M-CAM
Skills Gap Analysis
Reports

2016

**A compilation of skills gap analysis reports
for each of the eight M-CAM community colleges.**

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Introduction

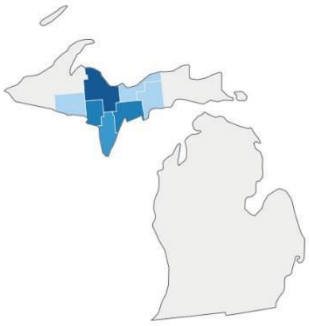
In 2014, the Michigan Coalition for Advanced Manufacturing (M-CAM) began developing comprehensive skills gap analysis reports for each of the eight partner community colleges: Bay de Noc College, Grand Rapids Community College, Kellogg Community College, Lake Michigan College, Lansing Community College, Macomb Community College, Mott Community College, and Schoolcraft College. The purpose of these reports was to provide important workforce information for each of the colleges as they developed, improved, and augmented key manufacturing programs (both credit and non-credit) within their institutions.

Macomb Community College, as the lead college on behalf of all eight institutions, partnered with the Corporation for a Skilled Workforce (CSW) and Thomas P. Miller & Associates (TPMA) to develop these reports, provide valuable feedback to program leads and decision makers at each of the colleges, and support employer engagement efforts where appropriate.

TPMA engaged directly and deeply with each of the colleges to scope out each report, define key metrics that would prove valuable to each of the colleges, and ensure that each report could be finalized in an effective and efficient manner. TPMA used a mixed-methods approach to develop the skills gap reports, combining quantitative data from both state and federal workforce data sources and qualitative data from in-person and telephonic interviews with college leaders, employers, and relevant stakeholders.

What follows are the eight individual skills gap analysis reports. In addition, five of the eight schools engaged TPMA for deeper employer engagement efforts and a summary messaging document developed for that process is included.

Bay Region



Executive Summary

The following is a labor market profile for Bay College. The profile includes quantitative research to assist Bay College in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic and labor force characteristics, industry analysis, occupation analysis, and labor force data. For the profile, the project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics, as well as regional reports that included the Upper Peninsula State of the Workforce Report 2013 and the Region 1 Rural Wage Disparity Study. Additionally, the project team talked with college staff with the M-CAM project and Michigan Works! personnel for information on real-time data.

Summary of Findings

Bay College has three locations – Bay College Main in Escanaba, Bay College West in Iron Mountain, and M-TEC in Escanaba. The college was founded in 1962 and in 2012 celebrated its 50th anniversary. The college awards degrees and certificates to over 500 students annually. Bay College is one of the eight community colleges that make up the Michigan Coalition for Advanced Manufacturing (M-CAM) consortium. The service area for Bay includes seven counties: Iron, Dickinson, Marquette, Menominee, Alger, Delta, and Schoolcraft. The counties most pertinent to the college are Dickinson, Alger, Delta, and Schoolcraft. The college is unique amongst the M-CAM colleges within Michigan, as its location in the western Upper Peninsula isolates it from the other colleges. Although the college covers a large service area, in reality workers are not as willing and able to travel for employment. According to representatives from Bay, the average student only wants to drive 10-15 minutes for a job versus what many employers consider an acceptable commute time of 45 minutes.

The population in the region has declined by 2% over the past ten years to just under 183,000. This is comparable to the state average of 1% decline. The population in the region is expected to continue to decline over the next five years. While the population continues to decline, it is also aging. Over the past 10 years, the population of 55-years-and-older increased significantly. The population age 65 years and older is projected to continue to increase. This is a concern as the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers are Government; Health Care and Social Assistance; and Retail Trade. All three of these industries have seen a decrease in employment over the past ten years, however, the Manufacturing sector (the fourth largest sector) has been adding jobs over the past five years, as the US economy continues to recover.

Drilling deeper, the largest manufacturing sector is pulp, paper, and paperboard mills. However, it should be noted that this industry saw a 24% decline in employment over the past ten years and is expected to see an additional 25% decline over the next five years. In contrast, Agriculture, Construction, and Mining Machinery Manufacturing; Aerospace Product and Parts Manufacturing; Alumina and Aluminum Production and Processing; and Industrial Machinery Manufacturing had significant growth in the past five years. Among these key industries, Agriculture, Construction, and Mining Machinery Manufacturing; Other Fabricated Metal Product Manufacturing; and Foundries are projected to have the highest growth

over the next five years. While several of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers and the growth from the last five years is more reflective of the future. Future trends should continue to be monitored through periodic contact with companies in these industries.

The top occupations by Standard Occupational Classification (SOC) codes within the region include Office and Administrative Support Occupations; Sales and Related Occupations; Food Preparation and Serving Related Occupations; Production Occupations; and Healthcare Practitioners and Technical Occupations.

Top occupations for manufacturing include: Miscellaneous Production Workers; Miscellaneous Assemblers and Fabricators; Machinists; Woodworking Machine Setters, Operators, and Tenders; Laborers and Material Movers, Hand; and Industrial Machinery Installation, Repair, and Maintenance Workers. It should be noted that the top industries for Miscellaneous Production Workers are expected to have employment declines over the next five years. While several of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Looking at the growth over the past five years may be more reflective of future trends. Fewer new jobs are likely to be created, but there may be opportunities due to retirements with the aging population.

Based on real time job posting information, the top skills that appear for the top five fastest growing occupations in the region include: Maintenance, Repairs, and Operations; Manufacturing; Tools; Machines; and Hand Tools. The top unique skills for these occupations include: Planned Maintenance; Soldering; Safety Regulations; Hand Tools; and Tools.

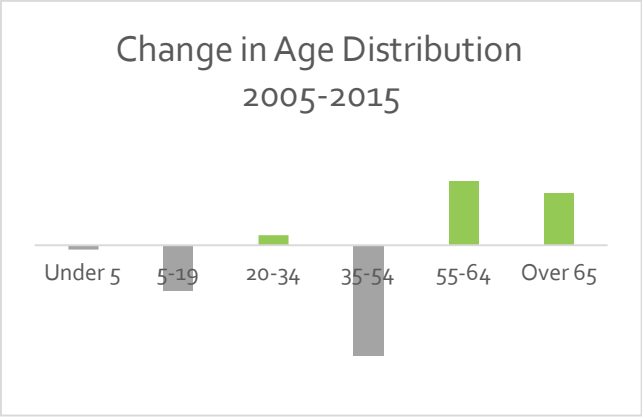
Demographics

The population in the Bay de Noc region has declined from 186,479 to 182,738 over the past ten years.[1] The population declined by 2%, which is comparable to the state average of 1% decline. However, the national rate over the same period was an increase of 9%. The population for the Bay de Noc region is projected to continue to decline over the next five years.

The region has an aging population. Over the past ten years, the population of 55-years-and-older increased significantly while the population decreased in all the other age groups, with the exception of 20-34 years. There was a 3% increase in the 20-34 age group, but this population is projected to decline by 5% over the next five years. The only age groups projected to grow are under age 5 and over age 65. The aging population is a concern as it will impact the availability of labor in this region over the next decade.

Age Distribution

Age	2015 Population	Change, 2005-2015		Change, 2015-2020	
Under 5	9,307	-454	-5%	208	2%
5-19	35,423	-5,030	-14%	-1,078	-4%
20-34	31,551	1,084	3%	-1,698	-5%
35-54	55,286	-12,325	-22%	-3,140	-7%
55-64	22,900	7,178	31%	-1,296	-4%
Over 65	32,013	5,806	18%	5,665	15%



The population of the region is not diverse, with 92.6% of the 2015 population identifying as White. The White population shrank by 4% from 2005-2015. The fastest growing races in the region are those identifying as Hispanic and Two or More Races.[2]

Race Distribution

Race	2015 Population	Change, 2005-2015	
White	169,288	-6,195	-4%
American Indian or Alaskan Native	4,128	328	9%
Two or More Races	3,512	822	31%
Hispanic	2,619	923	54%
Black	2,243	222	11%
Asian	904	137	18%
Native Hawaiian or Pacific Islander	43	19	79%

[1] EMSI Analyst 2015.

[2] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander.

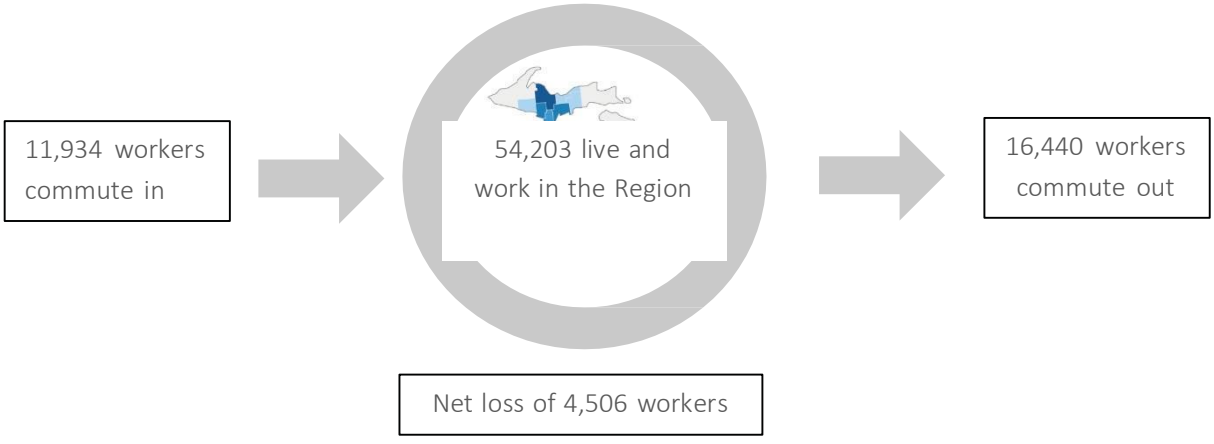
Income

Marquette County has the highest median income from 2010 to 2014, but trails the average for Michigan. All counties in the region trail the median household income averages for Michigan and the United States. Additionally, Schoolcraft County has the highest poverty rate over the same period. [3]

	Median Household Income ('10-'14)	Poverty Rate
Iron	$35,689	14.6%
Dickinson	$44,350	11.4%
Marquette	$45,066	16.8%
Menominee	$41,293	15.1%
Alger	$39,211	13.9%
Delta	$37,069	17.2%
Schoolcraft	$35,955	20.2%
Michigan	$49,087	16.9%
U.S.	$53,482	15.6%

Commuting Pattern and Labor Force Availability

In 2013, the region had nearly 12,000 workers commuting in and about 16,440 commuting out, making the region a net exporter of workers.[4] Over 70,000 workers are employed in the region, including 54,203 both living and working in the region and 16,440 commuting out of the region. The counties with the most workers are: Marquette (25,416, 38%); Dickinson (12,799, 19%); Delta (12,450, 19%); Menominee (7,451, 11%); and Iron (3,236, 5%).



[3] U.S. Census Bureau 2010-2014

[4] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/

HUMAN CAPITAL

In 2014, about 92,222 workers participated in the Bay de Noc regional labor force which includes employed and unemployed individuals. Of these, 87,202 are employed. Over the last 20 years, employment in the region was at its highest in July 2006 and lowest in January 1996. The unemployment rate for the region is 5.4%, which is lower than the rate for Michigan (7.1%), and the U.S. (5.9%).

EMPLOYMENT, 1994-2014 [5]		
Peak	July 2006 (94,571)	+8.4% (compared to Oct, 2014)
Trough	January 1996 (81,385)	-6.7% (compared to Oct, 2014)
Oct 2014	87,207	Current unemployment: 5.4%

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

Labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation rate for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boom generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

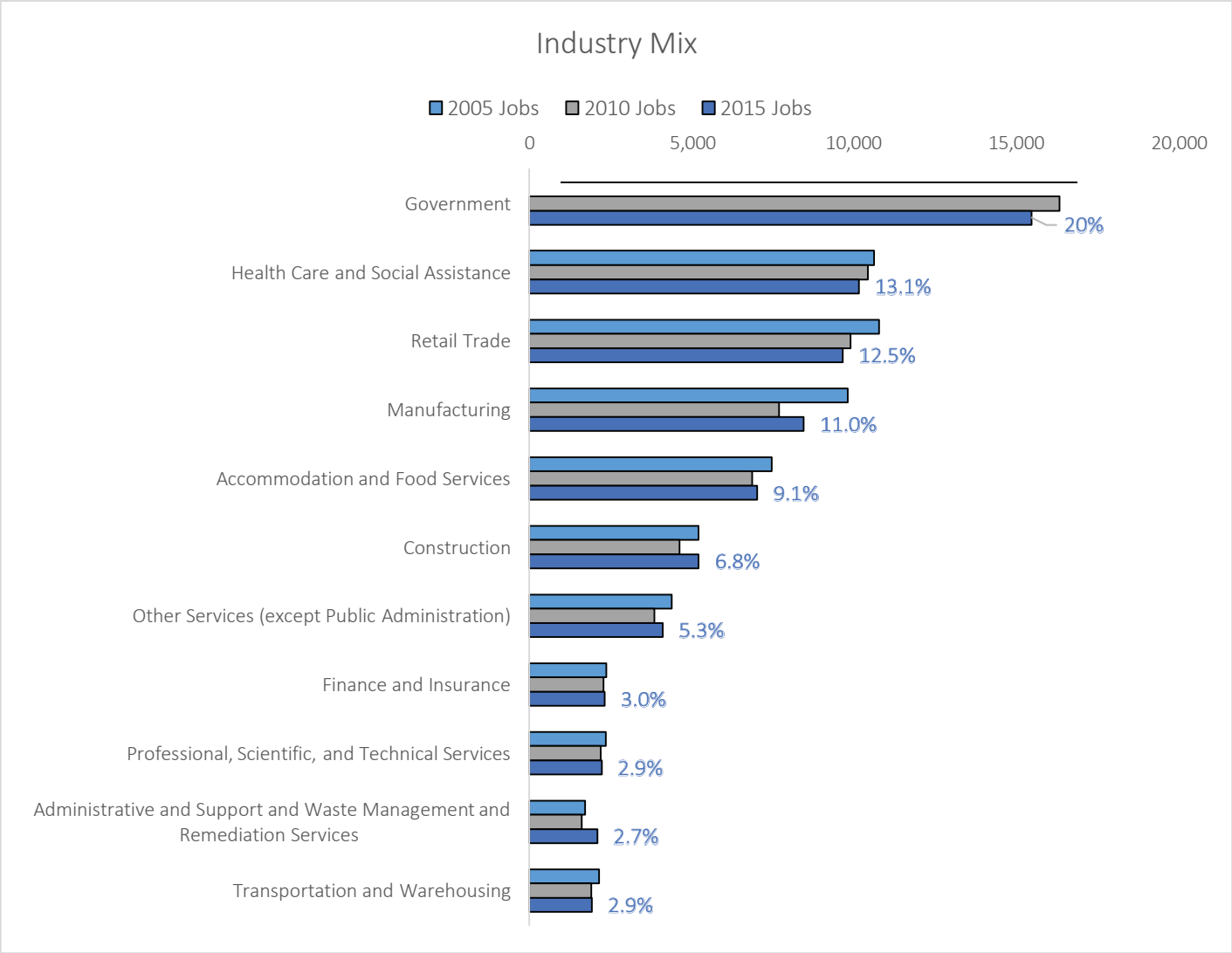
The older worker population (55 years and older) in the region is estimated to be 19,925 in 2014.[6] These older workers are expected to retire in the next ten years.

[5] U.S. Bureau of Labor Statistics, 1994.9-2014.9 (most recently available). http://www.bls.gov/data/

[6] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

Industry Analysis

The broad industry sectors in the region employing the most workers are Government (15,427), Health Care and Social Assistance (10,120), Retail Trade (9,636), Manufacturing (8,432), and Accommodation and Food Service (6,999).[7] It is worth noting that Manufacturing has resumed growing between 2010 and 2015, which suggests a potential for future growth.



[7] These industries are by 2-digit NAICS code. EMSI Analyst 2015.

Manufacturing Analysis

Drilling a bit deeper, the tables below show the top 25 largest manufacturing industries by employment in the Bay de Noc region.[8] It is worth noticing that Agriculture, Construction, and Mining Machinery Manufacturing; Aerospace Product and Parts Manufacturing; Alumina and Aluminum Production and Processing; and Industrial Machinery Manufacturing had significant growth in the past five years. Among these key industries, Agriculture, Construction, and Mining Machinery Manufacturing; Other Fabricated Metal Product Manufacturing; and Foundries are projected to have the highest growth over the next five years. It is important to look at the number of jobs as well as the percentage changes. [9] While several of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. The recent growth over the past years may be more reflective of future trends. Future trends should continue to be monitored through periodic contact with companies in these industries.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020	
Pulp, Paper, and Paperboard Mills	1,655	-527	-24%	-2	-10%	-415	-25%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	721	124	21%	67	10%	41	6%
Agriculture, Construction, and Mining Machinery Manufacturing	638	345	118%	277	77%	126	20%
Veneer, Plywood, and Engineered Wood Product Manufacturing	593	-136	-19%	-53	-8%	-99	-17%
Other Wood Product Manufacturing	454	-145	-24%	64	16%	-37	-8%
Foundries	399	-314	-44%	27	7%	121	30%
Other Fabricated Metal Product Manufacturing	338	-83	-20%	28	9%	109	32%
Sawmills and Wood Preservation	338	-140	-29%	97	40%	15	4%
Medical Equipment and Supplies Manufacturing	308	137	80%	-8	-3%	29	9%
Aerospace Product and Parts Manufacturing	251	148	144%	145	137%	10	4%
Household Appliance Manufacturing	224	-83	-27%	25	13%	-101	-45%
Household and Institutional Furniture and Kitchen Cabinet Manufacturing	208	-244	-54%	51	32%	-139	-67%
Industrial Machinery Manufacturing	158	6	4%	115	267%	69	44%
Architectural and Structural Metals Manufacturing	147	-195	-57%	-44	-23%	-8	-5%
Alumina and Aluminum Production and Processing	147	86	141%	124	539%	18	12%
Printing and Related Support Activities	137	-69	-33%	-62	-31%	-6	-4%
Motor Vehicle Parts Manufacturing	136	19	16%	-52	-28%	17	13%
Metalworking Machinery Manufacturing	132	27	26%	55	71%	20	15%
Bakeries and Tortilla Manufacturing	110	-69	-39%	-62	-36%	-12	-11%
Other Miscellaneous Manufacturing	106	-72	-40%	5	5%	10	9%
Cement and Concrete Product Manufacturing	103	-74	-42%	-44	-30%	-17	-17%
Commercial and Service Industry Machinery Manufacturing	93	24	35%	35	60%	23	25%
Motor Vehicle Body and Trailer Manufacturing	87	-16	-16%	-24	-22%	-19	-22%
Other Chemical Product and Preparation Manufacturing	87	-39	-31%	-31	-26%	-23	-26%
Plastics Product Manufacturing	80	28	54%	25	45%	-3	-4%

[8] These industries are by4-digit NAICS code.

[9] These industries are by 4-digit NAICS code.

Among these top industries, average earnings vary widely, from under $22,000 a year for Bakeries and Tortilla Manufacturing, to over $75,000 a year for Pulp, Paper and Paperboard Mills. The industries that both pay relatively higher average wages and have at least 10 establishments including: Machine Shops and Pulp, Paper and Paperboard Mills.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earning	Establishments
Pulp, Paper, and Paperboard Mills	1,655	$75,838	11
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	721	$46,546	16
Agriculture, Construction, and Mining Machinery Manufacturing	638	$56,704	1
Veneer, Plywood, and Engineered Wood Product Manufacturing	593	$52,065	9
Other Wood Product Manufacturing	454	$32,539	20
Foundries	399	$58,812	2
Other Fabricated Metal Product Manufacturing	338	$50,754	5
Sawmills and Wood Preservation	338	$38,134	17
Medical Equipment and Supplies Manufacturing	308	$52,561	5
Aerospace Product and Parts Manufacturing	251	$41,702	1
Household Appliance Manufacturing	224	$68,549	1
Household and Institutional Furniture and Kitchen Cabinet Manufacturing	208	$35,709	9
Industrial Machinery Manufacturing	158	$45,542	5
Architectural and Structural Metals Manufacturing	147	$41,657	5
Alumina and Aluminum Production and Processing	147	$37,100	1
Printing and Related Support Activities	137	$38,633	20
Motor Vehicle Parts Manufacturing	136	$57,849	6
Metalworking Machinery Manufacturing	132	$55,665	4
Bakeries and Tortilla Manufacturing	110	$21,611	6
Other Miscellaneous Manufacturing	106	$22,402	17
Cement and Concrete Product Manufacturing	103	$49,670	14
Commercial and Service Industry Machinery Manufacturing	93	$42,587	2
Motor Vehicle Body and Trailer Manufacturing	87	$43,190	2
Other Chemical Product and Preparation Manufacturing	87	$55,933	2
Plastics Product Manufacturing	80	$67,256	5

OCCUPATION ANALYSIS

The counties' highest number of occupations include Office and Administrative Support Occupations, Sales and Related Occupations, Food Preparation and Serving Related Occupations, Production Operations, Healthcare Practitioners and Technical Occupations.[10] The median hourly earnings range from $9.66/hour for Food Preparation and Serving Related Occupations, to $32.17/hour for Healthcare Practitioners and Technical Occupations.

Bay de Noc Regional Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	11,367	14.77%	$14.07
Sales and Related Occupations	7,333	9.53%	$12.71
Food Preparation and Serving Related Occupations	6,961	9.04%	$9.66
Production Occupations	6,120	7.95%	$16.94
Healthcare Practitioners and Technical Occupations	5,262	6.84%	$32.17
Transportation and Material Moving Occupations	4,715	6.13%	$15.90
Construction and Extraction Occupations	4,502	5.85%	$19.47
Installation, Maintenance, and Repair Occupations	4,413	5.73%	$20.08
Education, Training, and Library Occupations	4,388	5.70%	$20.76
Management Occupations	3,669	4.77%	$31.75
Healthcare Support Occupations	3,138	4.08%	$12.07
Building and Grounds Cleaning and Maintenance Occupations	2,725	3.54%	$10.58
Personal Care and Service Occupations	2,522	3.28%	$10.39
Business and Financial Operations Occupations	2,302	2.99%	$24.15
Protective Service Occupations	1,740	2.26%	$23.43
Community and Social Service Occupations	1,550	2.01%	$20.08
Arts, Design, Entertainment, Sports, and Media Occupations	956	1.24%	$13.99
Architecture and Engineering Occupations	918	1.19%	$28.88
Farming, Fishing, and Forestry Occupations	647	0.84%	$14.97
Computer and Mathematical Occupations	567	0.74%	$27.19
Life, Physical, and Social Science Occupations	545	0.71%	$26.96
Military occupations	344	0.45%	$13.88
Legal Occupations	284	0.37%	$27.57

[10] These occupations are by 2 digit SOC code (Standard Occupational Classification System).

Occupations in Manufacturing Sector

The table below shows employment of each occupation within the Manufacturing Sector. It is worth noticing that Production Occupations comprise 54.0% of Manufacturing Industry employment.

Bay de Noc Regional Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	4,550	54.0%
Office and Administrative Support Occupations	776	9.2%
Installation, Maintenance, and Repair Occupations	689	8.2%
Transportation and Material Moving Occupations	647	7.7%
Management Occupations	504	6.0%
Architecture and Engineering Occupations	374	4.4%
Business and Financial Operations Occupations	223	2.6%
Sales and Related Occupations	222	2.6%
Construction and Extraction Occupations	167	2.0%
Building and Grounds Cleaning and Maintenance Occupations	83	1.0%
Computer and Mathematical Occupations	56	0.7%
Arts, Design, Entertainment, Sports, and Media Occupations	39	0.5%
Life, Physical, and Social Science Occupations	36	0.4%
Farming, Fishing, and Forestry Occupations	24	0.3%
Healthcare Practitioners and Technical Occupations	15	0.2%
Protective Service Occupations	<10	0.2%
Personal Care and Service Occupations	<10	0.1%
Education, Training, and Library Occupations	<10	0.0%
Legal Occupations	<10	0.0%

Top Occupations in Manufacturing Sector

Drilling a bit deeper, the following table displays the top 25 occupations that are most often required to staff companies within manufacturing in the Bay de Noc region.[11] Median hourly earnings for these occupations range from $11.86 at the low end for Laborers and Material Movers, Hand to $43.56 at the high end for Industrial Production Managers. Some of the highest projected change is with Machinists which had 27% change from 2010-2015 and has projected change of 13% in the next five years. While several of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

Top 25 Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020		Median Hourly Earnings
Miscellaneous Production Workers	899	-243	-21%	-57	-6%	-190	-21%	$16.71
Miscellaneous Assemblers and Fabricators	436	-83	-16%	38	10%	-1	0%	$12.96
Machinists	428	80	23%	91	27%	55	13%	$17.13
Woodworking Machine Setters, Operators, and Tenders	314	-106	-25%	35	13%	-29	-9%	$13.83
Laborers and Material Movers, Hand	313	-91	-23%	29	10%	-12	-4%	$11.86
Industrial Machinery Installation, Repair, and Maintenance Workers	308	-31	-9%	32	12%	-6	-2%	$22.73
First-Line Supervisors of Production and Operating Workers	288	-56	-16%	26	10%	-4	-1%	$25.50
Maintenance and Repair Workers, General	256	-31	-11%	24	10%	-20	-8%	$15.34
Welding, Soldering, and Brazing Workers	255	4	2%	50	24%	20	8%	$16.86
Inspectors, Testers, Sorters, Samplers, and Weighers	216	-18	-8%	29	16%	7	3%	$15.35
Computer Control Programmers and Operators	195	38	24%	46	31%	35	18%	$19.71
Sales Representatives, Wholesale and Manufacturing	185	-27	-13%	21	13%	-1	-1%	$22.44
Driver/Sales Workers and Truck Drivers	178	-50	-22%	-5	-3%	-8	-8%	$16.19
Office Clerks, General	177	-10	-5%	22	14%	-3	-3%	$13.19
General and Operations Managers	158	-18	-10%	19	14%	1	1%	$33.11
Industrial Engineers, Including Health and Safety	148	4	3%	24	19%	-1	-1%	$29.97
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	142	-42	-23%	15	12%	11	11%	$15.27
Industrial Production Managers	129	-13	-9%	12	10%	-3	-3%	$43.56
Mechanical Engineers	104	12	13%	29	39%	7	7%	$30.49
Painting Workers	102	-9	-8%	16	19%	-4	-4%	$16.20

[11] Occupations are by 4 digit SOC code.

Industry and Occupation Connections in Manufacturing Sector

Although key manufacturing industries are highly diversified, they do share some common workforce requirements. Listed below are the top five occupations within the region and they key industries that employ them.[12]

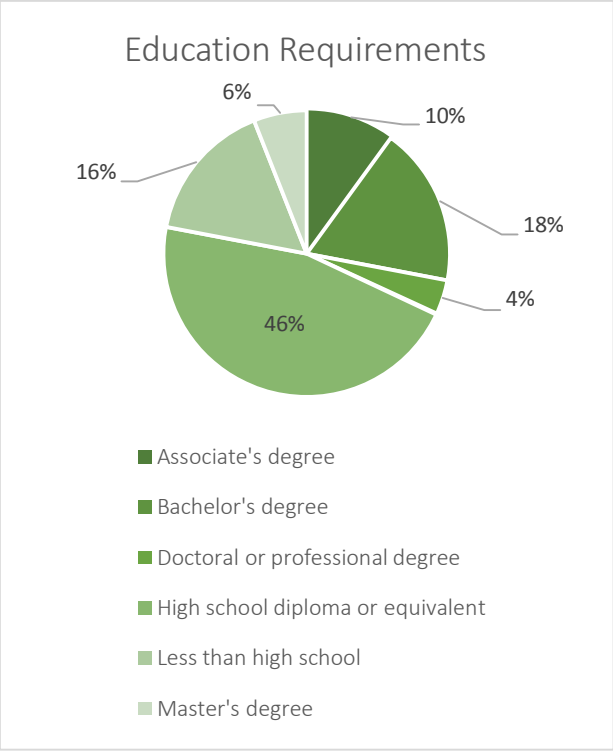
Connection between Top Occupations and Key Industries in Manufacturing Sector

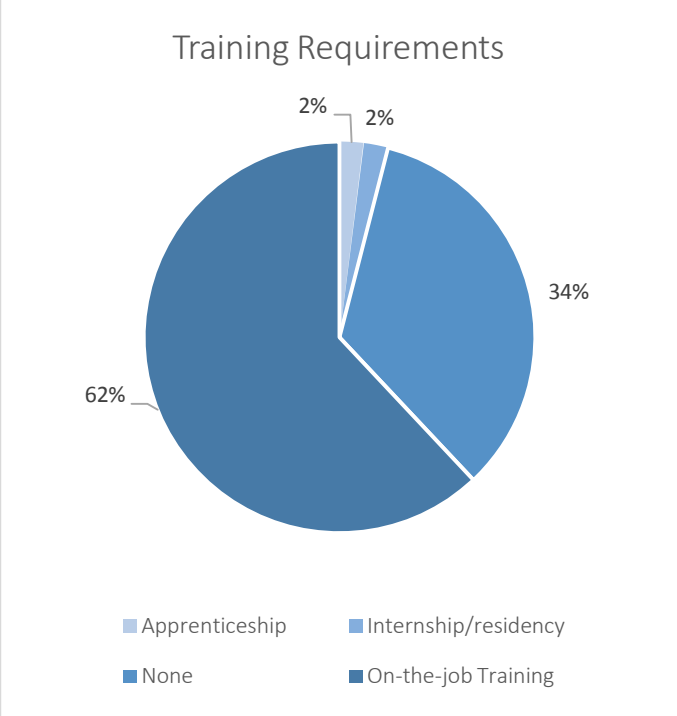
Top Occupations	Key Industries
Miscellaneous Production Workers	• Paper (except Newsprint) Mills • Newsprint Mills Paperboard Mills
Miscellaneous Assemblers and Fabricators	• Construction Machinery Manufacturing • Small Electrical Appliance Manufacturing • Reconstituted Wood Product Manufacturing
Machinists	• Machine Shops • Construction Machinery Manufacturing • Fluid Power Valve & Hose Fitting Manufacturing
Woodworking Machine Setters, Operators, and Tenders	• Reconstituted Wood Product Manufacturing • Hardwood Veneer and Plywood Manufacturing • Other Millwork (including Flooring)
Laborers and Material Movers, Hand	• Temporary Help Services • Supermarkets and Other Grocery (except Convenience) Stores • Couriers and Express Delivery Services

[12] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

Education and Skills For High Demand Jobs

Among high demand jobs in the Bay de Noc region, almost half of the jobs (46%) require a high school diploma or equivalent.[13] Approximately 18% of these high demand jobs require a Bachelor's Degree or above. Over 70% of these jobs require some type of training, which is mostly on-the-job training.

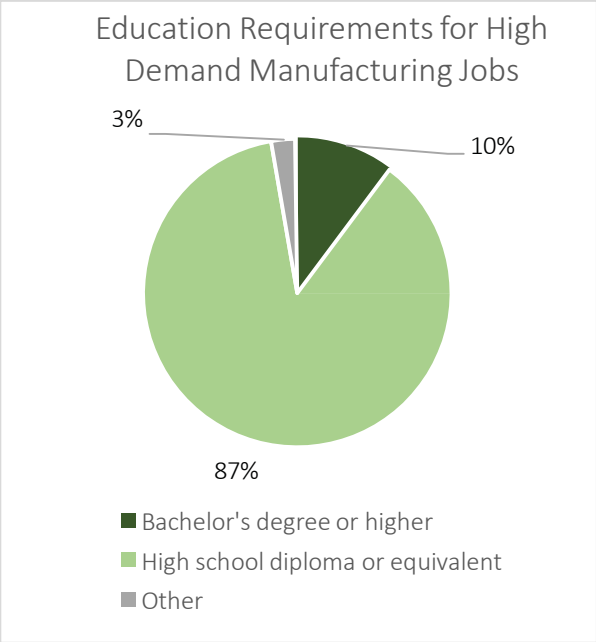


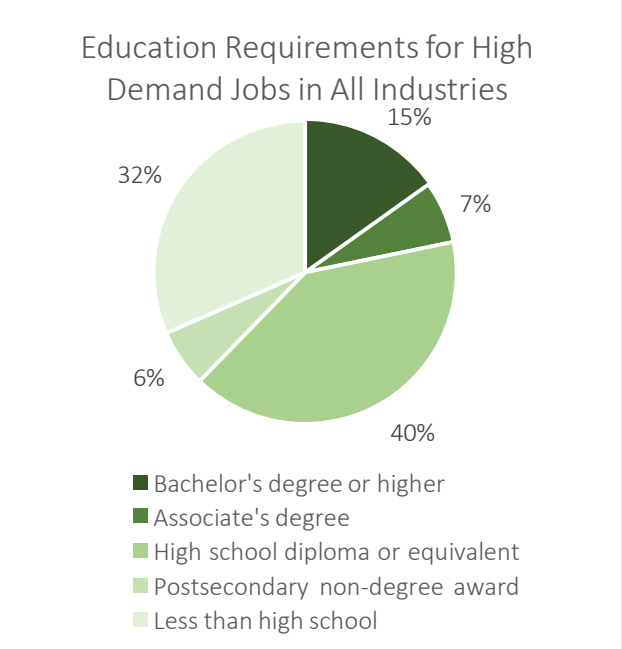


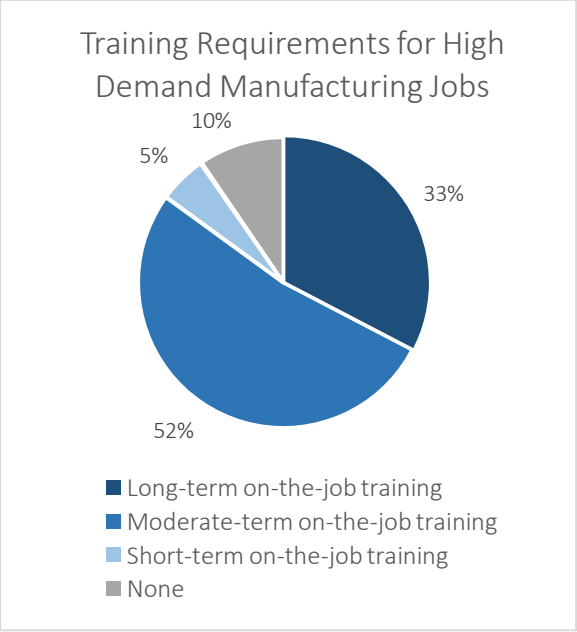
[13] A total of 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

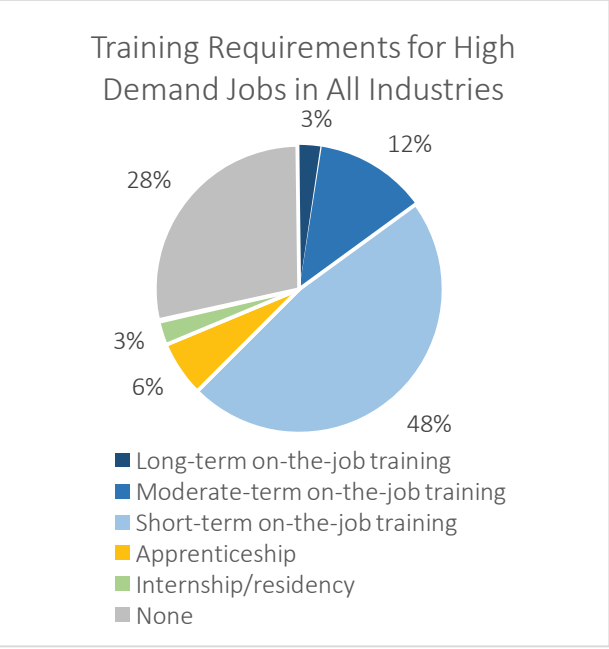
Education and Training For High Demand Jobs

The manufacturing sector has unique education and training requirements compared to the other industry sectors. Among high demand manufacturing jobs in the Bay de Noc region, almost 90% require a high school diploma or equivalent, while only 40% of the jobs among all industry sectors have the same requirement. [14] The most often required training in manufacturing sector is long-term on-the-job training (52%), followed by moderate-term on-the-job training (33%) and short-term on-the-job training (5%); while the short-term on-the-job training has the largest share (48%) in training requirement among all industries.









[14] A total of 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations that are with highest growth during 2014-2015 in the Bay de Noc region. The table on next page shows the top skills required for top 5 manufacturing jobs with highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Miscellaneous Assemblers and Fabricators	**426**	**436**	**10**	**2%**
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	**92**	**100**	**8**	**9%**
Electrical, Electronics, and Electromechanical Assemblers	**40**	**47**	**7**	**18%**
Metal Furnace Operators, Tenders, Pourers, and Casters	**32**	**37**	**5**	**16%**
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	**<10**	**13**	**4**	**44%**
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	138	142	4	3%
Aircraft Mechanics and Service Technicians	16	20	4	25%
Inspectors, Testers, Sorters, Samplers, and Weighers	213	216	3	1%
Medical, Dental, and Ophthalmic Laboratory Technicians	29	32	3	10%
Engineering Technicians, Except Drafters	43	46	3	7%
Software Developers and Programmers	17	20	3	18%
Sewing Machine Operators	50	52	2	4%
Structural Metal Fabricators and Filters	25	27	2	8%
Electrical and Electronics Engineers	14	16	2	14%
Aerospace Engineers	<10	<10	2	50%
Miscellaneous Electrical and Electronic Equipment Mechanics, Installers, and Repairers	25	27	2	8%
Miscellaneous Business Operations Specialists	20	21	1	5%
Miscellaneous Health Technologists and Technicians	<10	<10	1	33%
Production, Planning, and Expediting Clerks	44	45	1	2%
Aircraft Pilots and Flight Engineers	<10	<10	1	Insf. Data
Shipping, Receiving, and Traffic Clerks	69	70	1	1%
Database and Systems Administrators and Network Architects	10	11	1	10%
Forming Machine Setters, Operators, and Tenders, Metal and Plastic	32	33	1	3%
Miscellaneous Food Processing Workers	36	37	1	3%
Bakers	29	30	1	3%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	19	20	1	5%
Sales Engineers	<10	<10	1	50%
Miscellaneous Textile, Apparel, and Furnishings Workers	<10	<10	1	14%
Computer and Information Analysts	<10	<10	1	20%

The table below shows the top skills required for the top 5 manufacturing jobs with highest growth during 2014-2015. [15] Based on the data from real time job posting compiled by EMSI, the top five skills that appear in posting for manufacturing positions are Maintenance, Repairs, and Operations; Manufacturing; Tools; Machines; and Hand Tools. [16]

Top 50 In-Demand Skills

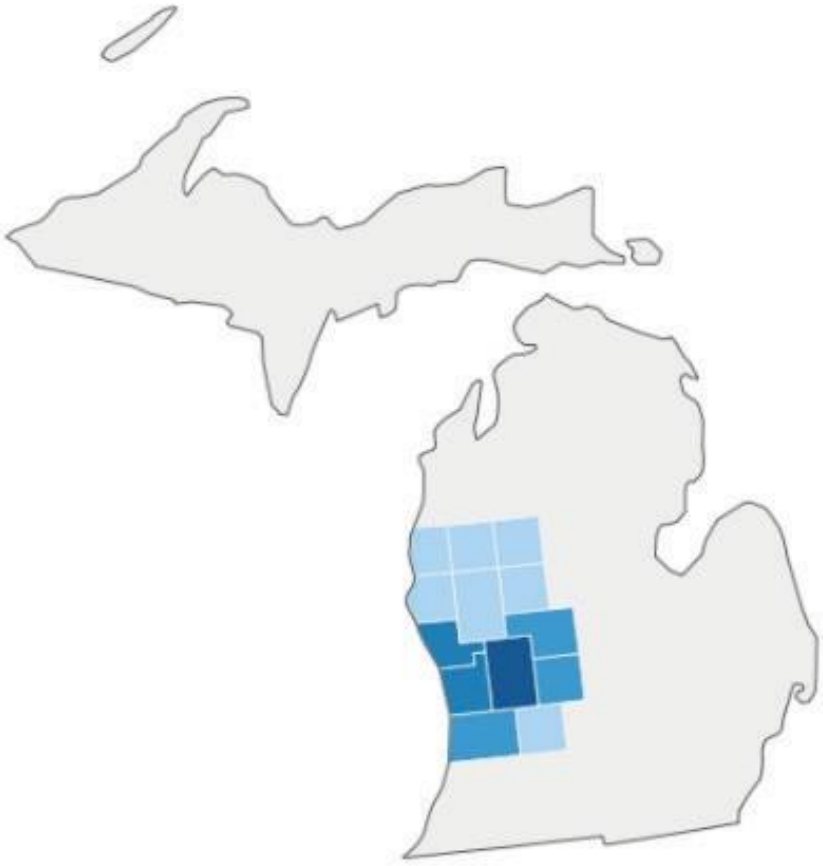
Skill	% of Postings with Skill		Skill	% of Postings with Skill
Maintenance, Repairs, and Operations	36%		Warehouse	4%
Manufacturing	34%		Wrench	4%
Tools	33%		Injection Molding	4%
Machines	32%		Screwdriver	4%
Hand Tools	17%		Circuit Boards	4%
Blueprints	15%		Fabrication	4%
Electricity	13%		Welding	3%
Safety Regulations	13%		Mechanical Aptitude	3%
Soldering	13%		Manual Dexterity	3%
Planned Maintenance	12%		Automation	3%
Inspection	10%		Electronic Components	3%
Electrical Wiring	8%		Genetics	3%
Schematics	8%		Housekeeping	2%
Transportation	8%		Engines	2%
Technology	6%		Rotation	2%
Plastics	5%		Production Environment	2%
Packaging	5%		Problem Solving	2%
Design	5%		Hammer	2%
Mechanical Assembly	5%		Casting	2%
Quality Control	5%		Workmanship	2%
Innovation	5%		Recognizing	2%
Drilling	5%		Wiring Diagrams	2%
Electromechanics	5%		Engineering Drawing	2%
Productivity	5%		Basic Math Skills	2%

[15] 4-digit SOC code. EMSI Analyst 2015.
[16] National data. EMSI Analysis 2015.

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Planned Maintenance, Soldering, Safety Regulations, and Hand Tools.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Planned Maintenance	46%	12%
Soldering	26%	13%
Safety Regulations	21%	13%
Hand Tools	20%	17%
Tools	16%	33%
Blueprints	11%	15%
Maintenance, Repairs, and Operations	9%	36%
Machines	6%	32%
Manufacturing	5%	34%
Electricity	2%	13%



Grand Rapids Community College

Skill Gap Analysis

THOMAS P. MILLER & ASSOCIATES

Executive Summary

Introduction

The following Skill Gap Analysis was created for the Grand Rapids Community College (GRCC) region to assist the Michigan Coalition for Advanced Manufacturing (M-CAM). Thomas P. Miller & Associates (TPMA) was hired to conduct a thorough and comprehensive analysis including a full labor market profile, a survey of employers and manufacturers within the region, and an input session for stakeholders, employers, recruiters, and other associated entities. The research centered on trends within manufacturing occupations and skills, specifically within the following four training opportunities for advanced manufacturing: Welding/Fabrication; CNC Machining; Multi-skilled Technology/Mechatronics; and Production Operations.

Skill Gap Analysis Process

The labor market profile was the first step of a three-part methodology that included quantitative research as well as qualitative research to assist Grand Rapids Community College in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic characteristics, industry analysis, occupation analysis, and labor force data. For the profile, the project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics.

Additionally, the project team interviewed college staff for additional information about the region. The data collected from the profile and conversations informed the next steps in the methodology which included a business demand survey and a regional input session. GRCC staff distributed the business demand survey to their employers. However, only six businesses completed the survey so the results are negligible. The survey results are included as an attachment to this report. Qualitative data obtained from the regional input session is included in this profile.

Summary of Quantitative Data

Grand Rapids Community College has multiple facilities and offers classes in several locations in West Michigan. The main campus and DeVos Campus are located in downtown Grand Rapids in the Heritage Hill neighborhood. GRCC has two additional Michigan Technical Education Centers (M-TECs) in Kent and Ottawa Counties. Additional classes are offered in various areas throughout greater Grand Rapids and along the Lakeshore. The college was founded in 1914 and offers over 5,000 classes, seminars, programs and workshops every year. GRCC offers eight job training programs in the following disciplines: automotive technician; computer support technician; computer applications specialist; construction remodeling; introduction to construction; machinist/CNC technician, residential construction, and welding/fabrication technician. GRCC also offers six workforce training programs in medical assistance; personal trainer; pharmaceutical technician; industrial sewing; advanced manufacturing and lean champion.

GRCC attracts students primarily from four counties: Kent, Ottawa, Allegan and Muskegon counties. However, since students come from areas throughout all of West Michigan, part of this report includes demographic trends for the broader thirteen-county region of: Allegan, Barry, Ionia, Kent, Lake, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Osceola, and Ottawa counties.

The population in the broader thirteen-county region has increased by 4% over the past ten years to over 1,500,000. By comparison, the state average population declined by 1%. The regional population is expected to continue to increase, although at a slower rate, over the next five years. The population is also aging. Over the past 10 years, the population of 55-years-and-older increased significantly, and this trend is likely to continue. This is a concern as the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers in the thirteen-county region are Manufacturing; Health Care and Social Assistance; Government; and Administrative and Support Services. Manufacturing experienced

significant job losses over the past ten years. However, it has rebounded significantly over the past five years. While not yet back to pre-recessionary levels, it has been recovering at a quick pace. Health Care and Social Assistance and Administrative and Support Services are the only sectors of the four that have been growing at a steady pace over the past ten years.

A key focus of this study is on the manufacturing sector. Drilling deeper into the four-county region, the largest manufacturing sector is motor vehicle parts manufacturing. Employment trends within this sector mirror overall economic trends that saw significant job losses and subsequent recovery over the past ten years. While the industry has recovered strongly over the past five years, it is projected to decline by 7% over the next five years. Significant manufacturing sectors within the region that are projected to grow include: semiconductor and other electrical component manufacturing; animal slaughtering and processing; and pharmaceutical and medicine manufacturing.

The top occupations by Standard Occupational Classification (SOC) codes within the four-county region include office and administrative support occupations; production operations; sales and related operations; transportation and material moving occupations; and food preparation and serving related occupations.

Top occupations for manufacturing include: miscellaneous assemblers and fabricators; laborers and material movers, hand; miscellaneous production workers; first-line supervision of production and operating workers; and inspectors, testers, sorters, samplers and weighers. It should be noted that many of the occupations for manufacturing workers are expected to have employment declines over the next five years. Thus, fewer new jobs are likely to be created, but there may be opportunities due to retirements with the aging population. While many of the occupations show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies where these occupations are represented.

Based on real time job posting information, the top skills that appear in job postings across the country for major regional manufacturers include: manufacturing; maintenance, repairs, and operations; machines; transportation; and tools.

Regional Input Session

An employer input session was held in Grand Rapids on December 10, 2015. Attendees included a mix of regional manufacturers as well as representatives from Grand Rapids Community College, West Michigan Works!, and the Right Place Program.

By far, the most significant workforce challenge discussed during the session was the upcoming worker shortages that are expected as baby-boomers continue to retire. One participant put it this way: the real challenge for his company is that they face the reality that they will have to replace 40% of their workforce sometime between 2022 and 2024. Much of the ensuring discussion was centered on how employers and service providers are working to address the anticipated shortages. A key strategy that most agreed with is the importance of exposing manufacturing as a potential career path to students at a young age, preferably at 8th grade or even earlier. There is an overall lack of understanding as to what opportunities currently exist coupled with misperceptions that turn many away from considering a career in manufacturing. One unique solution mentioned was a manufacturing trailer that is currently visiting area schools and exposing students, families, and teachers to modern manufacturing and available opportunities. Over 6,000 students are expected to participate in the event.

The group stated that in-demand occupations include CNC Machinists and General Machinists. Maintenance positions are also very challenging to fill, specifically those that require technical and trouble-shooting skills.

In general, most of the employers are not concerned with specific, industry-recognized credentials. However, one company mentioned that they look for candidates with National Career Readiness Certification (NCRC). They find that this credential helps identify employees who are best able to learn new equipment and processes. Many of the employers are more focused on skills rather than credentials. The skills that employers look for when hiring include math, mechanical aptitude, and general technical skills.

Barriers that employers frequently encounter when hiring include:

- A general bias towards a blue-collar work and manufacturing. It is often difficult to sell parents on manufacturing career opportunities for their children
- General difficulty in attracting millennials into the field
- Difficulty in finding employees who can pass drug tests

Barriers for mid or high-skill positions include:

- Math skills
- Everyone (regional manufactures) are looking for the same person – skilled trades
- Attraction is the real issue, not training programs
- Most are competing beyond the manufacturing industry, including against the construction industry
- Competition is making things more expensive. Hourly premiums are not being paid for 2nd shift work
- Lack of industrial arts teachers. Only one program left in Michigan that trains teachers for industrial arts

Several opportunities within the workforce were also mentioned. These include attracting more women to CNC Machinist positions (and other manufacturing occupations in general) and the overall importance of exposing school age children and parents to STEM careers and the opportunities available.

Findings and Considerations

With consideration to the labor market profile and business input, the following are key findings and considerations for Grand Rapids Community College.

- The Grand Rapids region is different from many of the other M-CAM regions as the population is growing rather than declining, and many of the manufacturing occupations are projected for growth in the next five years. In contrast, many of the manufacturing occupations in the other M-CAM regions do not have the same levels of projected growth and instead have higher levels of projected decline.
- The GRCC region has numerous resources and partnerships available and appears to be tackling the Skill Gap in a coordinated effort. For example, the region is utilizing the data and resources of Talent2025 as well as The Right Place, the economic development organization, secondary and career and technical education schools, West Michigan Works!, and employers to discuss the issues and develop comprehensive strategies. GRCC should continue to stay involved in the efforts and look for ways for the M-CAM programs to support the training gaps.
- Efforts to develop the pipeline are necessary. The quantitative data illustrates the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce. The employers indicated their concern with future retirements and the limited supply of young people interested in manufacturing. There is a strong interest in developing a campaign to promote manufacturing to students, parents and teachers. It is important to expose students as soon as possible, and ideally before high school. Community partners have the Manufacturing Trailer going to schools and other activities, but there is an opportunity for M-CAM and GRCC to get more involved with the partners and employers to support manufacturing awareness activities.

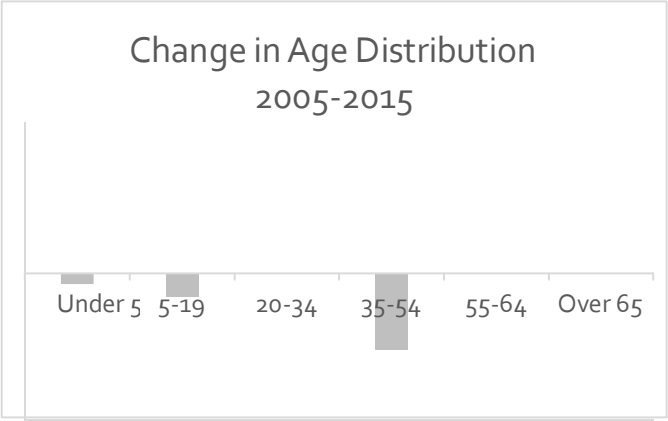
Demographics

The population in the broad GRCC region has increased from 1,504,239 to 1,566,040 over the past ten years.[1] The population increased by 4%, while the state average declined at a rate of 1% over the same time period. However, the national rate over the same period was an increase of 9%. The population for the region is projected to increase by 2% over the next five years.

The region has an aging population. Over the past ten years, the population of 55-years-and-older increased significantly, while the population decreased in all the other age groups, with the exception of 20-34 years which had a 4% increase. In the next five years, the only age groups projected to grow are under age 5 and over age 55. The aging population is a concern as it will impact the availability of labor in this region over the next decade.

Age Distribution

Age	2015 Population	Change, 2005-2015		Change, 2015-2020	
Under 5	100,604	-5,940	-6%	8,850	9%
5-19	211,090	-12,394	-6%	-7,269	-2%
20-34	429,081	17,977	4%	-3,021	-1%
35-54	392,884	-41,278	-11%	-14,314	-4%
55-64	205,776	58,285	28%	9,693	5%
Over 65	226,606	54,166	24%	42,616	19%



The population of the thirteen-county region is not diverse, with over 81% of the 2015 population identifying as White. However, other races are growing. The top three fastest growing races in the region are those identifying as Two or More Races, Asian, and Hispanic.[2]

Race Distribution

Race	2015 Population	Change, 2005-2015	
White	1,274,121	11,696	1%
Hispanic	125,733	26,529	21%
Black	99,264	7,787	8%
Two or More Races	30,357	8,560	28%
Asian	29,088	6,941	24%
American Indian or Alaskan Native	7,073	235	3%
Native Hawaiian or Pacific Islander	402	51	13%

[1] EMSI Analyst 2015.
[2] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander.

Income

Median income for the region varies significantly with Ottawa County reporting the highest income ($58,160) from 2010 to 2014 and Lake County the lowest income ($28,872) during the same time period. Lake County also has the highest poverty rate over the same period. [3] With the exception of Muskegon County, the median household incomes in Allegan, Kent and Ottawa tend to be significantly higher than the other counties within the region.

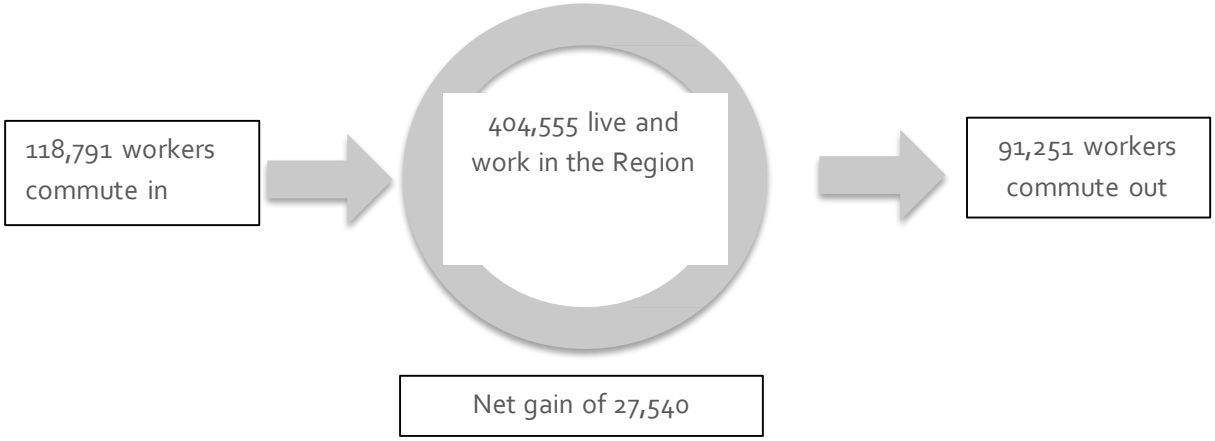
	Median Household Income ('10-'14)	Poverty Rate
Allegan	**$52,472**	**11.4%**
Barry	$53,730	10.2%
Ionia	$48,100	15.2%
Kent	**$52,716**	**15.3%**
Lake	$28,872	29.2%
Mason	$42,156	16.3%
Mecosta	$40,396	23.0%
Montcalm	$40,739	20.4%
Muskegon	**$41,842**	**20.0%**
Newaygo	$42,640	21.0%
Oceana	$40,969	20.1%
Ottawa	**$58,160**	**9.1%**
Michigan	**$49,087**	**16.2%**
United States	**$53,482**	**14.8%**

[3] U.S. Census Bureau 2010-2014

Commuting Pattern and Labor Force Availability

In 2013, the broad region had nearly 100,000 workers commuting in and over 116,000 commuting out, making the region a net exporter of workers.[4] Over 605,000 workers are employed in the region, including 505,240 both living and working in the region and 99,781 commuting into the region. The counties with the most workers are: Kent (331,921, 55%); Ottawa (106,796, 18%); Muskegon (51,107, 8%); and Allegan (33,522, 6%).

In 2013, the four-county region of Allegan, Kent, Muskegon and Ottawa Counties had over 118,000 workers commuting in and over 91,000 commuting out, making the region a net importer of workers.[5] Over 523,000 workers are employed in the region, including 404,555 both living and working in the region and 118,791 commuting into the region.



[4] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/
[5] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/

Human Capital

In 2014, about 787,913 workers participated in the GRCC regional labor force which includes employed and unemployed individuals. Of these, 755,464 are employed. Over the last 20 years, employment in the region was at its highest in December 1999 and lowest in March 1994. The unemployment rate for the broader region is 4.1%, which is lower than the rate for Michigan (7.3%), and the U.S. (6.2%).

EMPLOYMENT, 1994-2014 [6]		
Peak	Dec 1999 (768,035)	+.02% (compared to Nov, 2014)
Trough	March 1994 (629,446)	-17.0% (compared to Nov, 2014)
Nov 2014	755,464	Current unemployment: 4.1%

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

Labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation rate for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boom generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

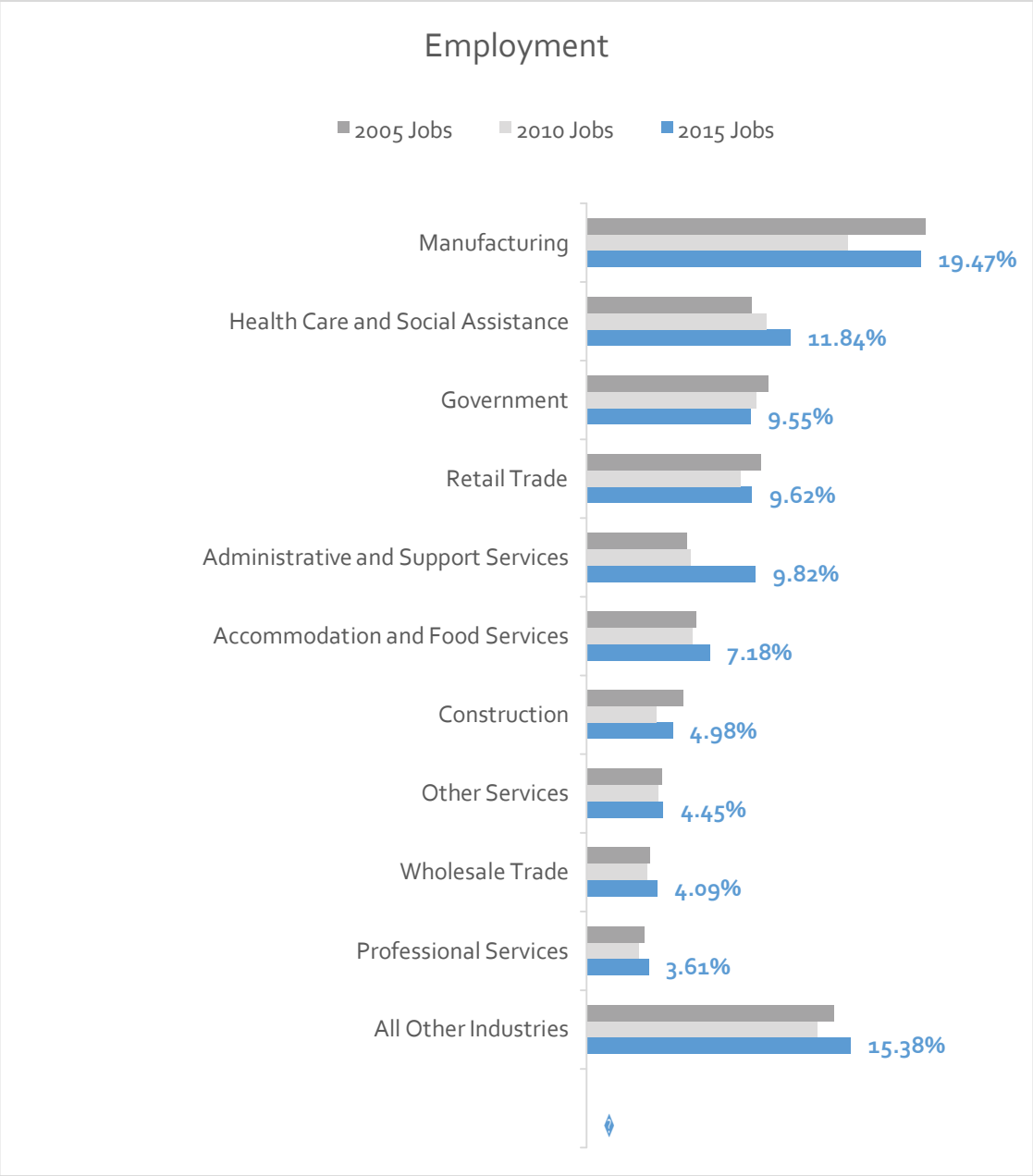
The older worker population (55 years and older) in the region is estimated to be 418,527 in 2014.[7] These older workers are expected to retire in the next ten years.

[6] U.S. Bureau of Labor Statistics, 1994.9-2014.9 (most recently available). http://www.bls.gov/data/

[7] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

Industry Analysis

The broad industry sectors in the 13-county region employing the most workers are Manufacturing (149,275, 19.47%), Health Care and Social Assistance (90,794, 11.84%), Government (73,218, 9.55%), Administrative and Support Services (75,281, 9.82%), and Retail Trade (73,755, 9.62%).[8]



[8] These industries are by 2-digit NAICS code. EMSI Analyst 2015.

Manufacturing Analysis

The tables below show the top 25 largest manufacturing industries by employment in the four-county region of Kent, Ottawa, Allegan, and Muskegon. [9] It is worth noticing that 90% of the industries experienced growth from 2010-2015 with many having double-digit growth. It is important to note the projected employment numbers as well as the percentage changes. Some of the industries with the highest projected growth include: Semiconductor and Other Electronic Component Manufacturing; Animal Slaughtering and Processing; and Pharmaceutical and Medicine Manufacturing. While a few of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2010	
Motor Vehicle Parts Manufacturing	15,782	-4,396	-22%	5,312	51%	-1,090	-7%
Office Furniture (including Fixtures) Manufacturing	13,580	-1,062	-7%	1,743	15%	-1,610	-12%
Plastics Product Manufacturing	9,435	865	10%	2,785	42%	202	2%
Metalworking Machinery Manufacturing	7,424	961	15%	2,286	44%	-416	-6%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	5,033	1,028	26%	1,703	51%	278	6%
Foundries	4,979	-685	-12%	973	24%	-462	-9%
Semiconductor and Other Electronic Component Manufacturing	4,833	2,346	94%	2,080	76%	772	16%
Animal Slaughtering and Processing	4,328	1,476	52%	1,221	39%	399	9%
Other General Purpose Machinery Manufacturing	4,226	-311	-7%	1,257	42%	-441	-10%
Pharmaceutical and Medicine Manufacturing	4,189	982	31%	1,138	37%	396	9%
Coating, Engraving, Heat Treating, and Allied Activities	3,628	207	6%	1,037	40%	-133	-4%
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3,601	-465	-11%	349	11%	-227	-6%
Forging and Stamping	3,148	1,500	91%	983	45%	275	9%
Soap, Cleaning Compound, and Toilet Preparation Manufacturing	2,743	-191	-7%	151	6%	-273	-10%
Printing and Related Support Activities	2,703	-568	-17%	-41	-1%	-234	-9%
Bakeries and Tortilla Manufacturing	2,682	1,117	71%	892	50%	-45	-2%
Architectural and Structural Metals Manufacturing	2,633	-277	-10%	748	40%	105	4%
Medical Equipment and Supplies Manufacturing	2,389	1,076	82%	365	18%	279	12%
Other Wood Product Manufacturing	2,107	597	40%	548	35%	326	15%
Converted Paper Product Manufacturing	1,737	-988	-36%	-82	-5%	-236	-14%
Other Fabricated Metal Product Manufacturing	1,719	-131	-7%	259	18%	-221	-13%
Household and Institutional Furniture and Kitchen Cabinet Manufacturing	1,648	206	14%	464	39%	274	17%
Grain and Oilseed Milling	1,629	584	56%	-553	-25%	-58	-4%
Glass and Glass Product Manufacturing	1,541	-1,466	-49%	-581	-27%	-1,117	-72%
Industrial Machinery Manufacturing	1,452	276	23%	692	91%	29	2%

[9] These industries are by4-digit NAICS code within Kent, Ottawa, Allegan and Muskegon Counties.

Among these top industries within the four-county region, average earnings vary widely, from under $40,000 a year for Other Wood Product Manufacturing, to nearly $95,000 a year for Soap, Cleaning Compound, and Toilet Preparation Manufacturing. This industry, in particular, is likely an outlier as it represents the major headquarters of a global firm. The high earnings likely represent a larger number of higher paying executive and management positions. It is also important to look at industries that also have a relatively large number of establishments.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earning	Establishments
Motor Vehicle Parts Manufacturing	15,782	$56,803	80
Office Furniture (including Fixtures) Manufacturing	13,580	$65,095	76
Plastics Product Manufacturing	9,435	$50,029	88
Metalworking Machinery Manufacturing	7,424	$61,235	212
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	5,033	$52,413	194
Foundries	4,979	$58,404	29
Semiconductor and Other Electronic Component Manufactu ring	4,833	$58,312	18
Animal Slaughtering and Processing	4,328	$44,555	16
Other General Purpose Machinery Manufacturing	4,226	$73,278	82
Pharmaceutical and Medicine Manufacturing	4,189	$66,393	14
Coating, Engraving, Heat Treating, and Allied Activities	3,628	$43,388	90
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3,601	$75,977	30
Forging and Stamping	3,148	$55,991	27
Soap, Cleaning Compound, and Toilet Preparation Manufacturing	2,743	$94,940	11
Printing and Related Support Activities	2,703	$44,992	138
Bakeries and Tortilla Manufacturing	2,682	$45,458	39
Architectural and Structural Metals Manufacturing	2,633	$51,648	96
Medical Equipment and Supplies Manufacturing	2,389	$46,006	51
Other Wood Product Manufacturing	2,107	$38,021	61
Converted Paper Product Manufacturing	1,737	$56,201	35
Other Fabricated Metal Product Manufacturing	1,719	$57,439	49
Household and Institutional Furniture and Kitchen Cabinet Manufacturing	1,648	$46,777	40
Grain and Oilseed Milling	1,629	$50,888	5
Glass and Glass Product Manufacturing	1,541	$55,231	12
Industrial Machinery Manufacturing	1,452	$51,672	44

Occupation Analysis

The four-county region's highest employment levels are in the occupations that include: Office and Administrative Support Occupations, Production Occupations, Sales and Related Occupations, Transportation and Material Moving Occupations, and Food Preparation and Serving Related Occupations.[10] The average median hour earnings in the region is $19.66/hour. The median hourly earnings range from $10.09/hour for Food Preparation and Serving Related Occupations, to $41.08/hour for Management Occupations.

GRCC Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	91,403	13.99%	$16.37
Production Occupations	87,553	13.40%	$16.14
Sales and Related Occupations	63,065	9.65%	$18.21
Transportation and Material Moving Occupations	52,296	8.01%	$14.48
Food Preparation and Serving Related Occupations	49,737	7.61%	$10.09
Education, Training, and Library Occupations	34,846	5.33%	$22.83
Management Occupations	34,167	5.23%	$41.08
Healthcare Practitioners and Technical Occupations	33,445	5.12%	$33.43
Installation, Maintenance, and Repair Occupations	25,535	3.91%	$20.11
Business and Financial Operations Occupations	25,128	3.85%	$28.08
Construction and Extraction Occupations	24,616	3.77%	$20.11
Building and Grounds Cleaning and Maintenance Occupations	24,047	3.68%	$11.89
Healthcare Support Occupations	19,736	3.02%	$13.58
Personal Care and Service Occupations	18,436	2.82%	$11.02
Architecture and Engineering Occupations	14,748	2.26%	$31.78
Computer and Mathematical Occupations	11,339	1.74%	$32.77
Arts, Design, Entertainment, Sports, and Media Occupations	10,674	1.63%	$18.00
Community and Social Service Occupations	10,238	1.57%	$21.80
Protective Service Occupations	8,279	1.27%	$19.85
Farming, Fishing, and Forestry Occupations	6,125	0.94%	$12.83
Life, Physical, and Social Science Occupations	3,082	0.47%	$30.63
Legal Occupations	2,447	0.37%	$36.67
Military occupations	2,269	0.35%	$19.15
Total/Average	653,212	100%	$19.66

[10] These occupations are by 2 digit SOC code (Standard Occupational Classification System).

Occupations in Manufacturing Sector

The table below shows employment of each occupation within the Manufacturing Sector. It is worth noting that 54.3% of occupations within the Manufacturing sector are Production Occupations.

GRCC Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	70,420	54.3%
Office and Administrative Support Occupations	11,522	8.9%
Transportation and Material Moving Occupations	9,994	7.7%
Architecture and Engineering Occupations	9,807	7.6%
Management Occupations	7,483	5.8%
Installation, Maintenance, and Repair Occupations	5,589	4.3%
Business and Financial Operations Occupations	4,231	3.3%
Sales and Related Occupations	4,090	3.2%
Computer and Mathematical Occupations	1,782	1.4%
Construction and Extraction Occupations	1,270	1.0%
Life, Physical, and Social Science Occupations	1,125	0.9%
Arts, Design, Entertainment, Sports, and Media Occupations	882	0.7%
Building and Grounds Cleaning and Maintenance Occupations	760	0.6%
Food Preparation and Serving Related Occupations	281	0.2%
Healthcare Practitioners and Technical Occupations	159	0.1%
Farming, Fishing, and Forestry Occupations	83	0.1%
Protective Service Occupations	79	0.1%
Legal Occupations	30	0.0%

Top Occupations in the Manufacturing Sector

Drilling a bit deeper, the following table displays the top 20 occupations that are most often required to staff companies within manufacturing in the four-county GRCC region.[11] Median hourly earnings for these occupations range from $10.90 at the low end for Laborers and Materials Movers, Hand to $43.11 at the high end for General and Operations Managers. Over the past five years, all occupations experienced growth. Additionally, Machinists; Computer Control Programmers and Operators; and Industrial Machinery Installation, Repair, and Maintenance Workers experienced growth over the past five years and are expected to grow over the next five years. While many of the occupations show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies where these occupations are represented.

Top 20 Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	14,173	-851	-6%	3,472	32%	-697	-5%	$14.43
Laborers and Material Movers, Hand	6,098	101	2%	1,293	27%	-199	-3%	$10.90
Miscellaneous Production Workers	5,725	-485	-8%	999	21%	-287	-5%	$12.23
First-Line Supervisors of Production and Operating Workers	4,775	-43	-1%	1,018	27%	-144	-3%	$25.79
Inspectors, Testers, Sorters, Samplers, and Weighers	4,622	371	9%	1,271	38%	-69	-1%	$14.93
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	4,103	-239	-6%	860	27%	-301	-7%	$16.01
Machinists	4,032	399	11%	1,256	45%	86	2%	$15.63
Industrial Engineers, Including Health and Safety	3,382	261	8%	982	41%	-121	-4%	$34.12
Sales Representatives, Wholesale and Manufacturing	3,195	15	0%	662	26%	-134	-4%	$26.74
Computer Control Programmers and Operators	2,881	386	15%	1,033	56%	116	4%	$15.25
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	2,867	-106	-4%	687	32%	-211	-7%	$12.72
Industrial Machinery Installation, Repair, and Maintenance Workers	2,438	163	7%	612	34%	93	4%	$21.78
Welding, Soldering, and Brazing Workers	2,419	-238	-9%	642	36%	-58	-2%	$16.54
Tool and Die Makers	2,364	109	5%	809	52%	-82	-3%	$23.49
Packaging and Filling Machine Operators and Tenders	2,295	223	11%	263	13%	-27	-1%	$12.77
Engineering Technicians, Except Drafters	2,234	245	12%	668	43%	-28	-1%	$24.21
Miscellaneous Food Processing Workers	2,160	722	50%	333	18%	-3	0%	$15.55
Maintenance and Repair Workers, General	2,115	-24	-1%	431	26%	-60	-3%	$17.44
General and Operations Managers	2,079	-18	-1%	417	25%	-51	-2%	$43.11
Shipping, Receiving, and Traffic Clerks	2,048	-29	-1%	446	28%	-63	-3%	$14.81

[11] Occupations are by 4 digit SOC code.

Industry and Occupation Connections in Manufacturing Sector

Although key manufacturing industries are highly diversified, they do share some common workforce requirements.[12] The following table identifies the top five occupations with corresponding key industries. Motor vehicle parts manufacturing overlaps with four of the top five occupations.

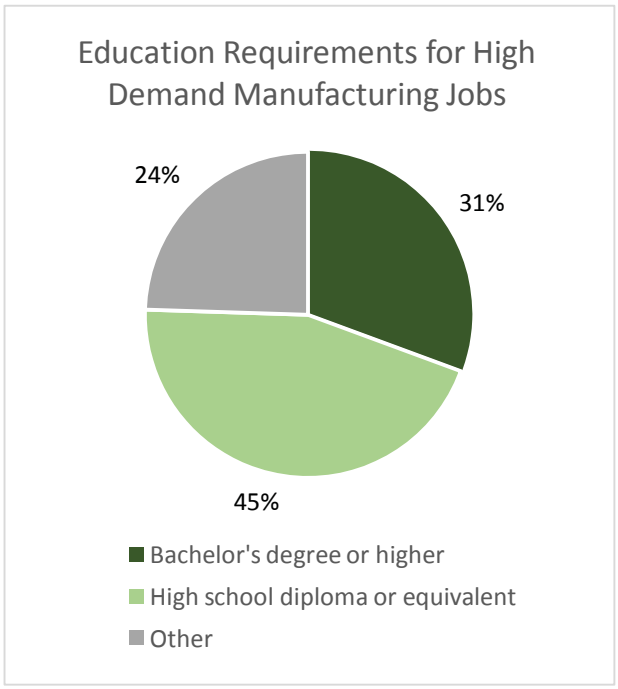
Connection between Top Occupations and Key Industries in Manufacturing Sector

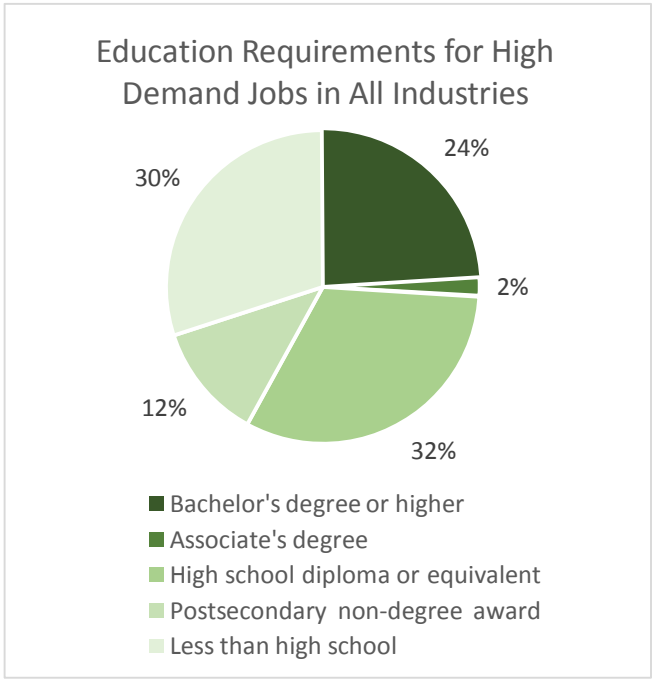
Top Occupations	Key Industries
Miscellaneous Assemblers and Fabricators	• Motor Vehicle Parts Manufacturing • Employment Services • Office Furniture (including Fixtures) Manufacturing • Plastics Product Manufacturing • Other General Purpose Machinery Manufacturing
Miscellaneous Production Workers	• Employment Services • Motor Vehicle Parts Manufacturing • Office Furniture (including Fixtures) Manufacturing • Converted Paper Product Manufacturing • Plastics Product Manufacturing
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	• Motor Vehicle Parts Manufacturing • Office Furniture (including Fixtures) Manufacturing • Metalworking Machinery Manufacturing • Forging and Stamping
First-Line Supervisors of Production and Operating Workers	• Office Furniture (including Fixtures) Manufacturing • Motor Vehicle Parts Manufacturing • Plastics Product Manufacturing
Laborers and Material Movers, Hand	• Employment Services • Plastics Product Manufacturing • Couriers and Express Delivery Services • Animal Slaughtering and Processing • Grocery and Related Product Merchant Wholesalers

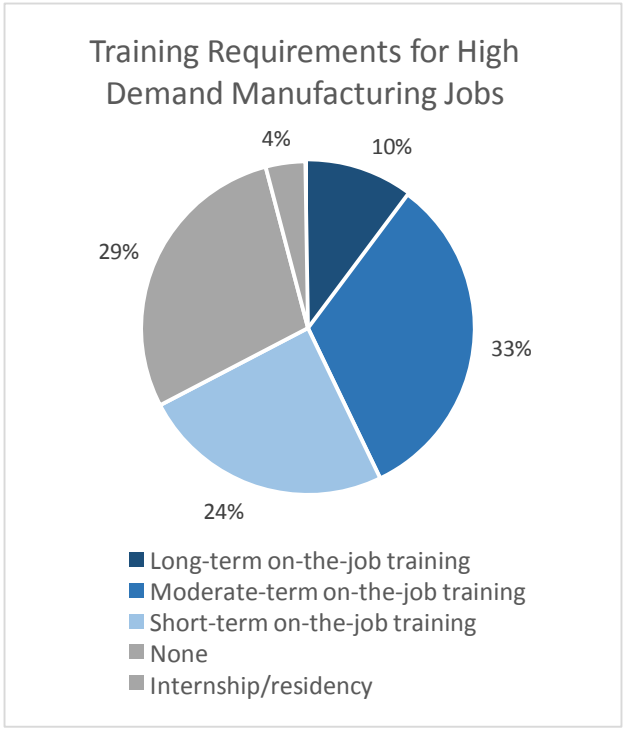
[12] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

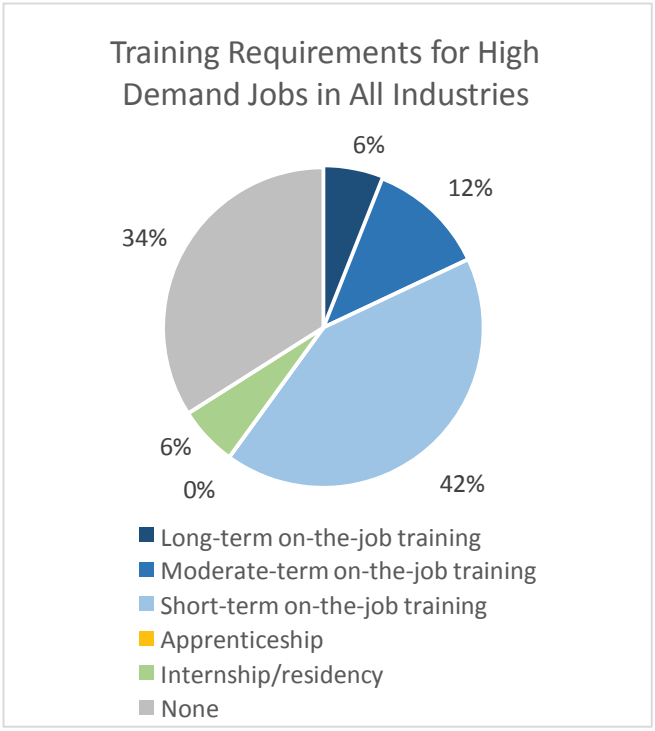
Education and Training For High Demand Jobs

The Manufacturing sector has unique education and training requirements compared to the other industry sectors. Among high demand manufacturing jobs in the four-county region, 31% require a high school diploma or equivalent, while only 24% of the jobs among all industry sectors have the same requirement.[13] The most often required training in the manufacturing sector is moderate-term on-the-job training (33%), followed by short-term on-the-job training (24%) and long-term on-the-job training (10%).









[13] A total of near 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations with largest employment and highest growth during 2014-2015 in the four-county region. Some of the occupations have fewer jobs but have higher percentage growth. The table on next page shows the top skills required for top 5 manufacturing jobs with highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Team Assemblers	12,133	12,757	624	5%
Machinists	3,743	4,033	290	8%
First-Line Supervisors of Production and Operating Workers	4,566	4,776	210	5%
Inspectors, Testers, Sorters, Samplers, and Weighers	4,434	4,633	199	4%
Computer-Controlled Machine Tool Operators, Metal and Plastic	2,358	2,529	171	7%
Industrial Engineers	3,226	3,373	147	5%
Tool and Die Makers	2,232	2,377	145	6%
Welders, Cutters, Solderers, and Brazers	1,699	1,838	139	8%
Laborers and Freight, Stock, and Material Movers, Hand	2,940	3,055	115	4%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2,810	2,922	112	4%
Mechanical Engineers	1,673	1,780	107	6%
Helpers--Production Workers	3,570	3,676	106	3%
General and Operations Managers	1,975	2,078	103	5%
Electrical and Electronic Equipment Assemblers	1,210	1,310	100	8%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2,326	2,422	96	4%
Industrial Machinery Mechanics	1,784	1,877	93	5%
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	2,559	2,651	92	4%
Shipping, Receiving, and Traffic Clerks	1,959	2,047	88	4%
Maintenance and Repair Workers, General	2,034	2,113	79	4%
Assemblers and Fabricators, All Other	1,428	1,505	77	5%
Packers and Packagers, Hand	2,516	2,591	75	3%
Cabinetmakers and Bench Carpenters	414	483	69	17%
Office Clerks, General	1,788	1,857	69	4%
Industrial Production Managers	1,515	1,582	67	4%
Purchasing Agents, Except Wholesale, Retail, and Farm Products	1,159	1,223	64	6%

The following table shows the top skills required for top 5 manufacturing jobs with highest growth during 2014-2015. [14] Based on the data from real time job posting compiled by EMSI, the top five skills that appear in postings for manufacturing positions are manufacturing; maintenance, repairs and operations; machines; transportation; and tools. [15]

Top 50 In-Demand Skills

Skill	% of Postings with Skill		Skil	% of Postings with Skill
	I			
Manufacturing	**48%**		Rotation	5%
Maintenance, Repairs, and Operations	**48%**		Welding	5%
Machines	**29%**		Fabrication	5%
Tools	**23%**		Product Quality	5%
Inspection	**16%**		Purchasing	5%
Productivity	15%		Sanitation	5%
Quality Control	15%		Workflow	4%
Planning	14%		Drilling	4%
Computer Numerical Control (CNC)	13%		Hand Tools	4%
Technology	13%		Microsoft Word	4%
Blueprints	13%		Plastics	4%
Design	11%		Automation	4%
Machining	11%		Preventive Maintenance	3%
Problem Solving	10%		Food Safety	3%
Innovation	10%		Six Sigma	3%
Packaging	9%		Recognizing	3%
Warehouse	8%		Project Management	3%
Lathes	8%		Engines	3%
Housekeeping	8%		Standardization	3%
Electricity	7%		Production Environment	2%
Corrective Action	7%		Mechanical Aptitude	2%
Transportation	6%		Cleanliness	2%
OSHA	6%		Recording	2%
Lean Manufacturing	6%		Turning	2%

[14] 4-digit SOC code. EMSI Analyst 2015.

[15] National data. EMSI Analysis 2015.

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Maintenance, Repairs and Operations; Tools; Manufacturing; Machines; and Transportation.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Computer Numerical Control (CNC)	78%	13%
Inspection	71%	16%
Maintenance, Repairs, and Operations	53%	48%
Machining	51%	11%
Productivity	48%	15%

Regional Input Session

GRCC Employer Input Session – December 10, 2015

Attendees: A mix of regional manufacturers as well as representatives from Grand Rapids Community College, West Michigan Works!, and the Right Place Program

The session began with discussion around the upcoming worker shortages as baby-boomers continue to retire. One person said that the real challenge for his company (and for most of the others) is that they face the reality that they will have to replace 40% of their workforce sometime between 2022 and 2024. They will have to replace skilled, experienced workers.

One of the questions they face is how many people will really retire over that time frame and how many new workers will realistically enter the workforce. They also wonder how many of the retiring workers they will need to replace depending on how demand, the work place, and technology changes in the coming years. As well as how they will fill positions due to growth.

The group is really working on how best to prepare. They are doing what they can to introduce industrial arts back into area high schools to inform students and staff of the opportunities available. One person stated that they need GRCC to keep filling classes to supply workers.

Occupations that are in demand include CNC Machinists (different than operators) and General Machinists. Maintenance positions are also very challenging to fill, specifically those that require technical and trouble-shooting skills.

Many of the employers are already working to address the issue. Some of their activities include:

- One employer mentioned that they have an apprenticeship program to develop and retain workers.
- Another employer has secession plans in place for 10 programs. They range from 9 months to 6 years. For example in one program, employees have the ability to move up to machinist and then to CNC machinist. When a position becomes available they then have someone already trained and ready to fill the position.

Many of the service providers are also working to address the issue

- A sub-committee is working on an event where a manufacturing trailer is brought to various schools throughout the region. This is a way to introduce manufacturing careers to students, parents, and teachers. Over 6,000 students are expected to go through the event.
- ISD expanded a current program to train teachers about introducing manufacturing.

These programs are designed to show kids and parents that a four-year degree is not the default option for everyone, and that there are some students with skills who may not otherwise be familiar with manufacturing opportunities.

A question was asked about credentials that employers look for:

- National Career Readiness Certification – look for bronze level or above. This helps with employees learning new equipment. Kids are not aware of it though.
- One employer has an internal mechanical aptitude process, which is designed to identify the best placement for them within the plant.

Skills that employers look for when hiring:

- Math

- Technical skills (do they come from a tech background? do they like to put things together?)

One participant made the point that the most untapped market for CNC machining is women. It's always about the men, but there are opportunities for women in manufacturing.

The conversation then turned back towards getting people exposed. Girls need to be exposed to manufacturing opportunities in school. It is important both girls and boys are exposed at an early age as high school is typically too late.

It is vital to have mom and dad on board too. One participant suggested having families tour manufacturing facilities.

A question was asked about how West Michigan Works! is working with the under and unemployed to get them connected to manufacturing:

- They have turned towards an employer demand system. They look for employer input and partner with employers and educators to give potential workers as much exposure as possible.
- There are six representatives that are focused on manufacturing and they have met with over 1,900 employers over the past year.

Barriers typically encountered with hiring:

- General bias against the blue-collar work and manufacturing, and it is difficult to sell parents on manufacturing jobs for their children
- Difficulty in attracting millennials in general – always wanting to know what's in it for them?
- Difficulty with employees and candidates passing drug tests

Barriers for mid or high-skill positions:

- Math skills
- Everyone (regional manufactures) are looking for the same person – skilled trades
- Attraction is the real issue, not training programs
- Most are competing beyond the industry, including construction
- Competition is making things more expensive. Hourly premiums are not being paid for 2nd shift work
- Lack of industrial arts teachers. Only one program left in Michigan that trains teachers. It is difficult to increase programs in schools when there is only one program statewide training industrial arts teachers.

Finally, the importance of STEM (Science, Technology, Engineering, and Math education) was discussed. Two-thirds of students are discouraged from STEM. It is important to expose children to STEM careers. At the 8th grade level a student's interest is a better indicator than achievement for going into a STEM career.

Grand Rapids Community College

Regional Profile

KENT OTTAWA ALLEGAN MUSKEGON

About M-CAM

The Michigan Coalition for Advanced Manufacturing (M-CAM) brings together the state of Michigan, community college leaders, employers, workforce development agencies, and other community partners to create education and training programs that lead to employment. With the award of a $24.9 million U.S. Department of Labor grant, M-CAM is creating a 21st century workforce through the development of seamless and responsive career pathways, credentials that have labor-market value, and strategies that connect the needs of employers with training providers throughout Michigan.

M-CAM provides training opportunities in four key areas of advanced manufacturing:

- Welding/ Fabrication
- CNC Machining
- Multi-Skilled Technology / Mechatronics
- Production Operations

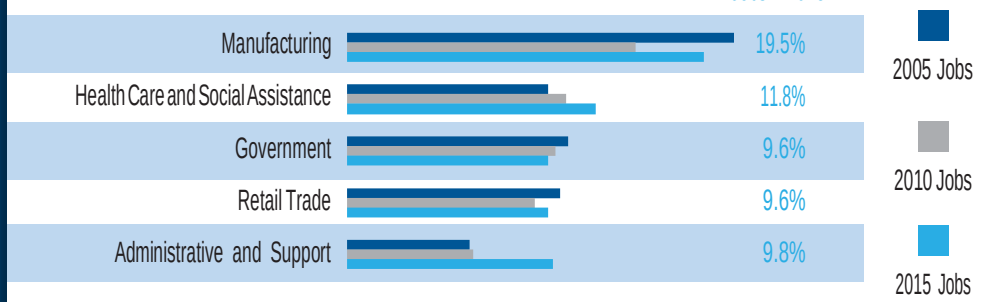
Job seekers will be able to earn various certificates, degrees, and credentials within these four areas.

Median Household Income

Michigan	Grand Rapids College Region	USA
$49,087	$45,233	$53,482

Employment

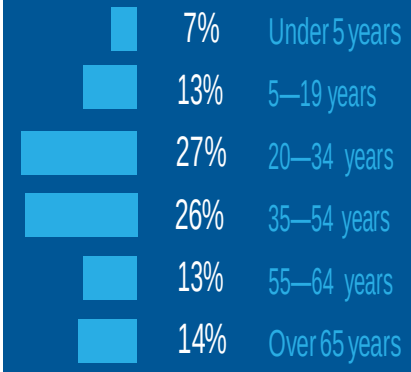
Major Industries



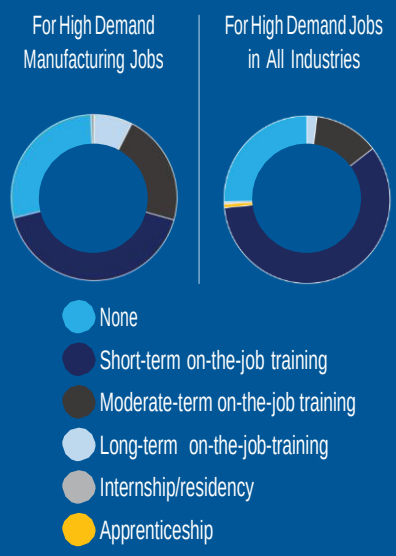
The People

Population 1,566,040

4% ↑ Increase over the past decade



Training Requirements



GRCC attracts students primarily from four counties: Kent, Ottawa, Allegan and Muskegon counties. However, since students come from areas throughout all of West Michigan, this report includes demographic trends for the broader region of: Allegan, Barry, Ionia, Kent, Lake, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Osceola, and Ottawa counties.

Grand Rapids Community College

Regional Profile

Kent Ottawa Allegan Muskegon

Top Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2010-2015	Projected Change, 2015-2020	Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	14,173	Growing	Loss	$14.43
Laborers and Material Movers, Hand	6,098	Growing	Loss	$10.90
Miscellaneous Production Workers	5,725	Growing	Loss	$12.23
First-Line Supervisors of Production and Operating Workers	4,775	Growing	Loss	$25.79
Inspectors, Testers, Sorters, Samplers, and Weighers	4,622	Growing	Loss	$14.93

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Team Assemblers	12,133	12,757	624	5%
Machinists	3,743	4,033	290	8%
First-Line Supervisors of Production and Operating Workers	4,566	4,776	210	5%
Inspectors, Testers, Sorters, Samplers, and Weighers	4,434	4,633	199	4%
Computer-Controlled Machine Tool Operators, Metal and Plastic	2,358	2,529	171	7%

Top In-Demand Skills

Skill	% of Postings with Skill
Manufacturing	48%
Maintenance, Repairs, and Operations	48%
Machines	29%
Tools	23%
Inspection	16%

Top Unique Skills

Skill	% of Top 5 Manufacturing Postings with Skill
Computer Numerical Control (CNC)	78%
Inspection	71%
Maintenance, Repairs, and Operations	53%
Machining	51%
Productivity	48%

Grand Rapids Community College

Julie Parks, Executive Director

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M-TEC

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KELLOGG COMMUNITY COLLEGE

SKILL GAP ANALYSIS

APRIL 2016

THOMAS P. MILLER AND ASSOCIATES

Executive Summary

Introduction

The following is a skill gap analysis for Kellogg Community College (KCC). The skill gap analysis is three-part methodology that included quantitative research as well as qualitative research to assist KCC in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic and labor force characteristics, industry analysis, occupation analysis, and labor force data. For the profile, the project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics. Additionally, the project team talked with college staff involved with the M-CAM project. The data collected from the profile and initial conversations informed the next steps in the methodology, which included a business demand survey and a regional input session.

Labor Market Profile

In addition to its main campus in Battle Creek, KCC has four regional centers – Eastern Academic Center in Albion, Fehsenfeld Center in Hastings, Grahl Center in Coldwater, and the Regional Manufacturing Technology Center (RMTC) in Battle Creek. The college was founded in 1956 by the Battle Creek Board of Education. The college serves approximately 12,700 students annually on five campuses and through its courses including customized training and Lifelong Learning programs. The tax district includes most of Calhoun county and small portions of Barry, Branch, Hillsdale, Kalamazoo, and St. Joseph counties. This regional profile focuses on the counties most pertinent to the college: Barry, Branch, and Calhoun counties.

The population in the region has declined by 3% over the past ten years to just over 235,000. This decline is greater than the state average of 1% population decline. The population is projected to continue to decline over the next five years. While the population continues to decline, it is also aging. Over the past 10 years, the population of 55-years-and-older increased and this trend is projected to continue. This is a concern, as the aging population will be a strain on future labor availability, and the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers are Manufacturing; Government; and Healthcare and Social Assistance. From 2005-2010, Healthcare and Social Assistance employment remained flat, Government employment decreased, and Manufacturing experienced significant losses. However, the Manufacturing and Health Care and Social Assistance sectors have been adding jobs over the past five years, as the U.S. economy continues to recover.

A key focus of this study is on the Manufacturing sector. Drilling deeper, the largest Manufacturing sector for the region is motor vehicle parts manufacturing. This industry has been significantly growing in employment in the past five years. This trend is expected to continue in the next five years with an additional 4% increase in employment. Significant sectors within the region that are projected to grow include: motor vehicle parts manufacturing; architectural and structural metals manufacturing; other food manufacturing, and navigational, measuring, electromedical, and control instruments manufacturing. While some of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that the decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with employers in these industries.

The top occupations by Standard Occupational Classification (SOC) codes within the region include office and administrative support occupations; production occupations; sales and related occupations; food preparation and serving related occupations; and healthcare practitioners and technical occupations.

Top occupations for manufacturing include: miscellaneous assemblers and fabricators; first-line supervisors of production and operating workers; inspectors, testers, sorters, samplers, and weighers; and machine tool cutting setters, operators, and tenders, metal and plastic. It should be noted that the top industries for miscellaneous assemblers and fabricators have grown over the past five years and are expected to experience continued employment increases over the next five years. While some of the manufacturing industries show an employment decline over the next five years,

the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Thus, more new jobs are likely to be created as well as opportunities due to retirements caused by the aging workforce.

Regional Input Session

An employer input session was held at KCC on January 28th, 2016, and included a diversified cohort of regional manufacturers within the college's service district.

The most significant workforce challenge discussed during the session was the worker shortages that are expected as baby-boomers continue to retire. The group identified a variety of in-demand occupations that included maintenance mechanics, maintenance electronics technician, electrical engineering, CNC set-up and programmers, molding and plastics engineers, and automation technology engineering. Most of the in-demand occupation require technical skills, as well as three to five years of experience. Some of the positons require over ten years of experience.

Next, the attendees identified the skills needed in the region. Many of the employers identified the need for job-seekers to have basic employability, or soft-skills. The specific soft-skills mentioned included problem-solving, teamwork, attendance, punctuality, and cultural sensitivity. There were also foundational educational skills needed such as basic math, measuring, and writing skills. The basic technical skills specified were tool knowledge, system knowledge, and set-up for machine presses.

In general, most of the employers are not concerned with specific, industry-recognized credentials. They are beneficial to have, but not necessary. One employer uses National Career Readiness Certification (NCRC) for their machinist and apprenticeship programs. The National Institute for Metalworking Skills (NIMS) is another industry-recognized credential employers listed as valued, but not necessary. Many of the employers are more focused on skills rather than credentials. For the group, assessments and results are of greater value than credentials. Many employers are using their own tools to assess skills and competencies.

Barriers that employers frequently encounter when hiring include:

- Quality of available talent, as many of the individuals are job hoppers with attendance and punctuality issues
- Inability to pass a drug-screen
- Lack a high school diploma or GED
- Lack transportation and child care
- Lack of experienced talent to train

Business Demand Survey

Additionally, Thomas P. Miller & Associates conducted an online business demand survey for manufacturers within the region. KCC distributed the survey to their business partners. Of the 24 employers that responded, almost half employed 250+ employees. The types of manufacturers included Machine Tool Manufacturing, Precision Turned Product Manufacturing, Motor Vehicle Air-Conditioning Manufacturing, Motor Vehicle Seating and Interior Trim Manufacturing and others. Companies were most interested in Manufacturing Production & Assembly, Multi-Skilled Technician, and Machinist programs for their employees.

When it came to filling vacancies within their companies, 87% of respondents said that it was very difficult to fill high-skill positions. The most cited barriers by skill-level to filling these positions included lack of soft-skills and passing a drug test for entry-level positions. A lack of job-specific technical skills was the most significant barrier for middle and high-skill positions. A little less than half (47.8%) indicated that the highest priority of workforce needs was alignment of current training and employer needs (i.e. closing the skills gap).

When asked what kinds of training/skills that their company requires; a substantial portion indicated Maintenance, CNC, or Machinist-related skills. Employers indicated that the occupations hardest to fill were CNC-related positions such as Precision CNC and Maintenance positions. In regard to education and training requirements for new employees, a

handful of employers required at least a high school diploma or equivalent, while other employers were more specific to the industry, such as technical-specific training, blueprint reading, basic machining, and measuring skills.

Employer partnerships with the college varied. Several of the employers mentioned specific programs at the RMTC including apprenticeships and specific trainings and courses. Other items included student recruitment, advisory committee meetings, and Manufacturing Day events. Many employers utilize on-the-job training, internships, and apprenticeships, but would like to utilize co-ops and job shadowing more in the future.

Findings and Considerations

With consideration to the labor market profile, survey results, and business input, the following are key findings and considerations for Kellogg.

- Employers indicated it was difficult to fill a variety of positions from entry-level to high skill. The employers feel that closing the skills gap is a high priority and want training that aligns with employer needs. It is important for KCC to stay engaged with employers to listen to their needs, and work together on developing solutions. The region has a need for skilled-workers with at least three years of experience for several in-demand occupations. The input session and survey reinforced the challenges employers face in filling middle and high-skill positions. Some of the needs cited included providing advanced, job-specific technical training to upskill incumbent workers so they can move into the high-skill positions and address some of the impending retirements. Expanding apprenticeship programs is another opportunity to explore.
- There is also a need for basic educational skills and employability or soft-skills training for entry-level positions. Kellogg could work with employers to further identify the math and writing skills necessary and how curriculum could be adjusted to further develop these skills. The region should also consider partnering with other organizations to determine if partners are providing, or could provide, soft-skills training.
- Efforts to develop the pipeline are necessary. The quantitative data illustrates the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce. The employers indicated their concern with future retirements and the limited supply of young people interested in manufacturing. There is an opportunity for M-CAM and KCC to get more involved with the partners and employers to support manufacturing awareness and promotional activities in schools and in the community.
- Lastly, employers are looking for ways to connect with the college. Many of the input session participants and survey respondents indicated a desire to work more closely with the college. Employers also expressed an interest in utilizing co-ops and job-shadowing more in the future.

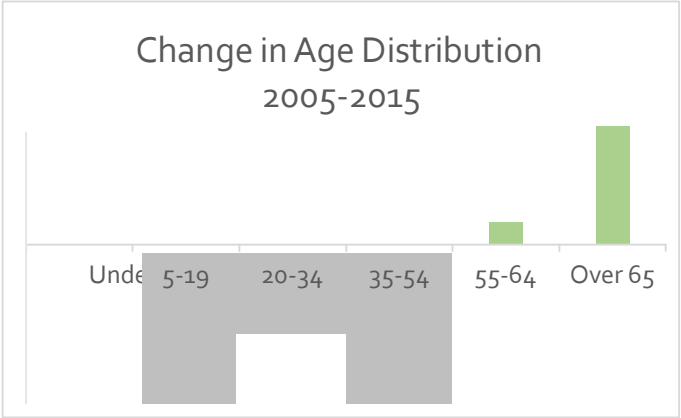
Demographics

The population in the KCC region has declined from 245,308 to 236,887 over the past ten years.[1] The population declined by 3%, compared to the state rate which declined by 1%. Additionally, the national rate over the same period increased by 9%. The population is projected to continue to decline over the next five years.

The region has an aging population. Over the past ten years, the population of 55-years-and-older increased, while the population decreased in all the other age groups. This trend is projected to continue over the next five years. The only age groups projected to grow are under age 5 and 55-years-and-older. The aging population is a concern as it will impact the availability of labor in the region over the next decade.

Age Distribution

Age	2015 Population	Change, 2005-2015		Change, 2015-2020	
Under 5	14,113	-2,272	-14%	741	5%
5-19	46,419	-5,962	-11%	-2,117	-5%
20-34	42,118	-2,122	-5%	-789	-2%
35-54	60,125	-11,792	-16%	-4,570	-8%
55-64	33,860	561	2%	236	1%
Over 65	40,252	7,271	22%	5,212	13%



The population of the region is not diverse, with over 85% of the 2015 population identifying as White. The White population shrank by 5% from 2005-2015. The top three fastest growing races in the region are those identifying as Hispanic, Asian, and Two or More Races.[2]

Race Distribution

Race	2015 Population	Change, 2005-2015	
White	201,502	-11,062	-5%
American Indian or Alaskan Native	1,150	-16	-1%
Two or More Races	5,308	1,319	33%
Hispanic	9,989	1,567	19%
Black	15,576	-1,119	-7%
Asian	3,297	897	36%
Native Hawaiian or Pacific Islander	64	10	19%

[1] EMSI Analyst 2015

[2] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian, or Pacific Islander.

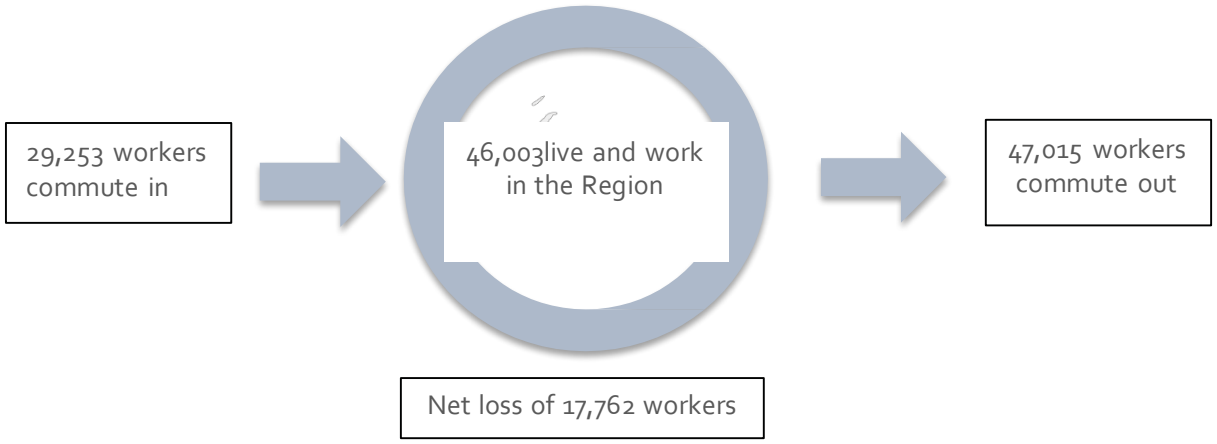
Income

Barry County has the highest median income from 2010-2014, and surpasses the average for Michigan and the United States. Branch and Calhoun Counties trail the median household income averages for Michigan. Additionally, Calhoun County has the highest poverty rate over the same period and surpasses the national poverty rate.[3]

	Median Household Income ('10-'14)	Poverty Rate
Branch	$42,538	15.2%
Barry	$53,730	10.2%
Calhoun	$43,199	15.4%
Michigan	**$49,087**	**16.2%**
U.S.	**$53,482**	**14.8%**

Commuting Pattern and Labor Force Availability

In 2013, the region had nearly 30,000 workers commuting in and roughly 47,000 commuting out, making the region a net exporter of workers.[4] Over 75,000 workers are employed in the region, including 46,003 both living and working in the region and 29,253 commuting into the region. The county with the most workers is Calhoun County (54,506, 69%) with Branch (12,921, 16%) and Barry (11,862, 14%) counties coming after.



[3] U.S. Census Bureau 2010-2014

[4] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/

Human Capital

In 2014, 116,947 workers participated in the Kellogg regional labor force, including employed and unemployed individuals. Of these, 111,655 are employed. Over the last 20 years, employment in the region was at its highest in November 1999 and lowest in January 2011. The unemployment rate for the region is 4.6%, which is lower than the rate for Michigan (7.1%) and the U.S. (5.9%)

EMPLOYMENT, 1994-2014 [5]		
Peak	122,944 (November 1999)	10% (compared to December 2014)
Trough	100,693 (January 2011)	-10% (compared to December 2014)
Dec 2014	111,655	Current unemployment: 4.6%

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

Labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boom generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

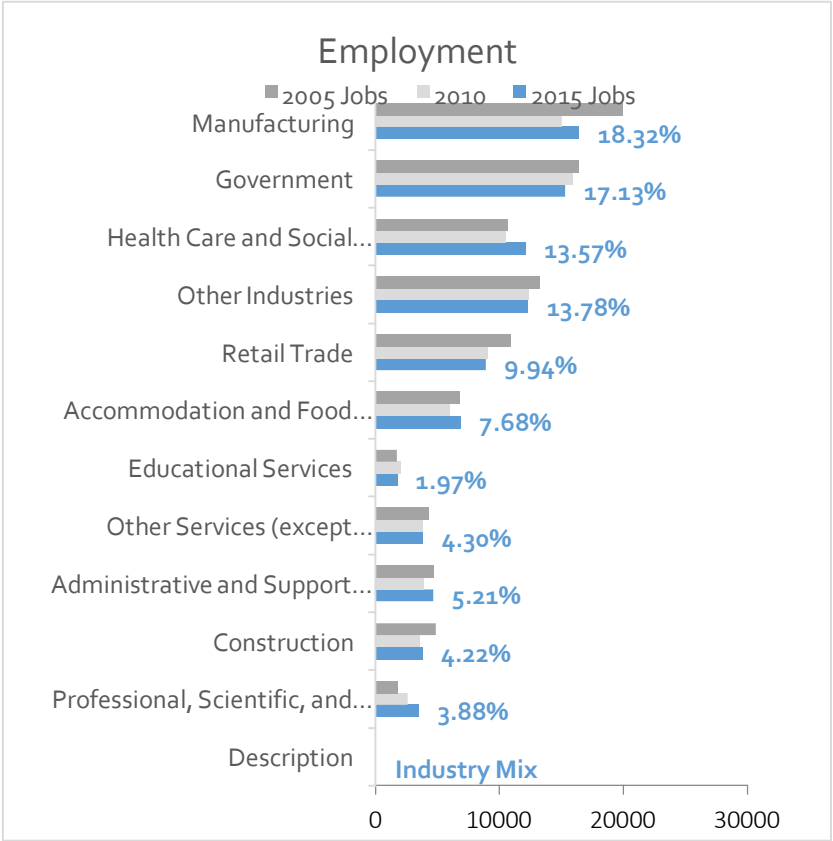
The older worker population (55 years and older) in the region is estimated to be 27,076 in 2014.[6] These older workers are expected to retire in the next ten years.

[5] U.S. Bureau of Labor Statistics, 1994.9-2014.9 (most recently available). http://www.bls.gov/data/

[6] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

Industry Analysis

The broad industry sectors in the region employing the most workers are Manufacturing (16,395, 18.32%), Government (15,325, 17.13%), Health Care and Social Assistance (12,144, 13.57%), Retail Trade (8,899, 9.94%), and Accommodation and Food Services (6,876, 7.68%)[7]. It is worth noting that Manufacturing, Health Care and Social Assistance, and Accommodation and Food Services have resumed growing between 2010 and 2015, which suggests a potential for future growth. In addition, Government has been declining since 2005 which may indicate future decline.



[7] These industries are by 2-digit NAICS code. EMSI Analyst 2015.

Manufacturing Analysis

Drilling a bit deeper, the tables below show the top 20 largest manufacturing industries by employment in the KCC region.[8] It is worth noticing that Motor Vehicle Parts Manufacturing has experienced significant growth since 2005. Additionally, Metalworking Machinery Manufacturing and Household Appliance Manufacturing has experienced growth in the past five years. Among these key industries, the largest projected growth by the number of positions is Motor Vehicle Parts Manufacturing. While some of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020	
Motor Vehicle Parts Manufacturing	6,016	374	7%	2,091	53%	248	4%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,247	-97	-7%	75	6%	-26	-2%
Household Appliance Manufacturing	1,090	34	3%	171	19%	64	6%
Grain and Oilseed Milling	1,019	-1,963	-66%	-977	-49%	-517	-51%
Metalworking Machinery Manufacturing	591	50	9%	228	63%	3	1%
Other General Purpose Machinery Manufacturing	574	-130	-18%	-130	-18%	-43	-7%
Printing and Related Support Activities	505	-327	-39%	-92	-15%	-116	-23%
Rubber Product Manufacturing	431	-25	-5%	-17	-4%	28	6%
Nonferrous Metal (except Aluminum) Production and Processing	403	-55	-12%	145	56%	-39	-10%
Architectural and Structural Metals Manufacturing	383	94	33%	51	15%	113	30%
Other Fabricated Metal Product Manufacturing	353	100	40%	142	67%	-21	-6%
Foundries	297	-26	-8%	-65	-18%	-21	-7%
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	287	197	219%	42	17%	84	29%
Plastics Product Manufacturing	223	-321	-59%	-113	-34%	-112	-50%
Boiler, Tank, and Shipping Container Manufacturing	210	161	329%	91	76%	55	26%
Coating, Engraving, Heat Treating, and Allied Activities	209	-145	-41%	4	2%	-48	-23%
Veneer, Plywood, and Engineered Wood Product Manufacturing	205	-83	-29%	21	11%	9	4%
Other Electrical Equipment and Component Manufacturing	163	86	112%	-13	-7%	31	19%
Other Food Manufacturing	156	NA	NA	95	156%	90	58%
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	154	129	516%	22	17%	47	31%

[8] These industries are by4-digit NAICS code.

Among these top industries, earnings vary widely, from $33,000 a year for Plastics Product Manufacturing, to over $93,000 a year for Grain and Oilseed Milling. Those industries that both pay relatively higher average wages and have at least 10 establishments include: Motor Vehicle Parts Manufacturing and Other General Purpose Machinery Manufacturing.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earnings	Establishments
Motor Vehicle Parts Manufacturing	6,016	$56,214	21
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,247	$45,814	29
Household Appliance Manufacturing	1,090	$78,983	1
Grain and Oilseed Milling	1,019	$93,636	4
Metalworking Machinery Manufacturing	591	$47,519	19
Other General Purpose Machinery Manufacturing	574	$59,565	11
Printing and Related Support Activities	505	$49,721	15
Rubber Product Manufacturing	431	$37,173	2
Nonferrous Metal (except Aluminum) Production and Processing	403	$61,942	3
Architectural and Structural Metals Manufacturing	383	$49,865	14
Other Fabricated Metal Product Manufacturing	353	$43,067	9
Foundries	297	$45,169	4
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	287	$35,191	2
Plastics Product Manufacturing	223	$33,656	7
Boiler, Tank, and Shipping Container Manufacturing	210	$50,385	1
Coating, Engraving, Heat Treating, and Allied Activities	209	$35,139	7
Veneer, Plywood, and Engineered Wood Product Manufacturing	205	$45,089	3
Other Electrical Equipment and Component Manufacturing	163	$55,185	3
Other Food Manufacturing	156	$80,004	2
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	154	$60,896	2

Occupation Analysis

The counties' highest number of occupations include Office and Administrative Support Occupations, Production Occupations, Sales and Related Occupations, Food Preparation and Serving Related Occupations, and Healthcare Practitioners and Technical Occupations.[9] The median hourly earnings range from $9.50/hour for Food Preparation and Serving Related Occupations, to $35.22/hour for Management Occupations.

Kellogg Regional Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	11,671	13.0%	$14.95
Production Occupations	11,637	12.9%	$15.61
Sales and Related Occupations	8,303	9.2%	$13.30
Food Preparation and Serving Related Occupations	5,314	8.1%	$9.50
Healthcare Practitioners and Technical Occupations	5,274	5.9%	$32.46
Education, Training, and Library Occupations	4,999	5.9%	$21.01
Transportation and Material Moving Occupations	4,984	5.6%	$14.85
Management Occupations	4,441	5.5%	$35.22
Business and Financial Operations Occupations	3,521	4.9%	$29.17
Installation, Maintenance, and Repair Occupations	3,378	3.9%	$19.21
Healthcare Support Occupations	3,301	3.8%	$13.43
Construction and Extraction Occupations	3,167	3.7%	$17.80
Personal Care and Service Occupations	2,834	3.5%	$10.06
Building and Grounds Cleaning and Maintenance Occupations	2,116	3.1%	$11.02
Community and Social Service Occupations	1,771	2.4%	$19.40
Protective Service Occupations	1,695	2.0%	$21.52
Architecture and Engineering Occupations	1,282	1.9%	$30.44
Computer and Mathematical Occupations	982	1.4%	$29.84
Arts, Design, Entertainment, Sports, and Media Occupations	727	1.1%	$16.59
Farming, Fishing, and Forestry Occupations	478	0.8%	$12.59
Life, Physical, and Social Science Occupations	470	0.5%	$30.45
Military occupations	314	0.5%	$14.19
Legal Occupations	5,314	0.3%	$29.81

[9] These occupations are by 2 digit SOC code (Standard Occupational Classification System).

Occupations in Manufacturing Sector

The table below shows employment of each occupation within the Manufacturing Sector. The regional occupations in the manufacturing sector with the highest percent of total employment in manufacturing are overwhelmingly Production Occupations. Other common occupations in manufacturing include: Office and Administrative Support Occupations; Architectural and Engineering Occupations; Management Occupations; Installation, Maintenance, and Repair Occupations; and Transportation and Material Moving Occupations.

Kellogg Regional Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	9,608	58.6%
Office and Administrative Support Occupations	1,447	8.8%
Architecture and Engineering Occupations	1,148	7.0%
Management Occupations	988	6.0%
Installation, Maintenance, and Repair Occupations	827	5.0%
Transportation and Material Moving Occupations	822	5.0%
Business and Financial Operations Occupations	532	3.2%
Sales and Related Occupations	350	2.1%
Construction and Extraction Occupations	188	1.1%
Computer and Mathematical Occupations	170	1.0%
Building and Grounds Cleaning and Maintenance Occupations	108	0.7%
Arts, Design, Entertainment, Sports, and Media Occupations	77	0.5%
Life, Physical, and Social Science Occupations	69	0.4%
Food Preparation and Serving Related Occupations	18	0.1%
Healthcare Practitioners and Technical Occupations	15	0.1%
Farming, Fishing, and Forestry Occupations	12	0.1%

Top Occupations in the Manufacturing Sector

Drilling a bit deeper, the following table displays the top 25 occupations that are most often required to staff companies within manufacturing in the KCC region.[10] Median hourly earnings for these occupations range from $11.29 at the low end for Laborers and Material Movers, Hand to $39.69 at the high end for Industrial Production Managers. Some of the highest projected change is with Miscellaneous Assemblers and Fabricators and Computer Control Programmers and Operators. Other occupations that experienced growth over the past five years and projected for future growth include Machinists; Welding, Soldering and Brazing Workers; and Electrical, Electronics, and Electromechanical Assemblers.

Top 25 Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	2,975	-15	-1%	834	39%	105	4%	$14.03
First-Line Supervisors of Production and Operating Workers	702	-177	-20%	33	5%	-34	-5%	$24.49
Inspectors, Testers, Sorters, Samplers, and Weighers	608	-70	-10%	84	16%	-12	-2%	$14.74
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	586	-138	-19%	51	10%	-41	-7%	$14.96
Computer Control Programmers and Operators	554	49	10%	148	36%	35	6%	$12.80
Miscellaneous Production Workers	450	-222	-33%	-41	-8%	3	1%	$13.07
Machinists	431	-12	-3%	59	16%	21	5%	$16.55
Laborers and Material Movers, Hand	419	-218	-34%	-44	-10%	9	2%	$11.29
Industrial Machinery Installation, Repair, and Maintenance Workers	405	-94	-19%	19	5%	6	1%	$22.05
Industrial Engineers, Including Health and Safety	377	-7	-2%	78	26%	3	1%	$30.27
Packaging and Filling Machine Operators and Tenders	328	-307	-48%	-143	-30%	-84	-26%	$13.70
Engineering Technicians, Except Drafters	306	11	4%	78	34%	2	1%	$23.87
Shipping, Receiving, and Traffic Clerks	291	-52	-15%	32	12%	-11	-4%	$13.92
Welding, Soldering, and Brazing Workers	290	-100	-26%	42	17%	29	10%	$15.95
Electrical, Electronics, and Electromechanical Assemblers	275	35	15%	70	34%	17	6%	$16.23
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	274	-66	-19%	16	6%	-31	-11%	$14.17
Sales Representatives, Wholesale and Manufacturing	274	-72	-21%	12	5%	-5	-2%	$23.84
Industrial Production Managers	271	-49	-15%	27	11%	-12	-4%	$39.69
Maintenance and Repair Workers	269	-100	-27%	-9	-3%	-10	-4%	$16.96
General and Operations Managers	264	-65	-20%	9	4%	-9	-3%	$36.36
Mechanical Engineers	257	1	0%	54	27%	4	2%	$37.14
Miscellaneous Food Processing Workers	248	-317	-56%	-158	-39%	-70	-28%	$17.93
Office Clerks, General	240	-53	-18%	11	5%	-15	-6%	$13.43
Industrial Truck and Tractor Operators	213	-113	-35%	-26	-11%	-8	-4%	$15.29
Forming Machine Setters, Operators, and Tenders, Metal and Plastic	193	-51	-21%	3	2%	-18	-9%	$16.12

[10] Occupations are by 4 digit SOC code.

Industry and Occupation Connections in Manufacturing Sector

Although key manufacturing industries are highly diversified, they do share some common workforce requirements.[11] The following table identifies the top occupations and connected key industries. It is important to note, that the Other Motor Vehicle Parts Manufacturing overlaps all five top occupations.

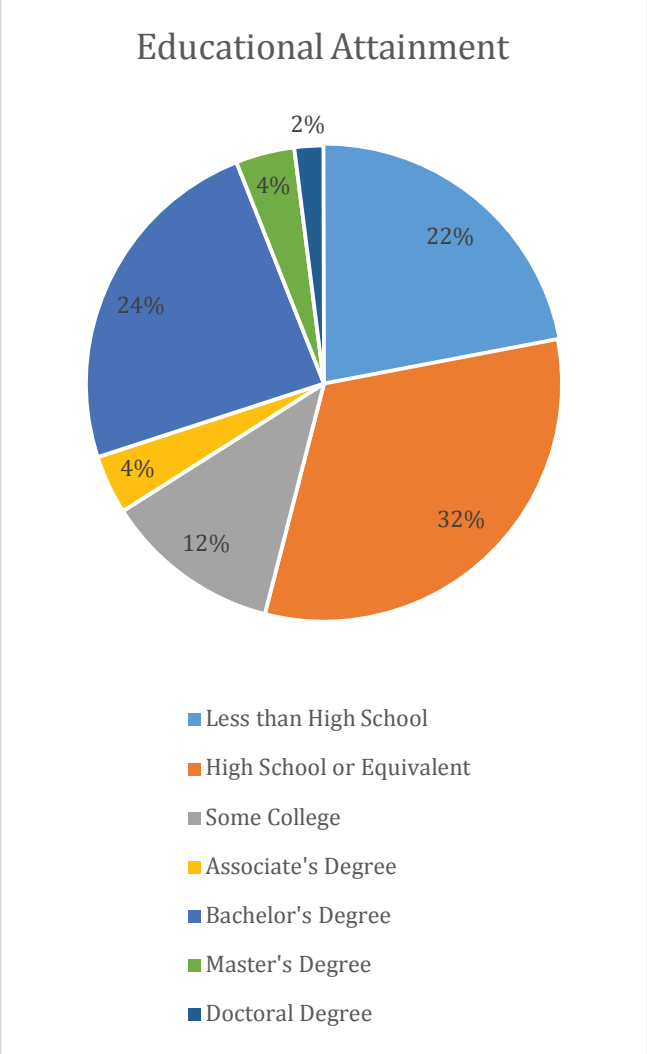
Connection between Top Occupations and Key Industries in Manufacturing Sector

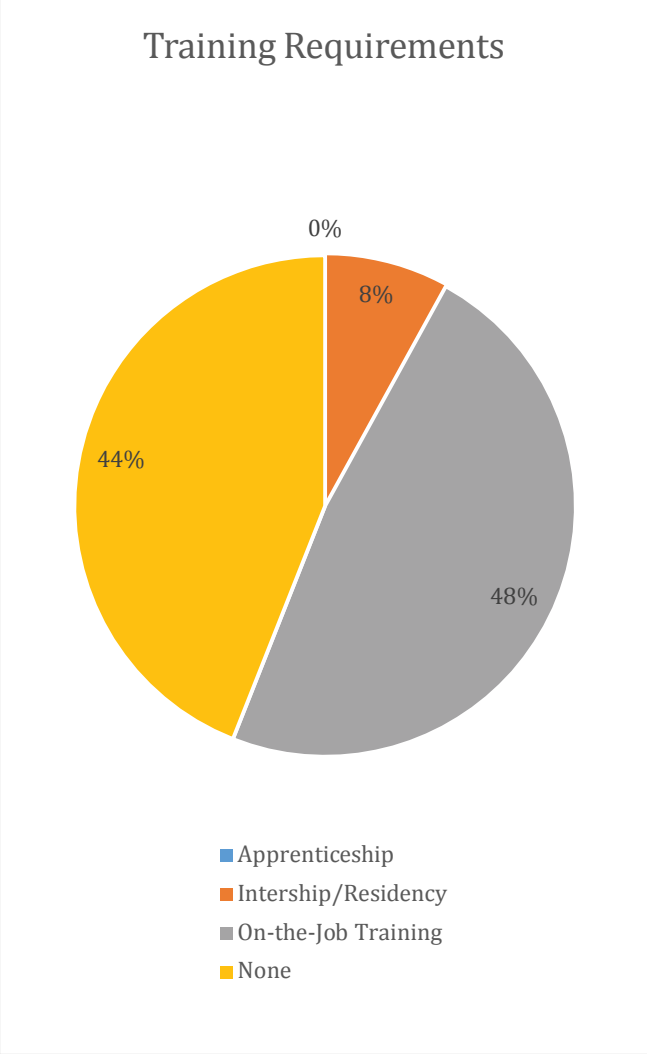
Top Occupations	Key Industries
Miscellaneous Assemblers and Fabricators	• Other Motor Vehicle Parts Manufacturing • Other Major Household Appliance Manufacturing
First-Line Supervisors of Production and Operating Workers	• Other Motor Vehicle Parts Manufacturing • Machine Shops • Other Major Household Appliance Manufacturing
Inspectors, Testers, Sorters, Samplers, and Weighers	• Other Motor Vehicle Parts Manufacturing • Machine Shops • Other Major Household Appliance Manufacturing
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	• Other Motor Vehicle Parts Manufacturing • Machine Shops • Other Major Household Appliance Manufacturing • Foundries
Computer Control Programmers and Operators	• Machine Shops • Other Motor Vehicle Parts Manufacturing • Motor Vehicle Electrical and Electronic Equipment Manufacturing

[11] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

Education and Skills for High Demand Jobs

Among high demand jobs in the Kellogg region, about 32% require a high school diploma or equivalent.[12] Approximately 25% of these high demand jobs require at least a Bachelor's degree. Approximately 56% of these jobs require some type of training, which is typically on-the-job training.

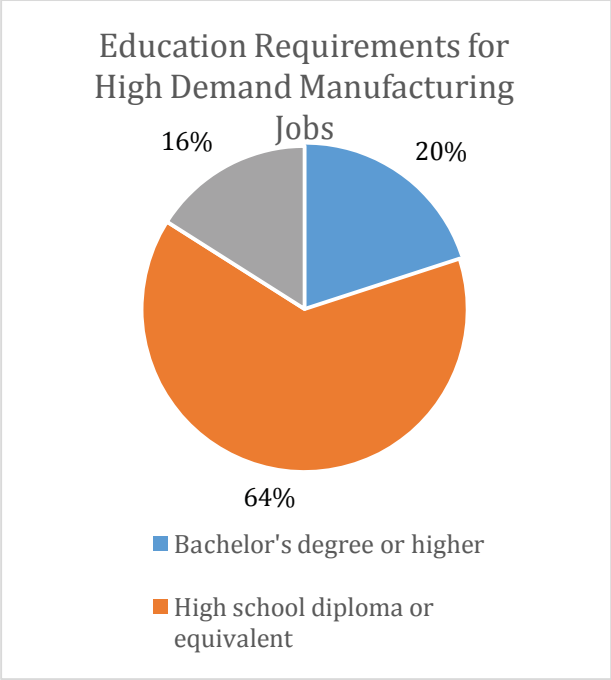


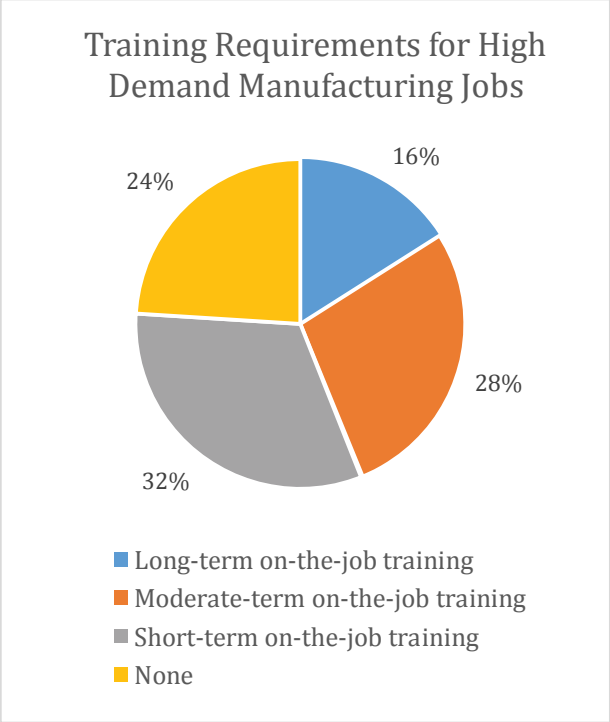


[12] A total of 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

Education and Training for High Demand Jobs

The Manufacturing sector has unique education and training requirements compared to the other industry sectors. Among high demand manufacturing jobs in the KCC region, over 60% require a high school diploma or equivalent, while only 25% of the jobs among all industry sectors have the same requirement.[13] The most common required training in the manufacturing sector is short-term on-the-job training (32%), followed by moderate-term on-the-job training (28%).





[13] A total of 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations that had the highest growth during 2014-2015 in the KCC region. The table on the following page displays the top skills required for the top 5 manufacturing jobs with the highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Team Assemblers	**2,554**	**2,694**	**140**	**5%**
Machinists	**405**	**431**	**26**	**6%**
Computer-Controlled Machine Tool Operators, Metal and Plastic	**487**	**512**	**25**	**5%**
Tool and Die Makers	**170**	**189**	**19**	**11%**
Industrial Engineers	**360**	**374**	**14**	**4%**
Mechanical Engineers	243	257	14	6%
Inspectors, Testers, Sorters, Samplers, and Weighers	595	608	13	2%
Electrical and Electronic Equipment Assemblers	232	245	13	6%
Assemblers and Fabricators, All Other	257	269	12	5%
Laborers and Freight, Stock, and Material Movers, Hand	264	274	10	4%
Welders, Cutters, Solderers, and Brazers	179	189	10	6%
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	92	101	9	10%
Engine and Other Machine Assemblers	100	109	9	9%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	266	273	7	3%
First-Line Supervisors of Production and Operating Workers	696	702	6	1%
Industrial Truck and Tractor Operators	207	213	6	3%
Industrial Machinery Mechanics	271	277	6	2%
Production, Planning, and Expediting Clerks	115	120	5	4%
Architectural and Engineering Managers	95	100	5	5%
Mechanical Engineering Technicians	125	130	5	4%
Shipping, Receiving, and Traffic Clerks	286	291	5	2%
Helpers--Production Workers	238	243	5	2%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	147	152	5	3%
Electromechanical Equipment Assemblers	18	22	4	22%
Maintenance and Repair Workers, General	265	269	4	2%
Purchasing Agents, Except Wholesale, Retail, and Farm Products	109	113	4	4%
Industrial Engineering Technicians	117	121	4	3%
Production Workers, All Other	88	92	4	5%

The following table shows the top skills required for the top 5 manufacturing jobs with the highest growth during 2014-2015.[14] Based on the data from real-time job postings compiled by EMSI, the top five skills that appear in job postings for manufacturing positions include: engineering, projects, designing, system, and communication.[15]

Top 50 In-Demand Skills

Skill	% of Postings with Skill		Skill	% of Postings with Skill
Engineering	**63%**		Statistical	12%
Projects	**50%**		Six Sigma	12%
Designing	**46%**		Research	12%
System	**46%**		Medical	11%
Communication	**45%**		Machining	11%
Analysis	34%		Chemical Reaction	11%
Technology	31%		Computer Numerical Control (CNC)	10%
Report	25%		Drawings	10%
Specification (Technical Standard)	22%		Quality Assurance	10%
Safety	22%		Automation	9%
Planning	19%		Methodology	9%
Innovation	19%		Manufacturing	9%
Industrial	19%		Automotive Industry	9%
Documentation	19%		Tools	9%
Software	18%		Tooling	8%
Computer	18%		Health	8%
Testing	18%		Failure	8%
Science	17%		Mechanical Engineering	8%
Project Management	17%		Lean Manufacturing	8%
Documents	16%		Maintenance, Repairs, and Operations	8%
Evaluation	16%		Interpreting	8%
Lean	15%		Packaging and Labeling	8%
Continuous Improvement Process	14%		Process Improvement	8%
Microsoft Office	13%		Machine	8%
Machines	13%		Process Control	8%

[14] 4-digit SOC code. EMSI Analyst 2015.
[15] National data. EMSI Analysis 2015.

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Lean; Computer Numerical Control (CNC); Continuous Improvement Process; Six Sigma; and Machining.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Lean	74%	15%
Computer Numerical Control (CNC)	69%	10%
Continuous Improvement Process	64%	14%
Six Sigma	62%	12%
Machining	57%	11%
Statistical	51%	12%
Chemical Reaction	41%	11%
Evaluation	36%	16%
Industrial	31%	19%
Designing	29%	46%

Regional Input Session

The KCC Employer Input Session was held on January 28th, 2016 and featured a mix of regional manufacturers.

The attendees identified in-demand occupations and required experiences levels for the region. The in-demand occupations included:

- Truck drivers with 3 to 5 years of experience.
- Maintenance mechanics for heavy equipment with 3 to 5 years of experience
- Maintenance electronics technician with 3 to 5 years of experience
- Electrical engineering (design) with 5+ years of experience
- Refrigeration for electrical engineering – both experienced and entry-level needed
- Tool design machine with 3 to 5 years of experience
- Forklift operators with 3+ years of experience
- CNC setup and programmers with 3 to 5 years of experience
- Molding and plastics engineers - entry-level and 10+ years of experience
- Automation technology engineering - entry-level and 3 to 5 years of experience

The attendees next identified the skills needed in the region. Many of the skills needed covered basic employability or soft skills such as problem solving, attendance, and punctuality. There were also foundational educational skills needed such as basic math and writing skills. The identified skill gaps include:

- Basic measuring skills
- Tool knowledge
- Problem solving skills
- Systems knowledge
- FMEA (Failure Modes Effects Analysis)
- Soft skills
    - Team work
    - Problem solving
    - Eye-to-eye contact
    - Shaking hands
    - Dressing appropriately
    - Writing
- Basic math
- Project management and the ability to multi-task or preform various jobs in the plant
- Lack of depth in technical skills
- Set-up skills for machine presses
- Entry-level leadership skills
- Cultural sensitivity
- Attendance and punctuality

The employers were asked to identify the largest barriers they face. The attendees identified the following barriers:

- Timing/availability of training (training needs to be on-demand)
- Quality of available talent (many are job hoppers and "c" level candidates)
- Attendance and punctuality issues
- Lack of GED
- Lack of experienced talent to train
- Ability to retain workers, particularly in the trades and engineering
- The need for ESL (English as Second Language) training and cultural sensitivity (especially in rural areas)
- Drug usage

- Transportation and childcare services
- Upcoming retirements

After discussing the barriers, the employers were asked about the strategies they use to address the barriers and develop a talent pipeline. The current strategies that are being used to address employment pipeline include:

- Apprenticeship programs
- Partnering with organizations for disabled workers
- Partnering with local Vocational Education schools
- In-house training (one employer designed and built their own in-house welding academy)
- Use of staffing agencies
- Use of assessments to gauge skill levels
- Career pathways
- Merit and skills-based promotions
- Bringing in translators and providing ESL training to bridge language barriers
- One employer is working with the city to develop a talent attraction program to overcome perception issues
- Leadership development program

The employers were then asked about the value of credentials within their industries. Do you they look for specific credentials? If so, what credentials are valued or required? How do they identify if an applicant has the skills necessary to perform a job? The Industry Related Credentials (IRCs) that are used:

- NCRC – one employer uses this for their machinist and apprenticeship programs
- NIMS is valued but not required as they will do the training
- Overall, credentials are beneficial to employers, but not necessary
- Many employers are using their own tools to assess workers
    - Accumax
    - Hogan
    - Watson
    - 360's
    - SMT & Ramsey
- For the group, assessments were of greater value than credentials

Next the group was asked how they are currently engaging with KCC and the workforce system.

- Education partnerships
    - Factory tours
    - Presentations at schools
    - Capstone projects for seniors
- Schools include KVCC (Kalamazoo Valley Community College), WMU (Western Michigan University), KCC (Kellogg Community College) – also identified as best Business-to-Business (B2B) model, secondary (kindergarten-twelfth grade) and vocational education throughout the regional counties
- Company-sponsored programs such as apprenticeships
- Colleges help with assessments
- KAMA (Kellogg Advanced Manufacturing Assembly) – one employer is using it and describes it as an excellent program. Most of the employees that have gone through the program do better than those with no skills

Lastly the group was asked how they would like to engage with KCC and the workforce system in the future:

- AMP-style program
- Middle college
- More structured access/support for unemployment
- Better Labor Market Information (LMI) data
- Better/more flexibility with training options and scheduling
- Candidate assessment/pre-screening

- Marketing program designed to get employees to take soft skills classes
- Closer relationship with DHS
- Need for sustainable funding
- Continued articulation efforts

Attachment A: Business Demand Survey

Survey Approach

As part of the Skill Gap Analysis work, Thomas P. Miller & Associates worked with KCC to create and distribute a business demand survey. KCC distributed the survey by email via Survey Monkey to their partner employers. A total of 24 employers completed the survey. Following are the results of the survey with each section identifying the question, providing an account of how many respondents answered the question, and the results of the question.

Key Findings by Question

Q1. What is the name of your company? (Optional)

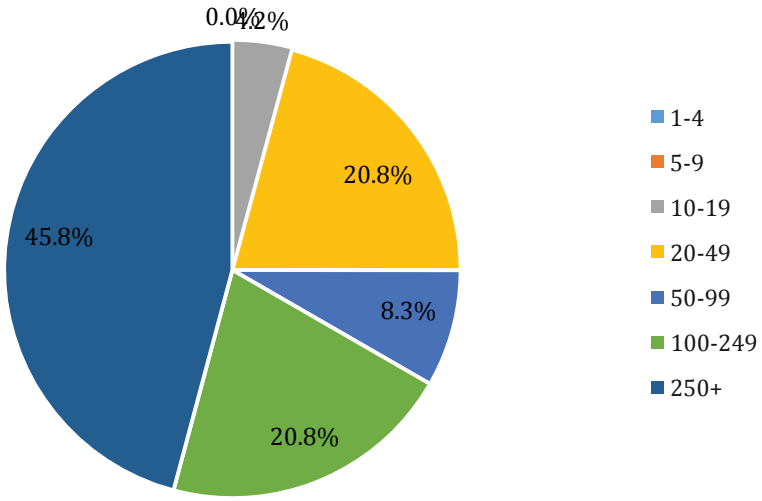
Of the 24 respondents, 17 provided the name of their companies. Cosma Casting Michigan had two responses and the remaining respondents were from separate, unique companies.

Table 1: Company Names	
Company Name	**Response Count**
Airgas	1
Autocam Precision Components Group	1
Bleistahl	1
CCMi or Cosma Casting Michigan	2
DENSO Air Systems	1
Graphic Packaging International, Inc.	1
II Stanley Co., Inc.	1
Isringhausen	1
Musashi Auto Parts	1
Olivet Machine Tool Engineering Company	1
Post Foods	1
Progressive Dynamics Inc.	1
Rosler Metal Finishing	1
Stewart Industries, LLC	1
TNR Machine Inc.	1
TRMI	1

Q2. How many individuals does your company currently employ?

Respondents were asked how many individuals were currently employed at their company. Of the 24 total responses, 11, or 45.8% of respondents indicated that their companies employ more than 250 employees, while the other respondents had a more evenly split number of total employees.

Figure 1: Employee Size



Q3. What is your company's NAICS code (i.e. 333517 – Machine Tool Manufacturing or 236111 Plastics Bag and Pouch Manufacturing) If unknown, answer N/A.

Respondents were asked if they knew their company's NAICS code. Most of the respondents responded with N/A with the exception of the following responses:

- 333517 – Machine Tool Manufacturing (2 responses)
- 332721 – Precision Turned Product Manufacturing
- 336391 – Motor Vehicle Air-Conditioning Manufacturing
- 336360 – Motor Vehicle Seating and Interior Trim Manufacturing

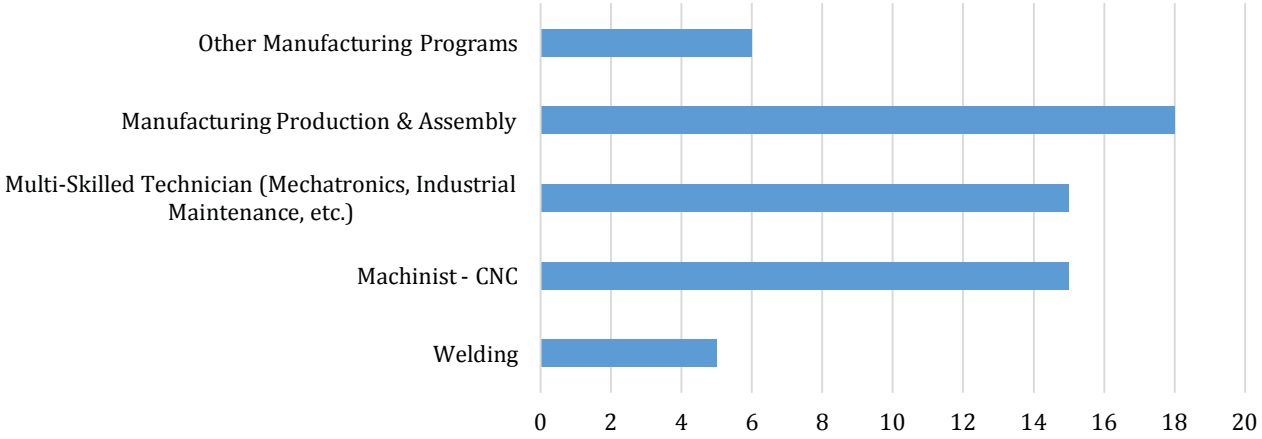
Other responses included:

- 3315
- HVAC Tubing

Q4. Identify all the programs or focus areas that your company would be interested in.

The survey asked respondents to identify all programs or focus areas that their company would be interested in. Of the total 24 respondents, 18, or 75%, expressed interest in a Manufacturing Production & Assembly program, followed by a tie at 15 respondents each for Multi-Skilled Technician and Machinist – CNC.

Figure 2: Programs or Focus Areas



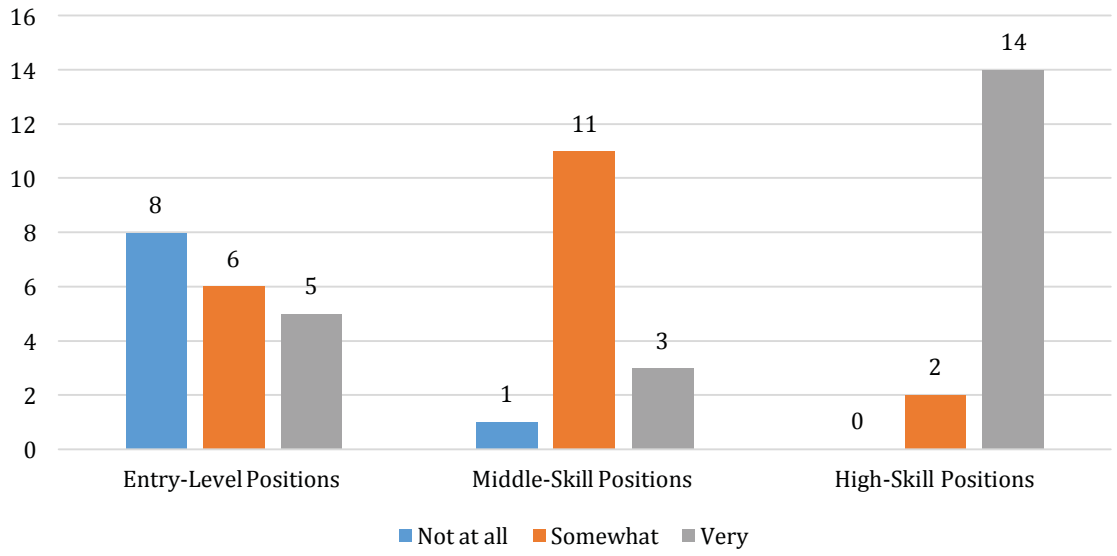
For the Other Manufacturing Programs, respondents suggested the following programs or focus areas:

- Soldering Certification Programs
- Basic Lean Manufacturing
- Aluminum Die Casting
- CMM Programming
- Fabricators
- Safety
- Leadership
- Printing

Q5. How difficult is it for your company to fill your manufacturing vacancies?

Respondents were asked to rate how difficult it is for their companies to fill manufacturing vacancies at the entry-level, middle-skill, and high-skill positions. Not all of the respondents answered this question and some of the respondents only answered part of the question. Of the 19 respondents, the responses for the difficulty in filling entry-level positions varied. Eight respondents said "not at all", six respondents said "somewhat", and five respondents said it was "very" difficult to fill entry-level positions. In contrast, for the middle-skill positions 11 of the 15 respondents (73%) said it was "somewhat" difficult. Similarly, 14 of the 16 respondents (87.5%) of the respondents indicated it was "very" difficult to fill the high-skill positions.

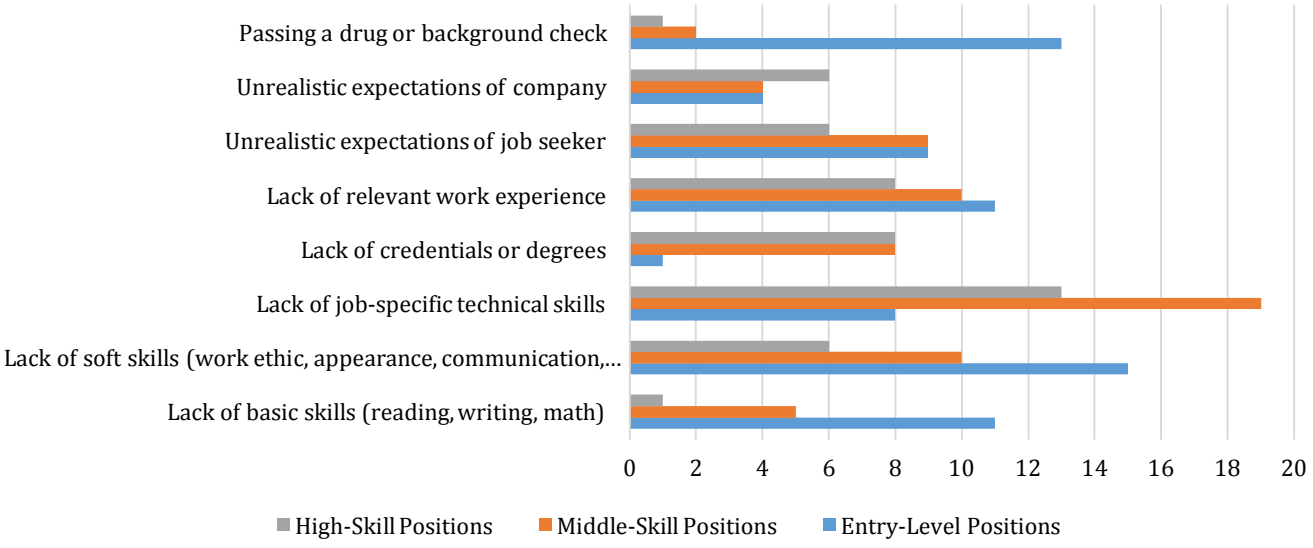
Figure 3: Filling Manufacturing Vacancies



Q6. What are the most significant barriers for your company to fill entry-level, middle-skill, and high-skill manufacturing positions? Select all that apply.

Respondents were asked what the most significant barriers are for their company to fill entry-level, middle-skill, and high-skill manufacturing positions. For entry-level positions, the most common barrier was a lack of soft skills (work ethic, appearance, communication) followed closely by passing a drug or background check. For middle and high-skill positions, the largest barrier was a lack of job-specific technical skills.

Figure 4: Barriers to Filling Positions by Level



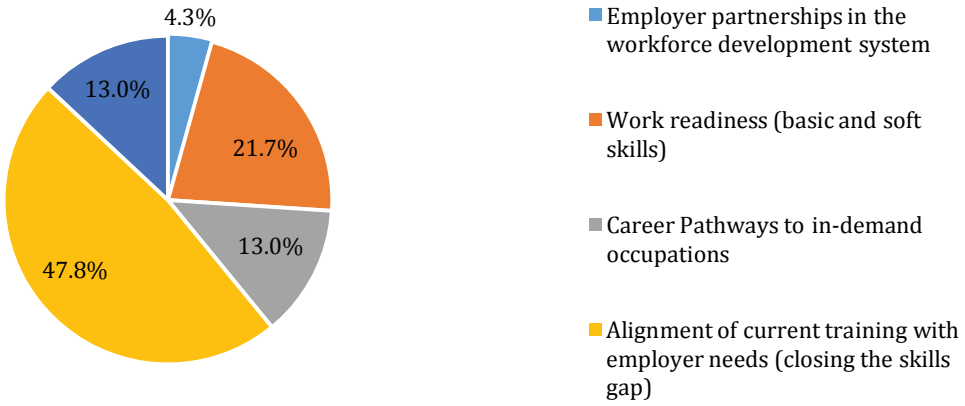
For the Other Barriers, respondents identified the following barriers:

- Passing our personality assessment and cognitive test
- Lack of mechanical aptitude
- Willingness to work nights or weekends in 24/7 operations

Q7. What do you see as the highest priority in addressing area workforce needs?

Respondents were asked what they saw as the highest priority in addressing workforce needs. Of the 23 that responded, 47.8% chose "alignment of current training with employer needs (closing the skills gap)." Following that, 21.7% or five respondents, selected work readiness (basic and soft skills), and followed by a tie with 3 respondents each choosing Career Pathways to In-Demand Occupations and Recruiting (youth or otherwise).

Figure 5: Highest Priorty in Workforce Needs



Q8. What percentage of new hires will be due to growth or replacement of retiring workforce within the next 12 months?

Respondents were asked what percentage of new hires will be due to growth or replacement of the retiring workforce within the next 12 months. The most common responses overall 5-9% due to growth. For retirement/replacement, the most common response was 10-14%.

Figure 6a: Growth

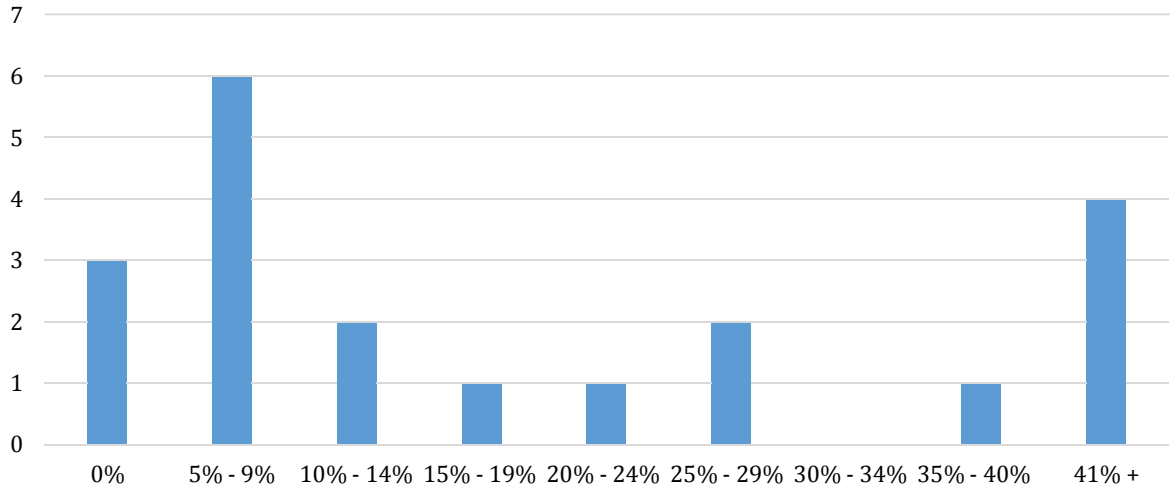
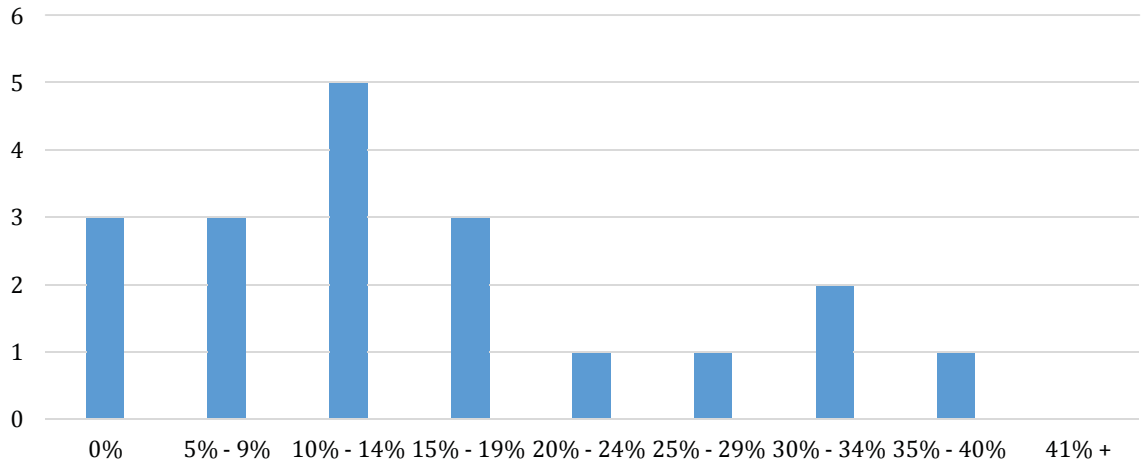


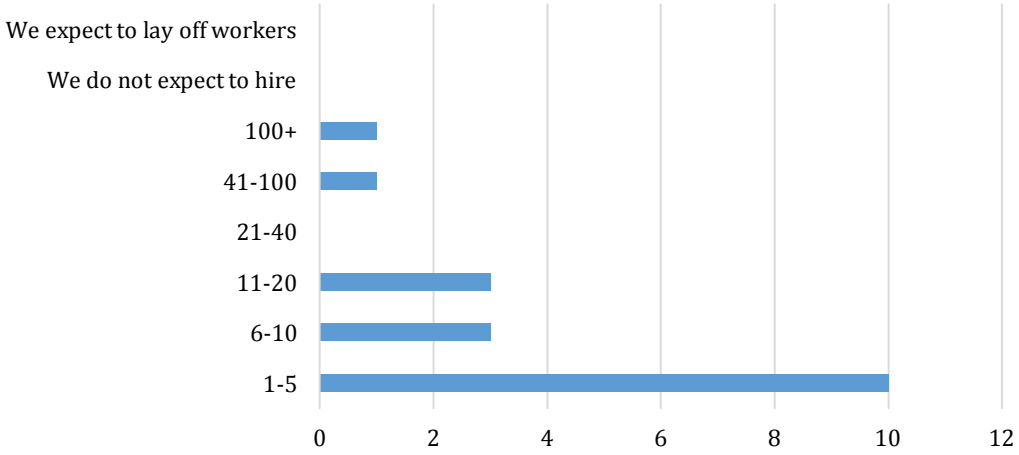
Figure 6b: Replacement/Retiring Workforce



Q9. How many employees needing some form of technical training will you be hiring in the next 12 months and 1-3 years?

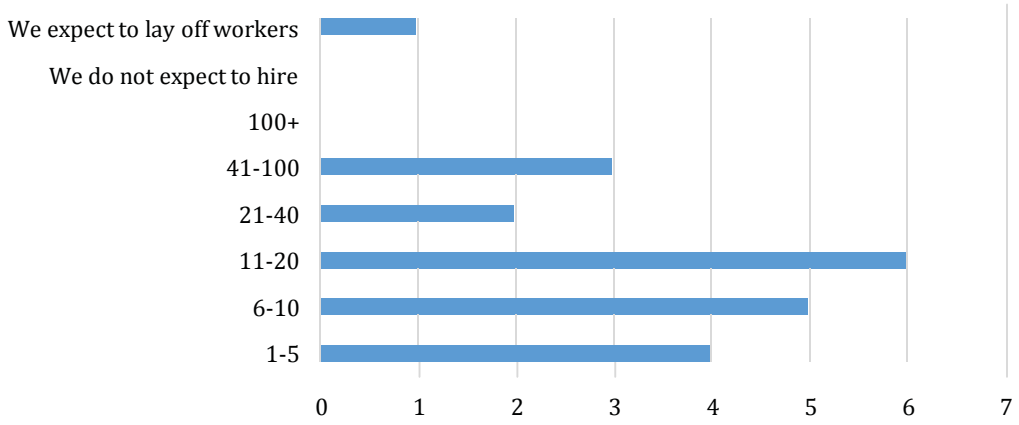
Respondents were asked how many employees needing some form of technical training they will be hiring in the next 12 months and 1-3 years. Within the next 12 months, most 10 employers expect to hire 1-5 employees that will need technical training.

Figure 7a: 12 Months



For the next 1-3 years, the employers had a wide range of responses to the question. For example, six employers plan on hiring 11-20 employees, three employers plan to hire 41-100 employees that will require technical training, and one employer anticipates laying off workers.

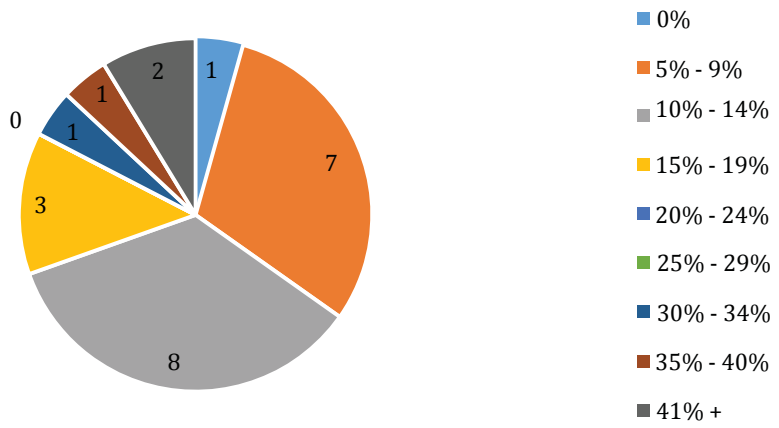
Figure 7b: 1-3 Years



Q10. What do you estimate your annual employee turnover rate is?

The survey asked respondents what they estimated their annual employee turnover rate is. Of the 23 total respondents, 8 (34.8%) responded that they estimated their turnover rate is somewhere between 10-14%, followed by seven (30.4%) of respondents with an estimate of 5-9%. One employer indicated at 0% turnover rate and two employers estimated turnover rates of more than 41%.

Figure 8: Annual Employee Turnover Rate Estimate



Q11. Which types of technical training/skills does your company require? Examples include: Maintenance, Repair and Operations, Inspection, Machines, etc.

Respondents were asked which type of technical training/skills their company requires. A large majority of respondents indicated Maintenance, CNC, or Machinist-related skills. **Table 2** below provides all of the responses.

Table 2: Required Technical Training / Skills
Assembly, Computer skills
CNC Machining
CNC Programming/OperatorEDM Programming, Operator Solid Model Computer Drafting
Inspection and basic machining practices
Machine repair, tool and die, basic machining
Machines, CNC, Coding
Machining, Maintenance, Programming, Repair
Maintenance and Repair, Machining and Inspection
Maintenance skills and computer skills
Maintenance PLC Programming CMM Programming
Maintenance, Machine Operators, Welding
Maintenance, PLC programming, robotics, CNC Machining
Maintenance, repair and operations, fabricators, capital equipment machine assembly
Must have some mechanical aptitude. Also significant need for millwrights and electricians
Operations, soldering, conformal coating, stamping, molding, electronics trouble shooting
Previous factory experience
Production engineering, maintenance, repair, quality inspection, production operators, machine maintenance
Quality inspection, maintenance, grinding, machine operating
Tooling, machine operating, maintenance

Q12. What specific manufacturing occupations / job titles are the most challenging to fill?

Respondents were asked what the most challenging occupations or job titles were the **most** challenging to fill. The most common response was CNC-related positions such as Precision CNC and Maintenance positions. **Table 3** below shows all responses.

Table 3: Most Challenging Occupations / Job Titles to Fill
All skilled trades; millwrights, electricians, pipefitters, power house
Assembly, Warehouse, Shipping
CNC Machinist
CNC mill and grinder
CNC operators
Controls Engineer! PLC knowledge
Engineering Maintenance/Process Technicians
Fabricator, Machine assembly (capital equipment), Field Service Technician
Field Service CNC Machinist – Advanced technical skill who fits our culture
HVAC
Journeyman tool and die
Machine Operators
Maintenance
Maintenance
Maintenance, Maintenance Electrician, Engineer, Quality Engineer
Manufacturing Technician – Prevent. Maint. and machine repair. Hourly Assembly personnel
Medium/High Skilled Machinist
Melt operator, Maintenance, Tooling, CNC Tech, Team Leader/Supervisor, Engineers
Technicians
Tool Maintenance Machine Repair

Q13. What are your primary education and training needs for current or potential employees?

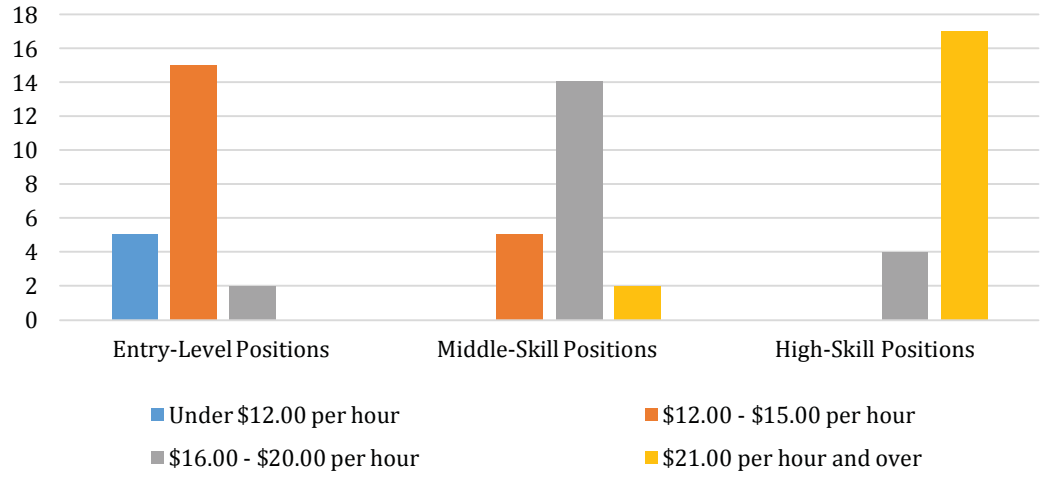
Respondents were asked what their primary education and training needs are for current or potential employees. **Table 4** below shows all responses. Many of the responses relate to high school diploma or equivalent, basic skills, and some technical skills.

Table 4: Primary Education and Training Needs for Current / Potential Employees
Basic measurement skills. Blueprint reading and basic machining
Blueprint and measuring tools
Company-specific technical training
Diploma
Education = GED or higher, Basics, come to work on time, Attendance, Lean Mfg.
H.S. Diploma/GED Licenses for specific technical positions
High school completion
High school education with 2 year degree, electrical, hydraulics, pneumatics, blue print reading, welding, troubleshooting, communication
High school equivalent
Gauge calibration, 8D, basic mathematics
How to machine metals and plastics, the right tooling to use and how to use it, etc.
Machine understanding and mechanical problem solving
Most positions require only high school diploma, though some very basic machining principles are helpful
Printing concepts. Skilled trades
Specific technical training based on job requirements
Technical training, mechanical, leadership
Work ethics and basic math skills

Q14. What is the average wage level paid to those within your company in Entry-Level, Middle-Skill, and High-Skill Positions?

Respondents were asked what the average wage paid was in their company by entry-level, middle-skill, and high-skill positions. Overall, entry-level positions were paid under $15 per hour, middle-skill positions were mostly at $12-$20 per hour, and high-skill positions were at $21 per hour and above.

Figure 9: Average Wage by Skill Level



Q15. What industry-recognized credentials associated with manufacturing does your company currently utilize and value? (I.e. AWS, NIMS, Siemens, PMMI, MSSC – CPT, or Certified Production Technician)

Of the 11 total responses, 6, of respondents indicated N/A or None, and four indicated that they currently utilize and value Siemens. The results are listed below.

Table 5. Industry-Recognize Credentials
AWS
Siemens (4)
Journeyman
Fanuc
NCRC
Allen Bradley
TS 16949

Q16. How is your company currently partnering with Kellogg Community College?

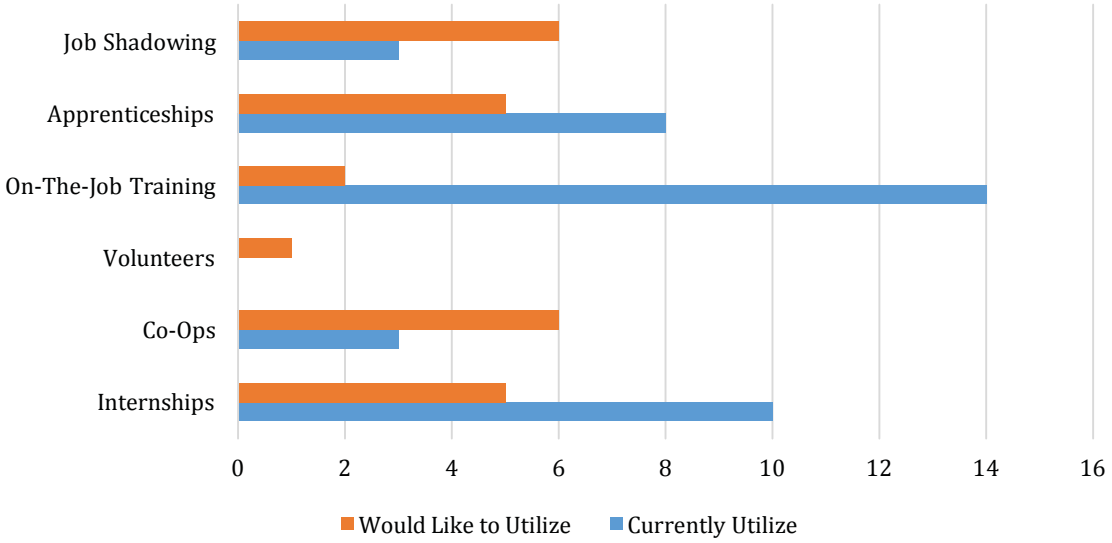
The respondents were asked how they are currently partnering with Kellogg Community College. The responses range from nothing to multiple methods including training, apprenticeships, and recruiting.

Table 6. Partnership with Kellogg Community College
Apprenticeship through RMTC
Blueprint training, GD&T training through RMTC
MNJTP
NA
NOT
Pneumatics training, Core Tools training
RMTC Programs
Sending employees for variety of training at the RMTC
Sending employees through skill specific training based on positions. Supplementing apprenticeship program.
Through our apprenticeship program
Training needs
Training needs, recruiting fairs, HS tours, STTF
Using KCC for millwright training and millwright and electrician skills assessments
Using KCC to post job openings for hourly
We are using the RMTC courses
We've attended Advisory Committee Meetings, had a booth at the Manufacturing Day event, our shop supervisor is a graduate of the RMTC and we have sent employees for training

Q17. Identify all experiential learning opportunities your company currently utilizes or would like to utilize.

Respondents were asked to identify **all** of the experiential learning opportunities that their company currently utilizes or would like to utilize. Overall, most employers utilize on-the-job training, internships, and apprenticeships. Of the opportunities that employers would most like to utilize, respondents indicated they would be interested in co-ops and job shadowing.

Figure 10: Experiential Learning Opportunities



Respondents also provided the following other experiential learning opportunities:

- AMP Curriculum through GRCC
- In 2016, we will also be partnering with WMU on an externship program.

Q18. Do you have any additional questions/comments?

Table 7: Comments/Questions
We would like to assist in developing an AMP Style program of study through Kellogg to WMU.
Need to make sure training parallels skills needed in machining industry to make an easy transition to machining industry

KELLOGG COMMUNITY COLLEGE

REGIONAL PROFILE

BRANCH BARRY CALHOUN

In addition to its main campus in Battle Creek, Kellogg Community College (KCC) has four regional centers – Eastern Academic Center in Albion, Fehsenfeld Center in Hastings, Grahl Center in Coldwater, and Regional Manufacturing Technology Center in Battle Creek. The college was founded in 1956 by the Battle Creek Board of Education. The college serves approximately 12,700 students annually on five campuses and through its courses including customized training and Lifelong Learning programs.

ABOUT M-CAM

The Michigan Coalition for Advanced Manufacturing (M-CAM) brings together the state of Michigan, community college leaders, employers, workforce development agencies, and other community partners to create education and training programs that lead to employment. With the award of a $24.9 million U.S. Department of Labor grant, M-CAM is creating a 21st century workforce through the development of seamless and responsive career pathways, credentials that have labor-market value, and strategies that connect the needs of employers with training providers throughout Michigan.

M-CAM provides training opportunities in four key areas of advanced manufacturing:

- Welding Technology
- Machining Technology
- Multi-Skilled / Mechatronics Technology
- Production Technologies

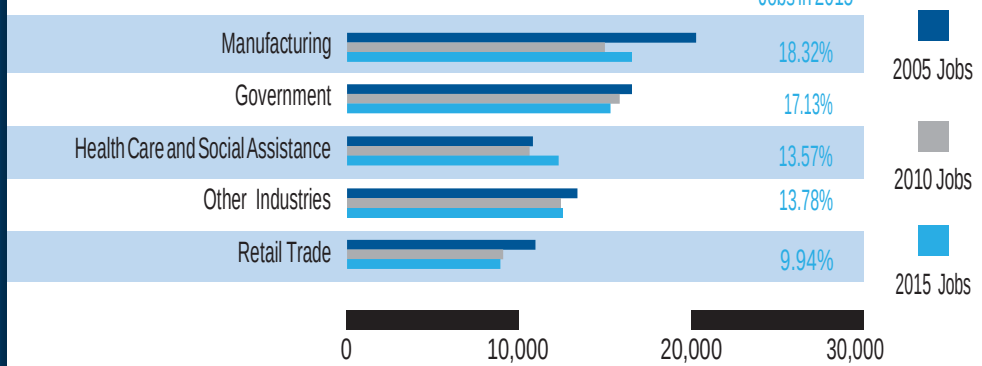
Job seekers will be able to earn various certificates, degrees, and credentials within these four areas.

Median Household Income

Branch	Calhoun	Barry	Michigan	USA
$42,538	$43,199	$53,730	$49,087	$53,482

Employment

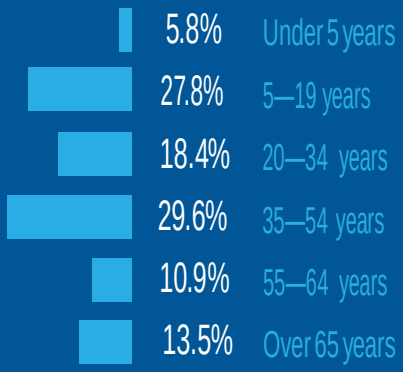
Major Industries



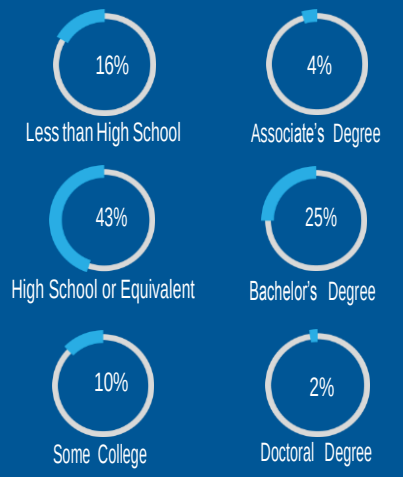
The PEOPLE

Population 235,384

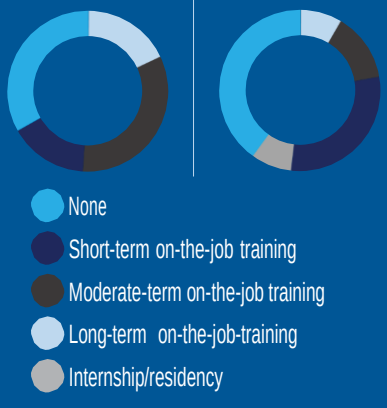
4% ↓ Stagnant over the past decade



Educational Attainment



Training Requirements



KELLOGG COMMUNITY COLLEGE
REGIONAL PROFILE

M-CAM
Michigan Coalition for Advanced Manufacturing

BRANCH BARRY CALHOUN

Top Occupations in Manufacturing Sector

	2015 Employment	Change, 2010—2015	Program				Median Hourly Earnings (2015)
			W/F	CNC	MECH	PO	
		Growing	•	•	•	•	
First-Line Supervisors of Production and Operating Workers	702	Growing	•	•	•	•	$24.49
		Growing		•	•		
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	586	Growing	•		•	•	$14.96
		Growing		•		•	
Machinists	431	Growing	•	•	•	•	$16.55
		Growing	•	•			
Industrial Engineers, Including Health and Safety	377	Growing	•		•	•	$30.27
		Growing		•			
Shipping, Receiving, and Traffic Clerks	291	Growing				•	$13.92

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	Program				Change, 2014-2015	
	W/F	CNC	MECH	PO		
	•		•	•		
Machinists		•	•	•	26	6%
Computer-Controlled Machine Tool Operators, Metal and Plastic		•				
Tool and Die Makers	•	•	•	•	19	11%
	•	•	•	•		

Top In-Demand Skills in 2015

Skill	% of Postings with Skill
Engineering	63%
Projects	50%
Designing	46%
System	46%
Communication	45%

Top Unique Skills in 2015

Skill	% of Top 5 Manufacturing Postings with Skill
Lean	74%
Computer Numerical Control (CNC)	69%
Continuous Improvement Process	64%
Six Sigma	62%
Machining	57%

Kellogg Community College

Levi Good, Director

Workforce Solutions

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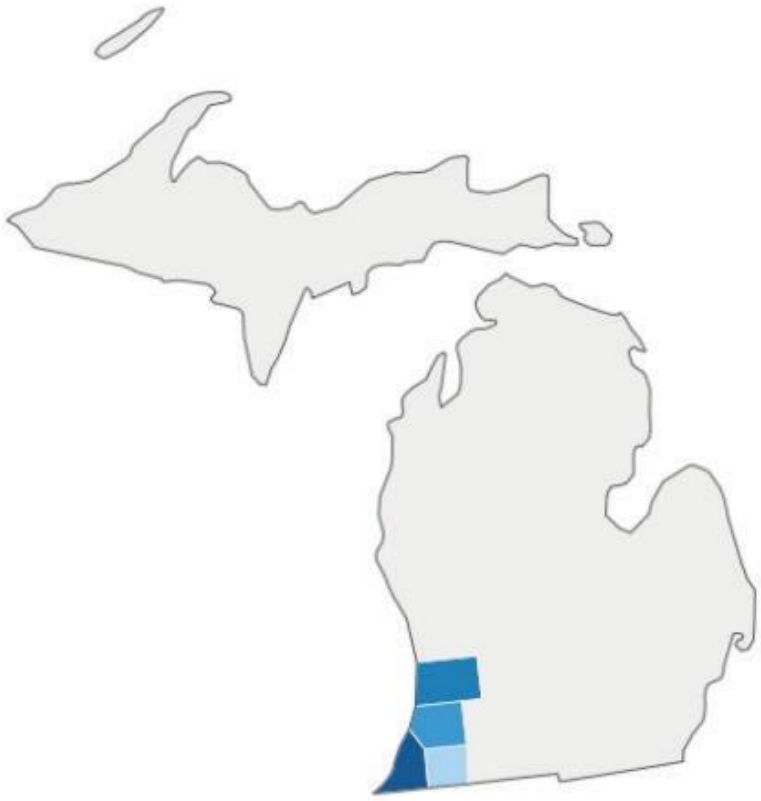
Scan for more information on industrial trade programs offered at Kellogg Community College



Lake Michigan Region

Skill Gap Analysis

THOMAS P. MILLER & ASSOCIATES

Executive Summary

Introduction

The following Skill Gap Analysis was created for the Lake Michigan College (LMC) region to assist the Michigan Coalition for Advanced Manufacturing (M-CAM). Thomas P. Miller & Associates (TPMA) was hired to conduct a thorough and comprehensive analysis including a full labor market profile, a survey of employers and manufacturers within the region, and an input session for stakeholders, employers, recruiters, and other associated entities. The research was centered on trends within manufacturing occupations and skills, specifically within the following four training opportunities for advanced manufacturing: Welding/Fabrication; CNC Machining; Multi-skilled Technology/Mechatronics; and Production Operations.

Skill Gap Analysis Process

The labor market profile was the first step of a three-part methodology that included quantitative research as well as qualitative research to assist Lake Michigan College in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic characteristics, industry analysis, occupation analysis, and labor force data. For the profile, the project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics.

Additionally, the project team interviewed college staff for additional information about the region. The data collected from the profile and conversations informed the next steps in the methodology which included a business demand survey and a regional input session. LMC staff distributed the business demand survey to their employers. However, only three businesses completed the survey so the results are negligible. The survey results are included as an attachment to this report. Qualitative data obtained from the regional input session is included in this profile.

Summary of Quantitative Data

Lake Michigan College has multiple facilities and offers classes in several locations. The main campus and Michigan Technical Education Center (M-TEC) facility are located in Benton Harbor and additional locations are in Nile and South Haven. The college was founded in 1946 and offers associate degrees, certificates, and a variety of continuing education and business and industry training. Annually, over 7,000 credit and non-credit students are served by LMC. The LMC Workforce Training Institute division serves more than 50 companies and 2,000 non-credit students.

LMC attracts students primarily from four counties in Michigan: Allegan, Berrien, Cass, and Van Buren counties. However, due to its location on the Michigan-Indiana border there are also students from Indiana. Since students come from multiple counties throughout the area, part of this report includes demographic trends for the broader region of: Allegan, Berrien, Cass and Van Buren counties in Michigan and Elkhart, La Porte, and St. Joseph counties in Indiana.

The population in the four-county Michigan region has decreased by 1% whereas the population in the three-county Indiana region experienced growth. The Indiana population is expected to continue to increase, although at a slower rate, over the next five years. Over the past 10 years, the population of 55-years-and-older increased significantly, and this trend is likely to continue. This is a concern as the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers in the four-county region are Manufacturing; Government; and Retail Trade. Manufacturing experienced significant job losses over the past ten years. However, it has grown over the past five years and suggests future growth.

A key focus of this study is on the manufacturing sector. Drilling deeper into the four-county region, the largest manufacturing sectors are Household Appliance Manufacturing and Pharmaceutical and Medicine Manufacturing. While Household Appliance Manufacturing experienced growth over the past 10 years, it is projected to decline by 21% over the next five years. Many of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is

likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

Pharmaceutical and Medicine Manufacturing has experienced growth since 2005 and is projected to grow by 10% over the next five years. Additional sectors within the region that are projected to grow include: Other Wood Product Manufacturing, Beverage Manufacturing, Alumina and Aluminum Production and Processing, Semiconductor and Other Electronic Component Manufacturing, and Forging and Stamping.

Top occupations for manufacturing by Standard Occupational Classification (SOC) codes include: Miscellaneous Assemblers and Fabricators; Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic; Laborers and Material Movers, Hand; and First-Line Supervisors of Production and Operating Workers. It should be noted that many of the occupations for manufacturing workers are projected to decline over the next five years. However many of these occupations experienced growth in the past five years. The model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries. Even if fewer new jobs are created there are likely to be opportunities due to retirements with the aging population.

Based on real time job posting information, the top skills that appear in job postings across the country for major regional manufacturers include: Maintenance, Repairs, and Operations; Manufacturing; Machines; Tools; and Inspection.

Regional Input Session

A total of six participants, composed of Lake Michigan College (LMC) staff, business development managers, and employers attended the input session for the Lake Michigan region. When asked what their most in-demand skills are, many noted that soft skills is at the top of the list. Showing up on time, having a good work ethic, and other qualities were commonly cited.

Others commented that they need more specific skills, like CNC machining, or employees that can operate and maintain several different kinds of machines. Many have turned to apprenticeships to fill the gap. One employer has had 16-20 apprenticeships over the past four years and estimated that 20% of his workforce is from apprenticeships.

Of the skills employers are looking for, answers included the ability to listen to and follow instructions, and ability to transfer into a newly skilled work set (adaptability). LMC representatives said that the college helps with basic skills such as blueprint reading, measuring skills, precision measuring, and others. Many noted that the most important skill is knowing machining setup. LMC has Introductory CNC skills, but often employers have different CNC curriculum and secondary skills are more often picked up there. Most often, the third party vendors, like equipment manufacturers provide the training. LMC noted that they are having issues enrolling enough people into these basic programs to get them started on their desired career path.

The participants identified a variety of avenues they are using to recruit workers. When asked about the challenges of recruitment, companies cited that they often have a lack of internal capacity to carry these efforts out and struggle with the scalability of existing programs. Also, time constraints and that everyone is competing with the employment base beyond manufacturing and other industries at the same time. A huge issue is that very little manufacturing is done within the high school curriculum anymore and the lack of exposure is their biggest challenge. Also, most companies only know what the next quarter is going to look like, as opposed to the next five years.

For recruitment barriers, many listed overall awareness of the industry and lack of transportation. Others stated that skill sets are already employed somewhere else and that it's the person with 8-10 years of experience that is the most difficult to find, not the entry level employees. Many manufacturers know aging is an issue but no one is addressing it.

Findings and Considerations

With consideration to the labor market profile and business input, the following are key findings and considerations for Lake Michigan College.

The region feels that they have strong sector partnerships and strong advisory boards for feedback loops. LMC should continue to build on these strong regional groups and utilize the input to refine course offerings and programs.

In the input session and survey, soft skills were overwhelmingly mentioned as the most sought after skill set. This includes having a good work ethic, good communication skills, an ability to follow instructions, and showing up on time. Basic education skills were also identified as a need for entry-level positions. LMC may want to consider offering work readiness classes to help overcome these deficits in basic and soft skills. At the same time the college may want to consider marketing the importance of having these skills to the workforce.

The participants in the input session and survey identified the challenges in filling high-skilled positions and difficulty finding job seekers with the specific technical skills needed as well as the lack of credentials and degrees. Likewise the employers identified an interest in Apprenticeship programs and the need for apprenticeship programs to have applicable course work. LMC should continue to work with employer partners to expand the available apprenticeship programs. LMC could develop and offer the course work. More apprenticeships could help meet the need for higher-skilled employees.

The college thought there may be an opportunity to expand and coordinate partnerships. There are many local organizations and services that could coordinate their efforts to better service individuals. The input session participants mentioned an opportunity to develop a mosaic type of structure that brought together faith-based organizations as well as programs such as FIRST Robotics, Pre-Apprenticeship Programs, Middle College, and Workplace Coordinators. Lake Michigan College could play a convener role in efforts to coordinate various partnerships and programs in the region.

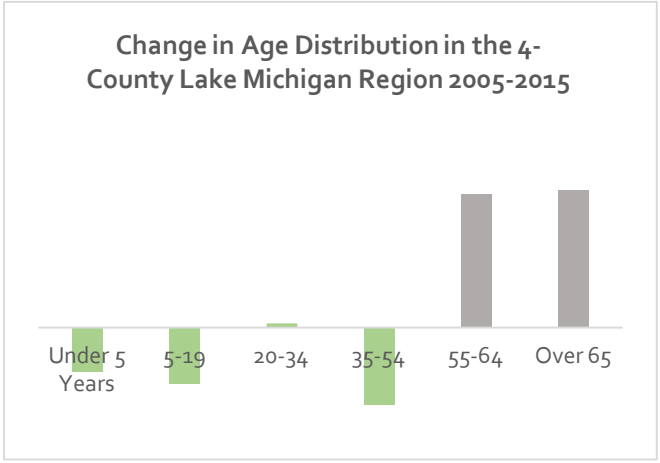
Demographics

The population in the four-county Michigan region has declined from 398,761 to 395,408 over the past ten years.[1] The population declined by 1%, equal to the state rate and lower than the national rate (9% growth). The population in the Michigan counties region is projected to remain the same over the next five years. The population for the three counties in Indiana has grown and is expected to continue to grow.

The broader seven-county Lake Michigan region has an aging population. Over the past ten years, the population of 55-years-and-older increased significantly, while the population decreased in other age groups. This trend is projected to continue over the next five years except for the age group under 5. The only age groups projected to grow are under age 5 and over age 55. Similar aging trends are observed in Elkhart-La Porte-St. Joseph Region in Indiana. The aging population is a concern as it will impact the availability of labor in these regions over the next decade.

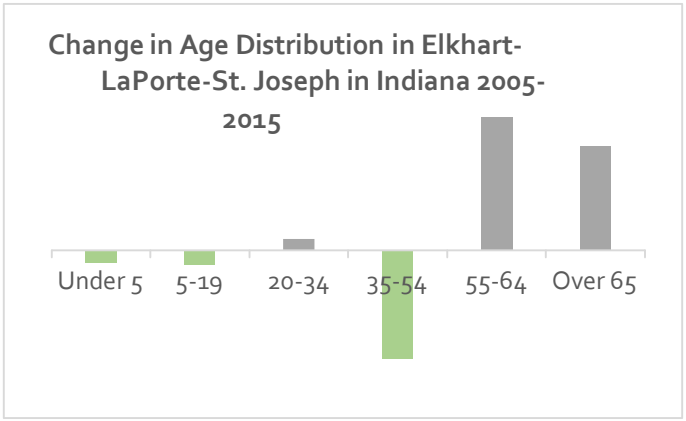
Age Distribution in 4-County Lake Michigan Region

Age	2015 Population	Change, 2005-2015		Change, 2015-2020	
Under 5	23,475	-2,382	-9%	1,114	5%
5-19	77,372	-10,097	-12%	-3,304	-4%
20-34	67,016	534	1%	-1,608	-2%
35-54	100,531	-19,094	-16%	-7,334	-7%
55-64	58,319	12,581	28%	348	1%
Over 65	68,713	15,122	28%	10,786	16%



Age Distribution in Elkhart-La Porte-St. Joseph Region

Age	2015 Population	Change, 2005-2015		Change, 2015-2020	
Under 5	39,320	1,733	-4%	2,280	6%
5-19	122,377	1,856	-2%	1,959	-1%
20-34	115,405	1,513	1%	1,655	-1%
35-54	145,223	14,275	-9%	5,755	-4%
55-64	74,663	17,641	31%	-36	0%
Over 65	84,818	13,859	20%	12,404	15%



[1] EMSI Analyst 2015.

The Lake Michigan region is not diverse, with over 96.4% of the 2015 population identifying as White. However, the White population in this region shrank by 3% from 2005-2015, the same as Elkhart-La Porte-St. Joseph Region in Indiana. The top three fastest growing races in both regions are those identifying as Hispanic, Two or More Races, and Asian.[2]

Race Distribution in Lake Michigan Region

Race	2015 Population	Change, 2005-2015	
White	323,017	-10,504	-3%
American Indian or Alaskan Native	2,524	234	10%
Two or More Races	8,215	2,195	37%
Hispanic	26,754	5,684	27%
Black	30,152	2,095	-7%
Asian	237	108	84%
Native Hawaiian or Pacific Islander	63	31	97%

Race Distribution in Elkhart-LaPorte-St. Joseph Region

Race	2015 Population	Change, 2005-2015	
White	439,557	12,282	-3%
American Indian or Alaskan Native	1,474	553	60%
Two or More Races	12,730	3,997	46%
Hispanic	60,483	16,523	37%
Black	58,369	4,973	9.%
Asian	387	122	46%
Native Hawaiian or Pacific Islander	285	42	17%

[2] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander.

Income

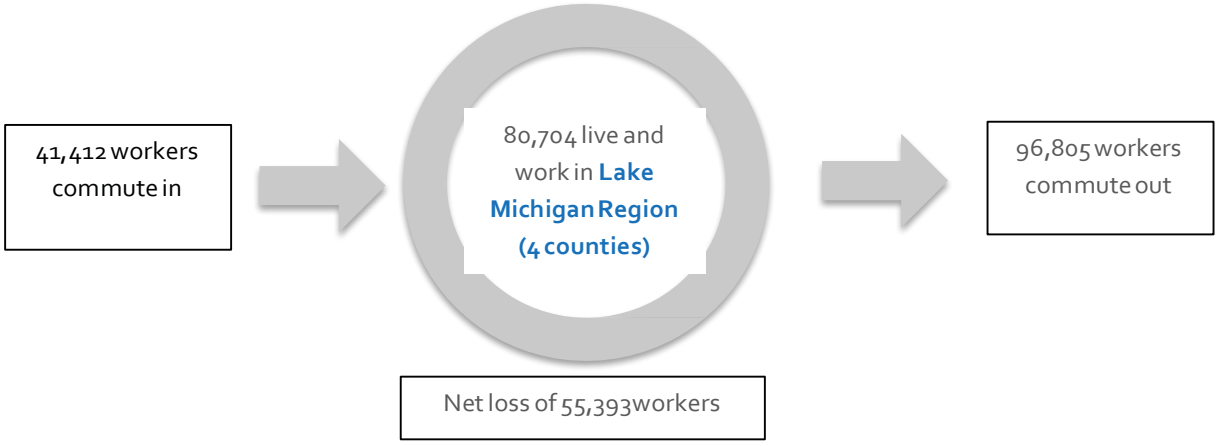
Allegan County had the highest median income from 2010 to 2014. All the other counties in the Lake Michigan region trail the median household income averages for Michigan and the United States. The average income for the Indiana counties are similar to the Michigan counties. Additionally, Van Buren County has the highest poverty rate over the same period. [3]

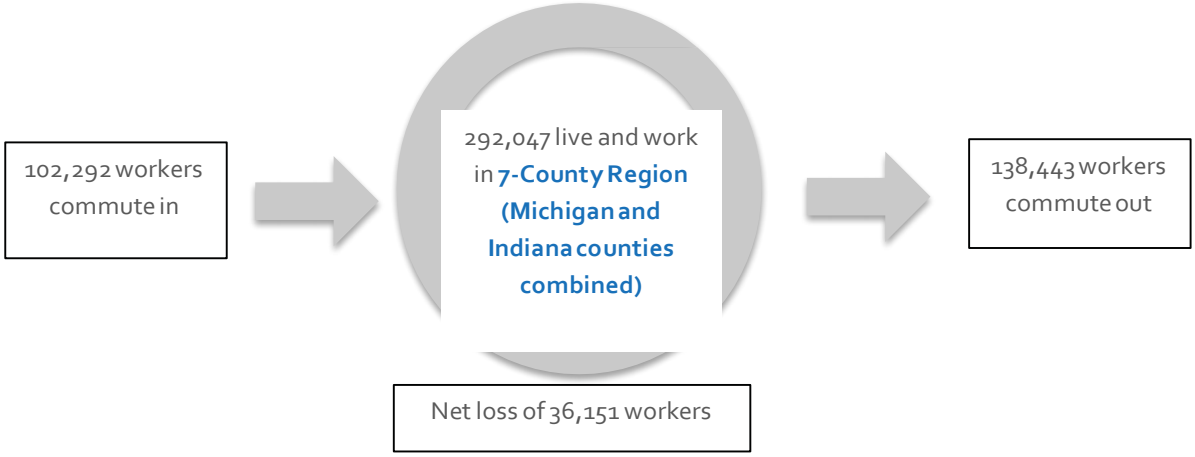
	Median Household Income ('10-'14)	Poverty Rate
Allegan (MI)	$52,472	13.7%
Berrien (MI)	$44,701	17.6%
Cass (MI)	$45,166	14.3%
Van Buren (MI)	$46,536	19.2%
Michigan	**$49,087**	**16.9%**
Elkhart (IN)	$46,983	16.2%
LaPorte (IN)	$47,117	17.7%
St. Joseph (IN)	$45,012	17.6%
Indiana	**$48,737**	**15.5%**
U.S.	**$53,482**	**15.6%**

[3] U.S. Census Bureau 2010-2014

Commuting Pattern and Labor Force Availability

In 2013, the four-county Lake Michigan region had over 41,000 workers commuting in and over 96,000 commuting out, making the region a net exporter of workers.[4] The region receives the most commuters from Kent County (15,018, 9.2%), Kalamazoo County (14,923, 9.2%), and Ottawa County (11,209, 6.9%), and sends the most workers to Kalamazoo County (8,062, 6.8%), Ottawa County (7,325, 6.1%), and Cass County (6,776, 5.7%). Over 112,000 workers are employed in the region, including 80,704 both living and working in the region and 41,412 commuting in from other counties.





[4] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/

Human Capital

In 2014, about 189,000 workers participated in the four-county Lake Michigan regional labor force which includes employed and unemployed individuals. Of these, 179,469 are employed. Over the last 20 years, employment in the region was at its highest in August 2000 and lowest in January 2010. The unemployment rate for the region is 5.1%, which is lower than the rate for the Elkhart-La Porte-St. Joseph Region (6.2%), Michigan (5.6 %), and the U.S. (5.6 %).

EMPLOYMENT, 1994-2014 [5]		
Peak	August 2000 (202,694)	+12.9% (compared to Dec, 2014)
Trough	January 2010 (162,262)	-9.6% (compared to Dec, 2014)
Dec 2014	Employment: 179,469 Labor Force: 189,103 Unemployment rate: 5.1%	

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

Labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation rate for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boom generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

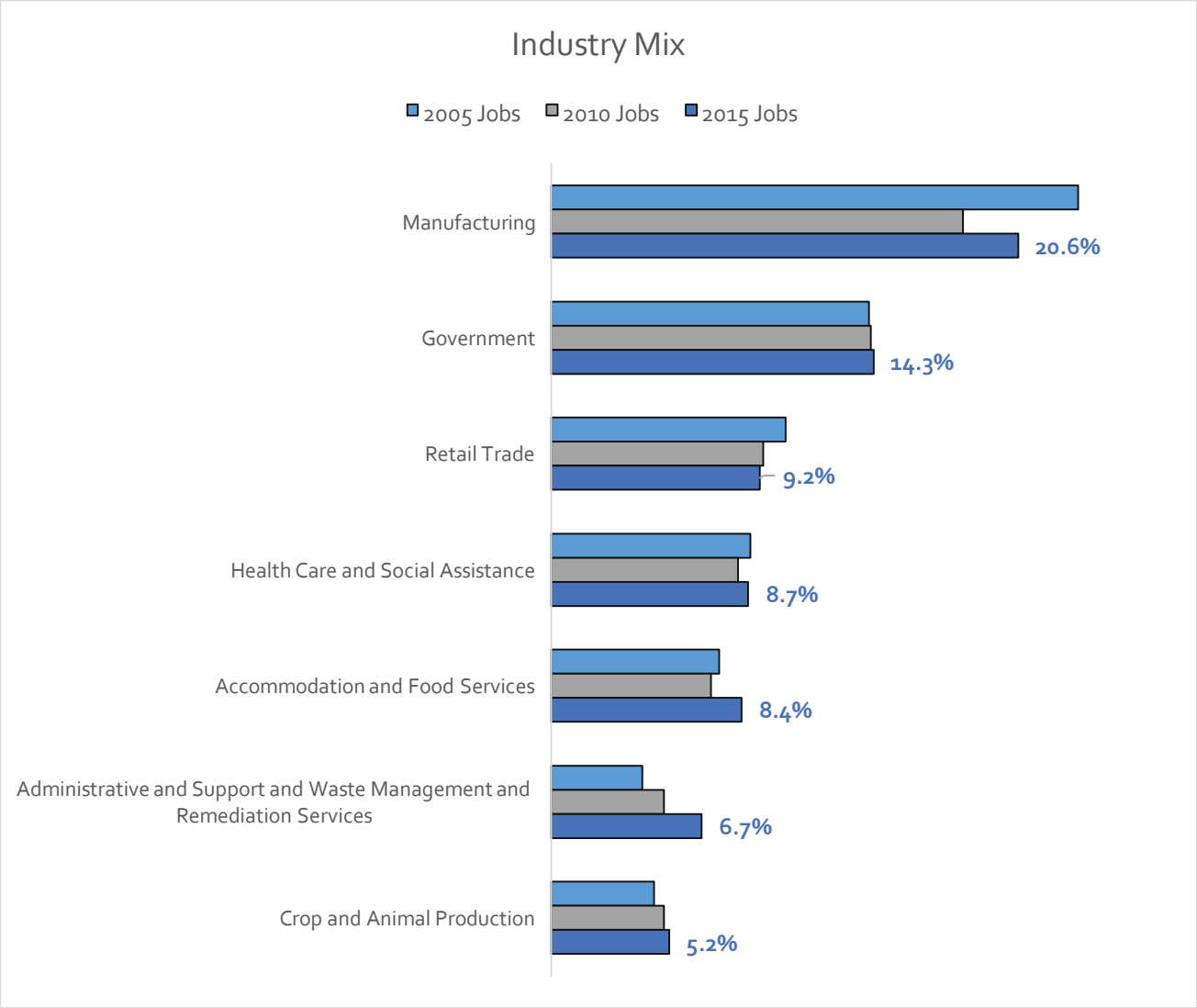
The older worker population (55 years and older) in the region is estimated to be 49,552 in 2014.[6] These older workers are expected to retire in the next ten years.

[5] U.S. Bureau of Labor Statistics, 1994.12-2014.12 (most recently available). http://www.bls.gov/data/

[6] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

Industry Analysis

The broad industry sectors in the four-county region employing the most workers are Manufacturing (30,443, 20.6 %), Government (21,017, 14.3%), and Retail Trade (13,619, 9.2%).[7] Manufacturing experienced a significant decline in the number of jobs from 2005 to 2010, but has experienced substantial growth in the past five years.



[7] These industries are by 2-digit NAICS code. EMSI Analyst 2015.

Manufacturing Analysis

The tables below show the top 25 largest manufacturing industries by employment in the Lake Michigan region. [8] The largest manufacturing sectors are Household Appliance Manufacturing and Pharmaceutical and Medicine Manufacturing. While Household Appliance Manufacturing experienced growth over the past 10 years, it is projected to decline by 21% over the next five years. Pharmaceutical and Medicine Manufacturing is projected to have the highest growth over the next five years, followed by Other Wood Product Manufacturing and Beverage Manufacturing. Several of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020	
Household Appliance Manufacturing	3,526	675	24%	372	12%	-758	-21%
Pharmaceutical and Medicine Manufacturing	3,195	958	43%	608	24%	335	10%
Office Furniture (including Fixtures) Manufacturing	2,890	38	1%	781	37%	226	-8%
Metalworking Machinery Manufacturing	1,705	-103	-6%	158	10%	-211	12%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,435	414	41%	304	27%	67	5%
Plastics Product Manufacturing	1,356	-530	-28%	-182	-12%	-77	-6%
Motor Vehicle Parts Manufacturing	1,355	-1,742	-56%	239	21%	-397	-29%
Animal Slaughtering and Processing	1,051	60	6%	-39	-4%	-41	-4%
Fruit and Vegetable Preserving and Specialty Food Manufacturing	904	-76	8%	-35	-4%	-75	-8%
Architectural and Structural Metals Manufacturing	838	-16	-2%	71	9%	27	3%
Foundries	830	-454	-35%	294	55%	-182	- 22%
Coating, Engraving, Heat Treating, and Allied Activities	769	-42	-5%	230	43%	-43	-6%
Other General Purpose Machinery Manufacturing	754	-138	-15%	63	9%	-74	-10%
Printing and Related Support Activities	741	-402	-35%	28	4%	-130	-18%
Other Fabricated Metal Product Manufacturing	697	-269	-28%	-3	-0%	-146	-21%
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	652	-256	-28%	-161	-20%	51	8%
Other Wood Product Manufacturing	542	34	7%	291	116%	128	24%
Beverage Manufacturing	529	157	42%	88	20%	116	22%
Forging and Stamping	484	300	163%	55	13%	90	19%
Converted Paper Product Manufacturing	329	19	6%	-23	-7%	33	10%
Electrical Equipment Manufacturing	306	38	14%	69	29%	48	16%
Alumina and Aluminum Production and Processing	299	198	196%	141	89%	95	32%
Semiconductor and Other Electronic Component Manufacturing	292	-92	-24%	-45	-13%	73	25%
Commercial and Service Industry Machinery Manufacturing	287	77	37%	56	24%	-8	-3%
Dairy Product Manufacturing	277	142	105%	98	55%	15	5%

[8] These industries are by 4-digit NAICS code.

Among these top industries, average earnings vary widely, from $27,108 for Beverage Manufacturing, to over $112,000 a year for Household Appliance Manufacturing. The average earnings above the **regional average** in manufacturing industries ($77,227) are highlighted in orange.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earning	Establishments
Household Appliance Manufacturing	3,526	**$112,407**	2
Pharmaceutical and Medicine Manufacturing	3,195	$69,676	4
Office Furniture (including Fixtures) Manufacturing	2,890	$60,501	15
Metalworking Machinery Manufacturing	1,705	$60,469	71
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,435	$44,887	64
Plastics Product Manufacturing	1,356	$42,770	29
Motor Vehicle Parts Manufacturing	1,355	$46,498	17
Animal Slaughtering and Processing	1,051	$31,075	4
Fruit and Vegetable Preserving and Specialty Food Manufacturing	904	$33,311	13
Architectural and Structural Metals Manufacturing	838	$49,676	33
Foundries	830	$46,861	17
Coating, Engraving, Heat Treating, and Allied Activities	769	$41,304	29
Other General Purpose Machinery Manufacturing	754	$67,918	26
Printing and Related Support Activities	741	$41,028	33
Other Fabricated Metal Product Manufacturing	697	$60,931	25
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	652	**$81,419**	5
Other Wood Product Manufacturing	542	$35,869	19
Beverage Manufacturing	529	$27,108	19
Forging and Stamping	484	$61,991	9
Converted Paper Product Manufacturing	329	$62,736	9
Electrical Equipment Manufacturing	306	$67,996	4
Alumina and Aluminum Production and Processing	299	$46,003	1
Semiconductor and Other Electronic Component Manufacturing	292	$61,883	6
Commercial and Service Industry Machinery Manufacturing	287	$65,035	7
Dairy Product Manufacturing	277	$49,351	4

Occupation analysis

The counties' top occupations include Office and Administrative Support Occupations; Production Operations; Sales and Related Occupations; and Food Preparation and Serving Related Occupations.[9] The median hourly earnings range from $9.87/hour for Food Preparation and Serving Related Occupations, to $31.92 for Healthcare Practitioners and Technical Occupations.

Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	19,226	13.22%	$14.65
Production Occupations	17,854	12.28%	$15.23
Sales and Related Occupations	13,448	9.25%	$13.73
Food Preparation and Serving Related Occupations	13,015	8.95%	$9.87
Management Occupations	9,758	6.71%	$31.60
Transportation and Material Moving Occupations	8,545	5.88%	$14.24
Education, Training, and Library Occupations	7,442	5.12%	$21.51
Construction and Extraction Occupations	6,426	4.42%	$17.90
Healthcare Practitioners and Technical Occupations	6,143	4.22%	$31.92
Building and Grounds Cleaning and Maintenance Occupations	5,846	4.02%	$11.14
Installation, Maintenance, and Repair Occupations	5,544	3.81%	$18.77
Business and Financial Operations Occupations	5,060	3.48%	$26.16
Personal Care and Service Occupations	4,240	2.92%	$10.28
Farming, Fishing, and Forestry Occupations	3,980	2.74%	$12.53
Healthcare Support Occupations	3,600	2.48%	$13.48
Architecture and Engineering Occupations	3,557	2.45%	$31.59
Protective Service Occupations	3,300	2.27%	$18.21
Arts, Design, Entertainment, Sports, and Media Occupations	2,121	1.46%	$19.46
Community and Social Service Occupations	2,011	1.38%	$19.22
Life, Physical, and Social Science Occupations	1,604	1.10%	$31.74
Computer and Mathematical Occupations	1,470	1.01%	$26.35
Military occupations	699	0.48%	$14.80
Legal Occupations	530	0.36%	$31.47

[9] These occupations are by 2 digit SOC code (Standard Occupational Classification System).

Occupations in Manufacturing Sector

The table below shows employment of each occupation within Manufacturing Sector. It is worth noticing that almost half of Production Occupations are within Manufacturing Industry.

Regional Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	14,906	49.9%
Office and Administrative Support Occupations	2,740	9.2%
Management Occupations	2,334	7.8%
Architecture and Engineering Occupations	2,327	7.8%
Transportation and Material Moving Occupations	1,752	5.9%
Business and Financial Operations Occupations	1,377	4.6%
Installation, Maintenance, and Repair Occupations	1,312	4.4%
Sales and Related Occupations	991	3.3%
Life, Physical, and Social Science Occupations	677	2.3%
Construction and Extraction Occupations	379	1.3%
Computer and Mathematical Occupations	288	1.0%
Arts, Design, Entertainment, Sports, and Media Occupations	269	0.9%
Building and Grounds Cleaning and Maintenance Occupations	231	0.8%
Food Preparation and Serving Related Occupations	88	0.3%
Healthcare Practitioners and Technical Occupations	62	0.2%
Farming, Fishing, and Forestry Occupations	55	0.2%
Protective Service Occupations	38	0.1%
Legal Occupations	12	0.0%

Top Occupations in Manufacturing Sector

Drilling a bit deeper, the following table displays the top 20 occupations that are most often required to staff companies within manufacturing in the Lake Michigan region.[10] Median hourly earnings for these occupations range from $11.45 at the low end for Laborers and Material Movers, Hand to $44.04 at the high end for Industrial Production Managers. While many of the occupations show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. The growth in the last five years indicates future growth. Future trends should continue to be monitored through periodic contact with companies where these occupations are represented.

Top 20 Occupations in Manufacturing Sector

Occupation	2015 Employment	Change 2005-2015		Change 2010-2015		Projected Change 2015-2020		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	3,435	-522	-13%	516	18%	-413	-12%	$12.05
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	1,318	-145	-10%	167	15%	-162	-12%	$14.08
Laborers and Material Movers, Hand	1,046	-198	-16%	63	6%	-7	-1%	$11.45
First-Line Supervisors of Production and Operating Workers	1,007	-198	-16%	86	9%	-44	-4%	$25.43
Miscellaneous Production Workers	994	-299	-23%	-10	-1%	-25	-3%	$13.07
Machinists	925	-40	-4%	135	17%	-28	-3%	$18.85
Sales Representatives, Wholesale and Manufacturing	806	-45	-5%	103	15%	-54	-7%	$21.38
Mechanical Engineers	783	-21	-3%	123	19%	-129	-17%	$35.09
Inspectors, Testers, Sorters, Samplers, and Weighers	703	-125	-15%	51	8%	8	1%	$15.45
Welding, Soldering, and Brazing Workers	700	-245	-26%	106	18%	-63	-9%	$15.85
Packaging and Filling Machine Operators and Tenders	624	-34	-5%	-8	-1%	7	1%	$13.20
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	619	-213	-26%	59	11%	-111	-18%	$13.63
Maintenance and Repair Workers, General	573	-72	-11%	59	11%	-39	-7%	$16.55
Engineering Technicians, Except Drafters	568	-13	-2%	72	15%	-42	-7%	$24.12
General and Operations Managers	566	-65	-10%	65	13%	-32	-6%	$38.99
Industrial Production Managers	542	-13	-2%	78	17%	-35	-7%	$44.04
Office Clerks, General	524	-32	-6%	73	16%	-43	-8.2%	$13.18
Industrial Machinery Installation, Repair, and Maintenance Workers	480	-82	-15%	37	8%	16	3%	$21.44
Industrial Engineers, Including Health and Safety	434	-46	-10%	53	14%	-1	0%	$32.89
Computer Control Programmers and Operators	415	-18	-4%	76	22%	13	3%	$14.41

[10] Occupations are by 4 digit SOC code.

Industry and Occupation Connections in Manufacturing Sector

Although key manufacturing industries are highly diversified, they do share some common workforce requirements.[11] The following table identifies the top occupations with corresponding key industries.

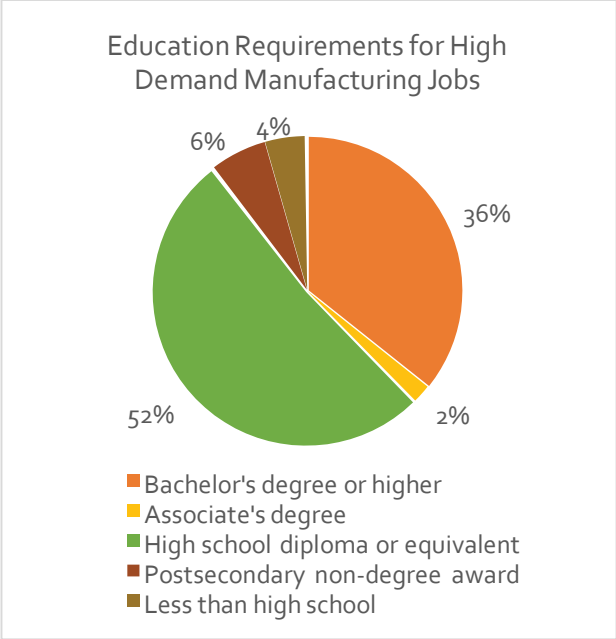
Connection between Top Occupations and Key Industries in Manufacturing Sector

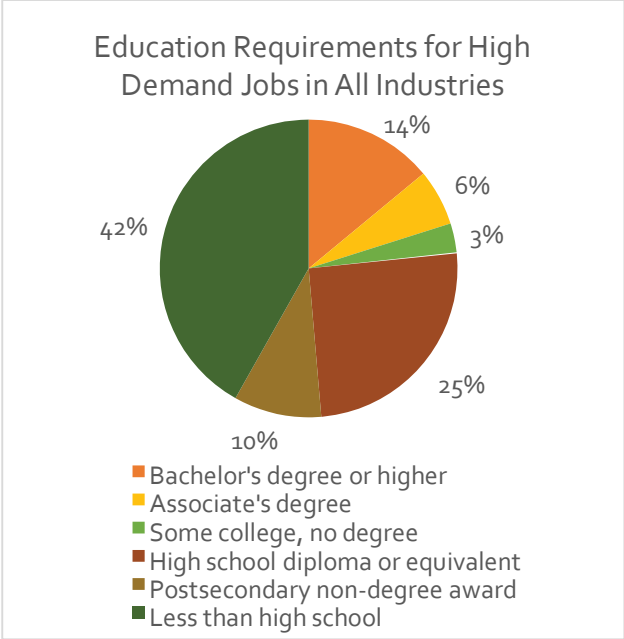
Top Occupations	Key Industries
Miscellaneous Assemblers and Fabricators	• Household Appliance Manufacturing • Pharmaceutical and Medicine Manufacturing • Metalworking Machinery Manufacturing
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	• Household Appliance Manufacturing • Office Furniture (including Fixtures) Manufacturing • Metalworking Machinery Manufacturing • Motor Vehicle Parts Manufacturing
Laborers and Material Movers, Hand	• Temporary Help Services • Supermarkets and Other Grocery (except Convenience) Stores • Animal (except Poultry) Slaughtering • Office Furniture (except Wood) Manufacturing
First-Line Supervisors of Production and Operating Workers	• Office Furniture (except Wood) Manufacturing • Pharmaceutical Preparation Manufacturing • Household Laundry Equipment Manufacturing • Nuclear Electric Power Generation
Miscellaneous Production Workers	• Temporary Help Services • Paper Bag and Coated and Treated Paper Manufacturing • Office Furniture (except Wood) Manufacturing • Animal (except Poultry) Slaughtering

[11] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

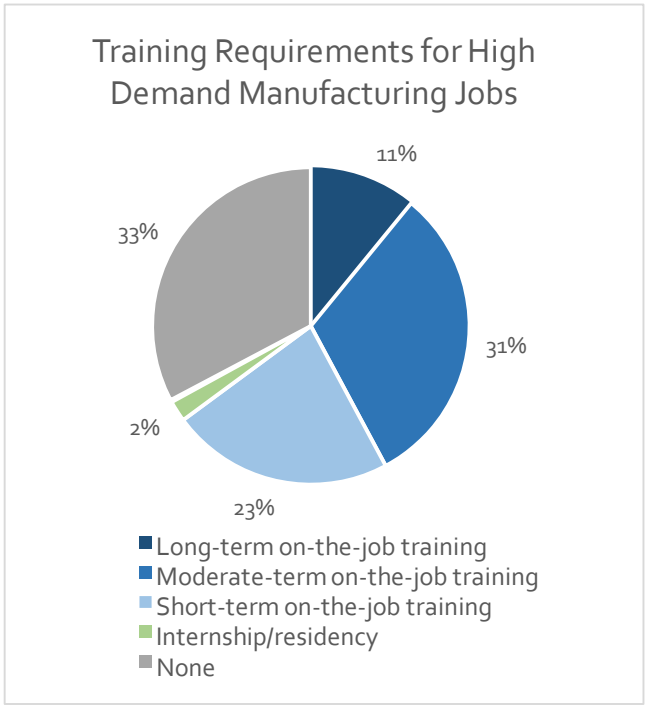
Education and Training For High Demand Jobs

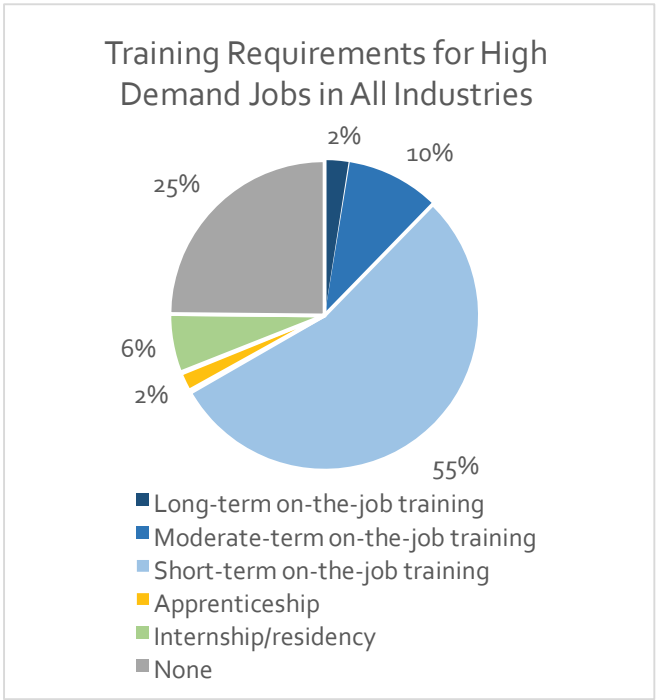
The manufacturing sector has unique education and training requirements compared to the other industry sectors. Among high demand manufacturing jobs in the Lake Michigan region, 52% require a high school diploma or equivalent, while only 25% of the jobs among all industry sectors have the same requirement.[12]





The most often required training in manufacturing sector is moderate-term on-the-job training (31%), followed by short-term on-the-job training (23%) and long-term on-the-job training (11%); while the short-term on-the-job training has the largest share (55%) in training requirement among all industries.





[12] A total of 50 occupations with the highest projected job growth from 2014-2019 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations with highest growth during 2014-2015 in the Lake Michigan region. The top growth occurred for Team Assemblers; First-Line Supervisors of Production and Operating Workers; and Machinists. The table on next page shows the top skills required for top 5 manufacturing jobs with highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Team Assemblers	3,048	3,128	80	3%
First-Line Supervisors of Production and Operating Workers	984	1,030	46	5%
Machinists	898	939	41	5%
Welders, Cutters, Solderers, and Brazers	603	639	36	6%
Inspectors, Testers, Sorters, Samplers, and Weighers	685	718	33	5%
Helpers--Production Workers	597	624	27	5%
Laborers and Freight, Stock, and Material Movers, Hand	537	563	26	5%
Computer-Controlled Machine Tool Operators, Metal and Plastic	356	382	26	7%
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	555	577	22	4%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	739	761	22	3%
Mechanical Engineers	773	795	22	3%
General and Operations Managers	555	576	21	4%
Industrial Engineers	418	438	20	5%
Maintenance and Repair Workers, General	565	584	19	3%
Industrial Machinery Mechanics	348	366	18	5%
Packers and Packagers, Hand	367	384	17	5%
Shipping, Receiving, and Traffic Clerks	325	342	17	5%
Cabinetmakers and Bench Carpenters	137	154	17	12%
Office Clerks, General	524	539	15	3%
Tool and Die Makers	246	261	15	6%
Industrial Production Managers	533	548	15	3%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	907	921	14	2%
Purchasing Agents, Except Wholesale, Retail, and Farm Products	360	374	14	4%
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	11	25	14	127%
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	266	280	14	5%
Electrical and Electronic Equipment Assemblers	178	191	13	7%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	252	265	13	5%
Meat, Poultry, and Fish Cutters and Trimmers	264	277	13	5%

The table below displays the top skills required for top 5 manufacturing jobs with highest growth during 2014-2015. [13] Based on the data from real time job posting compiled by EMSI, the top five skills that appear in posting for manufacturing positions are Maintenance, Repairs, and Operations; Manufacturing; Machines; Tools; and Inspection.[14]

Top 50 In-Demand Skills

Skill	% of Postings with Skill		Skill	% of Postings with Skill
Maintenance, Repairs, and Operations	**47%**		OSHA	6%
Manufacturing	**46%**		Lean Manufacturing	5%
Machines	**25%**		Rotation	5%
Tools	**23%**		Purchasing	5%
Inspection	**15%**		Sanitation	5%
Productivity	15%		Product Quality	5%
Quality Control	14%		Arc Welding	5%
Planning	14%		Hand Tools	4%
Blueprints	13%		Workflow	4%
Welding	13%		Microsoft Word	4%
Technology	12%		Drilling	4%
Design	11%		Plastics	4%
Problem Solving	10%		Automation	3%
Innovation	9%		Food Safety	3%
Machining	9%		Six Sigma	3%
Computer Numerical Control (CNC)	9%		Preventive Maintenance	3%
Packaging	9%		Recognizing	3%
Warehouse	8%		Project Management	3%
Housekeeping	7%		Engines	3%
Electricity	7%		Standardization	2%
Transportation	7%		Genetics	2%
Corrective Action	7%		Production Environment	2%
Fabrication	6%		Mechanical Aptitude	2%
Lathes	6%		Cleanliness	2%

[13] 4-digit SOC code. EMSI Analyst 2015.
[14] National data. EMSI Analysis 2015.

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Inspection; Maintenance, Repairs, and Operations; Tools; Productivity; and Blueprints.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Inspection	68%	15%
Maintenance, Repairs, and Operations	54%	47%
Tools	49%	23%
Productivity	48%	15%
Blueprints	44%	13%
Manufacturing	32%	46%
Welding	27%	13%
Machines	23%	25%
Quality Control	13%	14%
Design	2%	11%

Regional Input Session Summary

Attendees

Six (6) participants attended the input session. Attendees were representatives from the college, business development managers and Human Resources directors of various organizations.

Melissa Emory, Lake Michigan College (LMC)	Lynette Wolf, Lake Michigan College (LMC)
Karen Broadwater, Lake Michigan College (LMC)	Ken Flowers, Lake Michigan College (LMC)
Shelley Klug, Cornerstone Alliance	Jim Todd, Hanson Mold

What Do You See As the Most In-Demand Skills?

- Soft Skills such as showing up on time, knowing how to work, teamwork, etc.
- CNC Machinist Skills (in 4 categories)

What Skills Are You Looking For?

- Ability to take and follow instructions and ability to pick up and transfer to a new skill (adaptability)
- We need well-rounded employees that have a number of skills (boring operators, EDM wire operator, etc.)
- LMC helps with basic skills for various machines such as blueprint reading, measuring skills, etc.
- Machining setup skills, grinders.
- Welding skills, mechatronics, etc.
- Often skill gaps are filled by 3rd party vendors or the manufacturers.

What Are In-Demand Occupations?

- CDL Truck Drivers
- All Skilled Trade Occupations are in demand – everyone is looking for these individuals
- Engineers – but many employers are not entirely sure what kind of engineer they need
- Mold Making, Machinists – Some are really looking to find someone who will work a night shift.
- Food Safety
- Chemist/Testing
- Some Agriculture (Wine)
- Homeland Security
- Cyber Security
- Nuclear
- Logistics (Operational)

What Are Companies Doing To Recruit?

Many companies are using temp agencies. Colleges in the area have workplace learning coordinators that set up internship programs and find money to pay for internships. Small companies really need this kind of help and LMC is doing this "earn and learn" program model that it is working to upscale. They are also looking into non-traditional ways to get people into the workforce (i.e. prisoner re-entry, disability, agency on aging). LMC is working with Michigan Works!, the Veterans Administration and local schools to add machining to their curriculum. They are also using faith-based referrals and building a partnership with Goodwill.

What Are Some Recruitment Challenges?

- Lack of internal capacity to get the work done
- Low scalability of existing programs
- Time Constraints – Many companies have not set aside the time for a strategy
- Everyone is competing with the employment base beyond manufacturing and it is very hard to compete with healthcare and other industries as well
- Lack of exposure is their biggest challenge

- LMC is working with employers through their Apprentice Program and once every 2 months, 20 employers come to a meeting to discuss.

What Are Some Recruitment Opportunities?

- Goodwill Connects, in Battle Creek has a Machining program and Goodwill Edge has Mentoring.
- There is a need to attract women to manufacturing and transportation is needed to get people to work.
- We should offer more flexible scheduling to help families.
- Some employers would like a list of high school guidance counselors to give them ideas about the Manufacturing sector and send out information to give tours of the plants.
- Community Ventures
- There should be an accessible pool available with unemployment and low participation rates

What Are Some Recruitment Barriers?

- Awareness
- Transportation
- Skill sets are already employed somewhere else. It's the individual with 8-10 years of experience that is hard to find, not entry-level.
- Too often, LMC CNC students are getting snatched up by employers so they can't keep them enrolled
- Most employers are now growing/adding new employees through their own apprenticeships
- Manufacturing is more of a felony-friendly industry.
- Some employers are no longer doing drug tests because it is so hard to find workers

What Kind of Credentials Are Offered?

For LMC, the only credential we offer is welding. This credential will only get you in the door and most facilities have a welding test. The region is so small that LMC is more important than having a particular credential – their word for an employee acts as a kind of credential.

How Is The Region Addressing the Aging Workforce?

All manufacturing occupations are facing aging issues – even the industry itself is aging. More often than not, manufacturers know it's an issue but are not addressing it. Also, many have aging owners which increases the danger of businesses closing and acquisitions/mergers happening as a result.

What Are Some Other Challenges?

- Michigan Works! is always in transition and not focused on manufacturing
- Lack of education funds going into adult population (those over 24). Most of it is going to youth
- Many have learned how to survive on the welfare system and are not willing to move out
- There is a gap on front-end training – the funding only comes at the end and there is no support upfront
- All of the consortiums have had issues with Michigan Works (not giving or supporting funding). They are looking at performance measures, getting the most people for the least amount of money. Also MI Works is focused on higher wages and manufacturing wages tend to be lower
- It's essentially turned into a competition for education
- Individuals with 8-10 years of experience don't need to go through MI Works, they have a strong network
- Not knowing all of the resources available – we need a collective front rather than individual partners meeting separately with manufacturers
- There is a disconnect between K-12 education and careers

What Are Strengths of the Current System?

- LMC and the college system
- New M-TEC Building – They are moving back to LMC's main campus.
- Strong Sector Partnerships
- Veteran Numbers
- Strong Advisory Boards for feedback

What Are Some Best Practices?

- Mosaic kind of structure – faith-based organizations that teach soft skills through mentoring, DHS, prisoner re-entry, etc.
- FIRST Robotics
- Pre-Apprenticeship
- Middle College
- Workplace Coordinator
    - Common denominator is that all of these connect individuals with the workplace experience.

What Is On Your Wish List?

- Mobile Labs
- LMC's strongest program is apprenticeship. They recently sent out a survey and call companies twice a year – get continuous feedback from up to 40 companies.

LAKE MICHIGAN COLLEGE

REGIONAL PROFILE

M-CAM
Michigan Coalition for Advanced Manufacturing

ALLEGAN BERRIEN CASS VAN BUREN ELKHART LAPORTE ST. JOSEPH

Lake Michigan College has multiple facilities and offers classes in several locations. The main campus and Michigan Technical Education Center (M-TEC) facility are located in Benton Harbor and additional locations are in Nile and South Haven. The college was founded in 1946 and offers associate degrees, certificates, and a variety of continuing education and business and industry training. Annually, over 7,000 credit and non-credit students are served by LMC. The LMC Workforce Training Institute division serves more than 50 companies and 2,000 non-credit students.

ABOUT M-CAM

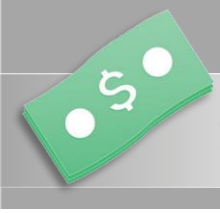
The Michigan Coalition for Advanced Manufacturing (M-CAM) brings together the state of Michigan, community college leaders, employers, workforce development agencies, and other community partners to create education and training programs that lead to employment. With the award of a $24.9 million U.S. Department of Labor grant, M-CAM is creating a 21st century workforce through the development of seamless and responsive career pathways, credentials that have labor-market value, and strategies that connect the needs of employers with training providers throughout Michigan.

M-CAM provides training opportunities in four key areas of advanced manufacturing:

- Welding/ Fabrication
- CNC Machining
- Multi-Skilled Technology / Mechatronics
- Production Operations

Job seekers will be able to earn various certificates, degrees, and credentials within these four areas.

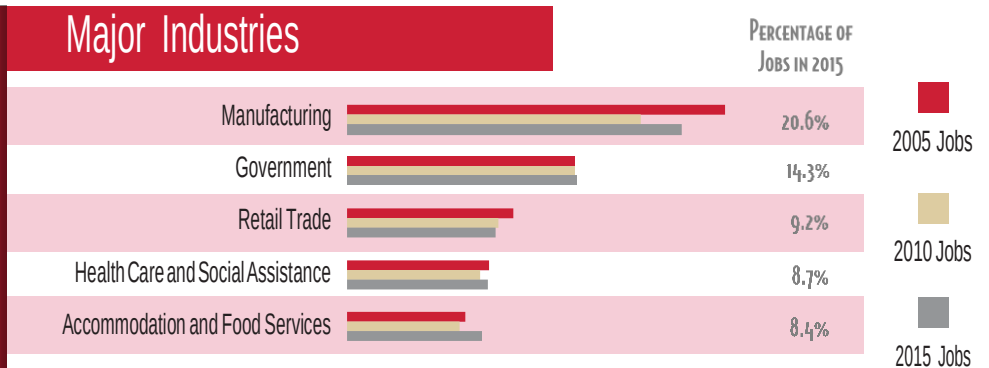
Median Household Income



Michigan	Indiana	Lake Michigan College Region	USA
$49,087	$48,737	$46,855	$53,482

Employment

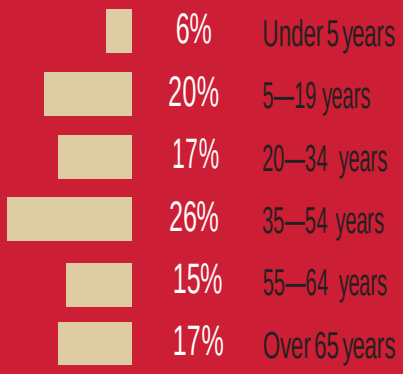
Major Industries



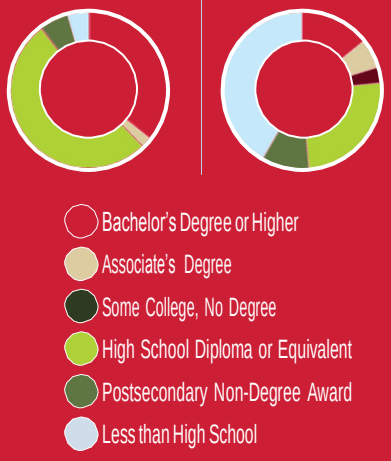
The PEOPLE

Population 395,408

1% ↓ Decline over the pastdecade



Education Requirements



LMC attracts students primarily from four counties in Michigan: Allegan, Berrien, Cass and Van Buren Counties. However, due to its location on the Michigan-Indiana border there are also students from Indiana. Since students come from multiple counties throughout the area, part of this report includes demographic trends for the broader region of: Allegan, Berrien, Cass and Van Buren Counties in Michigan and Elkhart, LaPorte, and St. Joseph Counties in Indiana.

LAKE MICHIGAN COLLEGE

Regional Profile

M-CAM Michigan Coalition for Advanced Manufacturing

Allegan Berrien Cass Van Buren Elkhart LaPorte St. Joseph

Top Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2010-2015	Projected Change, 2015-2020	Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	3,435	Growing	Loss	$12.05
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	1,318	Growing	Loss	$14.08
Laborers and Material Movers, Hand	1,046	Growing	Loss	$11.45
First-Line Supervisors of Production and Operating Workers	1,007	Growing	Loss	$25.43
Miscellaneous Production Workers	994	Loss	Loss	$13.07

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	Change, 2014-2015	
Team Assemblers	80	3%
First-Line Supervisors of Production and Operating Workers	46	5%
Machinists	41	5%
Welders, Cutters, Solderers, and Brazers	36	6%
Inspectors, Testers, Sorters, Samplers, and Weighers	33	5%

Top In-Demand Skills

Skill	% of Postings with Skill
Maintenance, Repairs, and Operations	47%
Manufacturing	46%
Machines	25%
Tools	23%
Inspection	15%

Top Unique Skills

Skill	% of Top 5 Manufacturing Postings with Skill
Inspection	68%
Maintenance, Repairs, and Operations	54%
Tools	49%
Productivity	48%
Blueprints	44%

Lake Michigan College

Ken Flowers, Director of M-TEC Career Education & Workforce Development

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LANSING REGION

SKILL GAP ANALYSIS

May 2016

Thomas P. Miller & Associates

Executive Summary

Introduction

The following is a skill gap analysis for Lansing Community College. The skill gap analysis was a two-part methodology that included quantitative research as well as qualitative research to assist Lansing Community College in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic and labor force characteristics, industry analysis, occupation analysis, and labor force data. The project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics. Additionally, the project team talked with college staff with the M-CAM project. The data collected from the profile and initial conversations informed the next step in the methodology which included a business demand survey.

Labor Market Profile

Lansing Community College has one campus located in Lansing, Michigan. The college was founded in 1957 to fulfill growing demand for specialized and technical education opportunities for the Greater Lansing industrial workforce. The college awards degrees and certificates to nearly 20,000 students annually. The regional profile focuses on the Lansing region known as S.L.I.I.C.E. – Shiawassee, Livingston, Ionia, Ingham, Clinton, and Eaton Counties.

The population in the region has increased by 2% over the past ten years to over 791,020. This increase counteracts the state average of 1% population decline. The population is projected to increase 1% over the next five years. The population is aging. Over the past ten years, the population of 55-years-and-older increased significantly and this trend is likely to continue. This is a concern as the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers are Government, Health Care and Social Assistance, and Manufacturing. It is worth noting that Health Care and Social Assistance has grown since 2005. Manufacturing declined from 2005 to 2010, but has been growing since 2010, which suggests a potential for future growth as the U.S. economy continues to recover.

A key focus of this study is on the Manufacturing sector, which has experience significant growth in the past five years due to a large expansion of General Motors and suppliers in the region. Drilling deeper, the largest Manufacturing sector for the region is Motor Vehicle Manufacturing. However, it should be noted that this industry saw a 3.7% decline in employment over the past ten years and is projected to decline 30% from 2015-2020. Significant sectors within the region that are projected to grow include: Motor Vehicle Parts Manufacturing, Motor Vehicle Body and Trailer Manufacturing, and Plastics Product Manufacturing. It should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

The top occupations by Standard Occupational Classification (SOC) codes within the region include: Office and Administrative Support; Sales and Related Occupations; Food Preparation and Serving Related Occupations; Production Occupations, Education, Training, and Library Occupations; and Transportation and Material Moving Occupations.

Top occupations for Manufacturing include: Miscellaneous Assemblers and Fabricators; Miscellaneous Production Workers, and Laborers and Material Movers, Hand. Nearly all of the occupations experienced growth from 2010-2015 which may indicate future growth. More new jobs are likely to be created as well as opportunities due to retirements with the aging population.

Based on real-time job posting information, the top skills that appear in job postings across the region include: Manufacturing; Maintenance, Repairs, and Operations; Machines; Tools; and Productivity.

Business Demand Survey

Additionally, Thomas P. Miller & Associates conducted an online business demand survey for manufacturers within the Lansing region. Lansing distributed the survey to their business partners. Of the 18 companies that responded, over half employed 250+ employees. The types of manufacturers included Machine Tool Manufacturing, Other Motor Vehicle Parts Manufacturing, and others. Companies were most interested in Manufacturing Production & Assembly and Multi-Skilled Technician programs for their employees.

When it came to filling vacancies within their companies, 69.2% of respondents said that it was very difficult to fill high-skill positions. The most cited barriers to filling high-skill positions is a lack of job-specific technical skills and lack of relevant work experience. The barriers to filling entry-level positions included a lack of soft skills, passing a drug test or background check, and unrealistic expectations of job seekers. A little less than half (45.5%) indicated that the highest priority of workforce needs was alignment of current training and employer needs (i.e. closing the skills gap).

When asked what kinds of training/skills that their company requires; a substantial portion indicated Maintenance-related skills. Similarly, employers indicated that the occupations hardest to fill were maintenance-related positions. In regards to education and training requirements for new employees, the responses varied from high school diploma to associate degree or technical-specific training, blueprint reading and basic machining.

Partnerships with Lansing Community College varied with several of the employers mentioned training, apprentices, and recruiting. Many employers utilize on-the-job training and internships, but would like to utilize apprenticeships and internships more in the future.

Findings and Considerations

With consideration to the labor market profile and survey results, the following are key findings and considerations for Lansing Community College.

- Employers indicated it was difficult to fill high skill positions. The employers feel that closing the skills gap is a high priority and want training to align with employer needs. It is important for LCC to stay engaged with employers to listen to their needs and work together on developing solutions. The survey reinforced the challenges employers face in filling middle and high-skill positions. The largest barrier for the middle- and high-skill positions is a lack of job-specific technical skills. Some of the needs cited included providing advanced, job-specific technical training to upskill incumbent workers so they can move into the high-skill positions and address some of the impending retirements. Expansion of apprenticeship programs is another opportunity to explore.
- There is also a need for employability or soft-skills training for entry-level positions. LCC should continue to talk with employers and identify the specific soft skills needed and then consider partnering with other organizations to see if partners are or could provide soft skills training. LCC could work with employers to further identify the foundational skills necessary and how curriculum could be adjusted to further develop the skills. The survey respondents identified the need for blue print reading, tape measure reading, navigating a computer, and math as some foundational skills needed.
- Lastly, efforts to develop the pipeline are necessary. The quantitative data illustrates the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce. There is an opportunity for M-CAM and LCC to get more involved with the partners and employers to support manufacturing awareness and promotional activities in schools and in the community

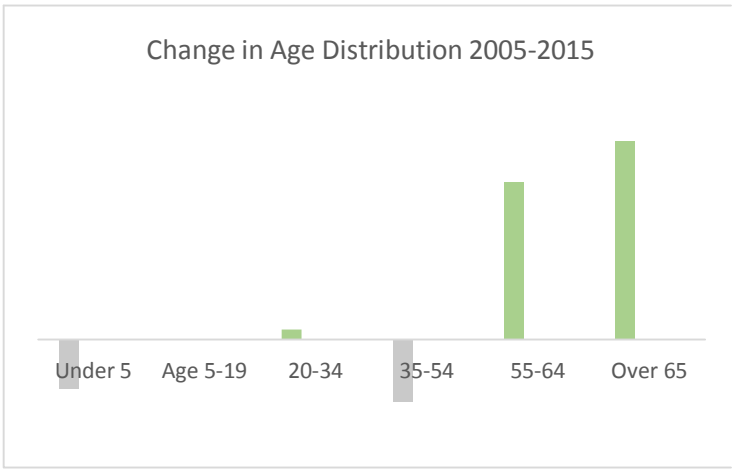
DEMOGRAPHICS

The population in the Lansing region has increased from 779,036 to 791,020 over the past ten years.[1] The population increased by 2% compared to the state rate which declined by 1%. The national rate over the same period experienced an increase of 9%. The region's population is projected to increase 1% over the next five years.

The region has an aging population. Over the past ten years, the population of 55-years-and-older increased significantly, while the population decreased in all other age groups besides 20-34 years. However, this age group only experienced a growth of 2.1% over the past ten years. This aging population trend is projected to continue over the next five years. The only age groups projected to grow are under 5, 20-34, and 55-years-and-older. The aging population is a concern as it will impact the availability of labor in this region over the next decade.

Age Distribution

Age	2015 Pop.	Change, 2005-2015		Change, 2015-2020	
Under 5	43,143	-5,047	-10.5%	3,812	8.8%
5-19	156,764	-16,898	-9.7%	-9,749	-6.2%
20-34	169,559	3,546	2.1%	2,972	1.8%
35-54	199,545	-30,760	-13.4%	-12,276	-6.2%
55-64	107,348	26,920	33.5%	1,257	1.2%
Over 65	114,660	34,222	42.5%	23,758	20.7%



The population of the region is not diverse, with over 83% of the 2015 population identifying as White. The top three fastest growing races in the region are those identifying as Hispanic, Asian, and Two or More Races.[2]

Race Distribution

Race	2015 Population	Change, 2005-2015	
White	660,003	-9,891	-1.5%
Asian	23,337	6,254	36.6%
Two or More Races	17,077	4,493	35.7%
Native Hawaiian or Pacific Islander	304	77	33.9%
Hispanic	40,725	8,476	26.3%
Black	46,339	2,593	5.9%
American Indian or Alaskan Native	3,174	-20	-0.6%

[1] EMSI Analyst 2015

[2] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian, or Pacific Islander.

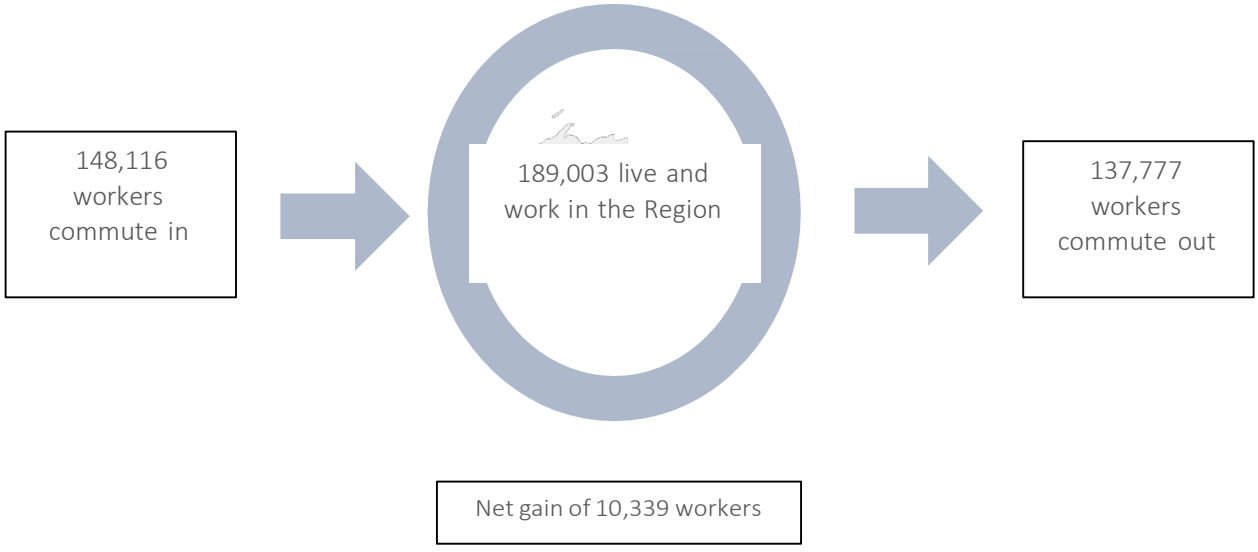
Income

Livingston County has the highest median income from 2010-2014, and drastically surpasses the average for Michigan. Ingham, Ionia and Shiawassee Counties fall below the median household income averages for Michigan. Clinton, Eaton, and Livingston counties in the region surpass the median household income averages for the United States. Additionally, Ingham County has the highest poverty rate over the same period and drastically surpasses the national poverty rate. [3]

	Median Household Income ('10-'14)	Poverty Rate
Clinton	$60,381	11.6%
Eaton	$55,223	10.4%
Ingham	$45,278	22.3%
Ionia	$48,100	15.4%
Livingston	$73,694	6%
Shiawassee	$47,723	15.5%
Michigan	$49,087	16.9%
U.S.	$53,482	15.6%

Commuting Pattern and Labor Force Availability

In 2013, the region had over 148,000 workers commuting in and over 137,000 commuting out.[4] Over 330,000 workers are employed in the region, including 189,003 both living and working in the region and 148,116 commuting into the region. The county with the most workers is Ingham County (186,828, 55%) with Clinton County (18,458, 5.4%) having the least workers.



[3] U.S. Census Bureau 2009-2013

[4] U.S. Census Bureau, OnTheMap, 2013- (most recently available). http://onthemap.ces.census.gov/

HUMAN CAPITAL

In 2014, 393,070 workers participated in the Lansing regional labor force, including employed and unemployed individuals. Of these, 377,915 are employed. Over the last 20 years, employment in the region was at its highest in November 2000 and lowest in January 2010. The unemployment rate for the region is 4.6%, which is lower than the rate for Michigan (7.1%) and the U.S. (5.9%).

EMPLOYMENT, 1994-2014 [5]		
Peak	397,576 (November 2000)	6.0% (compared to December 2014)
Trough	342,981 (January 2010)	-8.5% (compared to December 2014)
Dec 2014	374,915	Current unemployment: 4.6%

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

Labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boom generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

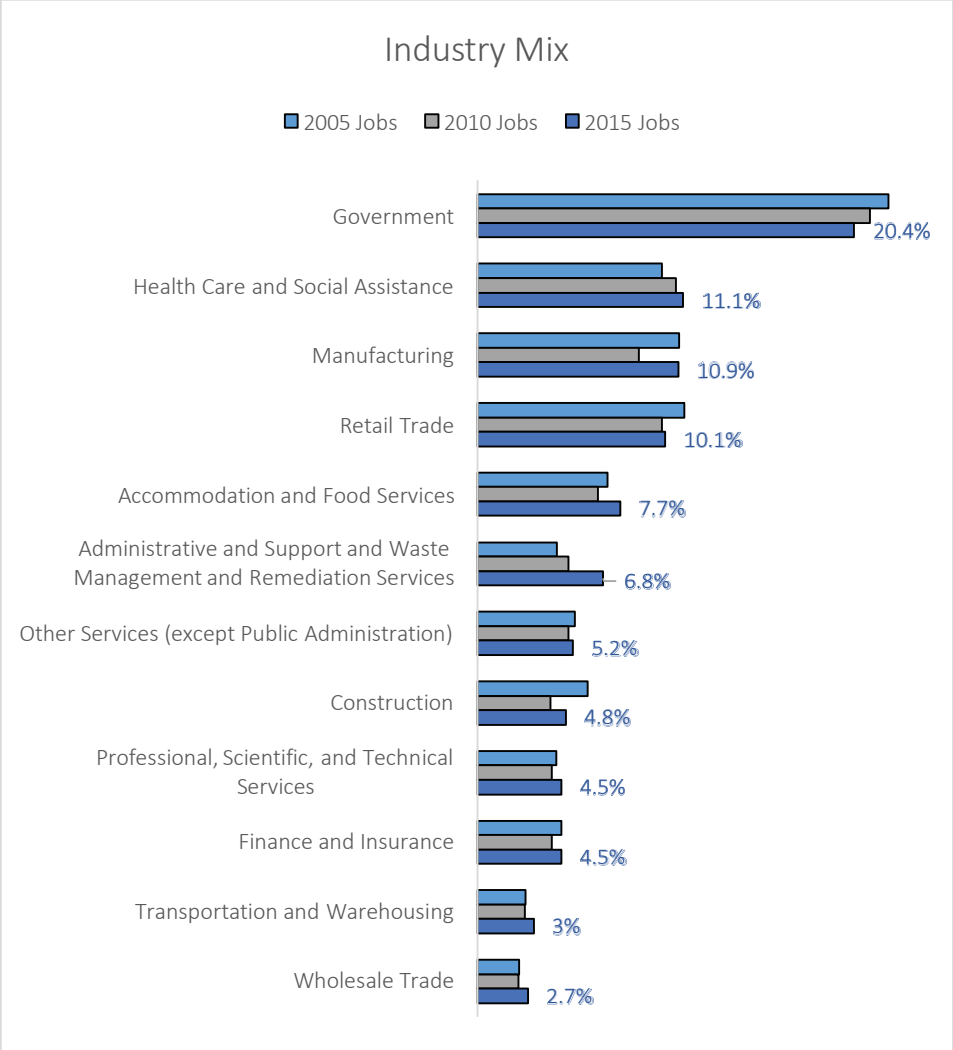
The older worker population (55 years and older) in the region is estimated to be 137,130 in 2014.[6] Many of these older workers are expected to retire in the next ten years.

[5] U.S. Bureau of Labor Statistics, 1994.9-2014.9 (most recently available). http://www.bls.gov/data/

[6] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

Industry Analysis

The broad industry sectors in the region employing the most workers are Government (68,340, 20.4%), Health Care and Social Assistance (37,293, 11.1%) Manufacturing (36,406, 10.9%), Retail Trade (33,981, 10.1%), and Accommodation and Food Services (25,858, 7.7%).[7] It is worth noting that Health Care and Social Assistance has grown since 2005. Manufacturing declined from 2005 to 2010, but has been growing since 2010, which suggests a potential for future growth. In addition, Government has been declining since 2005, which suggests a potential for future decline.



[7] These industries are by 2-digit NAICS code. EMSI Analyst 2015.

Manufacturing Analysis

Drilling a bit deeper, the tables below show the top 20 largest manufacturing industries by employment in the Lansing region.[8] Of the top 20 largest manufacturing industries, 70% experienced double-digit growth from 2010-2015. It is worth noticing that Motor Vehicle Body and Trailer Manufacturing has experienced significant growth since 2005, with 93% growth in the past five years. Additionally, Pharmaceutical and Medicine Manufacturing had 69% growth and Plastics Product Manufacturing has had significant growth as well. These same key industries are projected to have some of the highest number of positions added. It is important to note the number of positions as well as the percentages. It should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020	
Motor Vehicle Manufacturing	7,041	-271	-3.7%	1,641	30%	-2,090	-30%
Motor Vehicle Parts Manufacturing	5,909	-261	-4.2%	2,045	53%	399	7%
Motor Vehicle Body and Trailer Manufacturing	3,022	1,696	128.0%	1,453	93%	423	14%
Plastics Product Manufacturing	2,955	988	50.2%	1,048	55%	259	9%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,667	-483	-22.5%	305	22%	-157	-9%
Metalworking Machinery Manufacturing	1,492	-58	-3.7%	464	45%	-165	-11%
Printing and Related Support Activities	1,038	-286	-21.7%	-148	-12%	-84	-8%
Architectural and Structural Metals Manufacturing	882	327	58.9%	-435	-33%	146	17%
Pharmaceutical and Medicine Manufacturing	878	503	134.6%	359	69%	171	19%
Medical Equipment and Supplies Manufacturing	840	275	48.7%	134	19%	89	11%
Coating, Engraving, Heat Treating, and Allied Activities	710	-39	-5.3%	198	39%	48	7%
Other General Purpose Machinery Manufacturing	594	63	11.7%	239	67%	23	4%
Forging and Stamping	518	-404	-43.8%	-119	-19%	9	2%
Beverage Manufacturing	502	317	171.1%	28	6%	91	18%
Aerospace Product and Parts Manufacturing	433	117	36.8%	-28	-6%	-70	-16%
Other Fabricated Metal Product Manufacturing	421	-196	-31.9%	154	58%	-44	-10%
Other Chemical Product and Preparation Manufacturing	413	146	54.5%	99	32%	-25	-6%
Industrial Machinery Manufacturing	377	-130	-25.6%	56	17%	-8	-2%
Alumina and Aluminum Production Processing	373	260	229.4%	120	47%	74	20%
Bakeries and Tortilla Manufacturing	339	7	2.2%	46	16%	-26	-8%

[8] These industries are by4-digit NAICS code.

Among these top industries, earnings vary widely, from over $83,000 a year for Aerospace Product and Parts Manufacturing, to under $30,000 a year for Bakeries and Tortilla Manufacturing; with an overall average earning at over $56,488. Those industries that both pay relatively higher average wages and have at least 10 establishments include: Motor Vehicle Parts Manufacturing; Machine Shops, Turned Product, and Screw, Nut and Bolt Manufacturing; Medical Equipment and Supplies Manufacturing, Other General Purpose Machinery Manufacturing, and Other Chemical Product Preparation Manufacturing.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earnings	Establishments
Motor Vehicle Manufacturing	7,041	$74,177	4
Motor Vehicle Parts Manufacturing	5,909	$61,075	55
Motor Vehicle Body and Trailer Manufacturing	3,022	$47,888	8
Plastics Product Manufacturing	2,955	$52,471	31
Machine Shops; Turned Product, and Screw, Nut, and Bolt Manufacturing	1,667	$61,803	57
Metalworking Machinery Manufacturing	1,492	$54,956	62
Printing and Related Support Activities	1,038	$39,835	58
Architectural and Structural Metals Manufacturing	882	$54,504	21
Pharmaceutical and Medicine Manufacturing	878	$71,629	5
Medical Equipment and Supplies Manufacturing	840	$60,714	26
Coating, Engraving, Heat Treating, and Allied Activities	710	$44,068	21
Other General Purpose Manufacturing	594	$69,767	28
Forging and Stamping	518	$49,652	9
Beverage Manufacturing	502	$47,376	7
Aerospace Product and Parts Manufacturing	433	$83,428	5
Other Fabricated Metal Product Manufacturing	421	$50,894	16
Other Chemical Product and Preparation Manufacturing	413	$67,495	13
Industrial Machinery Manufacturing	377	$61,273	9
Alumina and Aluminum Production and Processing	373	$47,858	5
Bakeries and Tortilla Manufacturing	339	$28,909	19

Occupation Analysis

The region's top occupations include Office and Administrative Support Occupations; Sales and Related Occupations; Food Preparation and Serving Related Occupations and Production Occupations.[9] The median hourly earnings for all occupations range from $9.82/hour for Food Preparation and Serving Related Occupations to $38.80/hour for Management Occupations.

Lansing Regional Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	53,482	16.0%	$16.21
Sales and Related Occupations	32,379	9.7%	$14.12
Food Preparation and Serving Related Occupations	28,089	8.4%	$9.82
Production Occupations	27,922	8.3%	$14.81
Education, Training, and Library Occupations	24,143	7.2%	$26.74
Transportation and Material Moving Occupations	21,198	6.3%	$14.35
Management Occupations	18,055	5.4%	$38.80
Business and Financial Operations Occupations	17,272	5.2%	$29.27
Healthcare Practitioners and Technical Occupations	15,394	4.6%	$34.39
Construction and Extraction Occupations	13,092	3.9%	$19.10
Personal Care and Service Occupations	11,384	3.4%	$10.27
Installation, Maintenance, and Repair Occupations	11,377	3.4%	$19.14
Building and Grounds Cleaning and Maintenance Operations	10,737	3.2%	$11.07
Computer and Mathematical Occupations	9,544	2.8%	$30.34
Healthcare Support Occupations	9,425	2.8%	$13.06
Community and Social Service Occupations	5,919	1.8%	$21.36
Arts, Design, Entertainment, Sports, and Media Occupations	5,596	1.7%	$18.99
Protective Service Occupations	5,527	1.6%	$21.13
Architecture and Engineering Occupations	5,280	1.6%	$32.14
Life, Physical, and Social Science Occupations	3,228	1.0%	$29.06
Legal Occupations	2,317	0.7%	$33.35
Farming, Fishing, and Forestry Occupations	2,085	0.6%	$12.61
Military Occupations	1,510	0.5%	$14.34

[9] These occupations are by 2 digit SOC code (Standard Occupational Classification System).

Occupations in Manufacturing Sector

The table below shows employment of each occupation within the Manufacturing Sector. The regional occupations in the manufacturing sector with the highest percent of total employment in manufacturing are Production Occupations; Office and Administrative Support Occupations; Architecture and Engineering Occupations; and Transportation and Material Moving Occupations; and Management Occupations. It is worth noticing that 57.7% of Production Occupations are within the Manufacturing Industry.

Lansing Regional Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	21,019	57.7%
Office and Administrative Support Occupations	2,908	8.0%
Architecture and Engineering Occupations	2,329	6.4%
Transportation and Material Moving Occupations	2,092	5.7%
Management Occupations	2,057	5.7%
Installation, Maintenance, and Repair Occupations	1,716	4.7%
Business and Financial Operations Occupations	1,276	3.5%
Sales and Related Occupations	1,072	2.9%
Computer and Mathematical Occupations	554	1.5%
Construction and Extraction Occupations	550	1.5%
Life, Physical, and Social Science Occupations	269	0.7%
Arts, Design, Entertainment, Sports and Media Occupations	251	0.7%
Building and Grounds Cleaning and Maintenance Occupations	136	0.4%
Food Preparation and Serving Related Occupations	73	0.2%
Healthcare Practitioners and Technical Occupations	43	0.1%
Farming, Fishing, and Forestry Occupations	27	0.1%
Protective Service Occupations	17	0.0%

Top Occupations in the Manufacturing Sector

Drilling a bit deeper, the following table displays the top 25 occupations that are most often required to staff companies within manufacturing in the Lansing region.[10] Median hourly earnings for these occupations range from $11.75 at the low end for Laborers and Material Movers, Hand to $44.13 at the high end for Industrial Production Managers. Some of the highest projected change is with Computer Control Programmers and Operators, which experienced a 36% change from 2010-2015 and has a projected change of 6%. It is important to note that almost all of the top occupations (excluding Printing Workers) in the manufacturing sector have experienced growth in the past five years. The model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers.

Top 25 Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	7,371	344	5%	1,993	37%	-827	-11%	$11.96
Miscellaneous Production Workers	1,334	-113	-8%	238	22%	-62	-5%	$12.21
Laborers and Material Movers, Hand	1,251	55	5%	248	25%	15	1%	$11.75
Machine Tool Cutters, Setters, Operators, and Tenders, Metal and Plastic	1,236	-262	-17%	189	18%	-105	-8%	$15.60
Machinists	1,235	-106	-8%	261	27%	-31	-3%	$18.00
Welding, Soldering, and Brazing Workers	1,110	164	17%	161	17%	37	3%	$15.76
First-Line Supervisors of Production and Operating Workers	1,070	-59	-5%	192	22%	-24	-2%	$26.04
Inspectors, Testers, Sorters, Samplers and Weighers	1,046	7	1%	245	31%	-16	-2%	$15.44
Sales Representatives, Wholesale and Manufacturing	830	33	4%	140	20%	9	1%	$24.42
Mechanical Engineers	773	-7	-1%	202	35%	-33	-4%	$35.88
Industrial Engineers, Including Health and Safety	742	10	1%	191	35%	-36	-5%	$32.90
Industrial Machinery Installation, Repair, and Maintenance Workers	724	40	6%	169	30%	-6	-1%	$24.21
General and Operations Managers	647	7	1%	106	20%	1	0%	$44.09
Computer Control Programmers and Operators	619	-7	-1%	165	36%	39	6%	$17.77
Forming Machine Setters, Operators, and Tenders, Metal and Plastics	542	-35	-6%	118	28%	-21	-4%	$12.95
Maintenance and Repair Workers, General	533	5	1%	106	25%	2	0%	$15.91
Shipping, Receiving, and Traffic Clerks	529	4	1%	107	25%	5	1%	$14.91
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	527	27	5%	166	46%	2	0%	$13.43
Customer Service Representatives	525	44	9%	98	23%	1	0%	$13.85
Crushing, Grinding, Polishing, Mixing, and Blending Workers	480	36	8%	88	22%	6	1%	$15.77
Printing Workers	449	-102	-19%	-44	-9%	-28	-6%	$17.28
Industrial Production Managers	444	-15	-3%	88	25%	-15	-3%	$44.13
Office Clerks, General	444	-14	-3%	66	17%	-11	-2%	$13.70
Tool and Die Makers	436	-46	-10%	116	36%	-18	-4%	$22.17

Industry and Occupation Connections in Manufacturing Sector

[10] Occupations are by 4 digit SOC code.

Although key manufacturing industries are highly diversified, they do share some common workforce requirements.[11] The following table identifies the top occupations and connected key industries. It is important to note that the Automobile Manufacturing overlaps four out of the five top occupations.

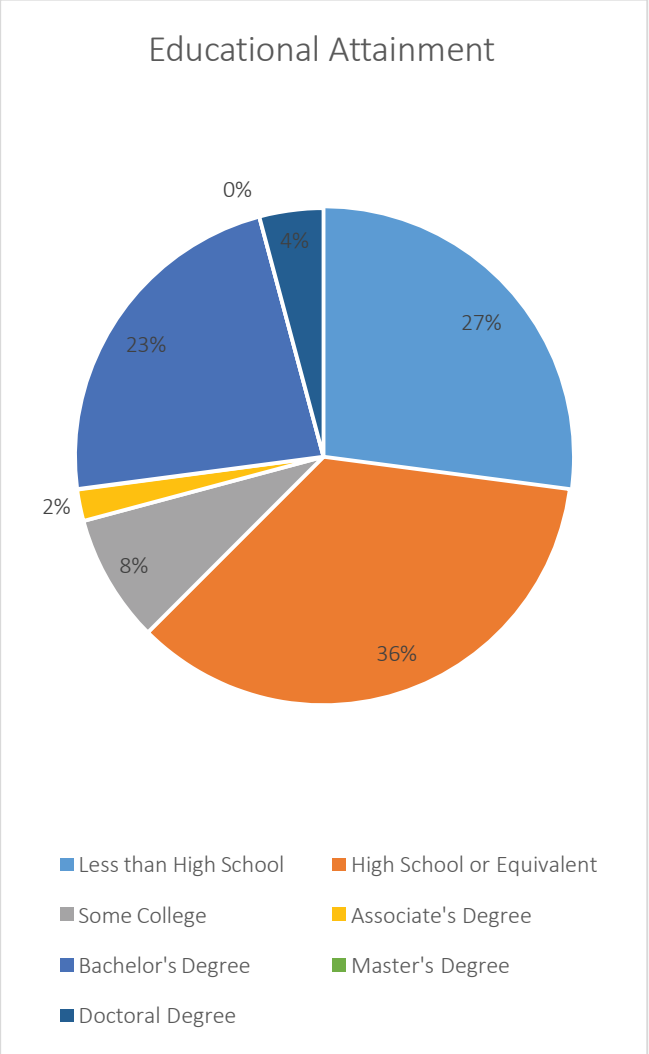
Connection between Top Occupations and Key Industries in Manufacturing Sector

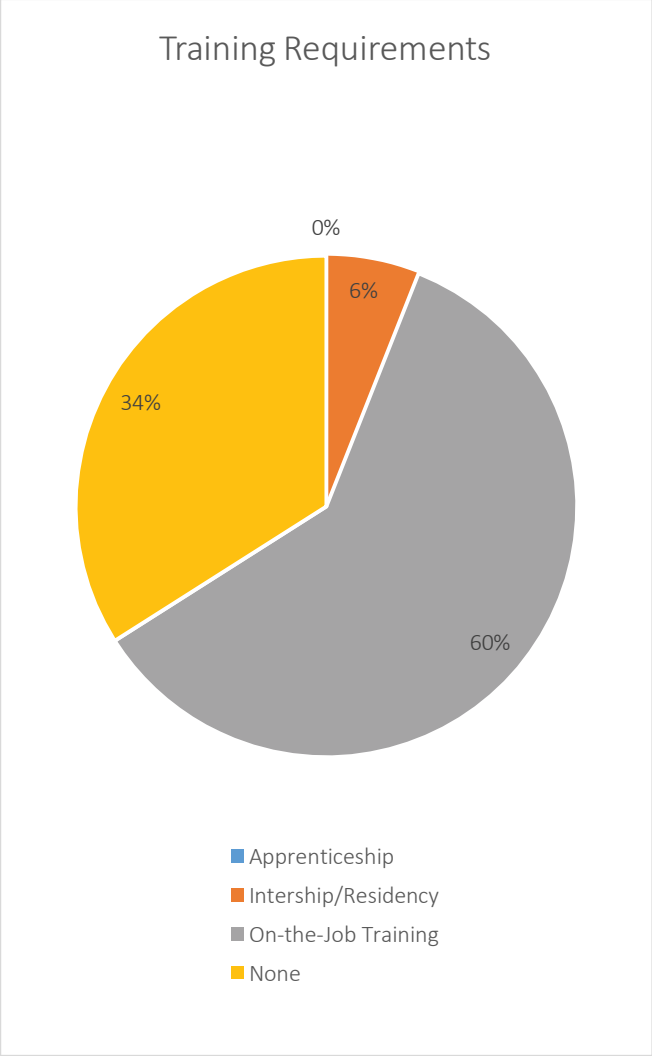
Top Occupations	Key Industries
Miscellaneous Assemblers and Fabricators	• Automobile Manufacturing • Motor Vehicle Body Manufacturing • Professional Employer Organizations
Miscellaneous Production Workers	• Professional Employer Organizations • Temporary Help Services • Automobile Manufacturing
Laborers and Material Movers, Hand	• Temporary Help Services • Professional Employer Organizations • General Warehousing and Storage
Machine Tool Cutters, Setters, Operators, and Tenders, Metal and Plastic	• Automobile Manufacturing • Other Motor Vehicle Parts Manufacturing • Motor Vehicle Metal Stamping
Machinists	• Machine Shops • Automobile Manufacturing • Other Motor Vehicle Parts Manufacturing

[11] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

Education and Skills for High Demand Jobs

Among high demand jobs in the Lansing region, over one third of the jobs (36%) require a high school diploma or equivalent.[12] Approximately 23% of these high demand jobs require at least a Bachelor's degree. Approximately 66% of these jobs require some type of training, which is typically on-the-job training.

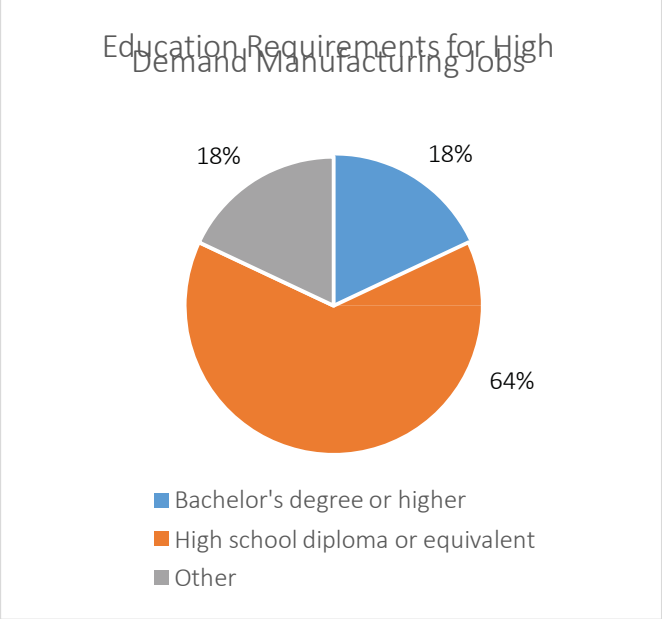


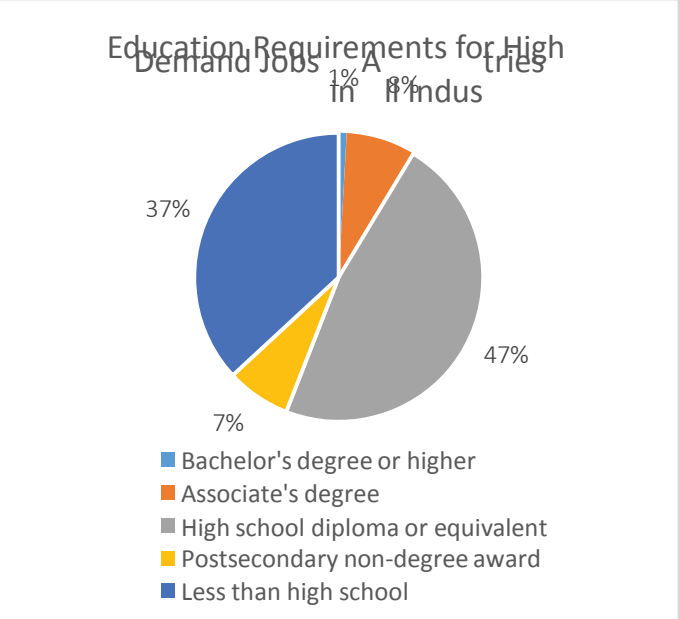


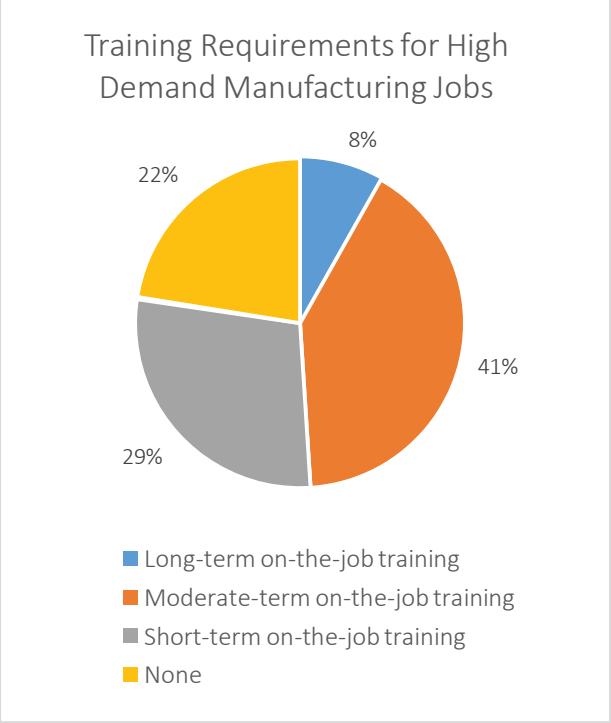
[12] A total of 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

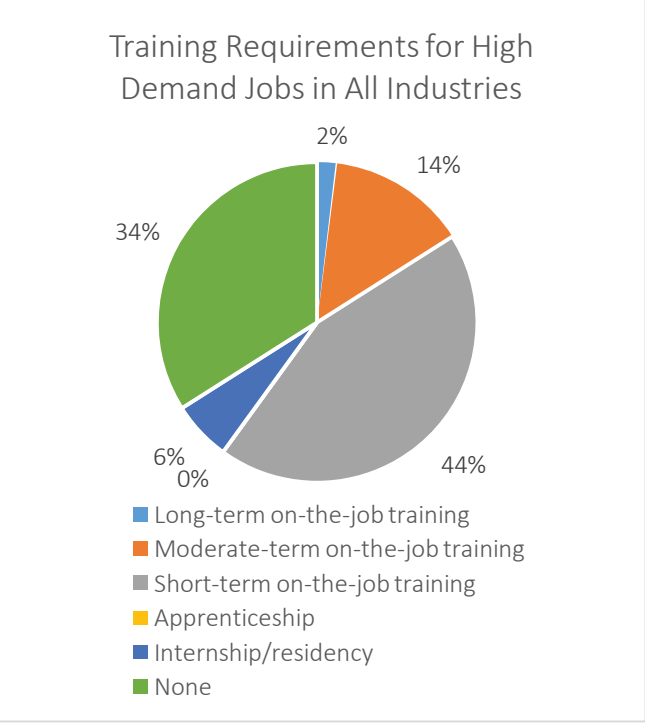
Education and Training for High Demand Jobs

The Manufacturing sector has unique education and training requirements compared to the other sectors. Among high demand manufacturing jobs in the region, approximately 64% require a high school diploma or equivalent, while only 47% of the jobs among all industry sectors have the same requirement.[13] The most common required training in manufacturing is moderate-term OJT (41%), followed by short-term OJT (29%) and long-term OJT (8%); while the short-term on-the-job training has the largest share (44%) in training requirements among all industries.









[13] A total of 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5 digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations that have the highest growth during 2014-2015 in the Lansing region. The table on the following page displays the top skills required for the top 5 manufacturing jobs with the highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Miscellaneous Assemblers and Fabricators	6,390	7,371	981	15%
Welding, Soldering, and Brazing Workers	993	1,110	117	12%
Miscellaneous Production Workers	1,252	1,334	82	7%
First-Line Supervisors of Production and Operating Workers	993	1,070	77	8%
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	1,160	1,236	76	7%
Inspectors, Testers, Sorters, Samplers, and Weighers	976	1,046	70	7%
Industrial Machinery Installation, Repair, and Maintenance Workers	658	724	66	10%
Laborers and Material Movers, Hand	1,189	1,251	62	5%
Industrial Engineers, Including Health and Safety	681	742	61	9%
Machinists	1,180	1,235	55	5%
Mechanical Engineers	727	773	46	6%
Painting Workers	319	362	43	13%
Tool and Die Makers	393	436	43	11%
Computer Control Programmers and Operators	579	619	40	7%
Electricians	265	303	38	14%
Industrial Production Managers	416	444	28	7%
Maintenance and Repair Workers, General	505	533	28	6%
Forming Machine Setters, Operators, and Tenders, Metal and Plastic	516	542	26	5%
Shipping, Receiving, and Traffic Clerks	504	529	25	5%
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	503	527	24	5%
Industrial Truck and Tractor Operators	277	299	22	8%
Engineering Technicians, Except Drafters	303	323	20	7%
Sales Representatives, Wholesale and Manufacturing	810	830	20	2%
General and Operations Managers	629	647	18	3%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	182	199	17	9%
Buyers and Purchasing Agents	246	262	16	7%
Production, Planning, and Expediting Clerks	174	189	15	9%
Engine and Other Machine Assemblers	133	148	15	11%
Electrical, Electronics, and Electromechanical Assemblers	187	202	15	8%

The table shows the top skills required for the top 5 manufacturing jobs with the highest growth during 2014-2015.[14] Based on the data from real-time job postings compiled by EMSI, the top five skills that appear in job postings for manufacturing positions include Manufacturing; Maintenance, Repairs, and Operations; Machines; Tools; and Productivity.[15]

Top 50 In-Demand Skills

Skill	% of Postings with Skill		Skill	% of Postings with Skill
Manufacturing	45%		Lean Manufacturing	5%
Maintenance, Repairs, and Operations	44%		Sanitation	4%
Machines	24%		Safety Regulations	4%
Tools	19%		Purchasing	4%
Productivity	14%		Arc Welding	4%
Planning	12%		Product Quality	4%
Welding	11%		Workflow	4%
Quality Control	11%		Plastics	3%
Technology	10%		Microsoft Word	3%
Packaging	10%		Planned Maintenance	3%
Warehouse	9%		Automation	3%
Blueprints	9%		Food Safety	3%
Problem Solving	9%		Machining	3%
Design	8%		Recognizing	3%
Innovation	8%		Six Sigma	3%
Inspection	8%		Production Environment	3%
Transportation	8%		Genetics	3%
Housekeeping	7%		Preventive Maintenance	2%
Electricity	6%		Production Equipment	2%
Fabrication	6%		Mechanical Aptitude	2%
Corrective Action	5%		Drilling	2%
Hand Tools	5%		Project Management	2%
Rotation	5%		Loading and Unloading	2%
OSHA	5%		Computer Numerical Control (CNC)	2%

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Maintenance, Repairs, and Operations; Productivity; Tools; Manufacturing; and Welding.

[14] 4-digit SOC code. EMSI Analyst 2014.
[15] National data. EMSI Analysis 2014.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Maintenance, Repairs, and Operations	56%	44%
Productivity	50%	14%
Tools	46%	19%
Manufacturing	34%	45%
Welding	26%	11%

Business Demand Survey Results

As part of the Skill Gap Analysis work, Thomas P. Miller & Associates worked with Lansing Community College to create and distribute a business demand survey. Lansing distributed the survey by email via Survey Monkey to their partner businesses. A total of 18 companies completed the survey. Following are the results of the survey with each section identifying the question, providing an account of how many respondents answered the question, and the results of the question.

Key Findings by Question

Q1. What is the name of your company? (Optional)

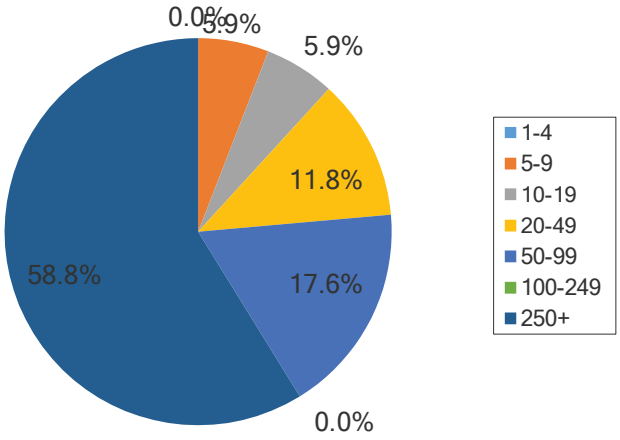
Of the 18 respondents, 11 provided the name of their company. Below is the list of companies that provided their company name.

Table 1: Company Name
Asahi Kasei Plastics North America
Cameron Tool
Dakkota Integrated Systems, LLC
Demmer Corp
HRU Technical Resources
IMPCO
Lansing Community College
Peckham
RSDC of Michigan
SA Automotive (Formerly S Group Automotive)
Spartan Motors

Q2. How many individuals does your company currently employ?

Respondents were asked how many individuals were currently employed at their company. Of the 17 total responses, 10 or 58.8%% of respondents indicated that their companies employ more than 250 employees, while the other respondents had a more evenly split number of total employees.

Figure 1: Employee Size



Q3. What is your company's NAICS code (i.e. 333517 – Machine Tool Manufacturing or 236111 Plastics Bag and Pouch Manufacturing) If unknown, answer N/A.

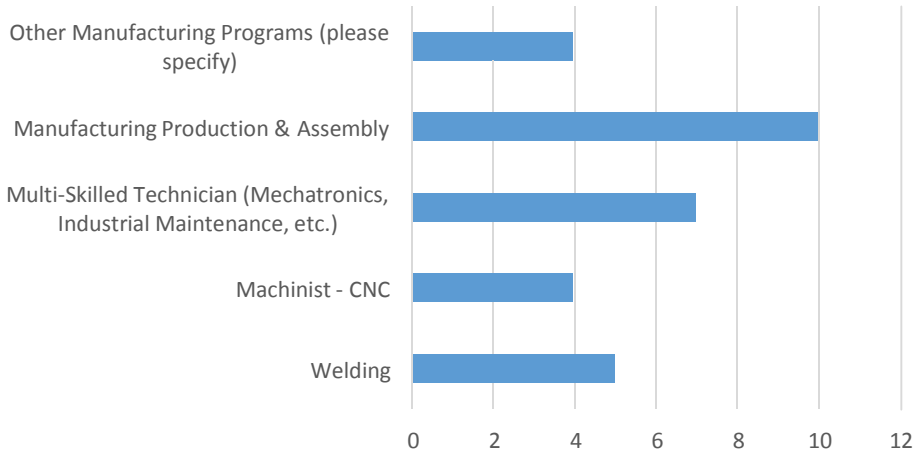
Respondents were asked if they knew their company's NAICS code. Most of the respondents responded with N/A with the exception of the below responses:

- 333514 Special Die and Tool, Die Set, Jig, and Fixture Manufacturing
- 333517 (2 responses) Machine Tool Manufacturing
- 336390 (2 responses) Other Motor Vehicle Parts Manufacturing
- 541330 Engineering Services
- 561210 Facilities Support Services

Q4. Identify all the programs or focus areas that your company would be interested in.

The survey asked respondents to identify all programs or focus areas that their company would be interested. Of the total 13 respondents, 10, or 76.9%, expressed interest in a Manufacturing Production & Assembly program, followed by seven respondents for Multi-Skilled Technician.

Figure 2: Programs or Focus Areas



For the Other Manufacturing Programs, respondents suggested the following programs or focus areas:

- CMM
- CAD
- Tool and Die Making
- Robotics, Control

Q5. How difficult is it for your company to fill your manufacturing vacancies?

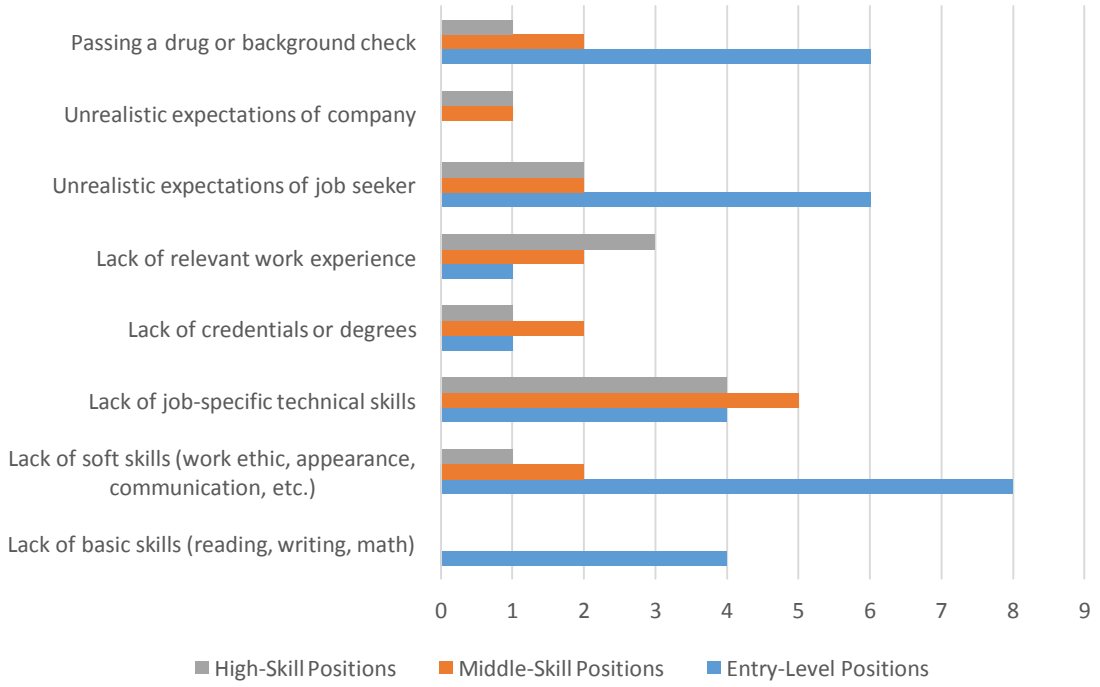
Respondents were asked to rate how difficult it is for their companies to fill manufacturing vacancies at the entry-level, middle-skill, and high-skill positions. Of the 13 total respondents, 69.2%, or 9 respondents indicated that it is very difficult to fill high-skill positions. A majority of the respondents indicated that it was not at all difficult to fill entry-level positions and somewhat difficult to fill middle-skill positions.

Figure 3: Filling Manufacturing Vacancies

Q6. What are the most significant barriers for your company to fill entry-level, middle-skill, and high-skill manufacturing positions? Select all that apply.

Respondents were asked what the most significant barriers are for their company to fill entry-level, middle-skill, and high-skill manufacturing positions. For entry-level positions, the most common barrier was a lack of soft skills (work ethic, appearance). For middle- and high-skill positions, the largest barrier was a lack of job-specific technical skills. One respondent also identified Work ethic as a significant barrier.

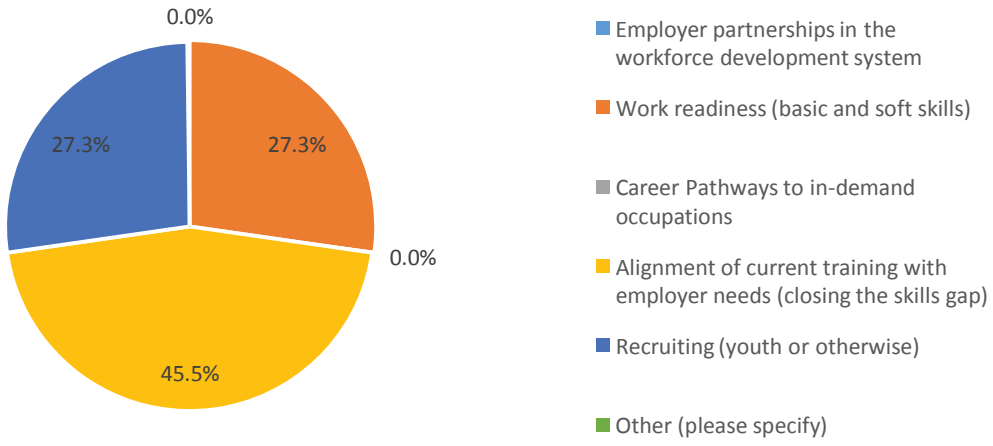
Figure 4: Barriers to Filling Positions by Level



Q7. What do you see as the highest priority in addressing area workforce needs?

Respondents were asked what they saw as the highest priority in addressing workforce needs. Of the 11 that responded to this question, 45.5% chose "alignment of current training with employer needs (closing the skills gap)." Following that, 27.3%, or 3 respondents, selected "work readiness (basic and soft skills)" and "recruiting (youth or otherwise)".

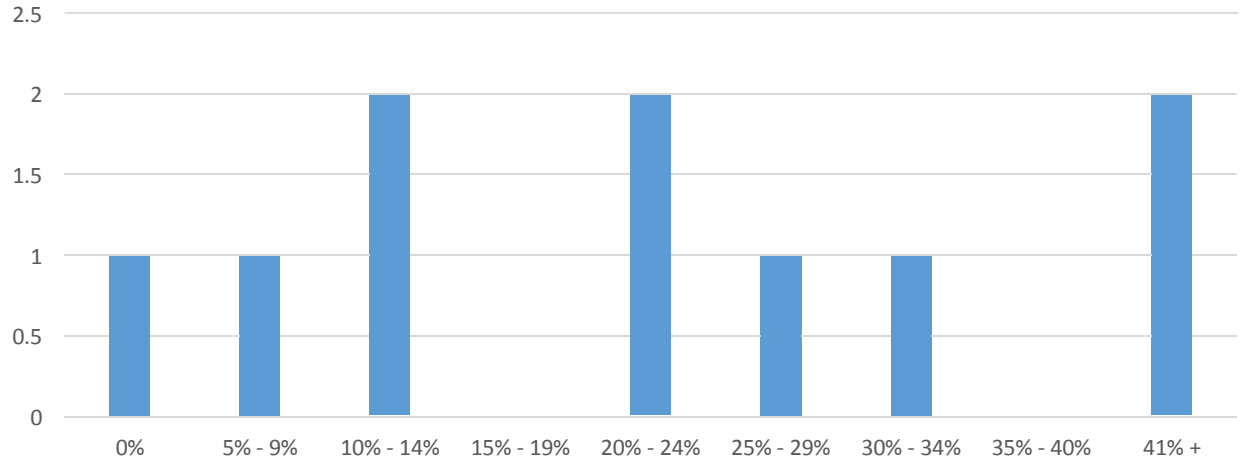
Figure 5: Highest Priority in Workforce Needs



Q8. What percentage of new hires will be due to growth or replacement of retiring workforce within the next 12 months?

Respondents were asked what percentage of new hires will be due to growth or replacement of the retiring workforce within the next 12 months. Only five answered the question regarding replacement of retiring workers. Of those that responded, five indicated that 5-9% of new hires will be due to replacement/retiring workforce and one business indicated that 10-14% of new hires will be due to replacement of a retiring workforce. More businesses indicated the percentages of new hires due to growth. The responses from growth varied with two respondents each selecting 10-14%, 20-24%, and over 41%.

Figure 6: Growth



Q9. How many employees needing some form of technical training will you hiring in the next 12 months and 1-3 years?

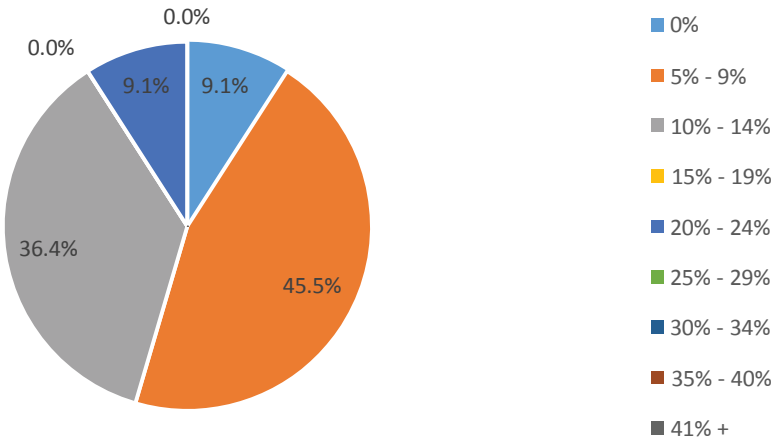
Respondents were asked how many employees needing some form of technical training they will be hiring in the next 12 months and 1-3 years. Within the next 12 months, four employers expect to hire 1-5 employees that will need technical training. For the next 1-3 years, three respondents indicated that they will be hiring 6-10 new employees that will need technical training.

Table 2: Employees Needing Technical Training		
Number of Employees	12 Months	1-3 Years
1-5	4	0
6-10	0	3
11-20	3	1
21-40	2	0
41-100	0	1
100+	0	0
We do not expect to hire	0	0
We expect to lay off workers	0	0

Q10. What do you estimate your annual employee turnover rate is?

The survey asked respondents what they estimated their annual employee turnover rate is. Of the 11 total respondents, 5 (45.5%) responded that they estimated their turnover rate is somewhere between 5-9%, followed by 36.4% (4 respondents) with an estimated turnover rate of 10-14%. Lastly, one respondent indicated 5-9% and one respondent also indicated 20-24% annual employee turnover rate.

Figure 7: Annual Employee Turnover Rate Estimate



Q11. Which types of technical training/skills does your company require? Examples include: Maintenance, Repair and Operations, Inspection, Machines, etc.

Respondents were asked which type of technical training/skills their company requires. A large majority of respondents indicated maintenance related skills. Table 3 below provides all of the responses.

Table 3: Required Technical Training / Skills
Basic blue print reading, reading tape measure,
Basic use of hand tools, reading a tape measure, navigating a computer, welding, blue print reading
CNC Machine, Die Assembly, Welding
Machine controls programing/trouble shooting
Maintenance
Maintenance, machining, welding, design (solidworks)
Maintenance, repair - operations, controls engineering
Maintenance, tool and die repair
math, detailed about WI and/or doing their jobs right

Q12. What specific manufacturing occupations / job titles are the most challenging to fill?

Respondents were asked what the most challenging occupations or job titles were the most challenging to fill. The most common response was welding and maintenance-related positions. Table 4 below shows all responses.

Table 4: Most Challenging Occupations / Job Titles to Fill
Controls Engineer
Journeyman machinists
Maintenance
Maintenance and IT
Manufacturing Engineers, Controls Engineers
NA
Strong work ethic for production assembly
Tool and Die Maker
Welder, Body Shop, Painter
Welders, experienced machinists
Welding Engineers/Techs, Paint Engineers/Techs

Q13. What are your primary education and training needs for current or potential employees?

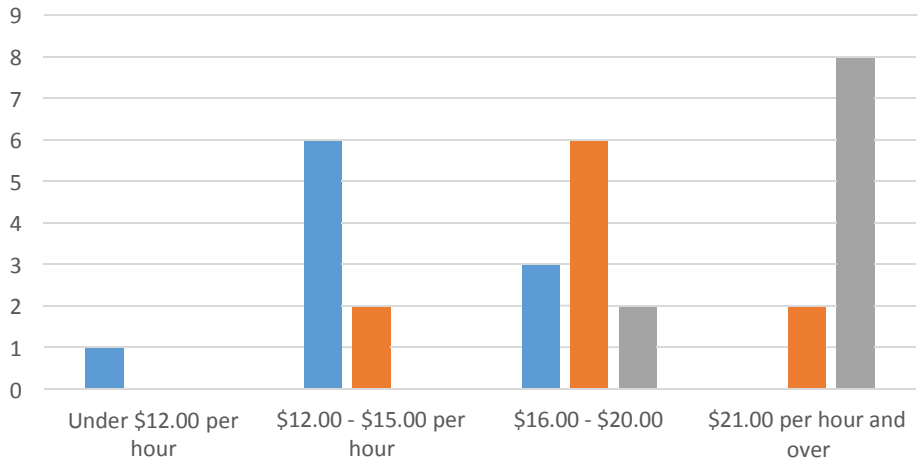
Respondents were asked what their primary education and training needs are for current or potential employees. Table 5 below shows all responses. The responses vary from high school diploma, basic skills, hands-on experience, associate degrees and technical training.

Table 5: Primary Education and Training Needs for Current / Potential Employees
High School Diploma, experienced within the areas of discipline
Using hand tools, reading blue prints, basic understanding of 5S concepts, comprehensive listening, basic computer skills, completing forms, self checking work
GD&T, math, quality
CNC Machining, Welding, Assembly, Unigraphics
Technical skills surrounding solidworks, mastercam, PLC programming
On the job, Associates Degree, technical training.
depends on the position

Q14. What is the average wage level paid to those within your company in Entry-Level, Middle-Skill, and High-Skill Positions?

Respondents were asked what the average wage paid was in their company by entry-level, middle-skill, and high-skill positions. Overall, entry-level positions were paid under $15 per hour, middle-skill positions were mostly at $12-$20 per hour, and high-skill positions were at $21 per hour and above.

Figure 8: Average Wage by Skill Level



Q15. What industry-recognized credentials associated with manufacturing does your company currently utilize and value? (I.e. AWS, NIMS, Siemens, PMMI, MSSC—CPT, or Certified Production Technician)

Only one company provided a response and AWS was the industry-recognized credential identified.

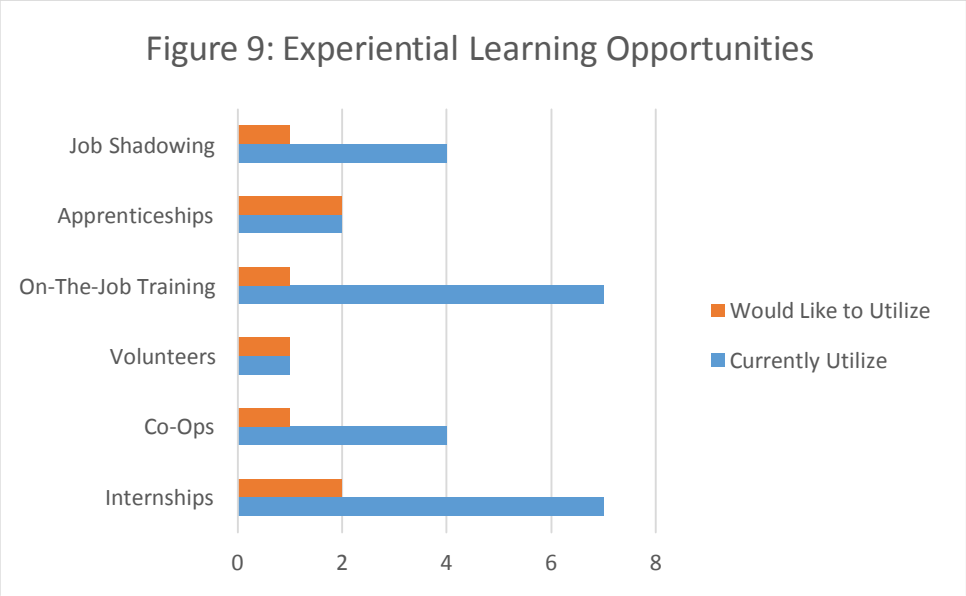
Q16. How is your company currently partnering with Lansing Community College?

The respondents were asked how they are currently partnering with Lansing Community College. The responses range from nothing to multiple methods including training, apprentices, and recruiting.

Table 6. Partnership with Lansing Community College
We have encouraged our employees to take courses under our tuition assistance program
Some training and recruiting
Educational grants
apprentices, grant training
apprenticeships, other training as needed
We use LCC for training and we try to hire LCC students where possible
Training
Working on a tooling apprentice program.

Q17. Identify all experiential learning opportunities your company currently utilizes or would like to utilize.

Respondents were asked to identify all of the experiential learning opportunities that their company currently utilizes or would like to utilize. Overall, most employers utilize internships and on-the-job training followed by co-ops and job shadowing. Of the opportunities that employers would most like to utilize, respondents indicated they would be interested in internships and apprenticeships.



Q18. Do you have any additional questions/comments?

Table 7: Comments/Questions
No

LANSING COMMUNITY COLLEGE
REGIONAL PROFILE

M-CAM
Michigan Coalition for Advanced Manufacturing

CLINTON EATON INGHAM IONIA LIVINGSTON SHIAWASSEE

ABOUT M-CAM

The Michigan Coalition for Advanced Manufacturing (M-CAM) brings together the state of Michigan, community college leaders, employers, workforce development agencies, and other community partners to create education and training programs that lead to employment. With the award of a $24.9 million U.S. Department of Labor grant, M-CAM is creating a 21st century workforce through the development of seamless and responsive career pathways, credentials that have labor-market value, and strategies that connect the needs of employers with training providers throughout Michigan.

M-CAM provides training opportunities in four key areas of advanced manufacturing:

- Welding/ Fabrication
- CNC Machining
- Multi-Skilled Technology / Mechatronics
- Production Operations

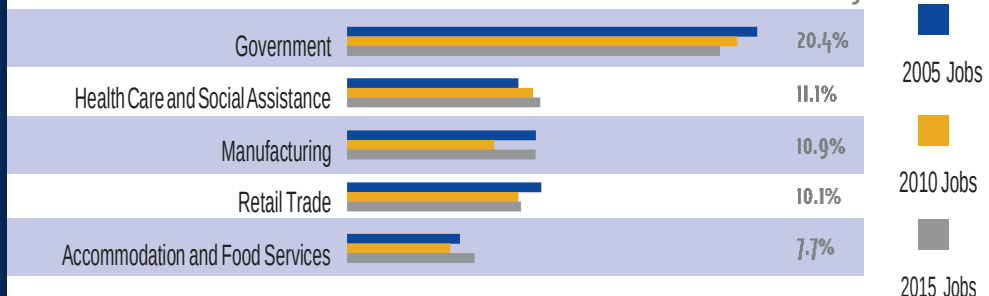
Job seekers will be able to earn various certificates, degrees, and credentials within these four areas.

Median Household Income

Michigan	Lansing Community College Region	USA
$49,087	$55,067	$53,482

Employment

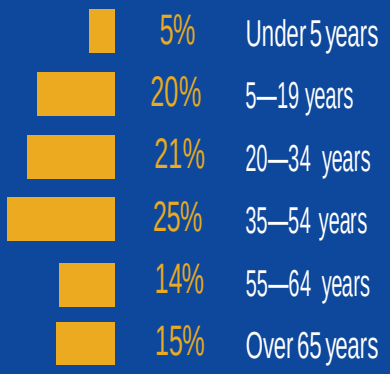
Major Industries



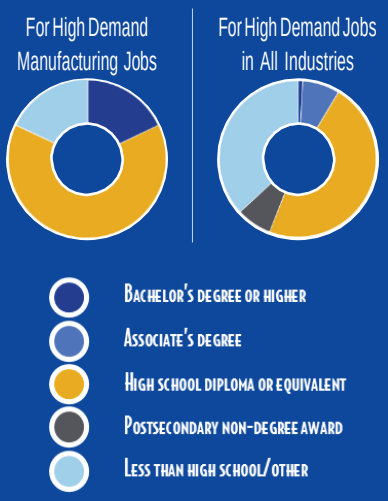
The PEOPLE

Population 791,020

2% ↑ Increase over the pastdecade



Education Requirements



Lansing Community College has one campus located in Lansing, Michigan. The college was founded in 1957 to fulfill growing demand for specialized and technical education opportunities for the Greater Lansing industrial workforce. The college awards degrees and certificates to nearly 20,000 students annually. The regional profile focuses on the Lansing region known as S.L.I.I.C.E. – Shiawassee, Livingston, Ionia, Ingham, Clinton, and Eaton Counties

LANSING COMMUNITY COLLEGE

REGIONAL PROFILE

M-CAM Michigan Coalition for Advanced Manufacturing

CLINTON EATON INGHAM IONIA LIVINGSTON SHIAWASSEE

Top Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2010-2015	Projected Change, 2014-2019	Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	7,371	Growing	Loss	$11.96
Miscellaneous Production Workers	1,334	Growing	Loss	$12.21
Laborers and Material Movers, Hand	1,251	Growing	Growing	$11.75
Machine Tool Cutters, Setters, Operators, and Tenders, Metal and Plastic	1,236	Growing	Loss	$15.60
Machinists	1,235	Growing	Loss	$18.00

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	Change, 2014-2015	
Miscellaneous Assemblers and Fabricators	981	15%
Welding, Soldering, and Brazing Workers	117	12%
Miscellaneous Production Workers	82	7%
First-Line Supervisors of Production and Operating Workers	77	8%
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	76	7%

Top In-Demand Skills

Skill	% of Postings with Skill
Manufacturing	45%
Maintenance, Repairs, and Operations	44%
Machines	24%
Tools	19%
Productivity	14%

Top Unique Skills

Skill	% of Top 5 Manufacturing Postings with Skill
Maintenance, Repairs, and Operations	56%
Productivity	50%
Tools	46%
Manufacturing	34%
Welding	26%

Lansing Community College

Glenys Warner, Director of Training

Business & Community Institute

warnerg@lcc.edu

517-483-9806

Macomb Region

Executive Summary

Introduction

The following is a labor market profile for Macomb Community College (MCC). The profile includes quantitative research to assist MCC in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic and labor force characteristics, industry analysis, occupation analysis, and labor force data. For the profile, the project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics. Additionally, the project team talked with college staff for additional information on the region.

Summary of Findings

MCC is located in Macomb County, Michigan and has several satellite locations in southeastern Michigan. The study region for this analysis includes the prosperity 10 region (Macomb, Oakland, and Wayne Counties) plus St. Clair County. However, it should be noted that 84.8% of students are from Macomb County.

The population in the 4-county region declined by 3% and is projected to continue to decline over the next five years. The population is also aging. Over the past ten years, the population of 55-years-and-older increased significantly, while the population decreased in other age groups. This is a concern because the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers in the 4-county region are: Other Industries (287,137, 16.3%), Health Care and Social Assistance (268,614, 14.9%), and Manufacturing (221,712, 12.7%). Manufacturing declined significantly from 2005-2010 but experienced growth from 2010-2015. Health Care and Social Assistance is the only sector that grew from 2005 to 2015.

Digging deeper into the four-county region, the largest manufacturing sector is Motor Vehicle Parts Manufacturing. Employment trends within this sector mirror overall economic trends that saw significant job losses and subsequent recovery over the past ten years. While many of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

The top occupations by 2-digit Standard Occupational Classification (SOC) codes within the four-county region include: Office and Administrative Support Occupations, Sales and Related Occupations, Production Occupations, Food Preparation and Serving Related Occupations, and Healthcare Practitioners and Technical Occupations.[1] The median hourly earnings range from $10.08/hour for Food Preparation and Serving Related Occupations, to $46.30/hour for Management Occupations.

Top occupations for manufacturing include: miscellaneous assemblers and fabricators; machine tool cutting setters, operators, and tenders, metal and plastic; mechanical engineers; machinists; and miscellaneous production workers. Median hourly earnings for these occupations range from $12.42 at the low end for Laborers and Material Movers, Hand to $53.26 at the high end for Industrial Production Managers.

Based on real-time job posting information, the top skills that appear in job postings across the country for major regional manufacturers include: engineering, designing, projects, system, and communication.

[1] These occupations are by 2-digit SOC code (Standard Occupational Classification System).

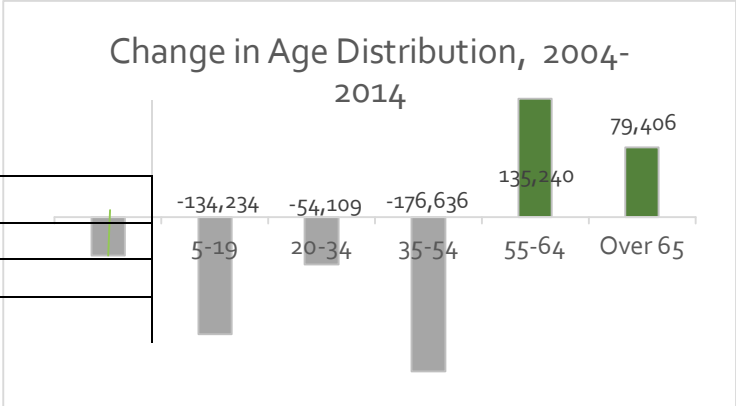
DEMOGRAPHICS

The population in the four-county region has declined from 4,160,555 to 4,016,355 over the past ten years.[2] The population declined by 3%, compared to the state rate (1% decline) and national rate (9% growth). The population in the region is projected to continue to decline over the next five years.

The Macomb region has an aging population. Over the past ten years, the population of 55-years-and-older increased significantly, while the population decreased in other age groups. The region is projecting small growth in the under 5 and 20-34 age groups. However, the aging population is a concern, as it will affect the availability of labor in this region over the next decade. The number of retiring workers may outpace the younger workers entering the workforce.

Age Distribution in Macomb Region

Age	2015 Population	Change, 2005-2015		Change, 2015-2020	
Under 5	239,078	-35,667	-13%	9,816	4%
5-19	772,417	-132,059	-15%	-41,194	-5%
35-54	1,076,661	-184,185	-14%	-83,491	
55-64	558,342	127,134	31%	8,565	
Over 65	604,544	99,254	18%	86,085	



The White population in this region shrank by 6% from 2005-2015. In 2015, 65% of the population in Macomb region identified as White. The top three fastest growing races are those identifying as Hispanic, Asian, and Two or More Races.[3]

Race Distribution in Macomb Region

Race	2015 Population	Change, 2005-2015	
White	2,618,940	-180,885	-6%
Black	955,914	-50,657	-5%
Hispanic	149,133	22,154	17%
Asian	169,192	37,193	28%
Two or More Races	93,616	21,774	35%
American Indian or Alaskan Native	12,022	-500	-4%
Native Hawaiian or Pacific Islander	769	-119	-13%

[2] EMSI Analyst 2015.

[3] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander.

Income

Oakland County has the highest median income from 2010 to 2014, followed by Macomb County, St. Clair County, and Wayne County. Wayne County has the lowest income and highest poverty rate over the same period. [4] The wages for the region are higher than the Michigan and United States averages.

	Median Household Income ('10-'14)	Poverty Rate
Macomb	$67,773	12.8%
Oakland	$91,053	10.4%
St. Clair	$61,371	15.2%
Wayne	$58,013	24.8%
Michigan	**$49,087**	**16.9%**
U.S.	**$53,482**	**15.6%**

Commuting Pattern and Labor Force Availability

In 2013, the four-county Macomb region had 267,678 workers commuting in and 215,931 commuting out, making the region a net importer of workers.[5] Over 1,600,000 workers are employed in the region, including 1,367,333 both living and working in the region and 267,678 commuting into the region.

[4] U.S. Census Bureau 2009-2013

[5] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/

Human Capital

In 2015, about 1,869,000 workers participated in the four-county Macomb regional labor force, which includes employed and unemployed individuals. Of these, 1,748,024 are employed. Over the last 20 years, employment in the region was at its highest in December 1999 and lowest in January 2011. The unemployment rate for the region is 6.5%.

EMPLOYMENT, 1995-2015[6]

Peak	December 1999 (2,129,289)	+21.8% (compared to Dec, 2014)
Trough	January 2011 (1,625,317)	-7.0% (compared to Dec, 2014)
Dec 2014	Employment: 1,748,024 Labor Force: 1,869,281 Unemployment rate: 6.5%	

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

Labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation rate for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boomer generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

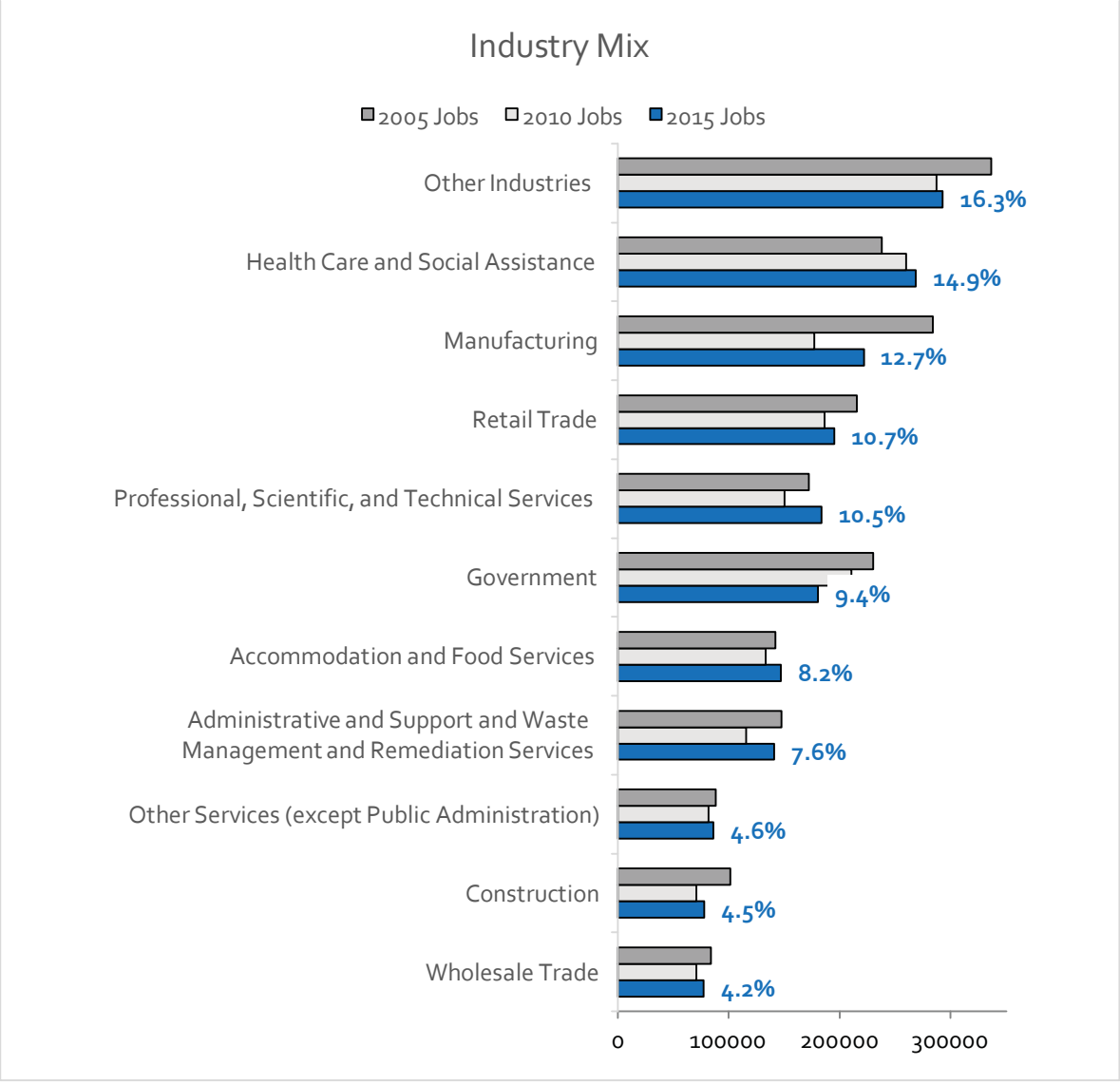
The older worker population (55 years and older) in the region is estimated to be 452,851 in 2014.[7] These older workers are expected to retire in the next ten years.

[6] U.S. Bureau of Labor Statistics, 1994.12-2014.12 (most recently available). http://www.bls.gov/data/

[7] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

Industry Analysis

The broad industry sectors in the four-county region employing the most workers are Other Industries (287,137, 16.3%), Health Care and Social Assistance (268,614, 14.9%), and Manufacturing (221,712, 12.7%).[8] Health Care and Social Assistance is the only sector that grew from 2005 to 2015. Manufacturing experienced a significant decline from 2005-2010, but has been growing since 2010. Manufacturing is still not at pre-recessionary levels of employment.



[8] These industries are by 2-digit NAICS code. EMSI Analyst 2015.

Manufacturing Analysis

The tables below show the top 25 largest manufacturing industries by employment in the Macomb region. [9] The largest manufacturing industries are Motor Vehicle Parts Manufacturing, Motor Vehicle Manufacturing, and Metalworking Machinery Manufacturing. Most of the industries that experienced growth during 2010-2015 are projected to decline in the next five years. It should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020	
Motor Vehicle Parts Manufacturing	64,559	-9,853	-13%	21,594	50%	-8,945	-14%
Motor Vehicle Manufacturing	39,105	-9,707	-20%	13,599	53%	-8,865	-23%
Metalworking Machinery Manufacturing	18,517	-1,318	-7%	4,936	36%	-2,074	-11%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	12,667	-825	6%	3,304	35%	-207	-2%
Plastics Product Manufacturing	10,153	-2,363	-19%	3,204	46%	-1,397	-14%
Coating, Engraving, Heat Treating, and Allied Activities	6,789	-1,216	-15%	1,371	25%	-504	-7%
Other General Purpose Machinery Manufacturing	5,517	-491	-8%	1,408	34%	-620	-11%
Iron and Steel Mills and Ferroalloy Manufacturing	4,751	125	3%	760	19%	-525	-11%
Printing and Related Support Activities	4,419	-1,202	-21%	-95	-2%	-668	-15%
Architectural and Structural Metals Manufacturing	3,941	-521	-12%	342	10%	-196	-5%
Other Miscellaneous Manufacturing	4,651	142	3%	1,396	43%	-376	-8%
Engine, Turbine, and Power Transmission Equipment Manufacturing	3,552	-28	-1%	528	17%	-186	-5%
Other Fabricated Metal Product Manufacturing	3,520	-992	-22%	279	9%	-727	-21%
Forging and Stamping	2,557	-632	-20%	594	30%	-132	-5%
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	2,528	30	1%	462	22%	-64	-3%
Medical Equipment and Supplies Manufacturing	2,419	-51	-2%	-22	-1%	-95	-4%
Beverage Manufacturing	2,396	100	4%	367	18%	-155	-6%
Paint, Coating, and Adhesive Manufacturing	2,576	725	39%	1,131	78%	-73	-3%
Bakeries and Tortilla Manufacturing	2,259	-1,567	-41%	-1,635	-42%	-577	-26%
Industrial Machinery Manufacturing	2,261	-520	-19%	390	23%	111	5%
Motor Vehicle Body and Trailer Manufacturing	2,406	262	12%	83	4%	-530	-22%
Aerospace Product and Parts Manufacturing	1,995	602	43%	404	25%	162	6%
Converted Paper Product Manufacturing	1,844	-172	-9%	-19	-1%	-97	-5%
Semiconductor and Other Electronic Component Manufacturing	1,752	-496	-22%	-872	-33%	-730	-42%
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	1,813	375	26%	690	61%	67	4%

[9] These industries are by4-digit NAICS code.

Among these top industries, average earnings vary widely, from $26,790 a year for Bakeries and Tortilla Manufacturing, to over $127,424 a year for Resin, Synthetic Rubber and Artificial Synthetic Fibers and Filaments Manufacturing. The industries whose average earning is above the regional average in manufacturing industries ($90,181) are highlighted in orange.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earning	Establishments
Motor Vehicle Parts Manufacturing	64,559	$95,971	381
Motor Vehicle Manufacturing	39,105	$107,172	46
Metalworking Machinery Manufacturing	18,517	$87,013	648
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	12,667	$73,485	609
Plastics Product Manufacturing	10,153	$59,881	147
Coating, Engraving, Heat Treating, and Allied Activities	6,789	$61,338	230
Other General Purpose Machinery Manufacturing	5,517	$95,651	197
Iron and Steel Mills and Ferroalloy Manufacturing	4,751	$106,386	28
Printing and Related Support Activities	4,419	$67,773	357
Architectural and Structural Metals Manufacturing	3,941	$71,308	200
Other Miscellaneous Manufacturing	4,651	$73,714	277
Engine, Turbine, and Power Transmission Equipment Manufacturing	3,552	$100,616	30
Other Fabricated Metal Product Manufacturing	3,520	$72,955	125
Forging and Stamping	2,557	$82,893	60
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	2,528	$94,449	122
Medical Equipment and Supplies Manufacturing	2,419	$81,541	166
Beverage Manufacturing	2,396	$67,348	44
Paint, Coating, and Adhesive Manufacturing	2,576	$120,102	41
Bakeries and Tortilla Manufacturing	2,259	$26,790	148
Industrial Machinery Manufacturing	2,261	$89,492	99
Motor Vehicle Body and Trailer Manufacturing	2,406	$119,729	33
Aerospace Product and Parts Manufacturing	1,995	$96,090	27
Converted Paper Product Manufacturing	2,018	$60,280	52
Semiconductor and Other Electronic Component Manufacturing	1,752	$74,730	47
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	1,813	$127,424	27

Occupation analysis

The counties' top occupations include Office and Administrative Support Occupations, Sales and Related Occupations, Production Occupations, Food Preparation and Serving Related Occupations, and Healthcare Practitioners and Technical Occupations.[10] The median hourly earnings range from $10.08/hour for Food Preparation and Serving Related Occupations, to $46.30/hour for Management Occupations.

Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	281,548	14.5%	$16.42
Sales and Related Occupations	197,626	10.2%	$16.52
Production Occupations	191,038	9.9%	$17.75
Food Preparation and Serving Related Occupations	151,664	7.8%	$10.08
Healthcare Practitioners and Technical Occupations	113,840	5.9%	$36.82
Transportation and Material Moving Occupations	114,193	5.9%	$16.45
Management Occupations	104,196	5.4%	$46.30
Business and Financial Operations Occupations	100,715	5.2%	$31.20
Education, Training, and Library Occupations	80,574	4.2%	$25.43
Architecture and Engineering Occupations	78,916	4.1%	$39.52
Installation, Maintenance, and Repair Occupations	71,357	3.7%	$20.88
Personal Care and Service Occupations	71,227	3.7%	$10.21
Healthcare Support Occupations	64,455	3.3%	$12.91
Building and Grounds Cleaning and Maintenance Occupations	61,039	3.2%	$11.37
Construction and Extraction Occupations	68,465	3.5%	$22.52
Computer and Mathematical Occupations	59,666	3.1%	$36.02
Protective Service Occupations	31,144	1.6%	$20.32
Arts, Design, Entertainment, Sports, and Media Occupations	31,722	1.6%	$21.68
Community and Social Service Occupations	25,137	1.3%	$20.60
Legal Occupations	18,098	0.9%	$38.52
Life, Physical, and Social Science Occupations	9,448	0.5%	$27.45
Military occupations	8,152	0.4%	$14.60
Farming, Fishing, and Forestry Occupations	1,859	0.1%	$13.11

[10] These occupations are by 2-digit SOC code (Standard Occupational Classification System).

Occupations in Manufacturing Sector

The table below shows employment of each occupation within the manufacturing sector. It is worth noting that more than half of jobs in the manufacturing industry are within the category of Production Occupations.

Regional Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	140,935	59.5%
Architecture and Engineering Occupations	26,804	11.3%
Office and Administrative Support Occupations	13,698	5.8%
Management Occupations	12,793	5.4%
Transportation and Material Moving Occupations	9,431	4.0%
Installation, Maintenance, and Repair Occupations	10,338	4.4%
Business and Financial Operations Occupations	7,581	3.2%
Sales and Related Occupations	5,367	2.3%
Construction and Extraction Occupations	3,247	1.4%
Computer and Mathematical Occupations	2,903	1.2%
Arts, Design, Entertainment, Sports, and Media Occupations	2,002	0.8%
Building and Grounds Cleaning and Maintenance Occupations	630	0.3%
Life, Physical, and Social Science Occupations	418	0.2%
Food Preparation and Serving Related Occupations	296	0.1%

Occupation	2014 Employment	Change, 2004-2014		Change, 2009-2014		Projected Change, 2014-2019		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	Miscellaneous Assemblers and Fabricators	40,345	-15,900	-28%	9,204	30%	-8,313	-21%
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	Machinists	10,745	-957	-8%	3,144	41%	-841	-8%
First-Line Supervisors of Production and Operating Workers	Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	9,692	-3,223	-25%	2,174	29%	-1,875	-19%
Laborers and Material Movers, Hand	Mechanical Engineers	8,885	-1,130	-11%	2,517	40%	-1,443	-16%
Machinists	Industrial Engineers, Including Health and Safety	7,921	-1,514	-16%	2,080	36%	-1,442	-18%
Miscellaneous Production Workers	First-Line Supervisors of Production and Operating Workers	7,572	-2,217	-23%	1,481	24%	-1,157	-15%
Mechanical Engineers	Miscellaneous	7,035	-2,129	-23%	1,096	18%	-932	-13%

Top Occupations in Manufacturing Sector

Drilling a bit deeper, the following table displays the top 20 occupations that are most often required to staff manufacturing companies in the Macomb region.[11] Median hourly earnings for these occupations range from $12.42 at the low end for Laborers and Material Movers, Hand to $53.26 at the high end for Industrial Production Managers. While many of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers given that many grew in the past five years. Future trends should continue to be monitored through periodic contact with companies in these industries.

Top 20 Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	45,849	-7,946	-15%	14,414	46%	-7,716	-17%	$17.11
Machine Tool Cutting Setters, Operators and Tenders, Metal and Plastic	11,091	-2,601	-19%	2,634	31%	-1,924	-17%	$16.98
Mechanical Engineers	10,906	-589	-5%	3,550	48%	-1,405	-13%	$44.89
Machinists	10,503	-452	-4%	3,060	41%	-495	-5%	$19.52
Miscellaneous Production Workers	8,531	-1,661	-16%	1,725	25%	-1,036	-12%	$14.01
Industrial Engineers, Including Health and Safety	8,111	-627	-7%	2,566	46%	-1,117	-14%	$41.81
First-Line Supervisors of Production and Operating Workers	8,089	-1,360	-14%	1,845	30%	-1,052	-13%	$29.53
Inspectors, Testers, Sorters, Samplers, and Weighers	6,299	-1,019	-14%	1,506	31%	-769	-12%	$16.14
Tool and Die Makers	5,871	-610	-9%	1,855	46%	-716	-12%	$26.96
Industrial Machinery Installation, Repair and Maintenance Workers	5,747	-256	-4%	1,668	41%	-493	-9%	$25.95
Laborers and Material Movers, Hand	5,059	-1,385	-21%	658	15%	-602	-12%	$12.42
Welding, Soldering, and Brazing Workers	5,024	-499	-9%	1,216	32%	-495	-10%	$18.06
Forming Machine Setters, Operators and Tenders, Metal and Plastic	4,874	-887	-15%	1,241	34%	-836	-17%	$16.66
Computer Control Programmers and Operators	4,835	-92	-2%	1,471	44%	-151	-3%	$19.78
Molders and Molding Machine Setters, Operators, and Tender, Metal and Plastic	4,384	-1,000	-19%	1,203	38%	-764	-17%	$13.59
Industrial Production Managers	4,117	-486	-11%	1,105	37%	-557	-14%	$53.26
Sales Representatives, Wholesale and Manufacturing	4,093	-605	-13%	806	25%	-449	-11%	$29.17
Engineering Technicians, Except Drafters	3,429	-475	-12%	832	32%	-510	-15%	$26.80
General and Operations Managers	2,995	-499	-14%	591	25%	-304	-10%	$47.87
Maintenance and Repair Workers, General	2,672	-500	-16%	564	27%	-295	-11%	$16.70

[11] Occupations are by 4-digit SOC code.

Industry and Occupation Connections in Manufacturing Sector

Although key manufacturing industries are highly diversified, they do share some common workforce requirements.[12] The following table identifies the top occupations with corresponding key industries. Note that three out of the five top occupations are within Automobile Manufacturing.

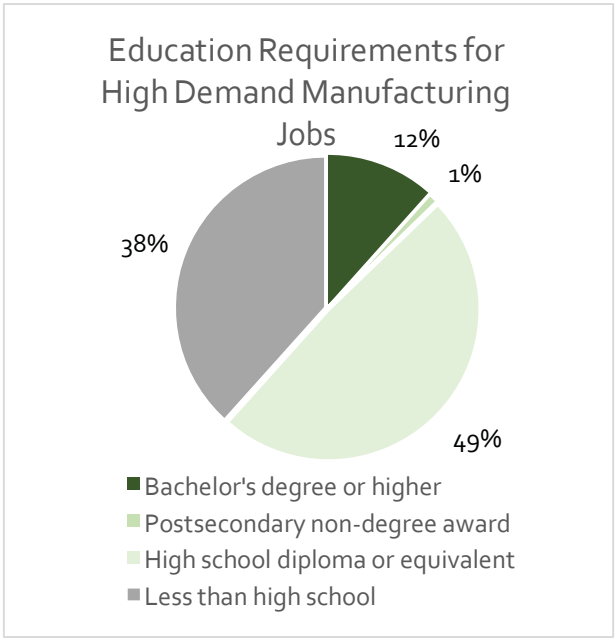
Connection Between Top Occupations and Key Industries in Manufacturing Sector

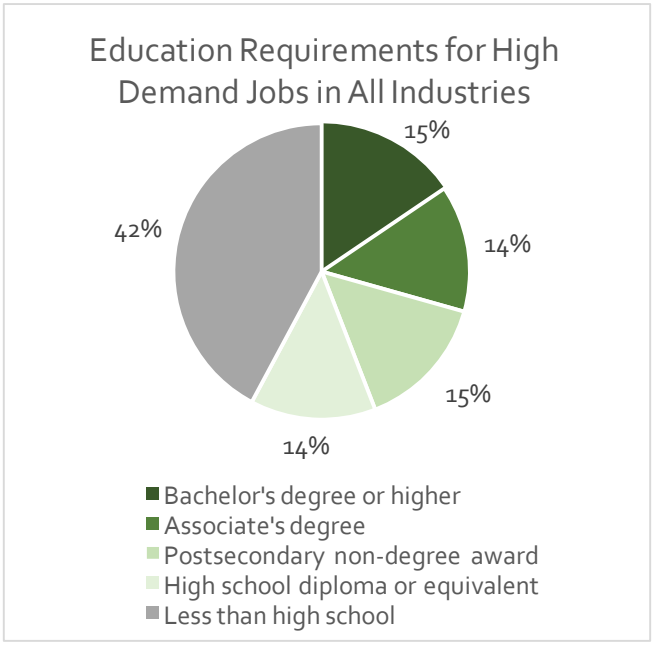
Top Occupations	Key Industries
Miscellaneous Assemblers and Fabricators	• Automobile Manufacturing • Temporary Help Services • Light Truck and Utility Vehicle Manufacturing
Machine Tool Cutting Setters, Operators and Tenders, Metal and Plastic	• Automobile Manufacturing • Motor Vehicle Metal Stamping • Motor Vehicle Transmission and Power Train Parts Manufacturing
Mechanical Engineers	• Engineering Services • Testing Laboratories • Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
Machinists	• Machine Shops • Special Die and Tool, Die Set, Jig, and Fixture Manufacturing • Industrial Mold Manufacturing
Miscellaneous Production Workers	• Temporary Help Services • Automobile Manufacturing • Professional Employer Organizations

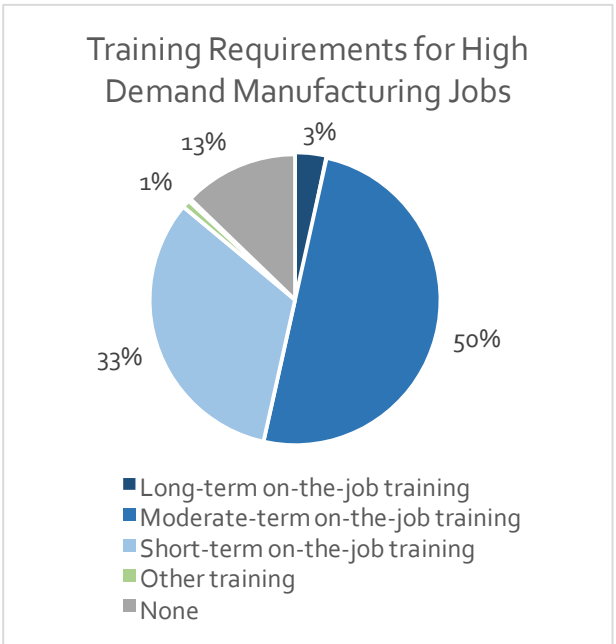
[12] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

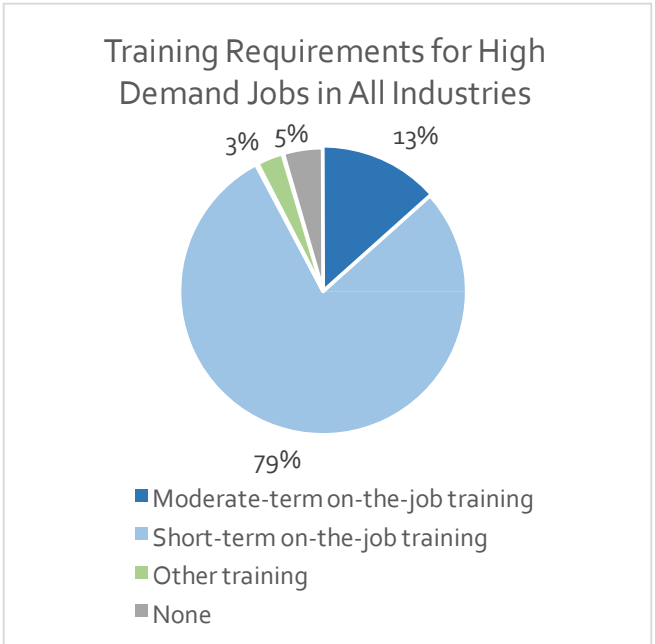
Education and Training For High Demand Jobs

The manufacturing sector has unique education and training requirements compared to the other industry sectors. Among high demand manufacturing jobs in the Macomb region, 49% require a high school diploma or equivalent, while only 14% of the jobs among all industry sectors have the same requirement.[13] The most often required training in manufacturing sector is moderate-term on-the-job training (50%), followed by short-term on-the-job training (33%) and long-term on-the-job training (3%); while the short-term on-the-job training has the largest share (79%) in training requirement among all industries.









[13] Occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5- digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations with highest growth during 2014-2015 in the Macomb region. The table on next page shows the top skills required for top five manufacturing jobs with highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Team Assemblers	38,613	42,062	3,449	9%
Industrial Engineers	**7,625**	**7,990**	**365**	**5%**
Machinists	**10,148**	**10,503**	**355**	**3%**
First-Line Supervisors of Production and Operating Workers	**7,744**	**8,089**	**345**	**4%**
Mechanical Engineers	**10,582**	**10,906**	**324**	**3%**
Tool and Die Makers	**5,557**	**5,871**	**314**	**6%**
Assemblers and Fabricators, All Other	3,282	3,573	291	9%
Inspectors, Testers, Sorters, Samplers, and Weighers	6,014	6,299	285	5%
Industrial Machinery Mechanics	3,858	4,125	267	7%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	7,300	7,549	249	3%
Computer-Controlled Machine Tool Operators, Metal and Plastic	3,966	4,191	225	6%
Production Workers, All Other	2,447	2,655	208	9%
Laborers and Freight, Stock, and Material Movers, Hand	2,949	3,116	167	6%
Industrial Production Managers	3,961	4,117	156	4%
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	1,549	1,696	147	9%
Electricians	1,661	1,795	134	8%
Welders, Cutters, Solderers, and Brazers	3,197	3,328	131	4%
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	4,107	4,238	131	3%
Maintenance and Repair Workers, General	2,547	2,672	125	5%
Industrial Truck and Tractor Operators	1,727	1,835	108	6%
Shipping, Receiving, and Traffic Clerks	2,520	2,628	108	4%
Helpers--Production Workers	3,909	4,014	105	3%
Engine and Other Machine Assemblers	1,479	1,579	100	7%
General and Operations Managers	2,902	2,995	93	3%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1,547	1,636	89	6%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3,643	3,728	85	2%
Logisticians	1,162	1,238	76	7%
Electrical and Electronic Equipment Assemblers	1,550	1,619	69	4%
Packaging and Filling Machine Operators and Tenders	2,117	2,183	66	3%

The table below displays the top skills required for the top five manufacturing jobs with highest growth during 2014-2015. [14] Based on the data from real-time job posting compiled by EMSI, the top five skills that appear in postings for manufacturing positions are Engineering, Designing, Projects, System, and Communication. [15]

Top 50 In-Demand Skills

Skill	% of Postings with Skill		Skill	% of Postings with Skill
Engineering	**51%**		Drawings	11%
Designing	**40%**		Machines	11%
Projects	**39%**		Microsoft Office	10%
System	**37%**		Research	9%
Communication	**34%**		Quality Control	9%
Technology	27%		Six Sigma	9%
Analysis	26%		Medical	9%
Planning	19%		Tools	9%
Maintenance, Repairs, and Operations	19%		Continuous Improvement Process	9%
Manufacturing	19%		Lean	8%
Report	18%		Automation	8%
Specification (Technical Standard)	18%		CAD	7%
Innovation	18%		Statistical	7%
Software	16%		Chemical Reaction	7%
Safety	15%		Automotive Industry	7%
Testing	15%		Machine	7%
Computer	14%		Energy	7%
Industrial	14%		Lean Manufacturing	7%
Documentation	13%		Productivity	7%
Project Management	13%		Machining	7%
Science	12%		Fabrication	6%
Documents	12%		Interpreting	6%
Mechanical Engineering	12%		Estimates	6%
Evaluation	12%		Failure	6%

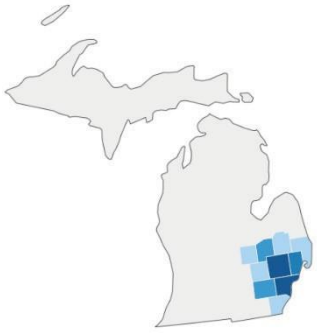
[14] 4-digit SOC code. EMSI Analyst 2015.
[15] National data. EMSI Analyst 2015.

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Mechanical Engineering, Evaluation, and Designing.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Mechanical Engineering	69%	12%
Evaluation	49%	12%
Designing	46%	40%
Maintenance, Repairs, and Operations	46%	19%
Specification (Technical Standard)	43%	18%
Industrial	42%	14%
Engineering	41%	51%
Computer	41%	14%
Drawings	38%	11%
Analysis	30%	26%

Mott Region



Executive Summary

Introduction

The following is a labor market profile for Mott Community College (MCC). The profile includes quantitative research to assist MCC in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic and labor force characteristics, industry analysis, occupation analysis, and labor force data. For the profile, the project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics. Additionally, the project team talked with college staff with the M-CAM project for additional information on the region.

Summary of Findings

Mott Community College is located in Flint, MI and has several nearby satellite locations in eastern Michigan. MCC attracts students primarily from four counties: Genesee, Lapeer, Livingston, and Shiawassee Counties. However, since students come from areas throughout all of Southeast Michigan, part of this report includes demographic trends for the broader region of: Genesee, Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Shiawassee, Washtenaw, and Wayne Counties.

The population in the broader ten-county region has decreased by 3% over the past ten years to 5,278,473. By comparison, the state average declined by 1%. The population is expected to continue to decline, although at a slower rate, over the next five years. The population is aging. Over the past 10 years, the population of 55-years-and-older increased significantly, and this trend is likely to continue. This is a concern because the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers in the ten-county region are Health Care and Social Assistance, Government, Manufacturing, and Retail Trade. Manufacturing experienced significant job losses over the past ten years. However, it has recovered with growth over the past five years. Health Care and Social Assistance is the only sector of the four that has been growing at a steady pace over the past ten years.

A key focus of this study is the manufacturing sector. Digging deeper into the four-county region, the largest manufacturing sector is motor vehicle parts manufacturing. Employment trends within this sector mirror overall economic trends that saw significant job losses and subsequent recovery over the past ten years. While the industry has recovered strongly over the past five years, it is projected to decline over the next five years. Motor Vehicle Manufacturing, Metalworking Machinery Manufacturing; Semiconductor and Other Electronic Component Manufacturing; and Coating, Engraving, Heating Treating, and Allied Activities; and are projected to experience the most growth. It should be noted that the model used to determine projected growth is largely dependent on past trends. Thus,

it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

The top occupations by 2-digit Standard Occupational Classification (SOC) codes within the four-county region include office and administrative support occupations; sales and related operations; food preparation and serving related occupations; and production occupations.

Top occupations for manufacturing include: miscellaneous assemblers and fabricators; machinists; machine tool cutting setters, operators, and tenders, metal and plastic; first-line supervisors of production and operating workers; miscellaneous production workers; and laborers and material movers. All of the occupations experienced growth from 2010-2015. However, it should be noted that many of the occupations for manufacturing workers are expected to have employment declines over the next five years. The model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries. There may be opportunities due to retirements with the aging population.

Based on real-time job posting information, the top skills that appear in job postings across the country for major regional manufacturers include: Transportation; Loading and Unloading; Manufacturing; Maintenance, Repair, and Operations; and Maintenance.

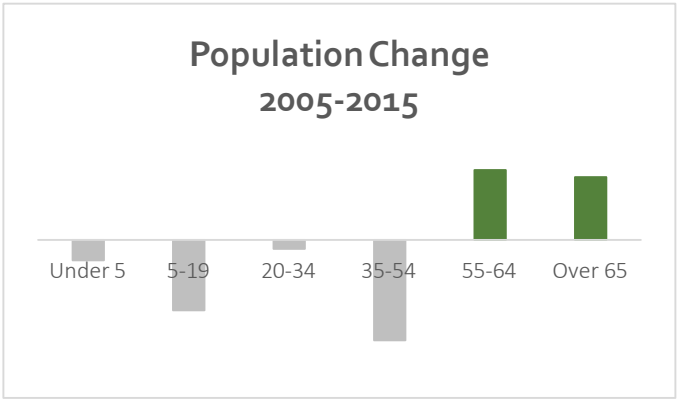
Demographics

The population in the broader Mott region has decreased from 5,440,968 to 5,278,473 over the past ten years.[1] The population decreased by 3%, while the state average declined at a rate of 1% over the same time period. However, the national rate in that period saw an increase of 9%. The population is projected to decline slightly at a rate of 1% over the next five years.

The region has an aging population. Over the past ten years, the 55-years-and-older population increased significantly, while the overall population decreased in all the other age groups. The age groups projected to grow from 2015-2020, are under age 5, between 20-34, and over age 55. The aging population is a concern as it will impact the availability of labor in this region over the next decade due to retirements of the older workers.

Age Distribution

Age	2015 Population	Change, 2005-2015		Change, 2015-2020	
Under 5	308,297	-48,869	-14%	14,293	5%
5-19	1,014,562	-170,615	-14%	-57,378	-6%
20-34	1,023,442	-22,031	-2	7,572	.07%
35-54	1,430,704	-244,220	-15%	-110,493	-8%
55-64	733,741	170,098	30%	11,158	2%
Over 65	794,727	153,141	24%	121,774	15%



The population of the ten-county region is fairly diverse, with 69% of the 2015 population identifying as White. The top three fastest growing races in the region are those identifying as: Hispanic, Two or More Races, and Asian.[2]

Race Distribution

ace	2015 Population	Change, 2005-2015	
White	3,629,532	-218,428	-6%
Black	1,090,545	-53,489	-5%
Hispanic	221,206	38,604	17%
Asian	208,579	44,098	27%
Two or More Races	110,781	27,463	33%
American Indian or Alaskan Native	16,677	-687	-4%
Native Hawaiian or Pacific Islander	1,152	-58	-5%

[1] EMSI Analyst 2015.

[2] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander.

INCOME

Median household income for the region varies significantly with Livingston County reporting the highest income from 2010 to 2014 and Wayne the lowest income during the same time period. Wayne County also has the highest poverty rate over the same period. [3] A majority of the counties in the broader Mott region are above the median household income and below the poverty rate compared to the Michigan state averages.

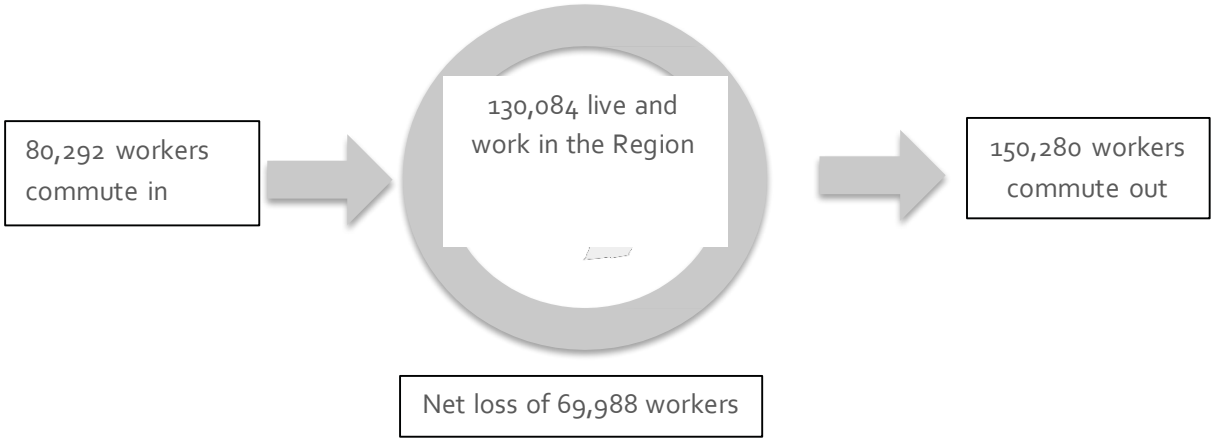
	MEDIAN HOUSEHOLD INCOME ('10-'14)	POVERTY RATE
Genesee	**$41,879**	**21.2%**
Lapeer	**$53,016**	**11.6%**
Livingston	**$73,694**	**6.0%**
Macomb	$54,059	12.8%
Monroe	$54,911	11.8%
Oakland	$66,436	10.4%
St. Clair	$48,703	15.2%
Shiawassee	**$47,723**	**15.5%**
Washtenaw	$60,805	15.2%
Wayne	$41,421	24.8%
Michigan	**$49,087**	**16.9%**
United States	**$53,482**	**15.6%**

[3] U.S. Census Bureau 2010-2014

Commuting Pattern and Labor Force Availability

In 2013, the region had nearly 200,000 workers commuting in and about 195,000 commuting out, making the region a net importer of workers.[4] Over 2,000,000 workers are employed in the region, including 1,874,671 both living and working in the region and 198,612 commuting into the region. The counties with the most workers are: Wayne (655,627, 32%); Oakland (653,292, 32%); Macomb (286,099, 14%); and Washtenaw (1888,130, 9%).

In 2013, the four-county region of Genesee, Lapeer, Livingston, and Shiawassee Counties had over 80,000 workers commuting in and over 150,000 commuting out, making the region a net exporter of workers.[5] Over 210,000 workers are employed in the region, including 130,084 both living and working in the region and 80,292 commuting into the region.



[4] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/
[5] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/

Human Capital

In 2014, about 2,388,822 workers participate in the MCC regional labor force which includes employed and unemployed individuals. Of these, 2,242,256 are employed. Over the last 20 years, employment in the region was at its highest in June 2000 and lowest in January 2014. The unemployment rate for the broader region is 6.1%, which is lower than the rate for Michigan (7.3%), and the U.S. (6.2%).

EMPLOYMENT, 1994-2014 [6]		
Peak	June 2000 (2,728,630)	+17.8% (compared to Dec, 2014)
Trough	January 2014 (2,216,243)	-1.2% (compared to Dec, 2014)
Dec 2014	2,242,256	Current unemployment: 6.1%

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

The labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation rate for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boomer generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

The older worker population (55 years and older) in the region is estimated to be 59,443 in 2014.[7] These older workers are expected to retire in the next ten years.

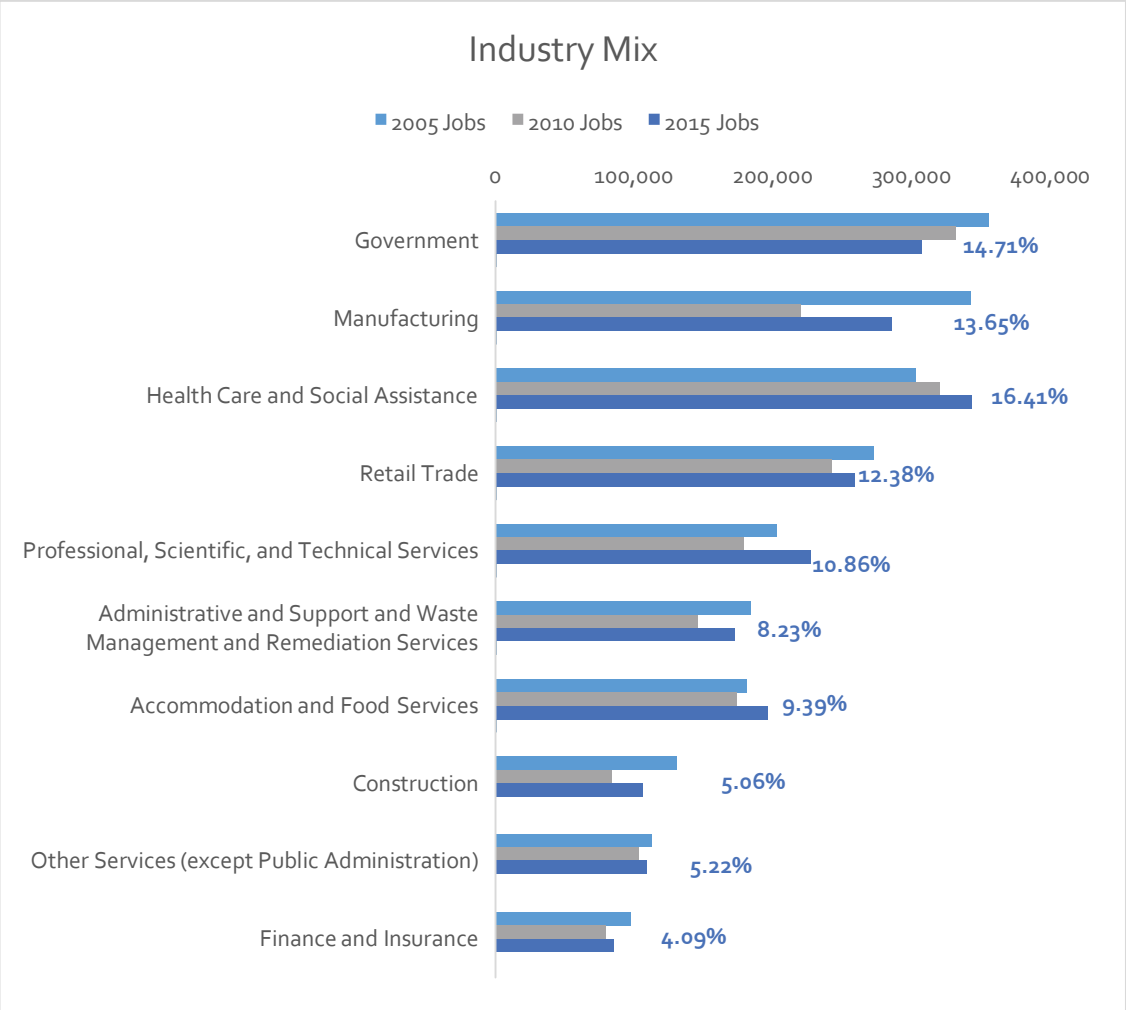
[6] U.S. Bureau of Labor Statistics, 1994.12-2014.12 (most recently available). http://www.bls.gov/data/

[7] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

Industry Analysis

The broad industry sectors in the 10-county region employing the most workers aside from All Other Industries are Health Care and Social Assistance (342,713, 16.41%), Government (307,193, 14.71%), Manufacturing (285,067, 13.65%), and Retail Trade (258,565, 12.38%).[8]

It is worth noting that Manufacturing experienced significant decline from 2005 to 2010, but substantial growth between 2010 and 2015, which suggests a potential for future growth. Government has declined from 2005 whereas Health Care and Social Assistance has grown since 2005.



[8] These industries are by 2-digit NAICS code. EMSI Analyst 2015.

Manufacturing Analysis

Drilling a bit deeper, the tables below show the top 25 largest manufacturing industries by employment in the four-county region of Genesee, Lapeer, Livingston, and Shiawassee.[9] It is worth noting that 70% of the industries experienced growth from 2010-2015 with many having double-digit growth. Among these key industries, Motor Vehicle Manufacturing, Metalworking Machinery Manufacturing; Semiconductor and Other Electronic Component Manufacturing; and Coating, Engraving, Heating Treating, and Allied Activities; and are projected to experience the most growth. It should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers resulting in projected decline for some of the industries. Future trends should continue to be monitored through periodic contact with companies in these industries.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020	
Motor Vehicle Parts Manufacturing	7,163	-4,826	-40%	2,103	42%	-1,856	-26%
Motor Vehicle Manufacturing	3,221	-4,019	-56%	543	20%	452	14%
Plastics Product Manufacturing	3,047	-217	-7%	1,086	55%	-412	-14%
Metalworking Machinery Manufacturing	1,814	388	27%	555	44%	374	21%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,547	-223	-13%	100	7%	-108	-7%
Coating, Engraving, Heat Treating, and Allied Activities	1,072	310	41%	487	83%	231	22%
Medical Equipment and Supplies Manufacturing	587	-6	-1%	-93	-14%	38	6%
Fruit and Vegetable Preserving and Specialty Food Manufacturing	557	113	25%	143	35%	89	16%
Motor Vehicle Body and Trailer Manufacturing	534	85	19%	115	27%	-119	-22%
Beverage Manufacturing	435	128	42%	-171	-28%	7	2%
Printing and Related Support Activities	414	-149	-26%	2	0%	-79	-19%
Rubber Product Manufacturing	392	252	180%	285	263%	187	48%
Electrical Equipment Manufacturing	381	-293	-43%	-117	-23%	-177	-46%
Semiconductor and Other Electronic Component Manufacturing	376	211	128%	123	49%	277	60%
Converted Paper Product Manufacturing	327	-239	-42%	-93	-22%	-37	-11%
Other General Purpose Machinery Manufacturing	318	-37	-10%	97	44%	26	8%
Dairy Product Manufacturing	317	87	38%	141	80%	-1	0%
Other Fabricated Metal Product Manufacturing	316	-398	-56%	67	27%	-39	-12%
Other Chemical Product and Preparation Manufacturi ng	309	54	21%	209	209%	-78	-25%
Ventilation, Heating, Air-Conditioning, and Commerc ial Refrigeration Equipment Manufacturing	286	71	33%	-49	-15%	38	13%
Household and Institutional Furniture and Kitchen Cabinet Manufacturing	283	-88	-24%	-10	-3%	-87	-31%
Other Miscellaneous Manufacturing	280	-49	-15%	86	44%	9	3%
Spring and Wire Product Manufacturing	279	-9	-3%	102	58%	11	4%
Cement and Concrete Product Manufacturing	269	-442	-62%	-19	-7%	-51	-19%
Architectural and Structural Metals Manufacturing	242	-82	-25%	39	19%	25	10%

[9] These industries are by4-digit NAICS code within Genesee, Lapeer, Livingston, and Shiawassee Counties.

Among these top industries within the four-county region, average earnings vary widely, from just over $36,000 a year for Other Miscellaneous Manufacturing, to over $75,000 a year for Other General Purpose Machinery Manufacturing. Those industries that pay relatively higher average wages, with a significant number of establishments include: Motor Vehicle Parts Manufacturing; Metalworking Machinery Manufacturing; and Motor Vehicle Manufacturing.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earning	Establishments
Motor Vehicle Parts Manufacturing	7,163	$68,863	55
Motor Vehicle Manufacturing	3,221	$65,413	5
Plastics Product Manufacturing	3,047	$42,716	41
Metalworking Machinery Manufacturing	1,814	$68,257	78
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1,547	$49,440	71
Coating, Engraving, Heat Treating, and Allied Activities	1,072	$36,657	16
Medical Equipment and Supplies Manufacturing	587	$61,301	29
Fruit and Vegetable Preserving and Specialty Food Manufacturing	557	$35,160	2
Motor Vehicle Body and Trailer Manufacturing	534	$69,232	7
Beverage Manufacturing	435	$54,907	8
Printing and Related Support Activities	414	$37,276	49
Rubber Product Manufacturing	392	$42,426	3
Electrical Equipment Manufacturing	381	$53,494	15
Semiconductor and Other Electronic Component Manufacturing	376	$45,400	4
Converted Paper Product Manufacturing	327	$46,450	10
Other General Purpose Machinery Manufacturing	318	$75,029	24
Dairy Product Manufacturing	317	$55,771	2
Other Fabricated Metal Product Manufacturing	316	$40,000	18
Other Chemical Product and Preparation Manufacturing	309	$58,552	8
Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	286	$61,409	6
Household and Institutional Furniture and Kitchen Cabinet Manufacturing	283	$41,656	13
Other Miscellaneous Manufacturing	280	$36,255	34
Spring and Wire Product Manufacturing	279	$62,389	7
Cement and Concrete Product Manufacturing	269	$52,550	21
Architectural and Structural Metals Manufacturing	242	$48,533	22

Occupation analysis

The four-county region's highest number of occupations include Office and Administrative Support Occupations, Sales and Related Occupations, Food Preparation and Serving Related Occupations, and Production Occupations. [10] The median hour earnings in the region is $18.30/hour. The median hourly earnings range from $9.64/hour for Food Preparation and Serving Related Occupations, to $36.94/hour for Management Occupations.

Mott Regional Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	37,321	14.56%	$14.71
Sales and Related Occupations	28,729	11.21%	$13.59
Food Preparation and Serving Related Occupations	24,500	9.56%	$9.64
Production Occupations	20,988	8.19%	$17.52
Healthcare Practitioners and Technical Occupations	17,139	6.69%	$34.30
Transportation and Material Moving Occupations	16,229	6.33%	$13.68
Education, Training, and Library Occupations	13,813	5.39%	$23.00
Management Occupations	12,600	4.92%	$36.94
Construction and Extraction Occupations	11,584	4.52%	$19.29
Personal Care and Service Occupations	10,612	4.14%	$9.77
Installation, Maintenance, and Repair Occupations	9,786	3.82%	$17.42
Business and Financial Operations Occupations	9,761	3.81%	$28.07
Healthcare Support Occupations	9,154	3.57%	$12.48
Building and Grounds Cleaning and Maintenance Occupations	8,948	3.49%	$11.10
Protective Service Occupations	4,974	1.94%	$17.46
Computer and Mathematical Occupations	4,679	1.83%	$27.90
Community and Social Service Occupations	4,109	1.60%	$20.87
Arts, Design, Entertainment, Sports, and Media Occupations	3,551	1.39%	$17.78
Architecture and Engineering Occupations	3,541	1.38%	$32.66
Military occupations	1,334	0.52%	$14.05
Legal Occupations	1,219	0.48%	$32.18
Life, Physical, and Social Science Occupations	972	0.40%	$26.92
Farming, Fishing, and Forestry Occupations	788	0.31%	$12.55
Total/Average	256,331	100%	$18.30

[10] These occupations are by 2 -digit SOC code (Standard Occupational Classification System).

Occupations in Manufacturing Sector

The table below shows employment of each occupation within Manufacturing sector. It is worth noting that 59.0% of occupations within the Manufacturing sector are Production Occupations.

Mott Regional Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	16,388	59.0%
Office and Administrative Support Occupations	2,024	7.3%
Architecture and Engineering Occupations	1,869	6.7%
Transportation and Material Moving Occupations	1,863	6.7%
Management Occupations	1,579	5.7%
Installation, Maintenance, and Repair Occupations	1,266	4.6%
Business and Financial Operations Occupations	872	3.1%
Sales and Related Occupations	711	2.6%
Construction and Extraction Occupations	472	1.7%
Computer and Mathematical Occupations	298	1.1%
Arts, Design, Entertainment, Sports, and Media Occupations	175	0.6%
Building and Grounds Cleaning and Maintenance Occupations	103	0.4%
Life, Physical, and Social Science Occupations	68	0.2%
Food Preparation and Serving Related Occupations	53	0.2%
Healthcare Practitioners and Technical Occupations	23	0.1%
Protective Service Occupations	15	0.1%
Farming, Fishing, and Forestry Occupations	11	0.0%

Top Occupations in the Manufacturing Sector

Drilling a bit deeper, the following table displays the top 20 occupations that are most often required to staff companies within manufacturing in the four-county MCC region.[11] Median hourly earnings for these occupations range from $12.17 at the low end for Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic to $40.24 at the high end for General and Operations Managers. Over the past five years, all of the occupations experienced growth. The model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers which is the reason all of the occupations are projected for decline. Future trends should continue to be monitored through other data sources and periodic contact with companies in these industries.

Top 20 Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	5,022	-3,428	-41%	1,065	27%	-216	-4%	$19.53
Machinists	1,344	-256	-16%	296	28%	-13	-1%	$18.16
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	1,014	-534	-34%	180	22%	-90	-9%	$13.59
First-Line Supervisors of Production and Operating Workers	1,012	-36	-26%	214	27%	-56	-6%	$28.29
Miscellaneous Production Workers	976	-411	-30%	185	23%	12	-1%	$29.04
Laborers and Material Movers, Hand	915	-315	-26%	150	20%	-92	-10%	$11.07
Inspectors, Testers, Sorters, Samplers, and Weighers	805	-271	-25%	185	30%	-31	-4%	$13.70
Tool and Die Makers	791	-174	-18%	244	45%	-33	-4%	$27.68
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	628	-139	-18%	203	48%	-72	-11%	$12.17
Mechanical Engineers	602	-158	-21%	145	32%	-20	-3%	$38.76
Industrial Engineers, Including Health and Safety	555	-211	-28%	144	35%	-13	-2%	$37.71
Sales Representatives, Wholesale and Manufacturing	544	-113	-17%	84	18%	-22	-4%	$23.12
Welding, Soldering, and Brazing Workers	532	-265	-33%	66	14%	-39	-7%	$15.39
Industrial Machinery Installation, Repair, and Maintenance Workers	509	-190	-27%	124	32%	19	4%	$22.26
Maintenance and Repair Workers, General	505	-132	-21%	118	30%	-47	-9%	$13.74
Computer Control Programmers and Operators	496	-135	-21%	110	28%	-3	-1%	$17.95
Industrial Truck and Tractor Operators	451	-235	-34%	64	17%	-79	-18%	$17.14
Forming Machine Setters, Operators, and Tenders, Metal and Plastic	445	-157	-26%	134	43%	-47	-11%	$13.63
Office Clerks, General	436	-85	-16%	85	24%	-29	-7%	$13.26
General and Operations Managers	433	-107	-20%	83	24%	-17	-4%	$40.24

[11] Occupations are by 4-digit SOC code.

Industry and Occupation Connections in Manufacturing Sector

Although key manufacturing industries are highly diversified, they do share some common workforce requirements.[12] The following table identifies the top five occupations with corresponding key industries. Motor vehicle parts manufacturing overlaps with all of the top five occupations.

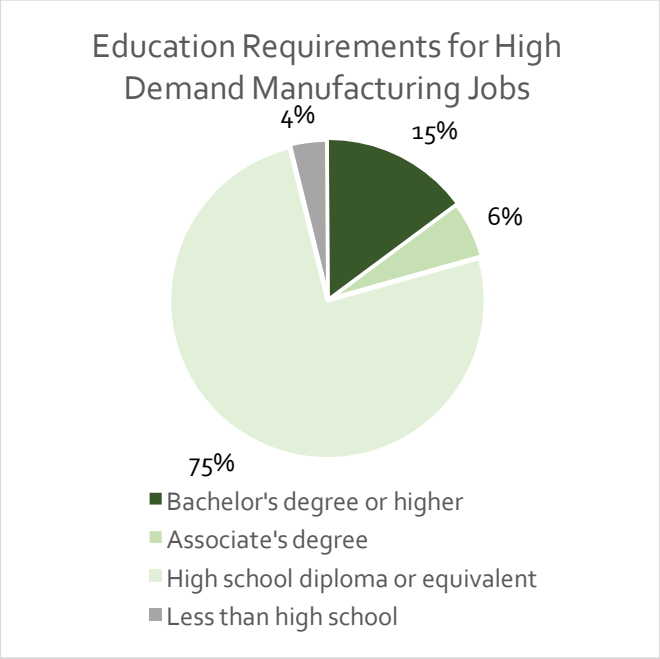
Connection Between Top Occupations and Key Industries in Manufacturing Sector

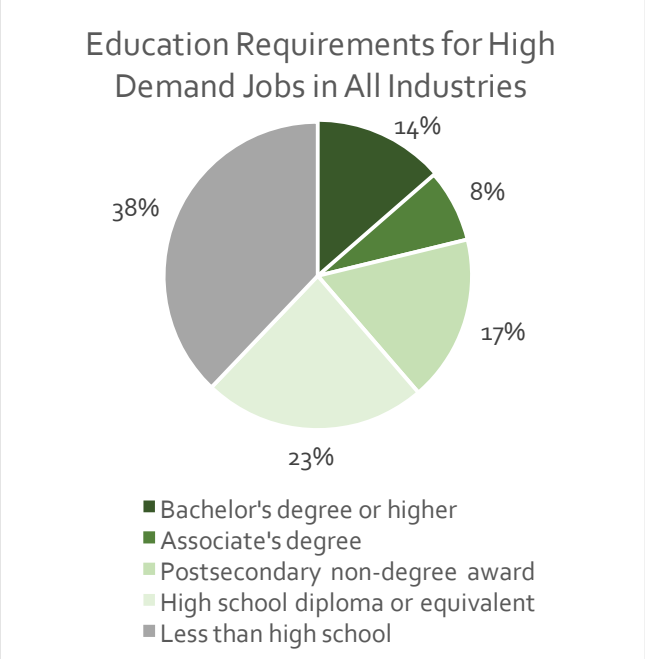
Top Occupations	Key Industries
Miscellaneous Assemblers and Fabricators	• Light Truck and Utility Vehicle Manufacturing • Motor Vehicle Metal Stamping • Other Motor Vehicle Parts Manufacturing
Machinists	• Machine Shops • Special Die and Tool, Die Set, Jig, and Fixture Manufacturing • Motor Vehicle Metal Stamping
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	• Other Motor Vehicle Parts Manufacturing • Motor Vehicle Metal Stamping • Machine Shops
First-Line Supervisors of Production and Operating Workers	• Motor Vehicle Metal Stamping • Light Truck and Utility Vehicle Manufacturing • Other Motor Vehicle Parts Manufacturing
Miscellaneous Production Workers	• Temporary Help Services • Professional Employer Organizations • Other Motor Vehicle Parts Manufacturing

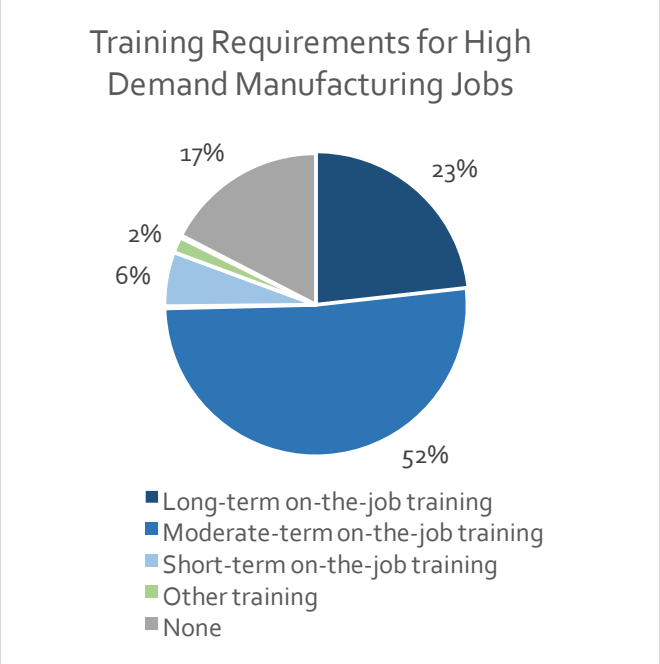
[12] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

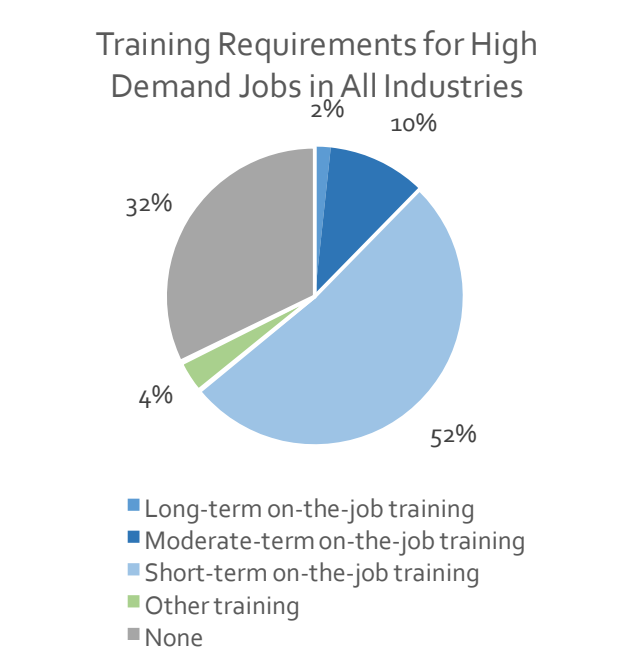
Education and Training For High Demand Jobs

The Manufacturing sector has unique education and training requirements compared to the other industry sectors. Among high demand manufacturing jobs in the four-county region, 75% require a high school diploma or equivalent, while only 23% of the jobs among all industry sectors have the same requirement.[13] The most often required training in the manufacturing sector is moderate-term on-the-job training (52%), followed by long-term on-the-job training (23%) and no training (17%); Short-term on-the-job training has the largest share (52%) in training requirement among all industries.









[13] A total of 50 occupations with the highest projected job growth from 2015-2020 are included in this analysis. These occupations are with 5-digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations with highest growth during 2014-2015 in the four-county region. The table on next page shows the top skills required for top 5 manufacturing jobs with highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Miscellaneous Assemblers and Fabricators	**4,808**	**5,022**	**214**	**4%**
Miscellaneous Production Workers	**938**	**976**	**38**	**4%**
Laborers and Material Movers, Hand	**881**	**915**	**34**	**4%**
Industrial Machinery Installation, Repair, and Maintenance Workers	**482**	**509**	**27**	**6%**
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	**604**	**628**	**24**	**4%**
Mechanical Engineers	582	602	20	3%
Forming Machine Setters, Operators, and Tenders, Metal and Plastic	426	445	19	4%
Miscellaneous Food Processing Workers	192	211	19	10%
Industrial Engineers, Including Health and Safety	537	555	18	3%
Electrical, Electronics, and Electromechanical Assemblers	201	215	14	7%
Computer Control Programmers and Operators	482	496	14	3%
Printing Workers	135	148	13	10%
First-Line Supervisors of Production and Operating Workers	1,001	1,012	11	1%
Packaging and Filling Machine Operators and Tenders	277	288	11	4%
Inspectors, Testers, Sorters, Samplers, and Weighers	795	805	10	1%
Crushing, Grinding, Polishing, Mixing, and Blending Workers	213	222	9	4%
Engine and Other Machine Assemblers	105	114	9	9%
Shipping, Receiving, and Traffic Clerks	326	335	9	3%
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators and Tenders	98	107	9	9%
Electricians	285	293	8	3%
Sewing Machine Operators	128	136	8	6%
Butchers and Other Meat, Poultry, and Fish Processing Workers	44	51	7	16%
Welding, Soldering, and Brazing Workers	525	532	7	1%
Industrial Production Managers	399	406	7	2%
Production, Planning, and Expediting Clerks	111	118	7	6%

The table below shows the top skills required for top 5 manufacturing jobs with highest growth during 2013-2014.[14] Based on the data from real-time job postings compiled by EMSI, the top five skills that appear in postings for manufacturing positions are Transportation; Loading and Unloading; Manufacturing; Maintenance, Repair, and Operations; and Maintenance. [15]

Top 50 In-Demand Skills

Skill	% of Postings with Skill		Skill	% of Postings with Skill
Transportation	**13%**		Innovation	3%
Loading and Unloading	**13%**		Installation	3%
Manufacturing	**11%**		Automation	3%
Maintenance, Repair, and Operations	**11%**		Safety Regulations	3%
Maintenance	**10%**		Basic Math Skills	2%
Machines	9%		Planned Maintenance	2%
Repair	9%		Blueprints	2%
Shipping	9%		Hydraulics	2%
Pallet	8%		Hazardous Materials	2%
Electricity	8%		Inspection	2%
Mechanical	7%		Purchasing	2%
Packaging	6%		Mechanical Aptitude	2%
Tools	6%		Plastics	1%
Driving	6%		Mechanics	1%
Machine	6%		Planning	1%
Pallet Jack	5%		Electrical Wiring	1%
Business	5%		Housekeeping	1%
Machine (Mechanical)	4%		Productivity	1%
Welding	3%		Electromechanics	1%
Warehouse	3%		Commercial	1%
Engines	3%		Valves	1%
Quality Control	3%		Health Care	1%
Hand Tools	3%		Distributors	1%
Technology	3%			
Rotation	3%			
Tires	3%			

[14] 4-digit SOC code. EMSI Analyst 2015.
[15] National data. EMSI Analyst 2015.

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Maintenance, Repair, and Operations; Tools; Productivity; Blueprints; and Maintenance.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Maintenance, Repairs, and Operations	57%	45%
Tools	51%	21%
Productivity	50%	14%
Blueprints	36%	10%
Manufacturing	35%	46%
Machines	30%	30%
Quality Control	11%	11%
Planning	2%	12%
Technology	1%	11%

Schoolcraft Region

Skill Gap Analysis

THOMAS P. MILLER & ASSOCIATES

Executive Summary

Introduction

The following Skill Gap Analysis was created for the Schoolcraft College (SC) region to assist the Michigan Coalition for Advanced Manufacturing (M-CAM). Thomas P. Miller & Associates (TPMA) was hired to conduct a thorough and comprehensive analysis including a full labor market profile, a survey of employers and manufacturers within the region, and an input session for stakeholders, employers, recruiters, and other associated entities. The research centered on trends within manufacturing occupations and skills, specifically within the following four training opportunities for advanced manufacturing: Welding/Fabrication; CNC Machining; Multi-skilled Technology/Mechatronics; and Production Operations.

Labor Market Profile

The Labor Market Profile was the first step of a three-part methodology that included quantitative research as well as qualitative research to assist Schoolcraft College in utilizing data to make informed decisions as part of the Michigan Coalition for Advanced Manufacturing (M-CAM). The quantitative data for the profile includes a geographic overview, demographic and labor force characteristics, industry analysis, occupation analysis, and labor force data. For the profile, the project team collected and analyzed data from Economic Modeling Specialists Intl. (EMSI), U.S. Census Bureau, and the U.S. Bureau of Labor Statistics. Additionally, the project team interviewed college staff for additional information on the region. The real-time data collected from the profile and initial conversations informed the next steps in the methodology which included a business demand survey and a regional input session.

Schoolcraft College's main campus is located in Livonia, Michigan with two additional locations. The Public Safety Training Complex in Livonia and the Radcliff Center in Garden City. SC attracts students primarily from five counties: Wayne, Oakland, Macomb, Livingston, and Washtenaw Counties. However, since students come from areas throughout all of Southeast Michigan, part of this report includes demographic trends for a broader seven-county region of: Wayne, Oakland, Macomb, Livingston, Washtenaw, Lapeer, and St. Clair Counties.

The population in the broader seven-county region has decreased by 3% over the past ten years to 4,650,585. By comparison, the state average declined by 1%. The population is expected to continue to decline, although at a slower rate, over the next five years. Additionally, the population is aging. Over the past 10 years, the population of 55-years-and-older increased significantly, and this trend is likely to continue. This is a concern because the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce.

The industry sectors employing the greatest number of workers in the seven-county region are health care and social assistance, government, and manufacturing. Manufacturing experienced significant job losses over the past ten years. However, it has recovered with growth over the past five years. Health care and social assistance is the only sector that has been growing at a steady pace over the past ten years.

A key focus of this study is the manufacturing sector. Digging deeper into the five-county region, the largest manufacturing sector is motor vehicle parts manufacturing. Employment trends within this sector mirror overall economic trends that saw significant job losses and subsequent recovery over the past ten years.

The top occupations by 2-digit Standard Occupational Classification (SOC) codes within the five-county region include office and administrative support occupations; production operations and sales and related operations. Top occupations for manufacturing include: miscellaneous assemblers and fabricators; machinists; machine tool cutting setters, operators, and tenders, metal and plastic; and mechanical engineers.

Based on real-time job posting information, the top skills that appear in job postings across the country for major regional manufacturers include: Engineering, Projects, System, Communication, and Designing.

Business Demand Survey

Additionally, Thomas P. Miller & Associates conducted an online business demand survey for manufacturers within the Schoolcraft region. Schoolcraft distributed the survey to their business partners. Of the 44 companies that responded, almost half employed 250+ employees. The types of manufacturers included Motor Vehicle Break System and Metal Stamping, Machine Shops, and others. Companies were most interested in Manufacturing Production & Assembly, Multi-Skilled Technician, and Machinist programs for their employees.

When it came to filling vacancies within their companies, 87% of respondents said that it was not difficult at all to fill middle-skill positions, but 90% responded that it was very difficult to fill high-skill positions The most cited barriers by skill level to filling these positions included lack of soft skills for entry-level and lack of job-specific technical skills for middle and high-skill positions.

A little less than half (48.6%) indicated that the highest priority of workforce needs was alignment of current training and employer needs (i.e. closing the skills gap). Respondents were also asked what percentage of new hires will be due to growth or replacement of their retiring workforce. Overall, respondents indicated that 10-14% of their new hiring was due to growth and 5-9% was due to replacement of their retiring employees. Most employers were looking to hire 1-5 employees that will need some form of training within the next 12 months and 1-3 years.

When asked what kinds of training/skills that their company requires; a substantial portion indicated some kind of CNC Machining and Programming and General Maintenance. Employers indicated that the occupations hardest to fill were CNC Programmers and Machinists, Project Engineers and Managers, General Machinists, and Lathe Operators. In regards to education requirements for new employees, a handful required at least high school graduation, while others were more specific to the industry such as technical-specific training, welding, blueprint reading, and industry-recognized certifications.

Respondents indicated overall that their entry-level positions paid less than $15 per hour; their middle-skill positions paid $16-$20 per hour; and their high-skill positions paid $21 per hour and over. Employers utilized AWS, NIMS Siemens, SAE, SME, SAME, ASQ and other industry-recognized credentials to train and certify their employees. Partnerships with Schoolcraft College varied from being on their Advisory Board to participating in Job Fairs, Career Centers, and Plant Manufacturing Tours. Many employers utilize internships and on-the-job training but would like to utilize co-ops and internships more in the future.

Regional Input Session

In addition to the business demand survey, TPMA conducted a regional input session with Schoolcraft. SC invited business partners to participate in the session. A total of 11 participants representing the manufacturing industry attended the input session for the Schoolcraft region. The participants included executives, operations managers, sales managers, recruiters and human resource representatives. The input session occurred immediately prior to a Skilled Trades job fair at Schoolcraft. The input session participants were recruiting new employees at the job fair. Many employers noted that they are struggling to fill positions because the timeline to train up employees at the skill level they need takes significant time.

Most are seeing a shortage of almost every type of employee that they are wanting to hire – from engineers to shipping and receiving. Also, some of the older skills – such as basic machining are difficult to find in new employees because many of the younger workers want to do more high-tech computerized and/or digitally-focused work. Other issues include hiring employees that have the certifications they are looking for, but lack skills in basic math and blueprint reading. There was a strong consensus among the group to create a national campaign to educate the public on the many benefits of working for the manufacturing industry in order to attract more talent and develop a pipeline.

In order to address talent attraction issues, many manufacturers are starting their own in-house apprenticeship programs – some programs admit students after working at the program for one year with paid tuition. Often, with this set-up it is difficult to keep individuals at the company for a year before investing in training for them. Typically, the lower the skill in a selected area, the more "job-jumping" occurs, so retention is a common issue with entry-level

positions. Many cited having issues finding employees with basic skills such as professionalism, good work ethic, and soft skills. There is so much demand for higher skilled employees that the employees are in control and driving up the wages. The in demand workers are getting the companies to compete by saying they will go to a competitor if their current employer does not meet their wage requests. The businesses are also concerned with the aging workforce and future retirements of the most skilled, experienced employees. A few businesses had success with recruiting employees from outside of Michigan. This has helped them find employees for hard to fill openings.

Of the employers participating in the input session, most of their involvement with Schoolcraft College was with the Machinist Training and Plastics Program. As far as recognized credentials, some employers thought that the primary options were too expensive, while others invested in various certifications such as the AS9100, welder, and others. Many of the employers trained employees to their own systems and equipment rather than utilizing standard industry certifications. As far as connections with K-12, many had small-scale relationships with a local school or career & technical education program, but most of the employers were not connected to local schools. However, they had a desire to get more involved with the advisory boards, curriculum development, and direct marketing campaigns to promote manufacturing to students.

Participants also included feedback about the recent job fair and many noted that it was the only interaction they had had with Schoolcraft but had an interest in becoming more involved with the college.

Findings and Considerations

With consideration to the labor market profile, survey results, and business input, the following are key findings and considerations for Schoolcraft.

- Efforts to develop the pipeline are necessary. The quantitative data illustrates the aging population will be a strain on future labor availability, as the number of retiring workers will outpace younger workers entering the workforce. The employers indicated their concern with future retirements and the limited supply of young people interested in manufacturing. There is a strong interest in developing a campaign to promote manufacturing to students, parents and teachers. M-CAM and Schoolcraft could partner with employers to coordinate and support manufacturing awareness activities.
- Employers indicated it was difficult to fill a variety of positions from entry-level to high skill. The employers feel that closing the skills gap is a high priority and want training to align with employer needs. It is important for Schoolcraft to listen to the employer needs and work together on developing solutions. Some of the needs cited included providing advanced, job-specific technical training to upskill incumbent workers so they can move into the high-skill positions and address some of the impending retirements. There is also a need for soft-skills training for entry-level positions.
- Lastly, the employers are looking for ways to connect with Schoolcraft. Many of the job fair participants indicated a desire to work more closely with the college. Employers also expressed an interest in utilizing co-ops and internships more in the future.

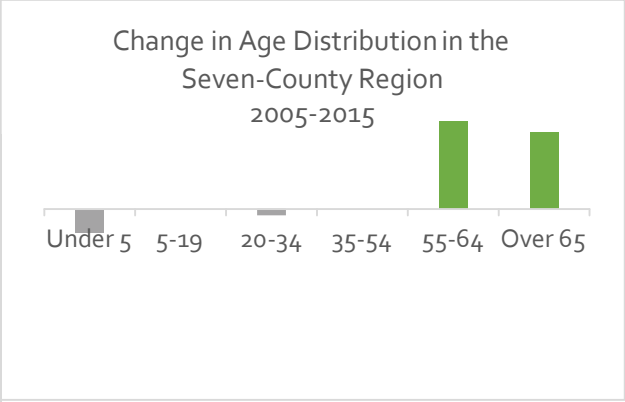
Demographics

The population in the seven-county Michigan region has declined from 4,773,308 to 4,650,585 over the past ten years.[1] It has declined by 3%, compared to the state rate (1% decline) and national rate (9% growth). The population in the Schoolcraft College region is projected to continue to decline over the next five years. The population in the five-county sub region within Schoolcraft College region has also declined by 3% during 2005-2015.

The broader seven-county Schoolcraft College region has an aging population. Over the past ten years, the 55-years-and-older population increased significantly, while the population decreased in other age groups. This trend is projected to continue over the next five years except for the age group under 5. The only age groups projected to grow are under age 5 and over age 55. Similar aging trends are observed in five-county sub region. The aging population is a concern as it will impact the availability of labor in these regions over the next decade.

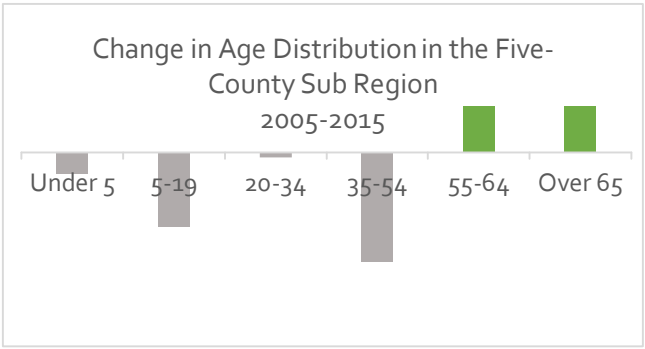
Age Distribution in Seven-County Schoolcraft College Region

Age	2015 Population	%Change, 2005-2015		%Change, 2015-2020	
Under 5	271,830	-40,782	-13%	13,351	5%
5-19	894,511	-141,155	-14%	-49,006	-5%
20-34	910,973	-11,062	-1%	10,362	1%
35-54	1,239,574	-208,668	-14%	-94,969	-8%
55-64	643,097	149,949	30%	11,285	2%
Over 65	692,601	131,390	23%	106,871	15%



Age Distribution in Five-County Sub Region

Age	2015 Population	%Change, 2005-2015		%Change, 2015-2020	
Under 5	259,367	-37,283	-13%	12,592	5%
5-19	845,636	-132,421	-14%	-42,766	-5%
20-34	870,701	-8,292	-0%	10,899	1%
35-54	1,172,260	-193,007	-14%	-87,310	-7%
55-64	604,676	140,578	30%	9,396	2%
Over 65	650,606	120,323	23%	99,1118	15%



The White population shrank by 5% from 2005-2015 in both the Schoolcraft region and the five-county sub region. In 2015, 70% of the population in both regions identified as White. The top three fastest growing races in the broad region identify as American Indian or Alaskan Native, Asian, and Two or More Races.[2] For the five-county sub region, the fastest growing include Hispanic, Asian, and Two or More Races.

[1] EMSI Analyst 2015.

[2] The Hispanic population includes Hispanics in White, Black, Two or More Races, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander.

Race Distribution in Schoolcraft Region

Race	2015 Population	Change, 2005-2015	
White	3,131,009	-178,789	-5%
Black	1,003,210	-47,724	-5%
Hispanic	200,474	35,389	18%
Asian	202,910	43,388	27%
Two or More Races	72,327	25,634	35%
American Indian or Alaskan Native	3,369	1,523	45%
Native Hawaiian or Pacific Islander	1,096	-92	-8%

Race Distribution in Five-County Sub Region

Race	2015 Population	Change, 2005-2015	
White	2,904,209	-163,261	-5%
Black	998,267	-48,053	-5%
Hispanic	191,290	34,001	21.6%
Asian	201,510	43,149	27%
Two or More Races	93,974	24,687	36%
American Indian or Alaskan Native	4,595	-513	-4%
Native Hawaiian or Pacific Islander	960	110	-10%

INCOME

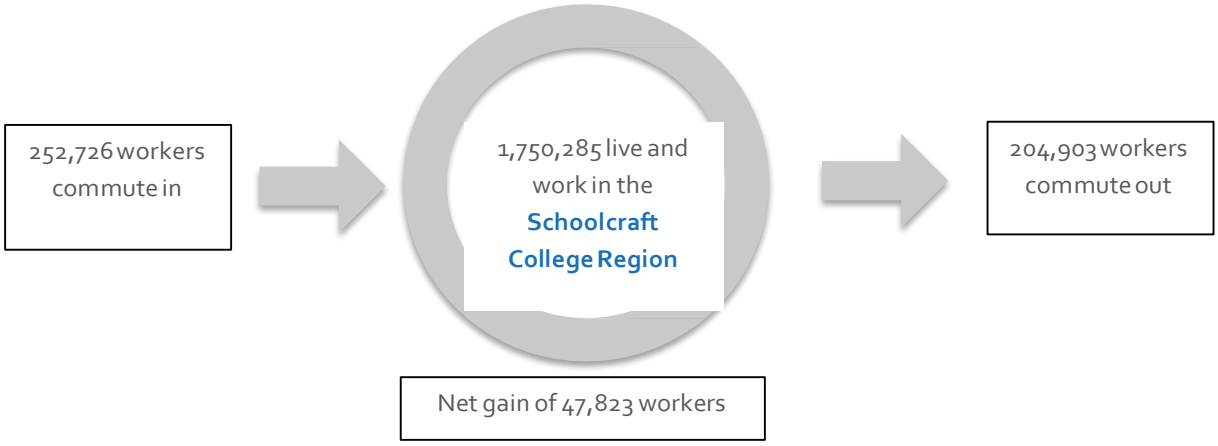
Washtenaw County had the highest median income from 2010 to 2014. Livingston County had the lowest poverty rate, at 6%, in the same time period. Most of the counties in Schoolcraft College region have higher incomes and lower poverty rates than the Michigan averages. Wayne County is the only county with poverty rate higher than the rate for Michigan over the same period. [3]

	MEDIAN HOUSEHOLD INCOME ('10-'14)	POVERTY RATE
Livingston	$ 83,606	6.0%
Macomb	$67,552	12.8%
Oakland	$ 85,677	10.4%
Washtenaw	$ 86,876	15.2%
Wayne	$52,838	24.8%
Lapeer	$61,203	11.6%
St. Clair	$60,120	15.2%
Michigan	$49,087	16.9%
U.S.	$53,482	15.6%

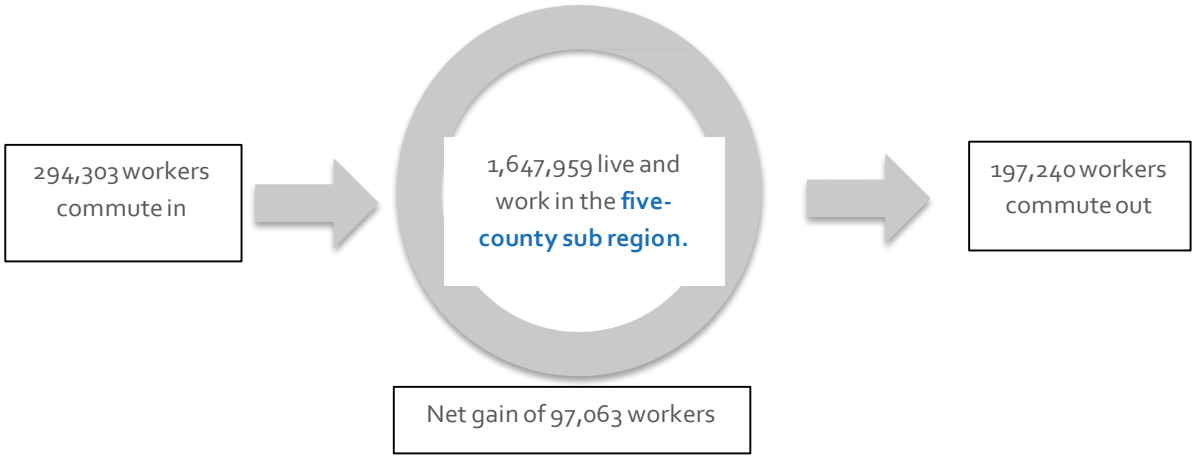
[3] U.S. Census Bureau 2010-2014

Commuting Patterns and Labor Force Availability

In 2013, the Schoolcraft College region had over 250,000 workers commuting in and just over 200,000 commuting out, making the region a net importer of workers.[4] The region receives the most commuters from Genesee County (39,751, 2.2%), Monroe County (24,669, 1.4%), and Ingham County (17,468, 1.0%), and sends the most workers to Ingham County (30,184, 1.7%), Genesee County (26,329, 1.5%), and Kent County (17,131, 1.0%).



In 2013, the five-county region of Wayne, Oakland, Macomb, Livingston, and Washtenaw Counties had nearly 295,000 workers commuting in and over 197,000 commuting out, making the region a net importer of workers.[5]



[4] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/
[5] U.S. Census Bureau, OnTheMap, 2013 (most recently available). http://onthemap.ces.census.gov/

Human Capital

In 2014, about 2,190,000 workers participated in the Schoolcraft College regional labor force which includes employed and unemployed individuals. Of these, 2,054,602 are employed. Over the last 20 years, employment in the region was at its highest in December 1999 and lowest in January 2011. As of December 2014, the unemployment rate for the region is 6.2%, which is higher than the rate for the five-county sub region (6.1%), Michigan (5.6 %), and the U.S. (5.6 %).

Employment in Schoolcraft Region, 1994-2014 [6]		
Peak	December 1999 (2,430,978)	+18.3% (compared to Dec, 2014)
Trough	January 2011 (1,909,044)	-7.1% (compared to Dec, 2014)
Dec 2014	Employment: 2,054,602 Labor Force: 2,190,280 Unemployment rate: 6.2%	

Labor Force Participation Rate

The labor force participation rate is a major indicator of the labor market. It represents the proportion of the population that is in the labor force. Labor force participation rates are affected by various factors, including demographic composition of the population as well as structural changes in the economy.

Labor force participation rate is sensitive to demographic change because the participation rates vary across age, gender, and race. In 2014, the national labor force participation rate for those 55-years-and-older was 39.9%, compared with a labor force participation rate of 80.7% for those between 25 and 54.

The national labor force participation rate has decreased since 2000, a trend that is expected to continue in the next decade. One of the major reasons for the decline is the aging of the baby-boomer generation. In 2000, baby boomers were the heart of the workforce, falling into the high participation rate group of 36-to-54 years old. However, as this large group of individuals began to retire, the effects were felt on the overall participation rate. It is worth mentioning that the participation rate of older workers has been increasing in the past ten years, but it is still significantly lower than those of the middle age groups.

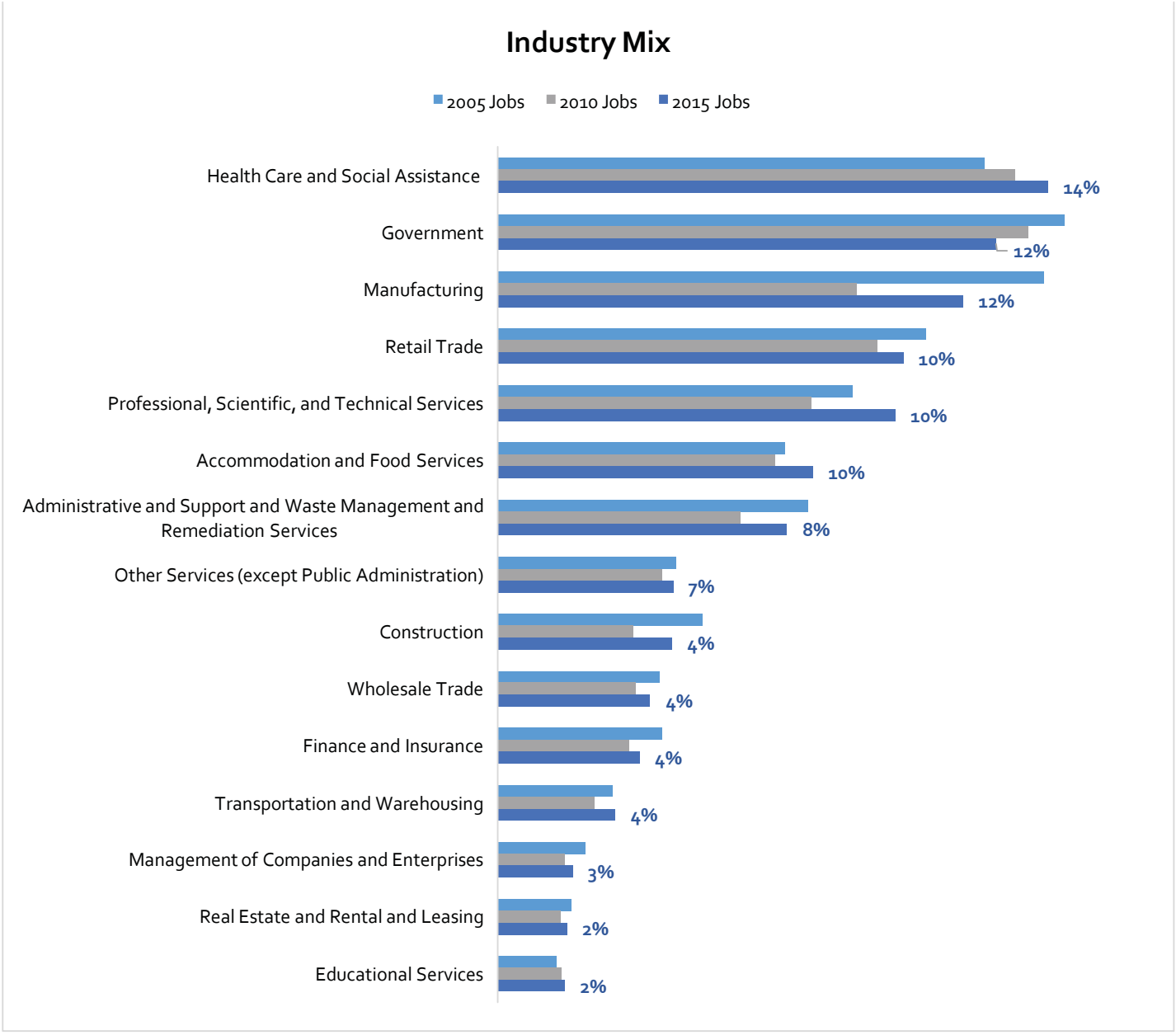
The older worker population (55 years and older) in the region is estimated to be 519,594 in 2014.[7] These older workers are expected to retire in the next ten years.

[6] U.S. Bureau of Labor Statistics, 1994.12-2014.12 (most recently available). http://www.bls.gov/data/

[7] The older worker population (55 years and older) in the region is estimated by multiplying the population of this age group by the corresponding labor force participation rate.

INDUSTRY ANALYSIS

The broad industry sectors in Schoolcraft College region employing the most workers are Health Care and Social Assistance (297,413, 14%), Government (269,256, 12%), and Manufacturing (251,515, 12%).



Manufacturing Analysis

Drilling a bit deeper, the table below show the top 25 largest manufacturing industries by employment in the five-county Schoolcraft College sub-region. [8] Many key industries grew significantly in the past five years. Industrial Machinery Manufacturing, Motor Vehicle Manufacturing, and Plastics Product Manufacturing in particular experienced significant growth based on percentage change. In actual numbers of jobs, the largest growth was in Motor Vehicle Parts Manufacturing and Motor Vehicle Manufacturing. While many of the manufacturing industries show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies in these industries.

Employment in Key Manufacturing Industries

Industry	2015 Jobs	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020	
Motor Vehicle Parts Manufacturing	69,219	18,016	-21%	20,936	43%	10,293	-15%
Motor Vehicle Manufacturing	39,159	9,651	-20%	13,644	53%	8,761	-22%
Metalworking Machinery Manufacturing	18,555	1,083	-6%	5,005	37%	2,010	-11%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	13,925	537	-4%	3,815	38%	426	-3%
Plastics Product Manufacturing	11,373	968	-8%	3,740	49%	646	-6%
Coating, Engraving, Heat Treating, and Allied Activities	6,855	1,302	-16%	1,321	24%	580	-6%
Printing and Related Support Activities	6,329	1,623	-20%	126	-2%	905	-14%
Other General Purpose Machinery Manufacturing	5,904	493	-8%	1,477	33%	558	-9%
Other Fabricated Metal Product Manufacturing	3,672	1,395	-28%	861	22%	773	-21%
Other Miscellaneous Manufacturing	4,844	129	-3%	1,197	33%	589	-12%
Iron and Steel Mills and Ferroalloy Manufacturing	4,854	220	5%	230	6%	577	-12%
Architectural and Structural Metals Manufacturin g	3,754	735	-16%	203	6%	164	-4%
Bakeries and Tortilla Manufacturing	2,773	1,258	-31%	299	9%	367	-13%
Engine, Turbine, and Power Transmission Manufacturing	3,616	62	-2%	444	14%	181	-5%
Medical Equipment and Supplies Manufacturing	3,842	315	9%	703	28%	22	-1%
Navigational, Measuring, Electromedical and Control Instruments Manufacturing	3,186	64	2%	1,469	-35%	80	-3%
Forging and Stamping	2,519	549	-18%	255	10%	124	-5%
Industrial Machinery Manufacturing	2,154	757	-26%	1,148	75%	80	-4%
Semiconductor and Other Electronic Component Manufacturing	2,088	600	-22%	591	31%	650	-31%
Beverage Manufacturing	2,708	372	16%	151	-6%	124	-5%
Motor Vehicle Body and Trailer Manufacturing	2,178	73	-3%	531	33%	548	-25%
Cement and Concrete Product Manufacturing	1,328	833	-39%	883	-30%	181	-14%
Converted Paper Product Manufacturing	1,920	204	-10%	488	31%	40	-2%
Manufacturing and Reproducing Magnetic and O ptical Media	376	1,621	-81%	7	0%	361	-96%
Paint, Coating, and Adhesive Manufacturing	2,677	722	37%	365	32%	71	-3%

[8] These industries are by4-digit NAICS code.

Among these manufacturing industries, average earnings vary widely, from $23,139 a year for Bakeries and Tortilla Manufacturing, to $112,344 a year for Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing. The average earnings above the regional average in manufacturing industries ($88,932) are highlighted in orange.

Establishments and Earnings in Key Manufacturing Industries

Industry	2015 Jobs	Average Earning	Establishments
Motor Vehicle Parts Manufacturing	69,219	$78,571	412
Motor Vehicle Manufacturing	39,159	**$92,210**	49
Metalworking Machinery Manufacturing	18,555	**$71,282**	666
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	13,925	$60,193	640
Plastics Product Manufacturing	11,373	$53,922	163
Coating, Engraving, Heat Treating, and Allied Activities	6,855	$50,181	237
Printing and Related Support Activities	6,329	$51,518	394
Other General Purpose Machinery Manufacturing	5,904	$78,329	224
Iron and Steel Mills and Ferroalloy Manufacturing	4,854	$84,980	29
Other Miscellaneous Manufacturing	4,844	$54,814	301
Architectural and Structural Metals Manufacturing	3,754	$59,264	193
Engine, Turbine, and Power Transmission Equipment Manufacturing	3,616	$81,567	33
Other Fabricated Metal Product Manufacturing	3,672	$59,362	135
Medical Equipment and Supplies Manufacturing	3,842	$65,612	198
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	3,186	$75,549	155
Forging and Stamping	2,519	$69,238	63
Bakeries and Tortilla Manufacturing	2,773	$23,139	171
Beverage Manufacturing	2,708	$50,536	46
Semiconductor and Other Electronic Component Manuf acturing	2,088	$62,305	60
Paint, Coating, and Adhesive Manufacturing	2,677	**$91,549**	45
Motor Vehicle Body and Trailer Manufacturing	2,178	**$102,032**	34
Industrial Machinery Manufacturing	2,514	$75,369	101
Aerospace Product and Parts Manufacturing	2,081	$71,901	29
Converted Paper Product Manufacturing	1,920	$46,780	57
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	1,508	**$112,344**	31

Occupation Analysis

For the sub-region, the counties' top occupations by employment include Office and Administrative Support Occupations, Sales and Related Occupations, and Production Occupations.[9] The median hourly earnings range from $10.12/hour for Food Preparation and Serving Related Occupations, to $46.55/hour for Management Occupations.

Occupation Mix

Occupation	2015 Employment	% of Total Employment	Median Hourly Earning
Office and Administrative Support Occupations	321,877	14.77%	$16.47
Sales and Related Occupations	216,319	9.93%	$16.62
Production Occupations	202,701	9.30%	$17.73
Food Preparation and Serving Related Occupations	170,474	7.82%	$10.12
Healthcare Practitioners and Technical Occupations	133,839	6.14%	$36.76
Transportation and Material Moving Occupations	122,742	5.63%	$16.39
Management Occupations	116,371	5.34%	$46.55
Education, Training, and Library Occupations	103,276	4.74%	$27.33
Business and Financial Operations Occupations	112,566	5.17%	$31.05
Personal Care and Service Occupations	78,001	3.58%	$10.30
Architecture and Engineering Occupations	84,131	3.86%	$39.98
Installation, Maintenance, and Repair Occupations	78,816	3.62%	$20.88
Building and Grounds Cleaning and Maintenance Occupations	71,713	3.29%	$11.59
Healthcare Support Occupations	73,218	6.14%	$36.76
Construction and Extraction Occupations	76,803	3.52%	$22.69
Computer and Mathematical Occupations	68,603	3.15%	$35.78
Protective Service Occupations	35,062	1.61%	$20.66
Arts, Design, Entertainment, Sports, and Media Occupations	36,169	1.66%	$21.60
Community and Social Service Occupations	28,130	1.29%	$20.65
Legal Occupations	19,040	0.87%	$39.06
Life, Physical, and Social Science Occupations	17,951	0.82%	$24.93
Military occupations	8,737	0.40%	$18.54
Farming, Fishing, and Forestry Occupations	2,334	0.11%	$13.48

[9] These occupations are by 2-digit SOC code (Standard Occupational Classification System).

Occupations in the Manufacturing Sector

The table below shows 2015 employment of each occupation within the Manufacturing Sector. It is worth noting, but not surprising, that more than half (59%) of Production Occupations are within Manufacturing industry.

Regional Occupations in Manufacturing

Occupation	2015 Employment in Manufacturing	% of Total Employment in Manufacturing
Production Occupations	148,271	59%
Architecture and Engineering Occupations	28,411	11.3%
Office and Administrative Support Occupations	15,156	6.0%
Management Occupations	13,976	5.6%
Installation, Maintenance, and Repair Occupations	10,749	4.3%
Transportation and Material Moving Occupations	10,094	4.0%
Business and Financial Operations Occupations	8,095	3.2%
Sales and Related Occupations	6,008	2.4%
Construction and Extraction Occupations	3,281	1.3%
Computer and Mathematical Occupations	3,169	1.3%
Arts, Design, Entertainment, Sports, and Media Occupations	2,245	0.3%
Building and Grounds Cleaning and Maintenance Occupations	672	0.3%
Life, Physical, and Social Science Occupations	561	0.2%
Food Preparation and Serving Related Occupations	363	0.1%
Healthcare Practitioners and Technical Occupations	176	0.1%
Protective Service Occupations	128	0.1%
Farming, Fishing, and Forestry Occupations	70	0.0%
Legal Occupations	72	0.0%

Top Occupations in the Manufacturing Sector

The following table displays the top 20 occupations that are most often required to staff manufacturing companies in the Schoolcraft College region.[10] Median hourly earnings for these occupations range from $12.33 at the low end for Laborers and Material Movers, Hand to $53.06 at the high end for Industrial Production Managers. While many of the occupations show an employment decline over the next five years, it should be noted that the model used to determine projected growth is largely dependent on past trends. Thus, it is likely that decline that occurred during the great recession may be skewing the actual numbers. Future trends should continue to be monitored through periodic contact with companies where these occupations are represented.

Top 20 Occupations in the Manufacturing Sector

Occupation	2015 Employment	Change, 2005-2015		Change, 2010-2015		Projected Change, 2015-2020		Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	48,044	9,722	-17%	14,307	42%	8,046	-17%	$17.00
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	11,599	3,076	-21%	2,618	29%	2,038	-18%	$16.94
Mechanical Engineers	11,299	856	-7%	3,538	46%	1,522	-13%	$44.90
Machinists	11,242	613	-5%	3,244	41%	595	-5%	$19.80
Industrial Engineers, Including Health and Safety	8,866	867	-9%	2,624	42%	1,242	-14%	$41.38
Miscellaneous Production Workers First-	8,768	1,798	-17%	1,710	24%	1,005	-11%	$13.76
Line Supervisors of Production and Operating Workers	8,467	1,591	-16%	1,831	28%	1,060	-13%	$29.70
Inspectors, Testers, Sorters, Samplers, and Weighers	6,736	1,216	-15%	1,517	29%	784	-12%	$16.12
Tool and Die Makers	6,117	802	-12%	1,870	44%	759	-12%	$27.27
Industrial Machinery Installation, Repair, and Maintenance Workers	5,916	346	-6%	1,680	40%	490	-8%	$26.01
Laborers and Material Movers, Hand	5,378	1,521	-22%	645	14%	571	-11%	$12.33
Welding, Soldering, and Brazing Workers	5,158	793	-13%	1,182	30%	514	-10%	$18.06
Computer Control Programmers and Operators	5,126	266	-5%	1,520	42%	174	-3%	$19.65
Forming Machine Setters, Operators, and Tenders, Metal and Plastic	4,970	880	-15%	1,274	34%	787	-16%	$16.68
Sales Representatives, Wholesale and Manufacturing	4,548	674	-13%	810	22%	494	-11%	$29.59
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastics	4,512	951	-17%	1,249	38%	686	-15%	$13.79
Industrial Production Managers	4,472	585	-12%	1,126	34%	610	-14%	$53.06
Engineering Technicians, Except Drafters	3,664	625	-15%	828	29%	538	-15%	$26.66
General and Operations Managers	3,245	583	-15%	591	22%	322	-10%	$48.31
Shipping, Receiving, and Traffic Clerks	2,846	597	-17%	523	23%	295	-10%	$15.35

[10] Occupations are by 4-digit SOC code.

Industry and Occupation Connections in Manufacturing Sector

Although key manufacturing industries are highly diversified, they do share some common workforce requirements.[11] The following table identifies the top occupations with corresponding key industries. The top occupations all have Motor Vehicle Parts Manufacturing, Motor Vehicle Manufacturing, and Metalworking Machinery Manufacturing industries listed.

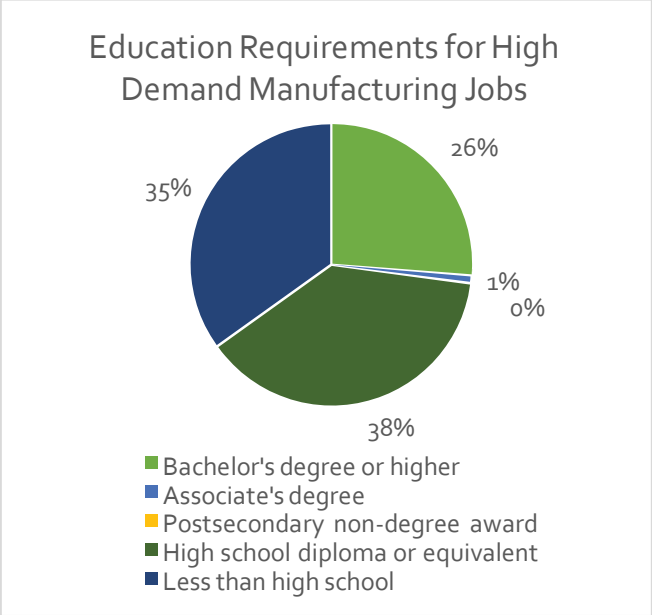
Connection Between Top Occupations and Key Industries in Manufacturing Sector

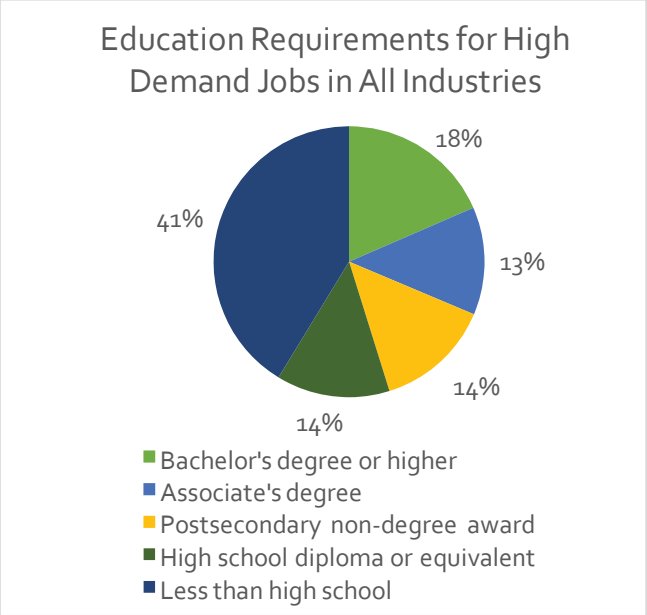
Top Occupations	Key Industries
Miscellaneous Assemblers and Fabricators	• Motor Vehicle Parts Manufacturing • Motor Vehicle Manufacturing • Metalworking Machinery Manufacturing • Plastics Product Manufacturing
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	• Motor Vehicle Parts Manufacturing • Motor Vehicle Manufacturing • Metalworking Machinery Manufacturing • Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing • Plastics Product Manufacturing
Mechanical Engineers	• Motor Vehicle Parts Manufacturing • Motor Vehicle Manufacturing • Metalworking Machinery Manufacturing • Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing
Machinists	• Motor Vehicle Parts Manufacturing • Motor Vehicle Manufacturing • Metalworking Machinery Manufacturing • Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing
Industrial Engineers, Including Health and Safety	• Motor Vehicle Parts Manufacturing • Motor Vehicle Manufacturing • Metalworking Machinery Manufacturing • Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing • Plastics Product Manufacturing

[11] Occupations are by 4-digit SOC codes and industries are by 4-digit NAICS codes.

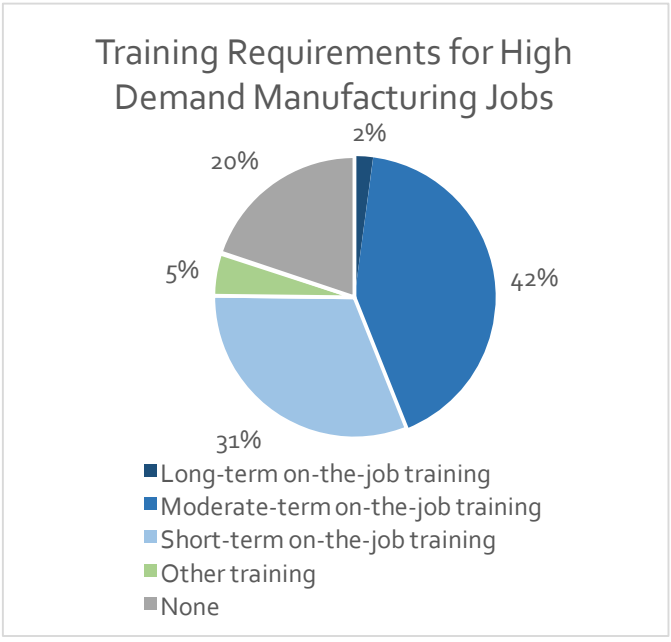
Education and Training For High Demand Jobs

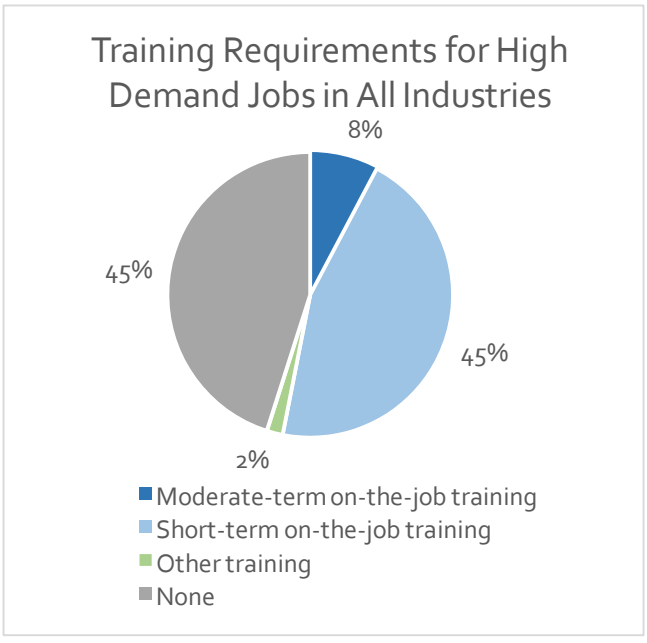
The manufacturing sector has unique education and training requirements compared to the other industry sectors. Among high demand manufacturing jobs in the five-county Schoolcraft College region, 38% require a high school diploma or equivalent, while only 14% of the jobs among all industry sectors have the same requirement.[12]





The most often required training in the manufacturing sector is moderate-term on-the-job training (42%), followed by short-term on-the-job training (31%) and other training (5%); while short-term on-the-job training and no training have the largest shares (45%, respectively) in training requirements among all industries.





[12] Occupations with the highest projected job growth from 2014-2019 are included in this analysis. These occupations are with 5-digit SOC code. EMSI Analyst 2015.

Skill Requirements of Growing Manufacturing Occupations

The following table displays the manufacturing occupations with highest growth during 2014-2015 in the five-county Schoolcraft region. The table on next page shows the top skills required for top 5 manufacturing jobs with highest growth during 2014-2015 (bolded).

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	2014 Jobs	2015 Jobs	Change, 2014-2015	
Miscellaneous Assemblers and Fabricators	**44,467**	**48,044**	**3,577**	**8%**
Machinists	**10,759**	**11,242**	**483**	**4%**
Industrial Machinery Installation, Repair, and Maintenance Workers	**5,545**	**5,916**	**371**	**7%**
Miscellaneous Production Workers	**8,409**	**8,768**	**359**	**4%**
Industrial Engineers, Including Health and Safety	**8,523**	**8,866**	**343**	**4%**
First-Line Supervisors of Production and Operating Workers	8,128	8,467	339	4%
Tool and Die Makers	5,799	6,117	318	5%
Inspectors, Testers, Sorters, Samplers, and Weighers	6,446	6,736	290	4%
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	11,312	11,599	287	3%
Computer Control Programmers and Operators	4,839	5,126	287	6%
Mechanical Engineers	11,022	11,299	277	3%
Laborers and Material Movers, Hand	5,121	5,378	257	5%
Welding, Soldering, and Brazing Workers	4,925	5,158	233	5%
Industrial Production Managers	4,325	4,472	147	3%
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	4,366	4,512	146	3%
Electricians	1,685	1,822	137	8%
Maintenance and Repair Workers, General	2,681	2,809	128	5%
Industrial Truck and Tractor Operators	1,774	1,884	110	6%
Shipping, Receiving, and Traffic Clerks	2,737	2,846	109	4%
Forming Machine Setters, Operators, and Tenders, Metal and Plastic	4,862	4,970	108	2%
Painting Workers	2,296	2,400	104	5%
General and Operations Managers	3,148	3,245	97	3%
Engineering Technicians, Except Drafters	3,568	3,664	96	3%
Engine and Other Machine Assemblers	1,545	1,640	95	6%
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1,614	1,700	86	5%

The table below displays the top skills required for the top 5 manufacturing jobs with highest growth during 2014-2015.[13] Based on the data from real-time job postings compiled by EMSI, the top skills that appear in postings for manufacturing positions are Engineering, Projects, System, Communication, and Designing. Analysis and Technology also rank high. [14]

Top 50 In-Demand Skills

Skill	% of Postings with Skill		Skill	% of Postings with Skill
Engineering	**47%**		Microsoft office	10%
Projects	**38%**		Health	10%
System	**35%**		Machine	10%
Communication	**35%**		Maintenance, Repairs, and Operations	10%
Designing	**34%**		Medical	9%
Analysis	26%		Statistical	9%
Technology	24%		Six Sigma	9%
Safety	21%		Research	9%
Report	20%		Chemical Reaction	8%
Specification (Technical Standard)	16%		Automation	8%
Industrial	16%		Maintenance	8%
Innovation	16%		Tools	8%
Planning	15%		Drawings	7%
Computer	14%		Quality Assurance	7%
Documentation	14%		Repair	7%
Science	14%		Methodology	6%
Software	14%		Machining	6%
Testing	13%		Automotive Industry	6%
Project Management	12%		Electricity	6%
Documents	12%		Interpreting	6%
Evaluation	12%		Quality Control	6%
Machines	12%		Meeting	6%
Manufacturing	11%		Microsoft PowerPoint	6%
Continuous Improvement Process	11%		Energy	6%
Lean	10%		Tooling	6%

[13] 4-digit SOC code. EMSI Analyst 2015.
[14] National data. EMSI Analyst 2015.

Nationally, the unique skills that are more concentrated in the top 5 manufacturing occupations include Lean, Continuous Improvement Process, Evaluation, Industrial, and Computer.

Top Unique Skills

Skill	% of Skill Postings in Top 5 Manufacturing Occupations	% of Postings with Skill
Lean	75%	10%
Continuous Improvement Process	69%	11%
Evaluation	39%	12%
Industrial	37%	16%
Computer	31%	14%
Designing	30%	34%
Specification (Technical Standard)	29%	16%
Engineering	29%	47%
Safety	26%	21%
Report	23%	20%

SURVEY ANALYSIS

As part of the Skill Gap Analysis work, Thomas P. Miller & Associates worked with Schoolcraft College to create and distributed a business demand survey. Schoolcraft College distributed the survey by email via Survey Monkey to their partner businesses. A total of 44 companies completed the survey. Following are the results of the survey with each section identifying the question, providing an account of how many respondents answered the question, and the results of the question.

KEY FINDINGS BY QUESTION

Q1. What is the name of your company? (Optional)

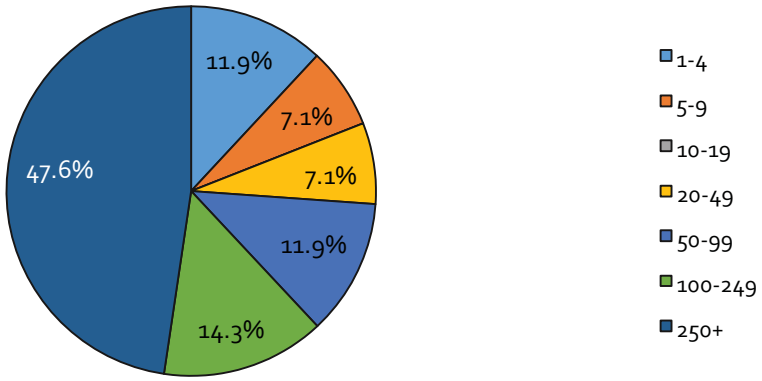
Of the 44 respondents, 32 provided the name of their company. Schoolcraft College had three responses, two were from Inteva Products, Lincoln Park Boring Company, and nanoMAG, LLC respectively and four were from Roush Industries, and the remaining 19 respondents were from separate, unique companies. Below is the list of companies that provided their company name.

Table 1: Company Names	
Company Name	Response Count
AK Steel Corporation	1
AlphaUSA	1
Ann Arbor Welding Supply	1
Belanger, Inc.	1
BELFOR Property Restoration	1
Delta Gear / Delta Research	1
ECCO Tool	1
Gonzalez Design Group	1
Hanon Systems	1
Inteva Products	2
KCS Advanced Machining Services	1
Krauss Maffei	1
Lincoln Park Boring Company	2
MetroStamp	1
Miller Electric	1
nanoMAG, LLC	2
OTC Daihen	1
Performance Machinery, LLC	1
Process Automation Systems	1
Rofin-Sinar, Inc.	1
Roush Industries	4
Schoolcraft College	3
Stoneridge, Inc.	1
Three M Tool	1

Q2. How many individuals does your company currently employ?

Respondents were asked how many individuals were currently employed at their company. Of the 44 total responses, 20, or 47.5% of respondents indicated that their companies employ more than 250 employees, while the other respondents had a more evenly split number of total employees.

Figure 1. Employee Size



Q3. What is your company's NAICS code (i.e. 333517 – Machine Tool Manufacturing or 236111 Plastics Bag and Pouch Manufacturing) If unknown, answer N/A.

Respondents were asked if they knew their company's NAICS code. Most of the respondents responded with N/A with the exception of the below responses:

- 336340 – Motor Vehicle Brake System Manufacturing
- 332710 – Machine Shops
- 541712 – Research and Development – Physical, Engineering, Life Sciences (except Biotechnology)
- 333517 – Machine Tool Manufacturing (2 responses)
- 332710 – Machine Shops
- 336370 – Motor Vehicle Metal Stamping

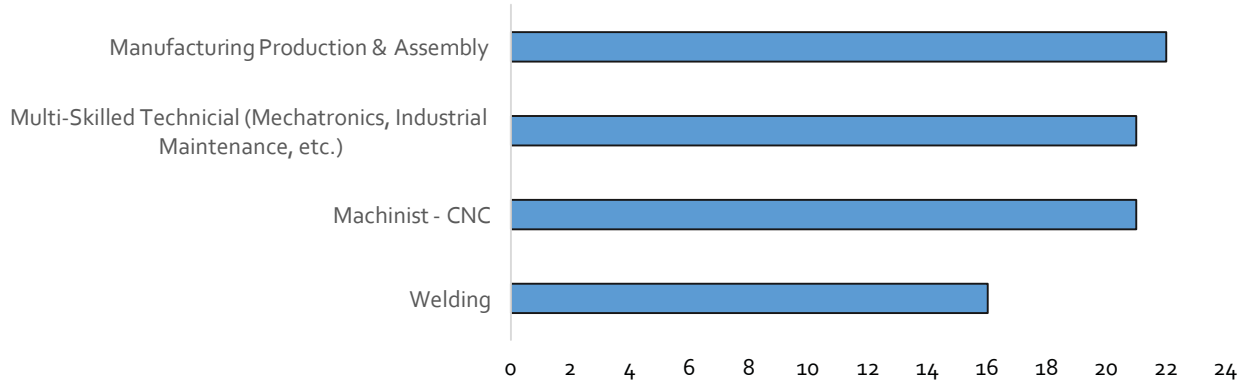
Other responses included:

- Manufacturing in multiple markets, CNC machining in my division
- N/A (steel producer)
- N/A (Tier One Auto Supplier)

Q4. Identify all the programs or focus areas that your company would be interested in.

The survey asked respondents to identify all programs or focus areas that their company would be interested. Of the total 40 respondents, 22, or 55%, expressed interest in a Manufacturing Production & Assembly program, followed by a tie at 21 respondents each for Multi-Skilled Technical and Machinist – CNC.

Figure 2. Programs or Focus Areas



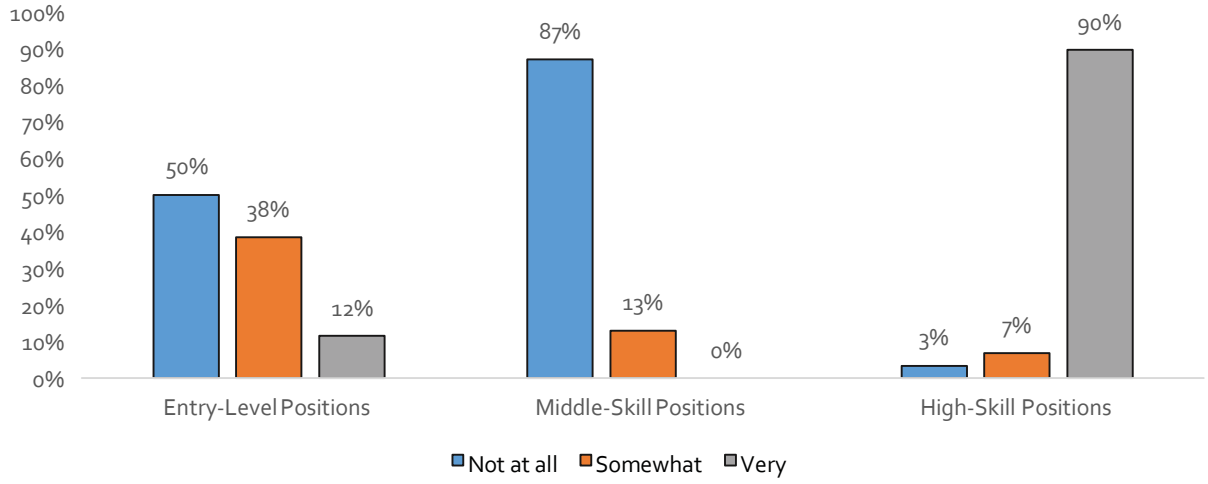
For the Other Manufacturing Programs, respondents suggested the following programs or focus areas:

- Sheet Metal Stamping
- Plastic Process Engineers
- CMM Operator
- CAD/Design/Engineering
- Electronics Technology and Laser Technology
- Metallurgy, Laboratory Technician (chemistry, mechanical, metallurgical)
- Metal Forming Technology
- Plastics
- Met Lab
- Fluedics / PLC / Electronics / Injection Molding
- Manual Machining, Robotics
- Project Management, Quality Technician
- Quality, Tool & Die, Electrical

Q5. How difficult is it for your company to fill your manufacturing vacancies?

Respondents were asked to rate how difficult it is for their companies to fill manufacturing vacancies at the entry-level, middle-skill, and high-skill positions. Of the 36 total respondents, 90%, or 26 respondents indicated that it is very difficult to fill high-skill positions. A majority of the respondents indicated that it was not at all difficult to fill middle-skill and entry-level positions. It appears to be more difficult to fill entry-level positions than middle-skill positions.

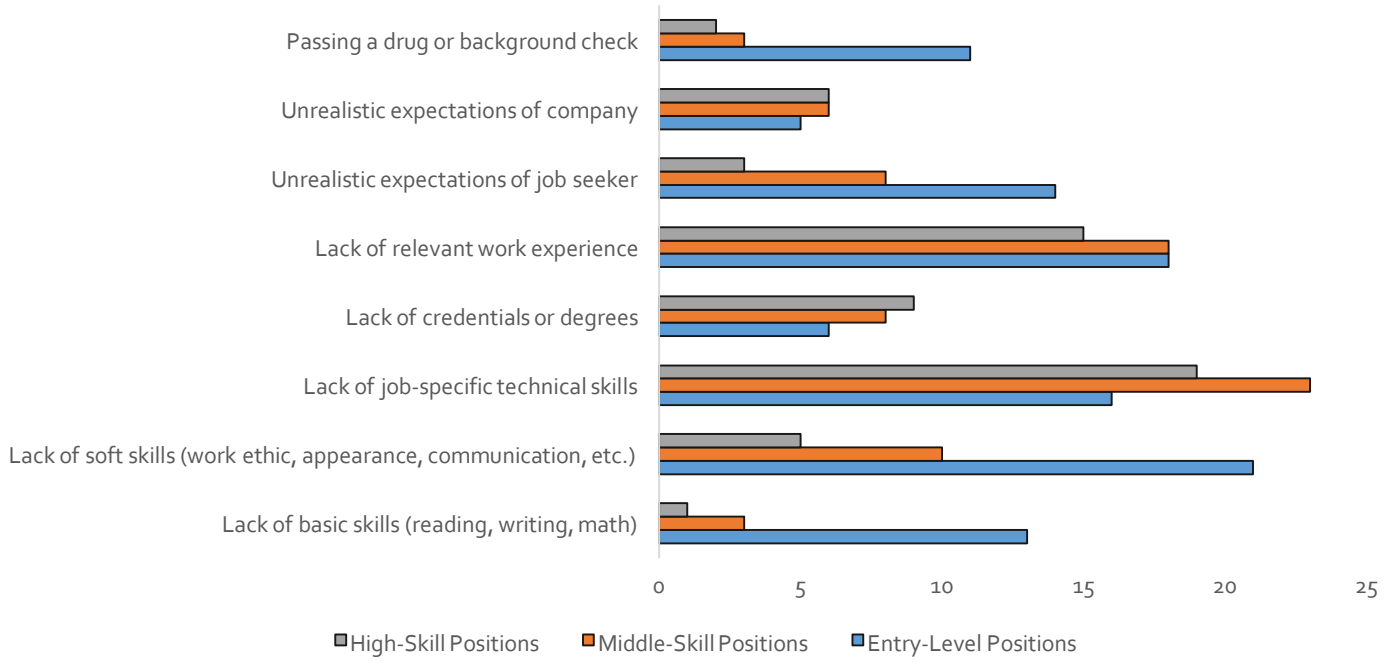
Figure 3. Filling Manufacturing Vacancies



Q6. What are the most significant barriers for your company to fill entry-level, middle-skill, and high-skill manufacturing positions? Select all that apply.

Respondents were asked what the most significant barriers are for their company to fill entry-level, middle-skill, and high-skill manufacturing positions. For entry-level positions, the most common barrier was a lack of soft skills (work ethic, appearance). For middle- and high-skill positions, the largest barrier was a lack of job-specific technical skills.

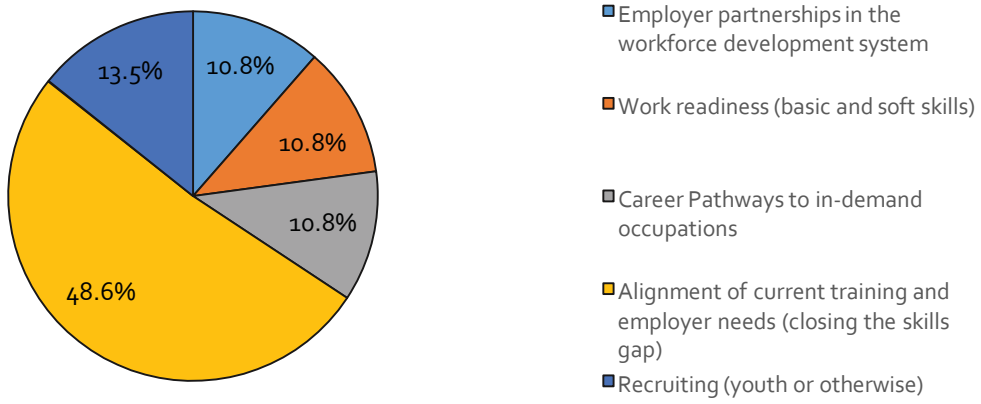
Figure 4. Barriers to Filling Positions by Level



Q7. What do you see as the highest priority in addressing area workforce needs?

Respondents were asked what they saw as the highest priority in addressing workforce needs. Of the 37 that responded to this question, 48.6% chose "alignment of current training with employer needs (closing the skills gap)." Following that, 13.5%, or 5 respondents, selected recruiting (youth or otherwise), followed by a tie with 4 respondents each choosing Career Pathways to In-Demand Occupations, Work Readiness (basic and soft skills) and Employer Partnerships in the Workforce Development System.

Figure 5: Highest Priority in Workforce Needs



Q8. What percentage of new hires will be due to growth or replacement of retiring workforce within the next 12 months?

Respondents were asked what percentage of new hires will be due to growth or replacement of the retiring workforce within the next 12 months. The most common responses overall 5-9% due to replacement/retiring workforce. For growth, the most common response was 10-14%.

Figure 6a: Growth

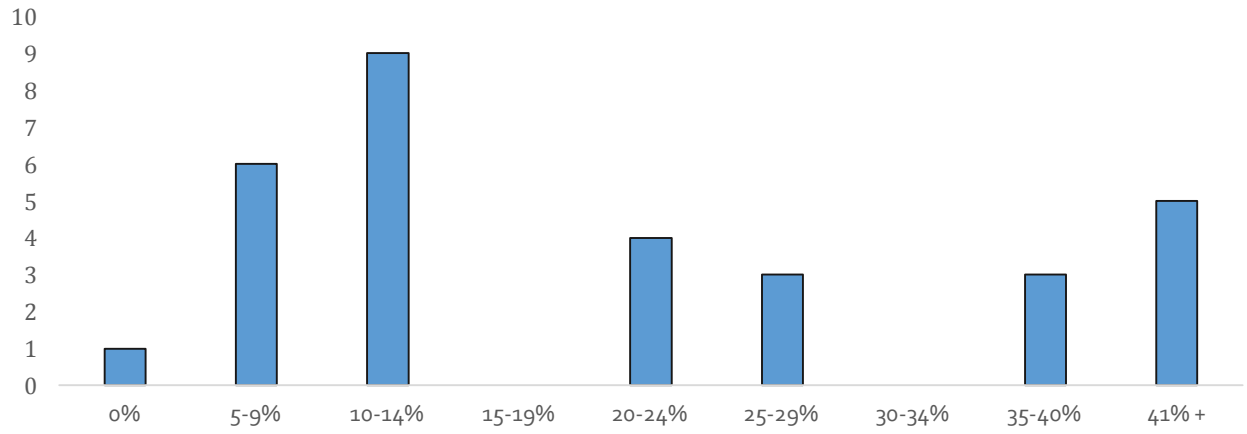
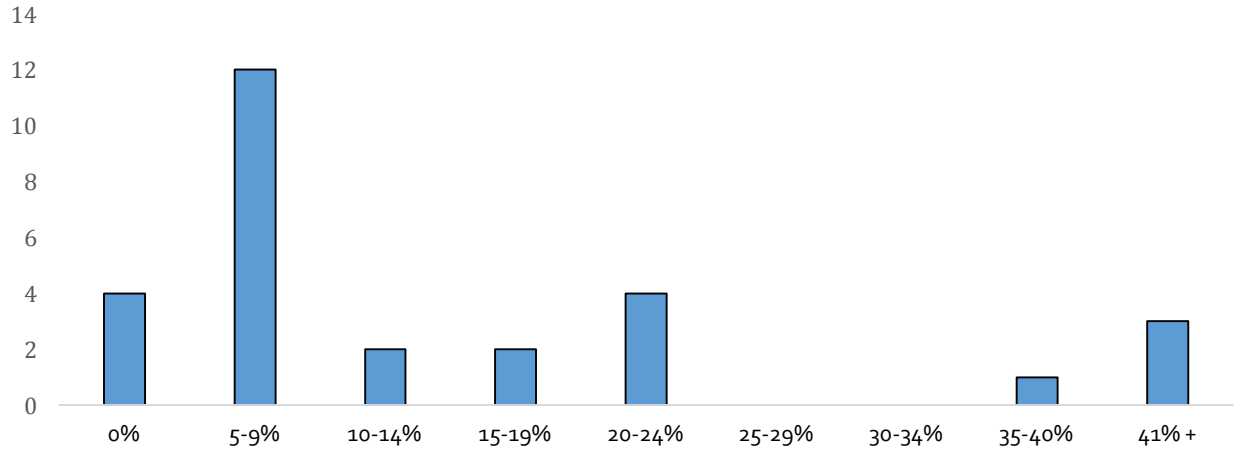


Figure 6b: Replacement / Retiring Workforce



Q9. How many employees needing some form of technical training will you hiring in the next 12 months and 1-3 years?

Respondents were asked how many employees needing some form of technical training they will be hiring in the next 12 months and 1-3 years. Within the next 12 months, most employers (12 total) expect to hire 1-5 employees that will need technical training. For the next 1-3 years, most respondents (11) indicated that they will be hiring 1-5 new employees that will need technical training.

Figure 7a: 12 Months

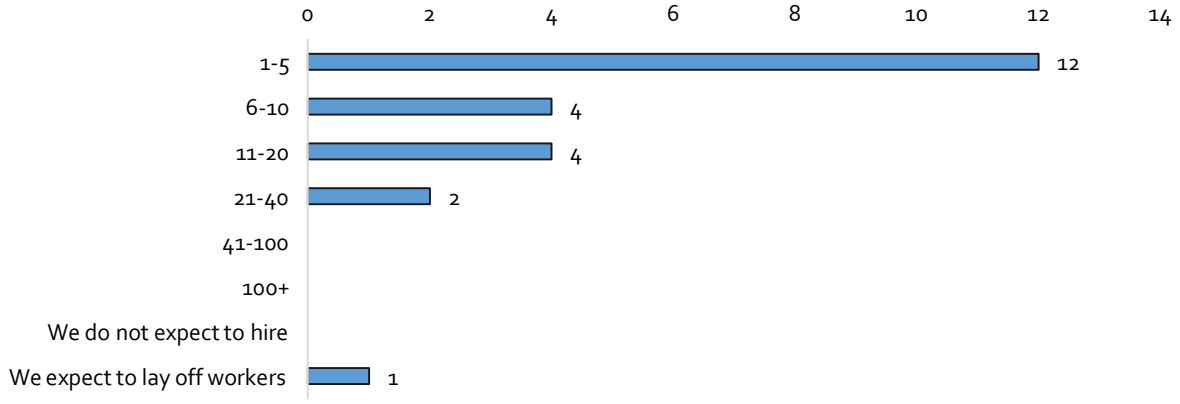
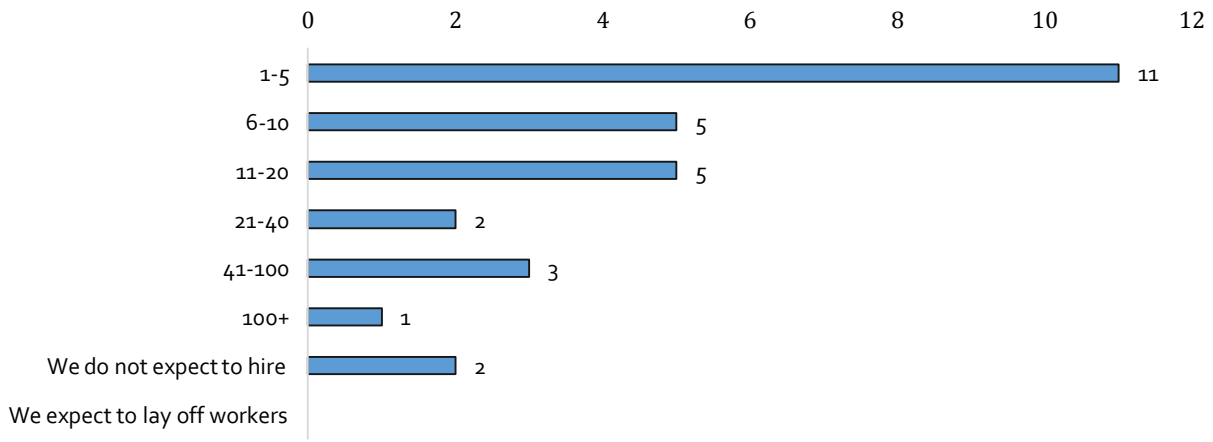


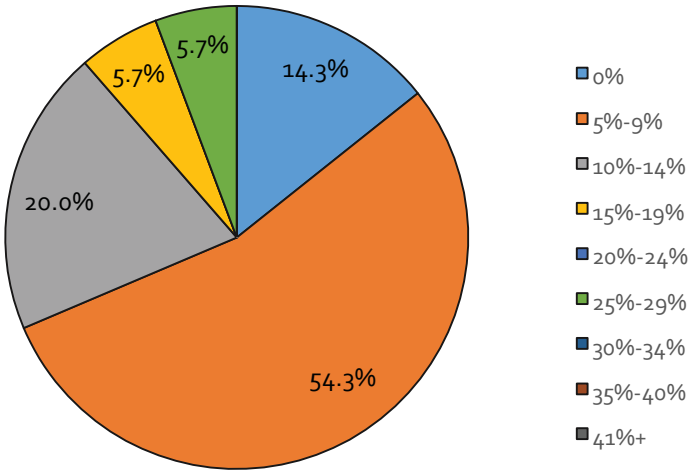
Figure 7b: 1-3 Years



Q10. What do you estimate your annual employee turnover rate is?

The survey asked respondents what they estimated their annual employee turnover rate is. Of the 35 total respondents, 19 (54.3%) responded that they estimated their turnover rate is somewhere between 5-9%, followed by 20% of respondents with an estimated turnover rate of 10-14%.

Figure 8: Annual Employee Turnover Rate Estimate



Q11. Which types of technical training/skills does your company require? Examples include: Maintenance, Repair and Operations, Inspection, Machines, etc.

Respondents were asked which type of technical training/skills their company requires. A large majority of respondents indicated CNC or Machinist-related skills. **Table 2** below provides all of the responses.

Table 2: Required Technical Training / Skills
Responses
Advanced CNC Machining and Metrology CMM
All skills associated with manufacturing a complex product such as high-strength steel for the transportation industry (land, air, marine)
Automotive Technician, Maintenance, Engine Building, Welding/Fabrication, Instrumentation/Wiring
Basic machine skills with knowledge of machine features
CAD
CNC Machine Operator, Competence with Measuring Equipment, CMM Operator
CNC Machining
CNC Machinist, EDM Operator
CNC Programmer
CNC, CMM, Welding
Conventional machine skills which can be upgraded to CNC Programming and Blueprint Reading in reference to Geometric Tolerances
Depends on the job
Electrical, Electronics, Laser Technology
Light Assembly, Machine Shop, Welding
Machine Operation, Tool Setting, Workplace Organization, Operating Test Equipment, Report Generation, Computer Skills
Machines – Injection Molding
Machining
Machining, Welding, Fabrication, Painters, Mechanics, Quality Inspection
Maintenance
Maintenance (Mech, Hyd, Elect), Quality Inspection, CNC Programming
Maintenance Repair
Maintenance, Inspection, Machine Operators, CNC Operators, Project Managers
Manufacturing, Machining, CNC, Maintenance, Testing
Mechatronics
Met Lab and General Manufacturing
Most entry-level positions do not require any type of certificate or degree. These things are preferred but not required. On-the-job training is where we learn. There are specific things that potential candidates could learn that would help them progress quicker though
Multiaxis CNC Machining, Programming, Set-Up Quality and Inspection
Operations, Inspection, Machining, Catia
Product knowledge and people skills
Repair and Operations
Tooling, Processing, Project Management
We are not hiring, so we do not need these skills
Welding
Writing, presentation, project management

Q12. What specific manufacturing occupations / job titles are the most challenging to fill?

Respondents were asked what the most challenging occupations or job titles were the **most** challenging to fill. The most common response was CNC-related positions such as Precision CNC Machinists, Programmers and Boring Mill Machinists. **Table 3** below shows all responses.

Table 3: Most Challenging Occupations / Job Titles to Fill
Responses
Boring Mill Operators
Catia designers, Machinists
CMM Inspection; Large Boring Mill
CNC Boring Mill Machinist / Operator capable of non-production work.
CNC Machinist, CNC Programmer, and CMM Programmer
CNC Programmers
Cold Heading
Competent Metallurgical, Mechanical, Chemical Lab Technicians, Quality Control Inspectors
Controls Engineers and Robot Programmers
Die Maker / Metal Forming Tech
Electrical Maintenance
Grind Hands, CNC Programmers
Lathe Operator
Machinist
Machinists, Mechanics, and Skill-Specific Welders
Manager level (operations), CNC, CMM, Fabrication & Welding
Manufacturing Engineer
Mold Makers, EDM Operators
Operators
People with grinding skills
Plastics Processing
Precision CNC Machinist
Project Engineer
Project Manager
Robot Weld Technicians
Service Technician
Technical with Travel
Test Engineers
Toolmaker, Project Manager, Quality Engineer

Q13. What are your primary education and training needs for current or potential employees?

Respondents were asked what their primary education and training needs are for current or potential employees. **Table 4** below shows all responses. The responses vary from high school graduate, hands-on experience, to associate degrees.

Table 4: Primary Education and Training Needs for Current / Potential Employees
Responses
2 Years Minimum or Relevant Experience
2-Year Associates with Technical Manufacturing Trade, Willing to Travel
Associates Degree minimum and/or 2 years of related experience
Associates' Degree, Experience with Test Setup and Electronics, Control Software (e.g. LabVIEW)
Basic electronics understanding but usually no degree is necessary. Some specific training to understand programming ladder logic or robot programming (on certain robot models) would be a huge leg up on anyone else starting out with no experience
Blueprint Reading
Certifications or Associates Degree
Continued education in their specific fields
Electronics / Digital Literacy
Engineering Project Management
Equipment
Good Decision Making Ability, Familiarity with Cutting Tools and Inspection Tools
Hands-on experience; being able to related education to real-world issues
Hands-On Weld Training, Product Knowledge, People Skills
High School and Machinist Training
High School Education, Basic Common Sense and Mechanical Aptitude
High School Grad
Logic Assessment
Math
Math skills, Experience running CNC Machines and Mastercam Training/Education. Most preferably – all three
On-the-job Training
Practical Training both basic and intermediate levels for lab techs and quality control, engineering techs
Process, Troubleshooting, Mechanical and Electrical Aptitude
Reading Prints – Using Inspection Tools
Short-Term Training to Enhance Skills
Technical Safety (ongoing) and professional development (internal to departments)
Technical Training, Associates, Bachelors
Technical Training; credentials with general education courses included.
Welding Education
Welding Skills
Work Experience in the Areas

Q14. What is the average wage level paid to those within your company in Entry-Level, Middle-Skill, and High-Skill Positions?

Respondents were asked what the average wage paid was in their company by entry-level, middle-skill, and high-skill positions. Overall, entry-level positions were paid under $15 per hour, middle-skill positions were mostly at $12-$20 per hour, and high-skill positions were at $21 per hour and above.

Figure 9: Average Wage by Skill Level

For the "other" section, respondents provided the following comments:

- For large mill operators, we pay $29+.
- Up to $32 per hour.
- Grinder and Gear Knowledge earn up to $35 per hour.

Q15. What industry-recognized credentials associated with manufacturing does your company currently utilize and value? (I.e. AWS, NIMS, Siemens, PMMI, MSSC – CPT, or Certified Production Technician)

Of the 15 total responses, 6, (40%) of respondents indicated that they currently utilize and value AWS, 3 responded with none and 2 respondent with all of the credentials listed.

Table 5. Industry-Recognize Credentials
Responses
All (2 responses)
AWS (6 responses)
NIMS Siemens
AWS, SAE, SME, SAME, ASQ, PMP, CPM, MBA
None (3 responses)
None specifically, NIMS is usually good. Skill level evaluated during interview
Siemens is a big credential to have right now. Rockwell Safety Certification is a bonus (most facilities require this to allow work in the safety end of PLC programming, if you don't have it, the company will send you but it costs money and time away from the job). Basics in C++/C# Programming would be helpful in understanding most robot programming
TS Certified, ISO

Q16. How is your company currently partnering with Schoolcraft College?

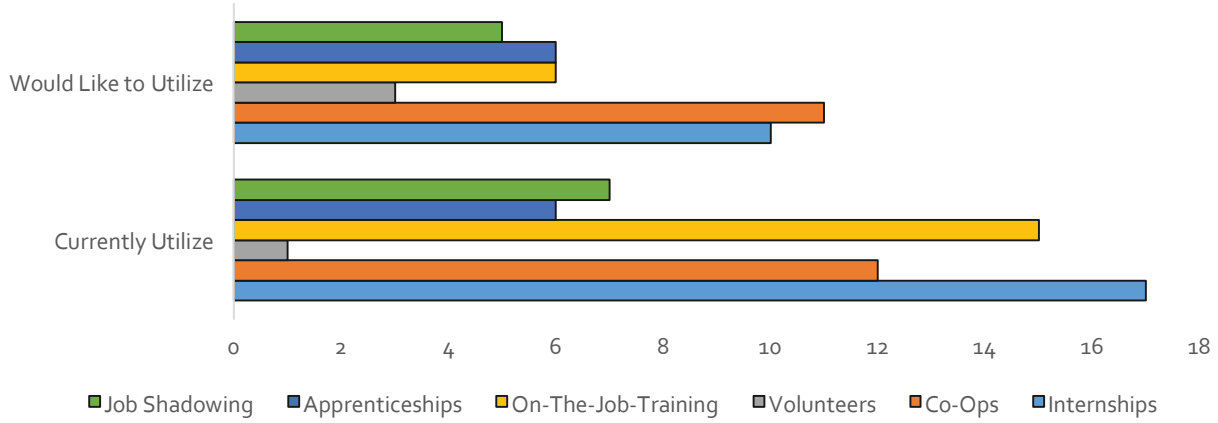
The respondents were asked how they are currently partnering with Schoolcraft College. The responses range from nothing to multiple methods including serving on the advisory board, partnering on curriculum design, and hiring graduates.

Table 6. Partnership with Schoolcraft College
Responses
Advisory Board (2 responses)
Advisory committee
Company has member on the curriculum advisory committee of a department in the school
Events, Machinists Program
I sit on the Advisory Board and have hired employees
Involved with the Industrial Council
Job Fair, Career Center
Livonia Industrial Council, Advisory Board, Kids on Campus, Manufacturing Day, and more
My company has employed many Schoolcraft students with some electronics experience
N/A (2 responses)
None. My single employee is a graduate of the industrial arts program
Not at all
Nothing yet
Plant Manufacturing Tour
Providing product to the welding lab and consultation
Recent acquaintance from trade show
Roush Machinist Training Program
Through previous event attendance and inclusion in similar events
We are Schoolcraft
We had students there for CNC & Mastercam, now looking to intern a student from there
We have designed a 2-year course that some of our employees are currently going through
We have hired multiple interns in the past and some have been retained as full-time employees.
We have sent employees to manufacturing courses from Basic Machining to Advanced Mastercam, currently we have one student in Basic Machining
We meet with them to discuss program curriculum and how it applies to the type of candidates we are seeking
Work with the Manufacturing Division for CNC
Working with Mr. Keyes in the machine shop and Ms. Cooley in Welding for entry-level positions so the students get practical, hands-on experience

Q17. Identify all experiential learning opportunities your company currently utilizes or would like to utilize.

Respondents were asked to identify **all** of the experiential learning opportunities that their company currently utilizes or would like to utilize. Overall, most employers utilize internships, followed by on-the-job training. Of the opportunities that employers would most like to utilize, respondents indicated they would be interested in co-ops and more internships.

Figure 10: Experiential Learning Opportunities



Q18. Do you have any additional questions/comments?

Table 7: Comments/Questions
Responses
I have heard about internships and courses based on internships or apprenticeships. I would like to know more about this. You have a current student who is a potential hire, however the ability to have him intern would allow us to make a decision based on his performance and learning

Q19. If you would like to see the results of this survey and be included in future M-CAM communications, please provide an email address below:

pblfc61@gmail.com pmosquera@daihen-usa.com bleonard@metrostamp.com slebeau@nanomag.us mel.koslowski@roush.com ron.radzilowski@aksteel.com admin@eccotool.com bkelley@gonzalez-group.com rick@linconlparkboring.com dlawrence@alphausa.com kris.munroe@roush.com paul@lincolnparkboring.com rleadley@schoolcraft.edu mimedwid@three-m.com Steven.Schlick@pa-ats.com bobs@delrecorp.com

Input Session Summary

Attendees

Eleven (11) participants attended the input session. Attendees were human resources recruiters, operations, and sales managers from the following companies.

Ackland Industries	ROUSCH
Monroe Environmental Corporation	Trillium Staffing
NHK International	Williams International

Feedback on Infographic and Discuss Information Presented

Participants noted that for the future, it will be difficult to add positions because of the skills gap. The primary reason for this is because employers are struggling to fill positions and the timeline to train up employees in that skill level is time-consuming.

Shortages

Employers reported that they were seeing a shortage of almost every type of employee they wanted to hire – from mechanical engineers to shipping and receiving. Additionally, some employers are struggling to find basic machinists because younger workers want to do computerized or digitally-focused work. They may not be trained in the manual processes and are not interested in learning as they would rather do computerized work.

Other employers are seeing skills gaps in the types of employees they hire – students come in with welding certificates, but struggle with basic math skills and blueprint reading. Other skills that are lacking include Bridgeport, manual lathe, grinders, and legacy skills. Many employers expressed a need to create a national campaign to educate the public on manufacturing opportunities and speed up the process to recruit and train talent in the industry.

Talent Attraction Efforts

In order to address this problem, two of the companies have started apprenticeship programs. One of these programs admits students into the program after working at the company for one year with paid tuition. The current issue with this set up is initially getting them into the program and keeping them at the company for another year before investing in training for them.

Other efforts include starting new hires off with basic exposure to the skillset – blueprint reading, rotate to conventional mills and lathes, CNC lathes, and bench assembly. Employers are struggling to attract the younger generation to these programs, as anecdotally, they seem to be more attracted to "cool" manufacturing that is more digitized as opposed to manual. There is a strong need to build up high school programs to develop their skills and early interest.

Recognized Credentials

Many felt that credentials were expensive and that for specific quality areas – inspectors are required to be certified and employers are having trouble finding them. Others noted that they recognize the AS9100 welder certifications, flang spray, and AMD/EDM and their employees are trained and certified at the company, not beforehand.
Machinists, on the other hand, do not necessarily need certifications and many employers will test and assess the candidate during the interview. Employers were less concerned with national credentials and certifications. Essentially, employers are looking for a basic background and skill set as well as mechanical aptitude. They will then train the employees to their equipment, systems, and processes.

Additional Skills Gaps

Many employers reported that the second shift is very hard to find and that the lower the skill, the more "job-jumping" occurs. On the other hand, the higher the skill, the more stability. Older workers stay longer and younger workers are more likely to move around from job to job. Employers worry about apprentices switching jobs if the wages aren't initially high enough. Often, entry-level positions have a higher turnover because workers are leaving for an additional $1 an hour and sometimes less. They may leave for additional money, a different shift, or other benefits.

The overall qualities that employers are looking for are basic professionalism, employability skills, and good work ethic. Employers explained that it is turning into a "talent war" in which companies are engaging in bid wars over skilled talent, and therefore driving the wages up. Employers are having difficulty finding the next generation of talent and worried about the impending retirements, given that 80% of their current staff is over 45 years old.

Stakeholder Engagement: Schoolcraft and Others

Some of the employers are involved with the Machinist Training program at Schoolcraft. Others will be working with Schoolcraft on their plastics program but would be interested in more design and CAD focused programs and metrology. Low enrollment is a growing problem in running certain programs.

Some companies are working with high school faculty to spread the word about open positions and they are making progress but not fully addressing the problem. Monroe County does not have the same quality talent pool that Macomb County has, and often employers are looking for young talent specifically. Many employers need at least 60 new employees in the next 5 years. Employers reported that the current workforce and education system needs a better way to connect employers, community colleges, and other schools in order to have students do more career inspiration and exploration early on.

K-12 School Connections

Employers were asked if they have any connections with K-12 schools in the area. Some respondent that they have connections on a small scale, such as tours during manufacturing day. Others reported that it's difficult to get students under 18 into the facilities to learn about the career. Employers are required to limit the number of visitors to the facilities because of security and access to proprietary information. Many noted that they need to be more involved with advisory board and curriculum development. There was an interest in creating a welding curriculum that includes apprenticeships that are more hands-on.

Other suggestions to get the word out including a more direct marketing campaign to promote manufacturing, such as creating videos on CNC machining to show how exciting it can be (i.e. building roller coasters, racing, jet engines, etc.) At the high school level, employers recommended more support on interviewing skills and basic employability.

Job Fair Employer Feedback

TPMA performed informal interviews with several additional companies during down-times in the job fair that immediately followed the input session.

Key feedback included:

- The job fair was the only interaction with Schoolcraft for most of the employers in attendance, but they expressed interested in becoming more involved with the school. Most companies also did not have a connection to Michigan Works! One did, but did indicated they were not able to find potential applicants through that relationship.
- One employer indicated success with recruiting from outside of Michigan, particularly for higher skill positions.
- One company acknowledged that they are having difficulty finding talent in part because of an inability to compete with other companies on compensation.
- All companies expressed a concern over finding talent at all skill levels from entry-level production to experienced engineers.

Schoolcraft College

Regional Profile

M-CAM Michigan Coalition for Advanced Manufacturing

Wayne Oakland Macomb Livingston Washtenaw Lapeer St. Claire

About M-CAM

The Michigan Coalition for Advanced Manufacturing (M-CAM) brings together the state of Michigan, community college leaders, employers, workforce development agencies, and other community partners to create education and training programs that lead to employment. With the award of a $24.9 million U.S. Department of Labor grant, M-CAM is creating a 21st century workforce through the development of seamless and responsive career pathways, credentials that have labor-market value, and strategies that connect the needs of employers with training providers throughout Michigan.

M-CAM provides training opportunities in four key areas of advanced manufacturing:

- Welding/ Fabrication
- CNC Machining
- Multi-Skilled Technology / Mechatronics
- Production Operations

Job seekers will be able to earn various certificates, degrees, and credentials within these four areas.

Median Household Income

Michigan	Schoolcraft College Region	USA
$49,087	$71,125	$53,482

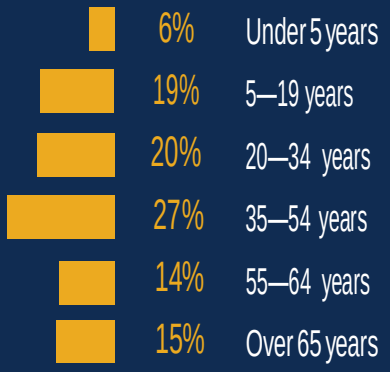
Employment

Major Industries

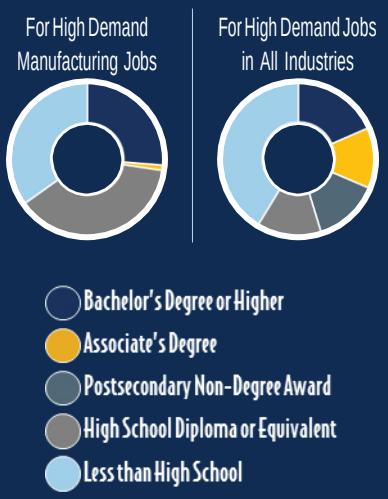
The People

Population 4,650,585

3% ↓ Decline over the pastdecade



Education Requirements



Schoolcraft College's main campus is located in Livonia, MI with an additional location in Livonia (The Public Safety Training Complex) and the Radcliff Center in Garden City. The Schoolcraft College region attracts students primarily from five counties: Wayne, Oakland, Macomb, Livingston, and Washtenaw Counties. However, since students come from areas throughout all of Southeast Michigan, this report includes demographic trends for the broader region of: Wayne, Oakland, Macomb, Livingston, Washtenaw, Lapeer, and St. Clair Counties.

Schoolcraft College

Regional Profile

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Top Occupations in Manufacturing Sector

Occupation	2015 Employment	Change, 2010-2015	Projected Change, 2015-2020	Median Hourly Earnings
Miscellaneous Assemblers and Fabricators	48,044	Loss	Loss	$17.00
Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic	11,599	Loss	Loss	$16.94
Mechanical Engineers	11,299	Loss	Loss	$44.90
Machinists	11,242	Loss	Loss	$19.80
Industrial Engineers, Including Health and Safety	8,866	Loss	Loss	$41.38

Manufacturing Jobs with Highest Growth during 2014-2015

Occupation	Change, 2014-2015	
Miscellaneous Assemblers and Fabricators	3,577	8%
Machinists	483	4%
Industrial Machinery Installation, Repair, and Maintenance Workers	371	7%
Miscellaneous Production Workers	359	4%
Industrial Engineers, Including Health and Safety	343	4%

Top In-Demand Skills

Skill	% of Postings with Skill
Engineering	47%
Projects	38%
System	35%
Communication	35%
Designing	34%

Top Unique Skills

Skill	% of Top 5 Manufacturing Postings with Skill
Lean	75%
Continuous Improvement Process	69%
Evaluation	39%
Industrial	37%
Computer	31%

Schoolcraft College

Amy Jones, Associate Dean

Occupational Programs

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Licensing, Funding, & Additional Information

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warrantees, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

The eight community colleges and MCAM are equal opportunity employers/program providers. Auxiliary aids and services are available upon request to individuals with disabilities. TTY users please call 1-877-878-8464 or visit www.michigan.gov/mdcr.

Michigan Coalition
for Advanced Manufacturing