector	261	15.86
Quality Manager	165	10.02
Quality Control Inspector	130	7.90
Quality Assurance Engineer	119	7.23
IT Quality Assurance Analyst	79	4.80
Quality Assurance (QA) Manager	72	4.37
Quality Control Manager	49	2.98
Quality Director	34	2.07
Quality Engineer	28	1.70
Parts Inspector	25	1.52
Quality Specialist	23	1.40
Quality Control Analyst	18	1.09
Regulatory Analyst	17	1.03
Regulatory Specialist	16	0.97
Director of Quality Assurance	13	0.79

Quality Control Occupation Descriptions




INDUSTRIAL PRODUCTION MANAGERS (11-3051.00)

-  92 annual openings
-  3% decline projected by 2027, 1,244 jobs expected
-  \$52.83 median hourly earnings; range \$31.35-\$87.67
-  Bachelor's degree and 5+ years' experience preferred

Quality Control Systems Managers (11-3051.01)





Plan, direct, or coordinate quality assurance programs. Formulate quality control policies and control quality of laboratory and production efforts.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, compliance software, content workflow software
-  **Knowledge Areas:** Administration and Management, Chemistry, Customer Service
-  **Workplace:** Reading Comprehension, Judgement and Decision Making, Monitoring

COMPLIANCE OFFICERS (13-1041.00)





Examine, evaluate, and investigate eligibility for or conformity with laws and regulations governing contract compliance of licenses and permits, and perform other compliance and enforcement inspection and analysis activities not classified elsewhere.

-  41 annual openings
-  14% growth projected by 2027, 475 jobs expected
-  \$30.65 median hourly earnings; range \$19.34-\$49.15
-  Bachelor's degree preferred, entry level openings available

Skill-specific data is not available across all Compliance Officer occupations. For this industry, data below is shown for Environmental Compliance Inspectors (13-1041.01), deemed most relevant to vehicle manufacturing. The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Analytical or scientific software, Database user interface and query software, map creation software
-  **Knowledge Areas:** English, law and government, computers and electronics
-  **Workplace:** Active listening, critical thinking, reading comprehension




LIFE, PHYSICAL AND SOCIAL SCIENCE TECHNICIANS, ALL OTHER (19-4099.00)

-  439 annual openings
-  6% growth projected by 2027, 3,724 jobs expected
-  \$14.43 median hourly earnings; range \$8.72-\$26.54
-  Associate's degree preferred, entry level openings available

Quality Control Analysts (19-4099.01)





Conduct tests to determine quality of raw materials, bulk intermediate and finished products. May conduct stability sample tests.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, content workflow software, document management software
-  **Knowledge Areas:** Chemistry, Mathematics, Production and Processing
-  **Workplace:** Quality control analysis, active listening, complex problem solving

INSPECTORS, TESTERS, SORTERS, SAMPLERS, AND WEIGHERS (51-9061.00)

Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.

-  267 annual openings
-  10% growth projected by 2027, 2,173 jobs expected
-  \$15.79 median hourly earnings; typical wage range \$9.97-\$27.18
-  Openings with high school diploma and entry-level experience

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Analytical or scientific software, computer aided design (CAD) software, enterprise resource planning (ERP) software
-  **Knowledge Areas:** Production and processing, mathematics, English
-  **Workplace:** Quality control analysis, active listening, critical thinking

Workforce Insight

Snapshot of Current Quality Control Employee Credentials

In addition to the occupation-specific requirements, below are data displaying the skill proficiencies and academic programs listed among the job profiles of individuals working in all designated quality control occupations, best compared with the specified O*NET information above. The top listed program in this group, Business Administration and Management, is offered by a wide variety of the region's institutions. To supplement quality assurance skills, employers are hiring individuals with management and customer service skills as well as extensive understanding of manufacturing processes. A wide range of postsecondary programs are represented, suggesting a focus on skillsets.

- 28% of current employees list management abilities, and 13% list leadership skills
- Continuous Improvement Process and Lean Manufacturing skills, among others, present in about 10% of profiles each
- Though Business Administration, Management, and Operations is the top program with 9% of profiles, responses ranging from Engineering or Psychology to Law are also represented.

Related Training Programs

Below are the specific training programs available for Quality Control occupations in the region, with around 2,300 total completions in 2016. This list provides a starting point, yet may not be all-inclusive. The data here is reported to IPEDS and Pure Michigan Talent Connect and may exclude some training programs. Notably, for this occupation group, a much wider range of educational backgrounds than is shown here may lead to a career in Quality Control.

Program	Institution(s)	Completions (2016)
Business Administration and Management	Adrian College, Baker College, Cleary University, Concordia, EMU, Jackson College, Monroe CCC, Siena Heights, Spring Arbor, UM, WCC	1,959
Public Policy Analysis	UM, EMU	179
Operations Management and Supervision	Spring Arbor	109
Business/Commerce	Monroe CCC, Baker College, EMU, Concordia, Cleary University, Adrian College	41
Quality Control Technology/Technician	Monroe CCC, Baker College, EMU	19



DATA MANAGEMENT AND CYBERSECURITY

Data Management and Cybersecurity is a large and important group for connected and automated vehicles occupations. The data warehousing specialists, information security analysts, and other computer- and network-related occupations in this group work on projects that protect data being collected and communicated by connected infrastructure and automated vehicles. Skills necessary for these occupations will be valuable to private owners of the new data as well as private individuals concerned for their physical safety and privacy as data is collected on their travel behavior.

Like the other occupation groups, a few interesting patterns were discovered for the Data Management and Cybersecurity group: first, there were more completions than openings for most occupations. This is most likely due to the high number of training providers and opportunities in the region, and may increase emphasis on building skills for these high-demand jobs. Second, most of the occupations are expected to witness an increase in jobs over the next ten years. However, the only occupation needing a only high school diploma or equivalent (Computer Operators) is expected to decline by 7 percent over the next ten years.

Projected growth: **↑ 14%**



Business Operations Specialists,
all other, top job.

**3,400 projected jobs,
12 completions**



**739 annual openings,
8,845 jobs predicted
in 2027**

Bachelor's

required for entry (high growth,
high wages, no experience)



TOP EARNER:

**Computer and Information
Systems Manager**

Cybersecurity Employers and Job Titles

Occupation codes and educational programs may not appear to line up perfectly with job openings, though the functions are the same. For example, in connected and automated vehicle production, many emerging jobs are in engineering and software areas that do not yet have O*NET codes. For individuals whose job profiles match up with Cybersecurity occupations, the companies doing the most hiring and the actual job titles are listed below. Individuals seeking work in this field may consider advertisements such as the following:


Company	Profiles	%
University of Michigan	398	7.43
CMS Energy Corporation	202	3.77
Ford Motor Company	56	1.04
Thomson Reuters Corporation	39	0.73
United States Dept of Treasury	39	0.73
General Motors Company	34	0.63
Truven Health Analytics	31	0.58
Allegiance Health Management, Inc.	29	0.54
Proquest	29	0.54
Dawn Food Products, Inc.	27	0.50
Domino's Pizza	27	0.50
Hewlett-Packard Company	25	0.47
Tenneco Inc.	25	0.47
Automatic Data Processing, Inc.	23	0.43
Trinity Health Corporation	23	0.43

Job Title	Profiles	%
Systems Administrator	415	7.74
Systems Analyst	179	3.34
IT Network Administrator	163	3.04
Software Engineer	162	3.02
Business Analyst	157	2.93
Programmer Analyst	147	2.74
Network Engineer	137	2.56
Information Technology (IT) Manager	132	2.46
Database Administrator	131	2.44
IT System Administrator	92	1.72
IT Quality Assurance Analyst	68	1.27
Project Manager	67	1.25
Director of Technology	66	1.23
Program Manager	63	1.18
Quality Assurance Engineer	61	1.14




Cybersecurity Occupation Descriptions

COMPUTER AND INFORMATION SYSTEMS MANAGERS (11-3021.00)




Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming.

-  98 annual openings
-  15% growth projected by 2027, 1,206 jobs expected
-  \$58.30 median hourly earnings; range \$35.16-\$90.10
-  Bachelor's degree preferred for entry, 5 years or more experience required

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Business intelligence and data analysis software, data base management software, customer relationship management (CRM) software
-  **Knowledge Areas:** Computers and electronics, customer and personal service, administration and management
-  **Workplace:** Critical thinking, active listening, reading comprehension




BUSINESS OPERATIONS SPECIALISTS, ALL OTHER (13-1199.00)

-  329 annual openings
-  12% growth projected by 2027, 3,433 jobs expected
-  \$29.83 median hourly earnings; range \$18.75-\$49.39
-  Bachelor's degree preferred for entry, no experience ok

Security Management Specialists (13-1199.02)

Conduct security assessments for organizations, and design security systems and processes. May specialize in areas such as physical security, personnel security, and information security. May work in fields such as health care, banking, gaming, security engineering, or manufacturing.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Data base user interface and query software, networking monitoring and security software, object or component oriented development software
-  **Knowledge Areas:** Public safety and security, English language, computer and electronics
-  **Workplace:** Critical thinking, active listening, speaking

COMPUTER SYSTEMS ANALYSTS (15-1121.00)

Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software.





-  125 annual openings
-  23% growth projected by 2027, 1,633 jobs expected
-  \$41.70 median hourly earnings; range \$27.51-\$56.26
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Configuration management software, data base management system software, enterprise application integration software
-  **Knowledge Areas:** Computers and electronics, english language, customer and personal services
-  **Workplace:** Active listening, critical thinking, reading comprehension

INFORMATION SECURITY ANALYSTS (15-1122.00)

Plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. May ensure appropriate security controls are in place that will safeguard digital files and vital electronic infrastructure. May respond to computer security breaches and viruses.





-  15 annual openings
-  28% growth projected by 2027, 180 jobs expected
-  \$43.81 median hourly earnings; range \$24.98-\$65.90
-  Bachelor's degree preferred for entry, some experience required

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Configuration management software, data base management system software, enterprise application integration software
-  **Knowledge Areas:** Computers and electronics, english language, customer and personal services
-  **Workplace:** Active listening, critical thinking, reading comprehension

DATABASE ADMINISTRATORS (15-1141.00)

Administer, test, and implement computer databases, applying knowledge of database management systems. Coordinate changes to computer databases. May plan, coordinate, and implement security measures to safeguard computer databases.





-  25 annual openings
-  16% growth projected by 2027, 340 jobs expected
-  \$41.18 median hourly earnings; range \$25.92-\$58.03
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Backup or archival software, data base management system software, object or component oriented development software
-  **Knowledge Areas:** Computers and electronics, english language, telecommunications
-  **Workplace:** Critical thinking/ Complex problem solving, active listening, judgement and decision making

NETWORK AND COMPUTER SYSTEMS ADMINISTRATORS (15-1142.00)


Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Monitor network to ensure network availability to all system users and may perform necessary maintenance to support network availability. May monitor and test Web site performance to ensure Web sites operate correctly and without interruption. May assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software. May supervise computer user support specialists and computer network support specialists. May administer network security measures.

-  66 annual openings
-  12% growth projected by 2027, 961 jobs expected
-  \$34.06 median hourly earnings; range \$21.41-\$51.51
-  Bachelor's degree preferred for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Configuration management software, data base management software, Enterprise resource planning software
-  **Knowledge Areas:** Computers and electronics, english language, customer sand personal services
-  **Workplace:** Critical thinking, judgement and decision making, reading comprehension




COMPUTER OCCUPATIONS, ALL OTHER (15-1199.00)

-  71 annual openings
-  10% growth projected by 2027, 979 jobs expected
-  \$39.45 median hourly earnings; range \$20.78-\$59.96
-  Bachelor's degree preferred for entry, no experience ok

Software Quality Assurance Engineers and Testers (15-1199.01)

Develop and execute software test plans in order to identify software problems and their causes.




The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Business
-  **Knowledge Areas:** top 3
-  **Workplace:** top 3

Computer Systems Engineers/Architects (15-1199.02)

Design and develop solutions to complex applications problems, system administration issues, or network concerns. Perform systems management and integration functions.




The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Business intelligence and data analysis software, CAD, Data base software
 -  **Knowledge Areas:** Computer and electronics, engineering and technology, mathematics
 -  **Workplace:** Active listening, critical thinking/complex problem solving, reading comprehension
-

Geospatial Information Scientists and Technologists (15-1199.04)

Research or develop geospatial technologies. May produce databases, perform applications programming, or coordinate projects. May specialize in areas such as agriculture, mining, health care, retail trade, urban planning, or military intelligence.




The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Analytical or scientific software, CAD, data base software
 -  **Knowledge Areas:** Geography, computers and electronics, education and training
 -  **Workplace:** Reading comprehension, active listening, science
-

Database Architects (15-1199.06)

Design strategies for enterprise database systems and set standards for operations, programming, and security. Design and construct large relational databases. Integrate new systems with existing warehouse structure and refine system performance and functionality.


The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Business intelligence and data analysis software, data base management software, metadata management
 -  **Knowledge Areas:** Computers and electronics, english language, design
 -  **Workplace:** Critical thinking, judgement and decision making, reading comprehension
-

Data Warehousing Specialists (15-1199.07)





Design, model, or implement corporate data warehousing activities. Program and configure warehouses of database information and provide support to warehouse users.

Some emerging occupations are still under construction and may be missing some skill data. The top technology skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Business intelligence and data analysis software, data base management system software, metadata management software

COMPUTER OPERATORS (43-9011.00)

Monitor and control electronic computer and peripheral electronic data processing equipment to process business, scientific, engineering, and other data according to operating instructions. Monitor and respond to operating and error messages. May enter commands at a computer terminal and set controls on computer and peripheral devices.

-  12 annual openings
-  7% decline projected by 2027, 113 jobs expected
-  \$14.27 median hourly earnings; range \$9.20-\$25.12
-  High school diploma or equivalent for entry, no experience ok

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Backup or archival software, electronic mail software, filesystem software
-  **Knowledge Areas:** Computers and electronics, customer and personal service, english language
-  **Workplace:** Operation monitoring, reading comprehension, judgement and decision making

Workforce Insight

Snapshot of Current Cybersecurity Employee Credentials

In addition to the occupation-specific requirements, below are data points displaying the skill proficiencies and academic programs listed among the job profiles of individuals working in all designated Data Management and Cybersecurity, contrasted to the specified O*NET information above. UM, EMU, and Sienna Heights offer the top listed programs for these occupations. Data Management and Cybersecurity, employers are hiring individuals with software proficiency with languages such as HTML and SQL, in combination with the ability to manage projects and conduct independent research.

- 42% of current employees list management skills, leadership and operations also popular (reflected in degrees—soft + hard skills)
- Information Technology skills and software in nearly half of profiles
- Most of top 15 programs are computer science and information system disciplines, but Medical Informatics is the eighth most popular



Related Training Programs

For the advanced IT occupations included in the Data Management and Cybersecurity group, training providers in the region offer numerous computer science as well as business management and operations-related degrees and programs. This list provides a starting point, yet may not be all-inclusive. The data here is reported to IPEDS and Pure Michigan Talent Connect and may exclude some training programs. In 2016, there were over 1,300 completions in related programs throughout the region.

Program	Institution(s)	Completions (2016)
Computer and Information Sciences	Cleary University, Siena Heights, WCC, UM, EMU	526
Information Science/Studies	UM, EMU, Siena Heights	218
Computer Engineering	UM	197
Operations Management and Supervision	Monroe CCC, Spring Arbor, Baker College	109
Management Information Systems	Monroe CCC, EMU, Spring Arbor, Cleary, Concordia, Baker College	78
Computer Systems Networking and Telecommunications	WCC, Jackson College, Monroe CCC, Baker College	56
Computer Science	Monroe CCC, Siena Heights, EMU, Spring Arbor, Siena Heights, Baker	47
Medical Informatics	UM	32
Computer Programming/Programmer	WCC, Monroe CCC, Siena Heights, Baker College, Cleary University	29
Bioinformatics	UM, EMU	22
Web Page, Digital/Multimedia and Information Resources Design	WCC, Monroe CCC, Jackson College, Siena Heights	21
Computer and Information Systems Security/Information Assurance	WCC, Monroe CCC, Jackson College, Baker College, EMU	12
Business, Management, Marketing, and Related Support Services, Other	Siena Heights, Cleary, Spring Arbor	9
Information Technology	Cleary, Jackson, WCC Monroe CCC, Siena Heights	5
Data Modeling/Warehousing and Database Administration	WCC, UM	4
System, Networking, and LAN/WAN Management/Manager	Monroe CCC	4
Meeting and Event Planning	Cleary	3
Information Resources Management	EMU	2
Data Processing and Data Processing Technology/Technician	Monroe CCC, Jackson, Baker, Siena Heights	0
Computer Systems Analysis/Analyst	Baker College, Monroe CCC, WCCC, Siena Heights	0
Web/Multimedia Management and Webmaster	Cleary University, Baker College, Jackson College, WCC	0
Information Technology Project Management	EMU	0
Mathematics and Computer Science	EMU	0



INTELLIGENT TRANSPORTATION SYSTEMS AND INFRASTRUCTURE DESIGN

Skilled and knowledgeable Intelligent Transportation Systems and Infrastructure workers like these will be key in the implementation of connected vehicle infrastructure and intelligent transportation systems. Telecommunications specialists and civil engineers will also work closely with transportation planners and engineers and traffic technicians within this group to inform decision making on connected infrastructure and traffic management. Therefore, workers in this group may work for state and local departments of transportation or private consulting firms.

In the Intelligent Transportation Systems group, occupations with high education requirements have more regional completions than openings. This is likely due to the high number of post-secondary training providers and opportunities in the region, and may increase emphasis on building skills for these high-demand jobs. However, many of the occupations also have high experience or on-the-job training needs to supplement any educational background. By gaining an entry-level foothold in this field, workers can open rewarding career pathways.



Logisticians
54 annual openings,
19% growth, 186 completions



All occupations: 144
annual openings, 1,588
projected jobs

Projected job growth across
occupation group: **↑ 17%**



TOP EARNER:
Computer Network Architects



Opportunities for most
degree levels

Intelligent Transportation Employers and Job Titles

Occupation codes and educational programs may not line up perfectly with job openings, though the functions are the same. For example, in connected and automated vehicle production, many emerging jobs are in engineering and software areas that do not yet have O*NET codes. For individuals whose job profiles match up with smart infrastructure occupations, the companies doing the most hiring and the actual job titles are listed below. Individuals seeking work in this field may consider advertisements such as the following:





Company	Profiles	%
University of Michigan	33	2.28
CMS Energy Corporation	25	1.73
Ford Motor Company	25	1.73
United States Dept of Treasury	16	1.10
Black & Veatch Corporation	15	1.04
AT&T Inc.	12	0.83
City of Ann Arbor	12	0.83
United States Army	12	0.83
General Motors Company	11	0.76
Ryder System, Inc.	11	0.76
Smithgroupjjr, Inc.	9	0.62
Commonwealth Associates, Inc.	8	0.55
Dawn Food Products, Inc.	8	0.55
DTE Energy Company	7	0.48
M-Dot, Inc.	6	0.41

Job Title	Profiles	%
Engineering Intern	111	7.66
Engineering Technician	87	6.00
Civil Engineer	73	5.04
Logistics Coordinator	55	3.80
Transportation Manager	50	3.45
Supply Chain Planner	33	2.28
Structural Engineer	31	2.14
Project Engineer	30	2.07
Design Engineer	29	2.00
Transportation Supervisor	27	1.86
Network Analyst	25	1.73
Engineering Consultant	21	1.45
Logistics Specialist	20	1.38
Project Manager	19	1.31
Operations Manager	18	1.24

Intelligent Transportation Occupation Descriptions

TRANSPORTATION, STORAGE, AND DISTRIBUTION MANAGERS (11-3071.00)




Plan, direct, or coordinate transportation, storage, or distribution activities in accordance with organizational policies and applicable government laws or regulations. Includes logistics managers.

-  17 annual openings
-  16% growth projected by 2027, 204 jobs expected
-  \$51.01 median hourly earnings; typical wage range \$34.78-\$70.83
-  Openings with high school diploma, 5+ years of experience

Transportation Managers (11-3071.01)





Plan, direct, or coordinate the transportation operations within an organization or the activities of organizations that provide transportation services

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Accounting software, compliance software, enterprise resource planning (ERP) software
-  **Knowledge Areas:** Transportation, Administration and Management, Public Safety and Security
-  **Workplace:** Active Listening, Critical Thinking, Time Management

LOGISTICIANS (11-1081.00)

Analyze and coordinate the logistical functions of a firm or organization. Responsible for the entire life cycle of a product, including acquisition, distribution, internal allocation, delivery, and final disposal of resources.





-  54 annual openings
-  19% growth projected by 2027, 518 jobs expected
-  \$36.05 median hourly earnings; range \$22.84-\$51.01
-  Bachelor's degree preferred, entry level openings available

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, materials requirements planning/logistics and supply chain software, route navigation software
-  **Knowledge Areas:** Transportation, English language, customer and personal service
-  **Workplace:** Critical thinking, coordination, monitoring

COMPUTER NETWORK ARCHITECTS (15-1143.00)

Design and implement computer and information networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. Perform network modeling, analysis, and planning. May also design network and computer security measures. May research and recommend network and data communications hardware and software.





-  16 annual openings
-  29% growth projected by 2027, 196 jobs expected
-  \$51.76 median hourly earnings; range \$32.17-\$73.96
-  Bachelor's degree preferred, 5+ years' experience

The top skills needed in this occupation, defined by O*NET, include:

-  **Technology:** Configuration management software, database user interface and query software, Network security or virtual private network (VPN) management software
-  **Knowledge Areas:** Computers and electronics, telecommunications, customer and personal service
-  **Workplace:** Active listening, operations analysis, systems evaluation

CIVIL ENGINEERS (17-2051.00)




Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, and water and sewage systems.

-  34 annual openings
-  16% growth projected by 2027, 419 jobs expected
-  \$37.57 median hourly earnings; range \$25.80-\$57.97
-  Bachelor's degree preferred, entry level experience available

Transportation Engineers (17-2051.01)





Develop plans for surface transportation projects, according to established engineering standards and state or federal construction policy. Prepare designs, specifications, or estimates for transportation facilities. Plan modifications of existing streets, highways, or freeways to improve traffic flow.

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Analytical or scientific software, Computer aided design (CAD) software, Map creation software
-  **Knowledge Areas:** Design, engineering and technology, building and construction
-  **Workplace:** Complex problem solving, reading, mathematics

CIVIL ENGINEERING TECHNICIANS (17-3022.00)

Apply theory and principles of civil engineering in planning, designing, and overseeing construction and maintenance of structures and facilities under the direction of engineering staff or physical scientists.





-  14 annual openings
-  5% growth projected by 2027, 154 jobs expected
-  \$27.69 median hourly earnings; range \$18.07-\$35.35
-  Associate's degree preferred, entry level openings available

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Development environment software, graphic or photo imaging software, map creation software
-  **Knowledge Areas:** Engineering and technology, mathematics, clerical
-  **Workplace:** Critical thinking, active listening, reading comprehension

TELECOMMUNICATIONS LINE INSTALLERS AND REPAIRERS (49-9052.00)

Install and repair telecommunications cable, including fiber optics.





-  10 annual openings
-  7% growth projected by 2027, 94 jobs expected
-  \$21.49 median hourly earnings; range \$12.70-\$37.67
-  High school diploma paired with long-term on the job training preferred

The top skills needed in this occupation, defined by O*NET, include:




-  **Technology:** Facilities management software, Computer aided design (CAD) software, Enterprise resource planning (ERP) software
-  **Knowledge Areas:** Telecommunications, customer and personal service, public safety and security
-  **Workplace:** Complex problem solving, operation monitoring, equipment maintenance

TRAFFIC TECHNICIANS (53-6041.00)

Conduct field studies to determine traffic volume, speed, effectiveness of signals, adequacy of lighting, and other factors influencing traffic conditions, under direction of traffic engineer.

-    } Fewer than 10 individuals employed in the region; limited regional growth and earning data available
-  High school diploma paired with moderate on-the-job training preferred

The top skills needed in this occupation, defined by O*NET, include:

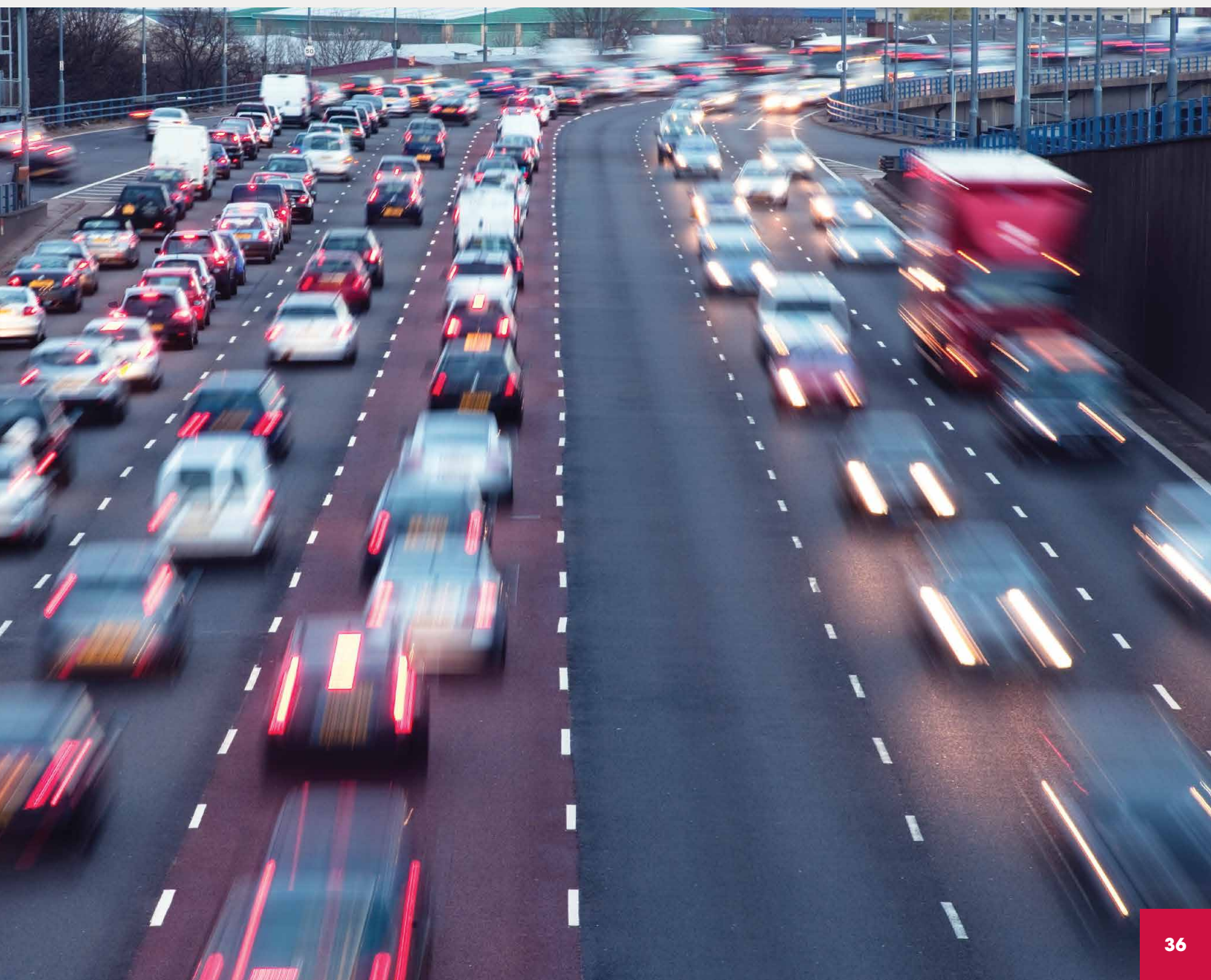
-  **Technology:** Analytical or scientific software, industrial control software, map creation software
-  **Knowledge Areas:** Computers and electronics, transportation, law and government
-  **Workplace:** Critical thinking, reading comprehension, coordination

Workforce Insight

Snapshot of Current Intelligent Transportation Employee Credentials

In addition to the occupation-specific requirements, below are data displaying the skill proficiencies and academic programs listed among the job profiles of individuals working in all designated intelligent transportation occupations, contrasted to the specified O*NET information above. Engineering and design programs dominate the top programs with about 18% of profiles altogether, though Business Administration and Management is the top program overall. Many institutions offer business and computer science related degrees, while a smaller group of primarily four-year institutions offer engineering programs. For this broad category of intelligent transportation occupations, successful candidates typically possess a broad range of software, building and engineering, and interpersonal skills such as customer service and project management.

- 35% of current employees list management skills as a qualification
- Microsoft Office and CAD proficiency top technology skills
- Most of top 15 programs are engineering disciplines, but several occupations do not require a four-year degree.



Related Training Programs

To suit the full range of occupations included in the intelligent transportation group, training providers in the region offer numerous business, computer science, engineering, and public administration degrees and programs. This list provides a starting point, yet may not be all-inclusive. The data here is reported to IPEDS and Pure Michigan Talent Connect and may exclude some training programs. In 2016, there were about 3,000 completions in related programs throughout the region.

Program	Institution(s)	Completions (2016)
Business Administration and Management	Adrian College, Baker College, Cleary, Concordia, EMU, Jackson, Monroe CCC, Siena Heights, Spring Arbor, UM, WCC	1,959
Computer and Information Sciences	Cleary University, Siena Heights, WCC, UM, EMU	526
Computer Engineering	UM	197
Operations Management and Supervision	Monroe CCC, Spring Arbor, Baker College	109
Civil Engineering	UM	79
Logistics, Materials, and Supply Chain Management	EMU, Siena Heights, UM	77
Computer Systems Networking and Telecommunications	WCC, Jackson College, Monroe CCC, Baker College	56
Computer Science	Monroe CCC, Siena Heights, EMU, Spring Arbor, Baker College	47
Public Administration	EMU, UM, Concordia	41
Business/Commerce	Monroe CCC, Baker College, EMU, Concordia, Cleary, Adrian College	41
Computer Programming/Programmer	WCC, Monroe CCC, Siena Heights, Baker College, Cleary University	29
Web Page, Digital/Multimedia and Information Resources Design	WCC, Monroe CCC, Jackson College, Siena Heights	21
Computer and Information Systems Security/Information Assurance	WCC, Monroe CCC, Jackson College, Baker College, EMU	12
Engineering Technology	Monroe CCC, Siena Heights, EMU	10
Aviation/Airway Management and Operations	EMU	10
Construction Engineering Technology/Technician	Monroe CCC, Siena heights, EMU	8
Information Technology	Cleary, Jackson College, WCC, Monroe CCC, Siena Heights	5
System, Networking, and LAN/WAN Management/Manager	Monroe CCC	4
Aeronautics/Aviation/Aerospace Science and Technology	Siena Heights, Concordia	3



DIRECTORY OF TRAINING PROVIDERS AND ACADEMIC PROGRAMS OFFERED

ADRIAN COLLEGE

110 S. Madison St. • Adrian, MI 49221
517.265.5161 • www.adrian.edu

ASSOCIATE'S:

Business Administration and Management

BACHELOR'S:

Business Administration and Management

Business/Commerce

Science Technologies/Technicians, Other

BAKER COLLEGE OF JACKSON

2800 Springport Rd. • Jackson, MI 49202
517.789.6123 • www.baker.edu

CERTIFICATES:

Computer Systems Analysis

Computer Systems Networking and Telecommunications

Web/Multimedia Management and Webmaster

Quality Control Technology/Technician

Computer Engineering Technology/Technician

Mechanical Drafting and CAD/CADD

ASSOCIATE'S:

Computer Programming/Programmer

Data Processing and Data Processing Technology/Technician

Computer Systems Analysis/Analyst

Computer Systems Networking and Telecommunications

Computer and Information Systems Security/Information Assurance

Web/Multimedia Management and Webmaster

Electrical, Electronic and Communications Engineering
Technology/Technician

Quality Control Technology/Technician

Mechanical Drafting and Mechanical Drafting CAD/CADD

Commercial and Advertising Art

Business/Commerce

Business Administration and Management

BACHELOR'S:

Computer Programming/Programmer

Computer Science

Computer and Information Systems Security/Information Assurance

Commercial and Advertising Art

Business Administration and Management

Operations Management and Supervision

Management Information Systems

CAREER QUEST LEARNING CENTER

209 East Washington Ave. • Jackson, MI 49201
877.365.8144 • www.careerquest.edu

CERTIFICATES:

Network Administration

ASSOCIATE'S:

Business Administration
Network Administration

CLEARY UNIVERSITY

3750 Cleary Dr. • Howell, MI 48843
800.686.1883 • www.cleary.edu

CERTIFICATES:

Information Technology
Meeting and Event Planning
Web/Multimedia Management and Webmaster
Computer Support Specialist
Meeting and Event Planning

ASSOCIATE'S:

Computer and Information Sciences
Information Technology
Web/Multimedia Management and Webmaster
Business Administration and Management
Meeting and Event Planning
Bachelor's:
Computer Programming/Programmer
Business/Commerce
Business Administration and Management
Management Information Systems
Business, Management, Marketing, and Related Support Services, Other

MASTER'S:

Business Administration and Management

CONCORDIA UNIVERSITY (ANN ARBOR)

4090 Geddes Rd. • Ann Arbor, MI 48105
734.995.7300 • www.cuaa.edu

BACHELOR'S:

Aeronautics/Aviation/Aerospace Science and Technology
Business/Commerce
Business Administration and Management
Management Information Systems

MASTER'S:

Business Administration and Management
Public Administration

EASTERN MICHIGAN UNIVERSITY

202 Welch Hall • Ypsilanti, MI 48197
734.487.1849 • www.emich.edu

CERTIFICATES:

Artificial Intelligence
Computer and Information Systems Security/Information Assurance
Information Technology Project Management
Quality Control Technology/Technician
Public Administration

Public Policy Analysis
Business Administration and Management
Logistics, Materials, and Supply Chain Management
Management Information Systems
Information Resources Management
Quality Control Technology/Technician
Business Administration and Management

BACHELOR'S:

Computer and Information Sciences
Information Science/Studies
Computer Science
Engineering Physics/Applied Physics
Polymer/Plastics Engineering
Electrical, Electronic and Communications Engineering Technology/Technician
Electrical and Electronic Engineering Technologies/Technicians, Other
Plastics and Polymer Engineering Technology/Technician
Manufacturing Engineering Technology/Technician
Mechanical Engineering/Mechanical Technology/Technician
Construction Engineering Technology/Technician
Computer Engineering Technology/Technician
Mechanical Drafting and Mechanical Drafting CAD/CADD
Engineering Technologies and Engineering-Related Fields, Other
Public Administration
Aviation/Airway Management and Operations
Business/Commerce
Business Administration and Management
Logistics, Materials, and Supply Chain Management
Management Information Systems

MASTER'S:

Computer and Information Sciences
Information Science/Studies
Computer Science
Computer and Information Systems Security/Information Assurance
Polymer/Plastics Engineering
Plastics and Polymer Engineering Technology/Technician
Manufacturing Engineering Technology/Technician
Quality Control Technology/Technician
Construction Engineering Technology/Technician
Bioinformatics
Mathematics and Computer Science
Public Administration
Business Administration and Management
Logistics, Materials, and Supply Chain Management
Management Information Systems

DOCTORATE:

Engineering Technology

JACKSON AREA CAREER CENTER

6800 Browns Lake Rd. • Jackson, MI 49201
517.990.8070 • www.jacc-mi.net

CERTIFICATES AND COURSEWORK:

Precision Machining/CAM
Engineering
Networking and Cybersecurity
Programming

JACKSON COLLEGE

2111 Emmons Rd. • Jackson, MI 49201
517.787.0800 • www.jccmi.edu

CERTIFICATES:

Information Technology
Computer Programming, Specific Applications

Data Processing and Data Processing Technology/Technician
Web Page, Digital/Multimedia and Information Resources Design
Computer Systems Networking and Telecommunications
Engineering
Electrical, Electronic and Communications Engineering
Technology/Technician
Energy Management and Systems Technology/Technician
Manufacturing Engineering Technology/Technician
Electrician
Industrial and Product Design
Business Administration and Management

ASSOCIATE'S:

Information Technology
Computer Programming, Specific Applications
Data Processing and Data Processing Technology/Technician
Web Page, Digital/Multimedia and Information Resources Design
Computer Systems Networking and Telecommunications
Computer and Information Systems Security/Information Assurance
Web/Multimedia Management and Webmaster
Electrical, Electronic and Communications Engineering
Technology/Technician
Energy Management and Systems Technology/Technician
Manufacturing Engineering Technology/Technician
Electrician
Industrial and Product Design
Business Administration and Management

LISD TECH CENTER

1372 North Main St. • Adrian, MI 49221
517.265.2119 • www.lisd.us/adult-learning

CERTIFICATE:

Industrial Blueprint Reading

LIVINGSTON REGIONAL M-TEC

1240 Packard Dr. • Howell, MI 48843
517.552.2163 • www.mcc.edu/livingston

CERTIFICATES:

Welding
CNC Machining

UNIVERSITY OF MICHIGAN (ANN ARBOR)

503 Thompson St. • Ann Arbor, MI 48109
734.764.1817 • www.umich.edu

CERTIFICATES:

Systems Engineering
Data Modeling/Warehousing and Database Administration
Chemical and Biomolecular Engineering
Electrical and Electronics Engineering
Engineering Science
Engineering, Other
Public Policy Analysis

BACHELOR'S:

Computer and Information Sciences
Informatics
Information Science/Studies
Data Modeling/Warehousing and Database Administration
Engineering
Civil Engineering
Computer Engineering

Electrical and Electronics Engineering
Engineering Physics/Applied Physics
Environmental/Environmental Health Engineering
Materials Engineering
Mechanical Engineering
Industrial Engineering
Geological/Geophysical Engineering
Public Policy Analysis
Design and Visual Communications
Commercial and Advertising Art
Industrial and Product Design
Business Administration and Management

MASTER'S:

Information Science/Studies
Engineering
Chemical and Biomolecular Engineering
Civil Engineering
Computer Engineering
Electrical and Electronics Engineering
Electrical, Electronics and Communications Engineering, Other
Environmental/Environmental Health Engineering
Materials Engineering
Mechanical Engineering
Systems Engineering
Polymer/Plastics Engineering
Construction Engineering
Industrial Engineering
Manufacturing Engineering
Mechatronics, Robotics, and Automation Engineering
Engineering, Other
Bioinformatics
Public Administration
Public Policy Analysis
Business Administration and Management
Logistics, Materials, and Supply Chain Management

DOCTORATES:

Information Science/Studies
Engineering
Civil Engineering
Computer Engineering
Electrical and Electronics Engineering
Environmental/Environmental Health Engineering
Materials Engineering
Mechanical Engineering
Industrial Engineering
Manufacturing Engineering
Engineering, Other
Bioinformatics
Public Policy Analysis
Business Administration and Management

MONROE COUNTY COMMUNITY COLLEGE

1555 South Raisinville Rd. • Monroe, MI 48161
734.242.7300 • www.monroeccc.edu

CERTIFICATES:

Computer Programming/Programmer
Data Processing and Data Processing Technology/Technician
Web Page, Digital/Multimedia and Information Resources Design
System, Networking, and LAN/WAN Management/Manager
Materials Engineering
Solar Energy Technology/Technician
Manufacturing Engineering Technology/Technician
Quality Control Technology/Technician
Mechanical Engineering/Mechanical Technology/Technician
Construction Engineering Technology/Technician
Mechanical Drafting and Mechanical Drafting CAD/CADD
Computer Systems Networking and Telecommunications

ASSOCIATE'S:

Information Technology
 Computer Programming/Programmer
 Data Processing and Data Processing Technology/Technician
 Computer Systems Analysis/Analyst
 Computer Science
 Web Page, Digital/Multimedia and Information Resources Design
 Computer Systems Networking and Telecommunications
 System, Networking, and LAN/WAN Management/Manager
 Computer and Information Systems Security/Information Assurance
 Materials Engineering
 Engineering Technology
 Electrical, Electronic and Communications Engineering
 Technology/Technician
 Manufacturing Engineering Technology/Technician
 Quality Control Technology/Technician
 Mechanical Engineering/Mechanical Technology/Technician
 Construction Engineering Technology/Technician
 Mechanical Drafting and Mechanical Drafting CAD/CADD
 Engineering Technologies and Engineering-Related Fields, Other
 Business/Commerce
 Business Administration and Management
 Operations Management and Supervision
 Management Information Systems

PINCKNEY CYBER TRAINING INSTITUTE

10255 Dexter-Pickney Rd. • Livingston, MI 48169
 810.225.5540 • www.pinckneycti.org

CERTIFICATES:

Certified Cloud Security Professional
 Certified Ethical Hacker
 Certified Information Systems Security Professional
 CompTIA A+ / Network+ / Security+ Certification
 Certified Secure Software Lifecycle Professional

SIENA HEIGHTS UNIVERSITY

1247 E. Siena Heights Dr. • Adrian, MI 49221
 517.263.0731 • www.sienaheights.edu

ASSOCIATE'S:

Computer and Information Sciences
 Computer Programming/Programmer
 Computer Science
 Electrical and Electronics Engineering
 Engineering Science
 Engineering, Other
 Electrical, Electronic and Communications Engineering
 Technology/Technician
 Energy Management and Systems Technology/Technician
 Hydraulics and Fluid Power Technology/Technician
 Electrician
 Business Administration and Management

BACHELOR'S:

Computer and Information Sciences
 Information Technology
 Computer Programming/Programmer
 Computer Programming, Other
 Data Processing and Data Processing Technology/Technician
 Information Science/Studies
 Computer Systems Analysis/Analyst

Computer Science
 Web Page, Digital/Multimedia and Information Resources Design
 Engineering
 Computer and Information Sciences
 Information Technology
 Computer Programming/Programmer
 Computer Programming, Other
 Data Processing and Data Processing Technology/Technician
 Information Science/Studies
 Computer Systems Analysis/Analyst
 Computer Science
 Web Page, Digital/Multimedia and Information Resources Design
 Engineering
 Engineering, Other
 Engineering Technology
 Civil Engineering Technology/Technician
 Electrical, Electronic and Communications Engineering
 Technology/Technician
 Electrical and Electronic Engineering Technologies/Technicians, Other
 Energy Management and Systems Technology/Technician
 Environmental Control Technologies/Technicians, Other
 Plastics and Polymer Engineering Technology/Technician
 Mechanical Engineering/Mechanical Technology/Technician
 Construction Engineering Technology/Technician
 Hydraulics and Fluid Power Technology/Technician
 Engineering-Related Technologies, Other
 Computer Engineering Technology/Technician
 Mechanical Drafting and Mechanical Drafting CAD/CADD
 Engineering Design
 Engineering Technologies and Engineering-Related Fields, Other
 Electrician
 Aeronautics/Aviation/Aerospace Science and Technology
 Commercial and Advertising Art
 Business Administration and Management
 Logistics, Materials, and Supply Chain Management
 Business, Management, Marketing, and Related Support Services, Other

SPRING ARBOR UNIVERSITY

106 E. Main St. • Spring Arbor, MI 49283
 517.750.1200 • www.arbor.edu

ASSOCIATE'S:

Business Administration and Management

BACHELOR'S:

Computer Science
 Design and Visual Communications
 Business Administration and Management
 Operations Management and Supervision
 Management Information Systems

MASTER'S:

Business Administration and Management
 Business, Management, Marketing, and Related Support Services, Other

SOUTHERN MICHIGAN CENTER FOR SCIENCE AND INDUSTRY

550 East Main St. • Hudson, MI 49247
 517.448.1413 • www.smcsi.org

CERTIFICATES:

FANUC CNC Operator and Robotics Tool Handling
 Metrology/Quality Control

THE ACADEMY FOR MANUFACTURING CAREERS

2545 Spring Arbor Rd. • Jackson, MI 49203
517.782.8268 • www.jacksonjama.org

CERTIFICATES:

CNC Operator
Machine Maintenance
Quality
Tool & Die
Welding

APPRENTICESHIP TRACKS:

CNC Machinist
Electrical Technician
Engineering Technician
Industrial Maintenance Mechanic
Prototype Technician
Quality Engineer
Robotic Welding Technician
Tool & Die Maker
Welding

WASHTENAW COMMUNITY COLLEGE

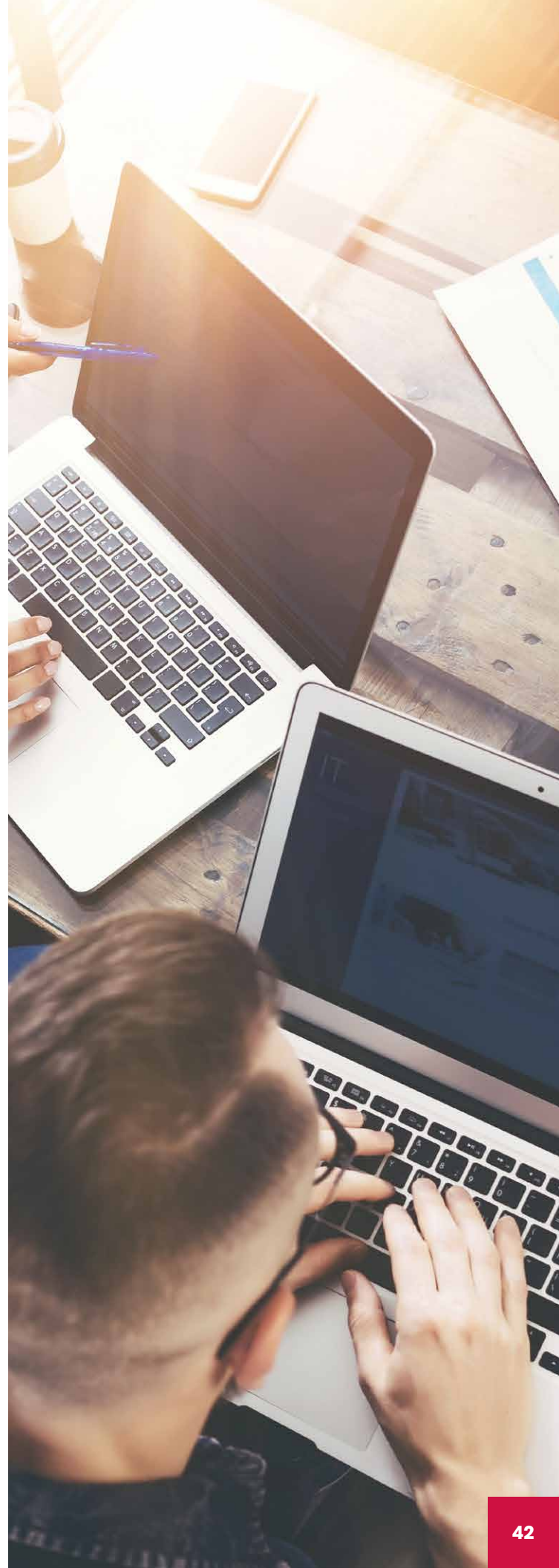
4800 E Huron River Dr. • Ann Arbor, MI 48105
734.973.3300 • www.wccnet.edu

CERTIFICATES:

Computer Programming/Programmer
Computer Programming, Specific Applications
Web Page, Digital/Multimedia and Information Resources Design
Computer Systems Networking and Telecommunications
Computer and Information Systems Security/Information Assurance
Manufacturing Engineering Technology/Technician
Hydraulics and Fluid Power Technology/Technician
Computer Technology/Computer Systems Technology
Construction Trades
Computer Programming, Specific Applications
Data Modeling/Warehousing and Database Administration
Computer Systems Networking and Telecommunications
Web/Multimedia Management and Webmaster
Computer Graphics
Commercial and Advertising Art

ASSOCIATE'S:

Computer and Information Sciences
Information Technology
Computer Programming/Programmer
Computer Programming, Specific Applications
Computer Systems Analysis/Analyst
Web Page, Digital/Multimedia and Information Resources Design
Computer Graphics
Computer Systems Networking and Telecommunications
Computer and Information Systems Security/Information Assurance
Engineering
Mechanical Engineering/Mechanical Technology/Technician
Hydraulics and Fluid Power Technology/Technician
Computer Engineering Technology/Technician
Construction Trades
Commercial and Advertising Art
Business Administration and Management





Want more information? Contact
your local Michigan Works!
Southeast service center.

HILLSDALE SERVICE CENTER

21 Care Drive
Hillsdale, MI 49242
P: 517.437.3381
F: 517.437.4128

JACKSON SERVICE CENTER

Commonwealth Center
209 E. Washington Ave. • Suite 100
Jackson, MI 49201
P: 517.841.5627
F: 517.782.7437

LENAWEE SERVICE CENTER

Human Services Building
1040 S. Winter Street • Suite 1014
Adrian, MI 49221
P: 517.266.5627
F: 517.266.2745

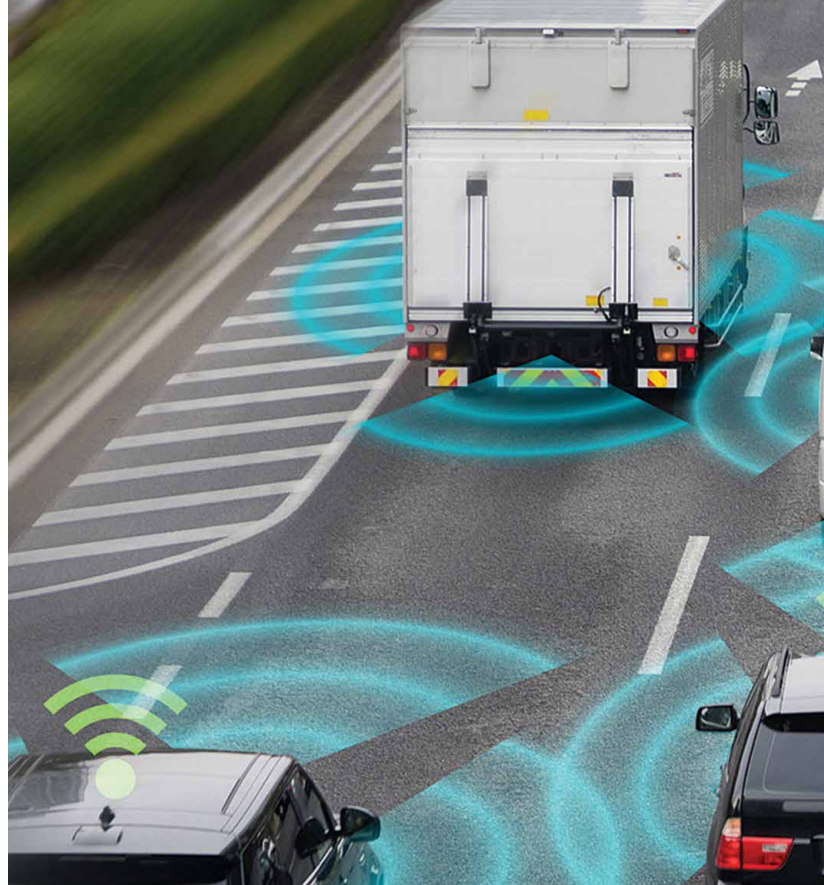
LIVINGSTON SERVICE CENTER

Mott Community College - Livingston Center
1240 Packard Drive
Howell, MI 48843
P: 517.546.7450
F: 517.552.2145

WASHTENAW SERVICE CENTER

304 Harriet Street
Ypsilanti, MI 48197
P: 734.714.9814
F: 734.481.2516

TTY: 771



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www.WINintelligence.org