



WORKFORCE INTELLIGENCE NETWORK

QUARTERLY REPORT · **WASHTENAW COUNTY**

Q4 2015 & 2015 Annual Summary



CONTENTS

Executive Summary

Labor Market and Job Demand Overview

Occupational Clusters

Advanced Manufacturing: Skilled Trades & Technicians

Advanced Manufacturing: Engineers & Designers

Information Technology

Health Care

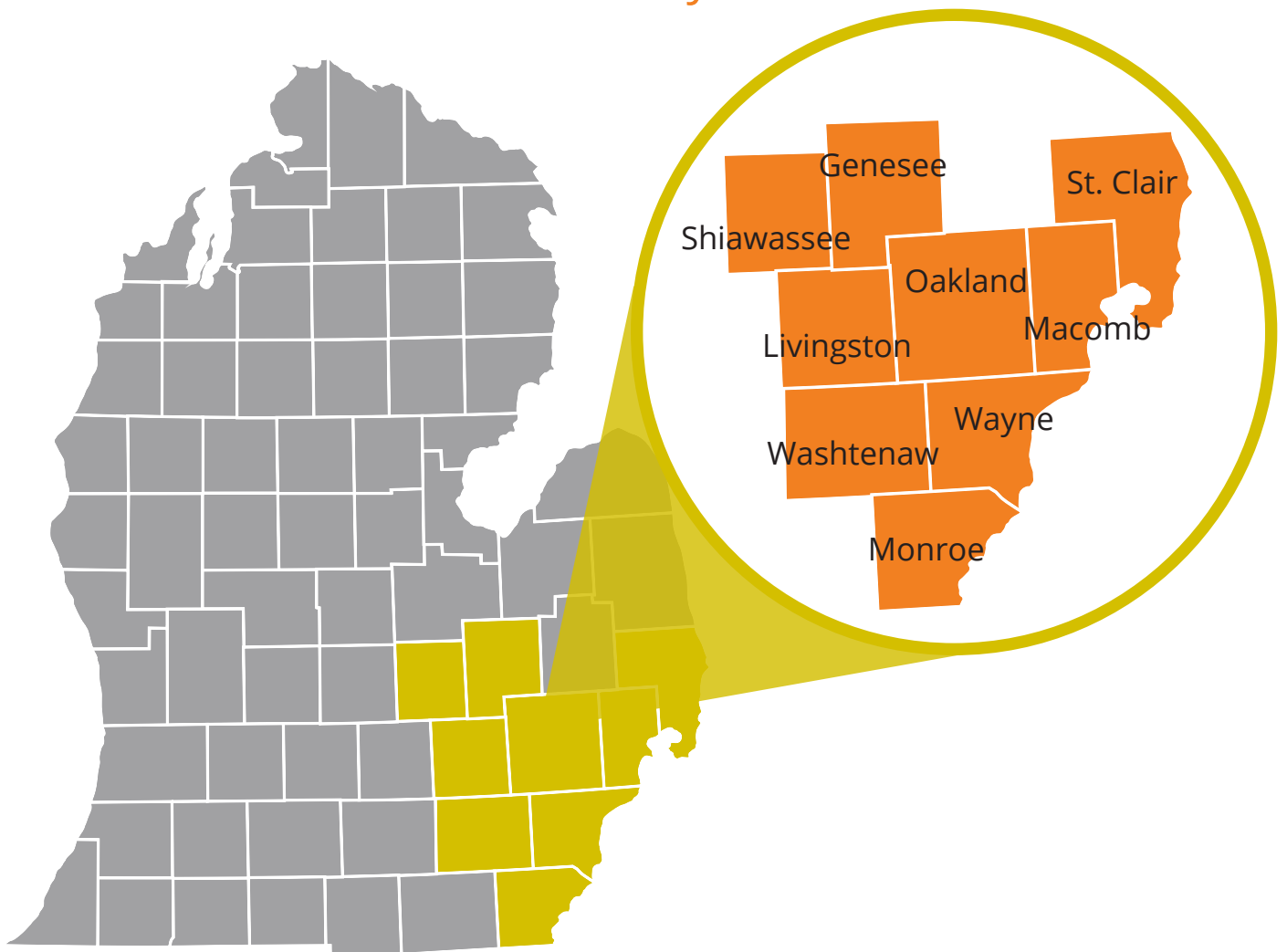
Retail & Hospitality

Agriculture

Data Notes and Sources

Southeast Michigan WIN region includes
9 counties:

**Genesee, Livingston, Monroe, Macomb,
Oakland, Shiawassee, St. Clair, Washtenaw, and
Wayne.*** This report focuses on Washtenaw
County.



* The original WIN partnership included the 9 counties in this report . The WIN partnership expanded to include 16 counties as of late 2015. Hillsdale, Huron, Jackson, Lapeer, Lenawee, Sanilac, and Tuscola counties were added. While this report is still focused on the original 9-county labor shed, much of the analysis (wages, location quotients, recent graduates, and educational attainment requirements), are shown in all reports for the new broader 16-county area.

SECTION ONE

EXECUTIVE SUMMARY

Findings

- ***Washtenaw was just one of two counties in southeast Michigan with increasing employment and labor force in 2015 (see pages 9-11)***

Employment in Washtenaw County has been trending upwards since mid-2011. Similarly, the labor force has been trending upwards, albeit at a slower rate than employment. Most recently, employment increased by 6,121 workers (3.4%) and the labor force by 5,154 individuals (2.8%) in Q4 compared to Q3 2015. The preliminary Q4 estimates of 184,302 individuals employed and 190,296 in the labor force would be the highest level of both metrics in the county since Q4 2006.

- ***Washtenaw tied with Kent, Ottawa Counties for the lowest unemployment rate in Michigan as of November 2015 (see pages 9-11)***

The 2010 annual unemployment rate has been cut by more than half for the year-to-date rate of 3.7%. The unemployment rate continued its decline in Q4 and the November estimate for the county's unemployment rate was 2.9%. This not only tied for the lowest county average in Michigan but also compared to the lowest statewide averages seen in Nebraska and South and North Dakota.

- ***Demand for Health Care workers defies Q4 business cycles as postings increase for a fourth consecutive quarter (see page 41)***

Online ads for occupations in the Health Care cluster increased from 1,790 in Q3 to 1,828 in Q4 2015 (+2.1%). While online ads have historically declined for health care in Washtenaw between Q3 and Q4, 2015 bucked that trend as employer demand continued to increase. Q4 2015 marked the fourth consecutive quarter of posting growth and a historic high for Washtenaw County. Online ads for the Health Care occupation cluster accounted for 15.8% of all postings in Washtenaw County during Q4 2015. Like increasing employer demand, employment for health care has been growing in the region.

Findings

- ***Despite decreases in overall online job postings, RNs and software developers remain the most in-demand occupations in Washtenaw County (see page 7)***

Registered nurses became the most in-demand occupation in Washtenaw County during Q4 2015 despite postings falling from 631 in Q3 to 607 (-3.8%). Software developers had the steepest drop with 150 (-21.9%) fewer ads in Q4 (534) than in Q3 (684). Compared to Q4 2014, postings for this occupation increased 85.4%, indicating that employers continue to struggle to find talent. Ads for RNs in Q4 2015 nearly doubled the 335 postings in Q4 2014.

- ***Washtenaw County IT workers make \$12,400 less annually compared to national average (see page 37)***

Occupations in the IT cluster offer very competitive wages with all but one offering hourly earnings between \$18 and \$27 at the entry level. Web developers, software developers and computer systems analysts offer the most upward mobility with 90th percentile hourly earnings greater than \$58 per hour (\$120,640 annually). IT workers in Washtenaw County earn on average six dollars less per hour than their counterparts at the national level—this could explain the systemic demand for some of these top occupations.





SECTION TWO

LABOR MARKET AND DEMAND OVERVIEW



TOP 20 JOBS IN DEMAND

OCTOBER - DECEMBER 2015



* Data : Burning Glass Technologies

Registered nurses became the most in-demand occupation in Washtenaw County during Q4 2015 despite postings falling from 631 in Q3 to 607 (-3.8%). Fifteen of the top twenty occupations had a decrease in postings from Q3 to Q4; software developers had the steepest drop with 150 (-21.9%) fewer ads in Q4 (534) than in Q3 (684). From the top 20 occupations from Q4 2014, 17 remain in the top 20 for Q4 2015.

New to the Q4 top 20:

- Postsecondary teachers – 151 postings, up from 98 in Q3 (54.1%) and from 60 in Q4 2014 (151.7%)
- Mechanical engineers – 127 postings, up from 122 in Q3 (4.1%) and from 65 in Q4 2014 (95.4%)
- Business intelligence analysts – 119 postings, down from 138 in Q3 (-13.8%) but up from 59 in Q4 2014 (101.7%)

Gone from the Q4 top 20:

- Nursing assistants
- Computer programmers
- Civil engineers

The top 20 posting occupations in Washtenaw accounted for 36% of all online ads in the county during Q4 2015.

EMPLOYER DEMAND

OCTOBER - DECEMBER 2015

Washtenaw County Online Job Postings



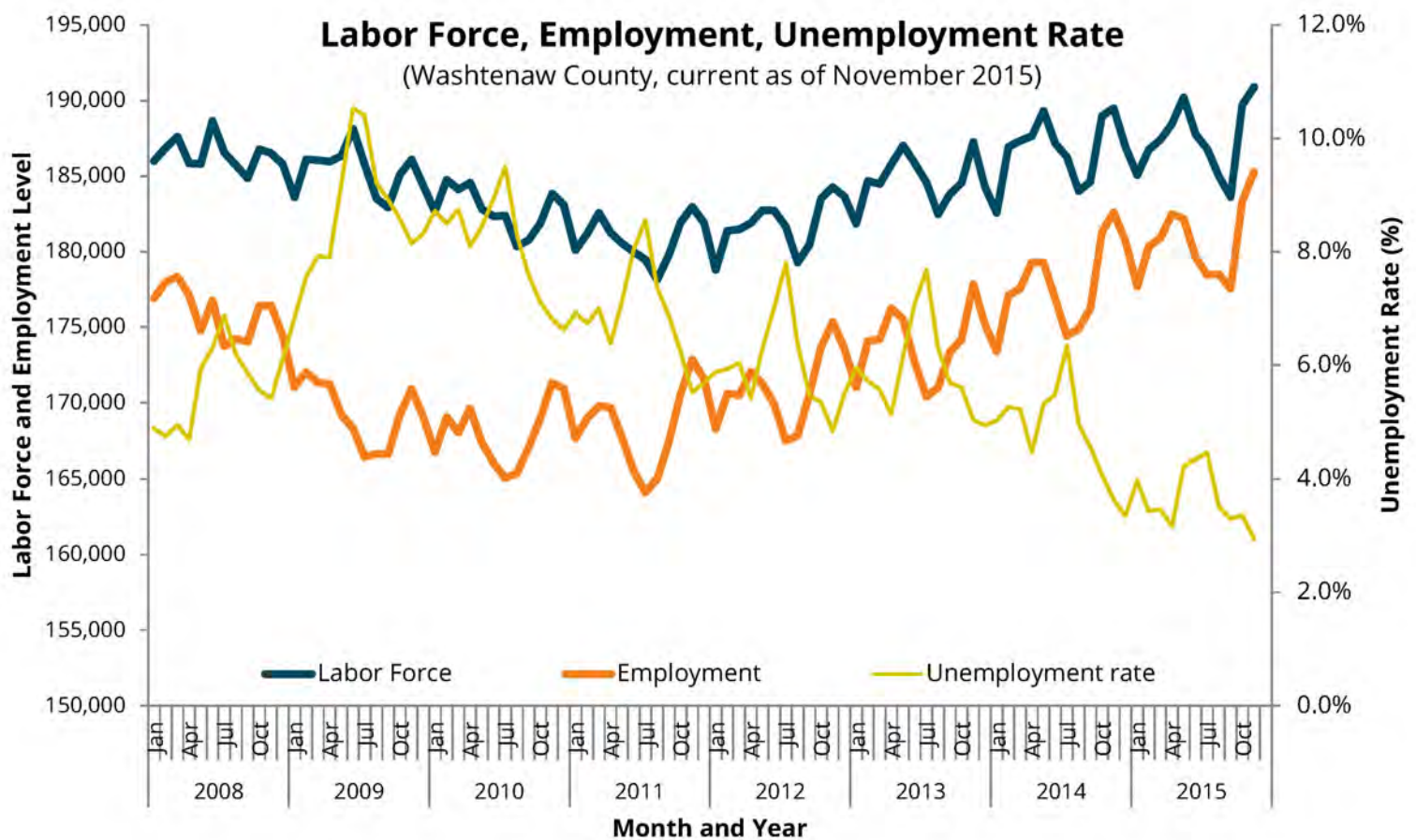
Source: Burning Glass Technologies

Analysis: Workforce Intelligence Network

Following historical business trends, Washtenaw County online job postings dropped in Q4 to 11,581 from 2015's Q3 peak of 12,519 (-7.5%). Prior to Q4, online ads had been growing at a rate of 1,216 per quarter through 2015. The 11,581 postings in Q4 2015 were a 30.6% increase compared to the 8,870 ads in Q4 2014. Washtenaw County averaged 11,524 online ads per quarter throughout 2015.

The six occupation clusters analyzed by WIN in this report accounted for 6,742 (58.2%) of the online ads in Washtenaw County during Q4 2015.

EMPLOYMENT AND LABOR FORCE



Source: Bureau of Labor Statistics
Analysis: Workforce Intelligence Network

Employment in Washtenaw County has been trending upwards since mid-2011. Similarly, the labor force has been trending upwards, albeit at a slower rate than employment. Unemployment continued its downward trend, averaging sub-4% in 2015. Employment increasing at a faster rate than the labor force has contributed to Washtenaw County having such low unemployment figures.

EMPLOYMENT AND LABOR FORCE OVERVIEW

Annual Labor Market Data

	2010 Annual	2011 Annual	2012 Annual	2013 Annual	2014 Annual	2015 To-Date	Change from 2014	Percent Change from 2014
Labor Force	182,801	180,826	181,818	184,722	186,775	187,424	649	0.3%
Employment	167,969	168,414	170,928	173,822	177,805	180,580	2,775	1.6%
Unemployment	14,832	12,412	10,890	10,900	8,970	6,844	-2,126	-23.7%
Unemployment Rate	8.1%	6.9%	6.0%	5.9%	4.8%	3.7%	-1.2%	na

Data: Bureau of Labor Statistics

Quarterly Labor Market Data

	4th Quarter 2014	1st Quarter 2015	2nd Quarter 2015	3rd Quarter 2015	4th Quarter Esimate	Change from 3rd Quarter 2015	Percent Change from 3rd Quarter 2015
Labor Force	188,470	186,400	188,816	185,141	190,296	5,154	2.8%
Employment	181,528	179,646	181,431	178,181	184,302	6,121	3.4%
Unemployment	6,943	6,755	7,385	6,960	5,994	-967	-13.9%
Unemployment Rate	3.7%	3.6%	3.9%	3.8%	3.1%	0	na

*Note: Monthly data averaged by quarter

Data: Bureau of Labor Statistics

EMPLOYMENT AND LABOR FORCE OVERVIEW

The preliminary Q4 estimates of 184,302 individuals employed and 190,296 in the labor force would be the highest level of both metrics in the county since Q4 2006. Most recently, employment increased by 6,121 workers (3.4%) and the labor force by 5,154 individuals (2.8%) in Q4 compared to Q3 2015. Unemployment has continued its decline. The November estimate for the county's unemployment rate was 2.9%, indicating that Washtenaw has some of the lowest unemployment rates not only in Michigan but in the entire nation.

Monthly Labor Market Data

	October 2014	November 2014	December 2014	January 2015	February 2015	March 2015	April 2015	May 2015	June 2015	July 2015	August 2015	September 2015	October 2015	November 2015
Labor Force	188,990	189,485	186,936	185,072	186,738	187,391	188,458	190,197	187,794	186,805	185,004	183,615	189,696	190,895
Employment	181,304	182,601	180,678	177,715	180,321	180,901	182,496	182,160	179,638	178,470	178,511	177,563	183,319	185,285
Unemployment	7,686	6,884	6,258	7,357	6,417	6,490	5,962	8,037	8,156	8,335	6,493	6,052	6,377	5,610
Unemployment Rate	4.1%	3.6%	3.3%	4.0%	3.4%	3.5%	3.2%	4.2%	4.3%	4.5%	3.5%	3.3%	3.4%	2.9%

* Note: Data shown for 14 most recently available months

Data: Bureau of Labor Statistics






SECTION THREE

OCCUPATIONAL CLUSTERS

WASHTENAW COUNTY DEMAND OVERVIEW

	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Change over time	Share of Total Postings Q4 2015
Total	8,870	10,617	11,380	12,519	11,581		
Skilled Trades & Technicians	225	291	337	335	329		2.8%
Engineers & Designers	325	493	526	561	514		4.4%
IT	1,067	1,718	1,697	1,919	1,633		14.1%
Health Care	1,356	1,595	1,646	1,790	1,828		15.8%
Retail & Hospitality	1,385	1,973	2,031	2,499	2,230		19.3%
Agriculture	176	212	236	249	208		1.8%



ADVANCED MANUFACTURING

SKILLED TRADES AND TECHNICIANS

WIN's technicians/skilled trades category includes jobs related to advanced manufacturing. Southeast Michigan has more demand for skilled- trades labor, such as CNC machinists and welders, than almost anywhere else in the country. In 2015, skilled trades employment reached 4,575 individuals in Washtenaw.

NOTE: Skilled trades related to construction and repair are not included in this cluster, as the focus is on advanced manufacturing.

ADVANCED MANUFACTURING

SKILLED TRADES AND TECHNICIANS: TOP JOBS



** Data : Burning Glass Technologies*

Despite postings for production workers decreasing from 76 in Q3 to 60 in Q4 (-21.1%) this occupation remained at the top of the list for the most in-demand Skilled Trades occupations in Washtenaw County. Overall, however, demand is up for production workers compared to Q4 last year by 50% (40 ads in Q4 2014, 60 ads in Q4 2015). Similarly, demand for supervisors of production workers has more than doubled in the past year (13 ads in Q4 2014, 32 ads in Q4 2015). Of the 15 most in-demand occupations from Q4 2014, 11 remained on the Q4 2015 list (73.33%).

New to the top 15:

- Cutting, punching, and press machine operators (8 online ads)
- Packaging and filling machine operators (7 online ads)
- Prepress technicians and workers (6 online ads)
- Mechanical engineering technicians (6 online ads)

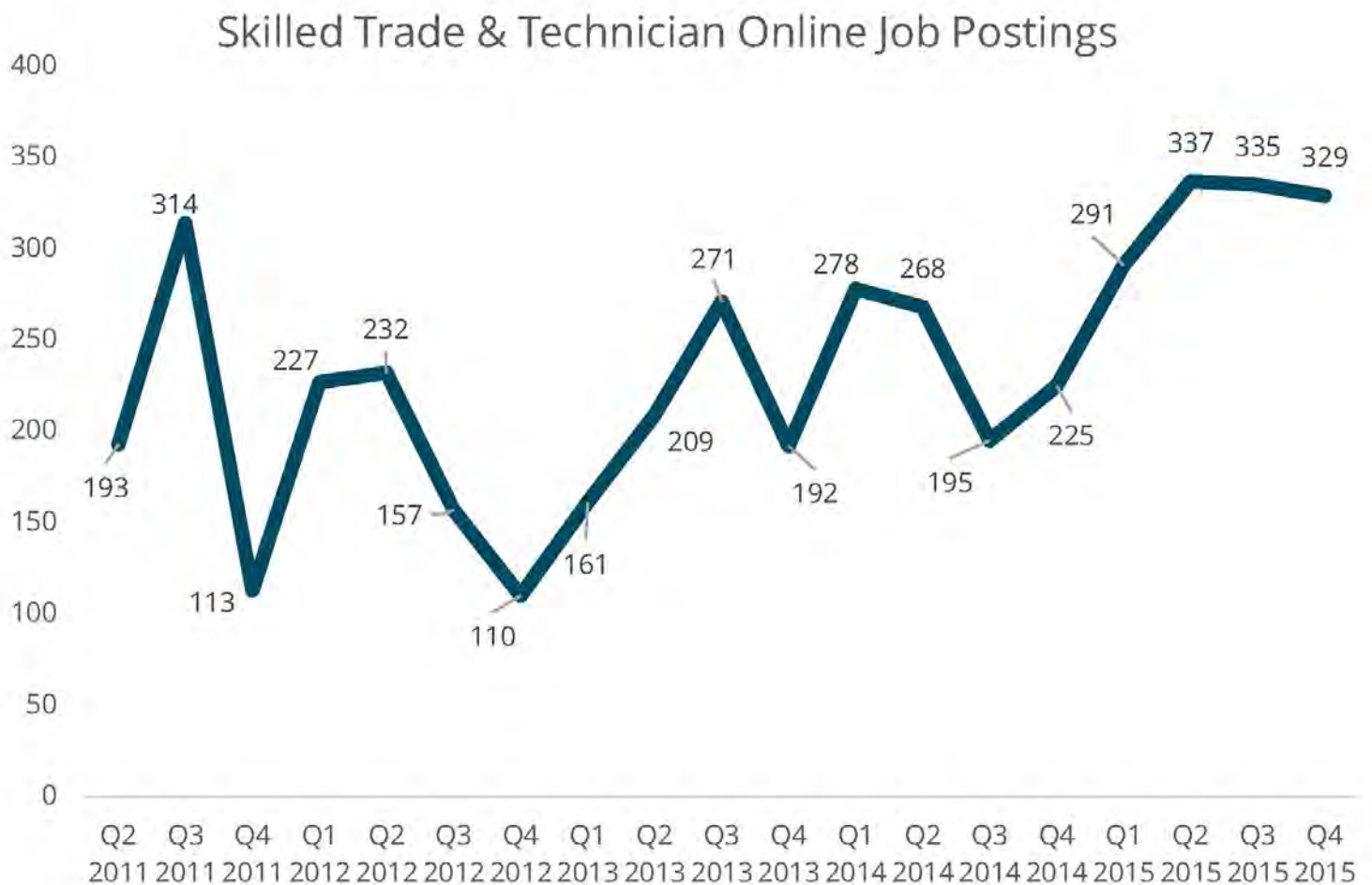
Gone from the top 15:

- Molding, coremaking, and casting machine setters
- Milling and planing machine setters
- Coating, painting, and spraying machine setters
- Water and wastewater treatment plant and systems operators

The top four occupations in the Skilled Trades accounted for 53.5% of all postings in this cluster in Washtenaw during Q4 2015.

ADVANCED MANUFACTURING

SKILLED TRADES AND TECHNICIANS: ONLINE JOB POSTINGS OVER TIME



Source: Burning Glass Technologies

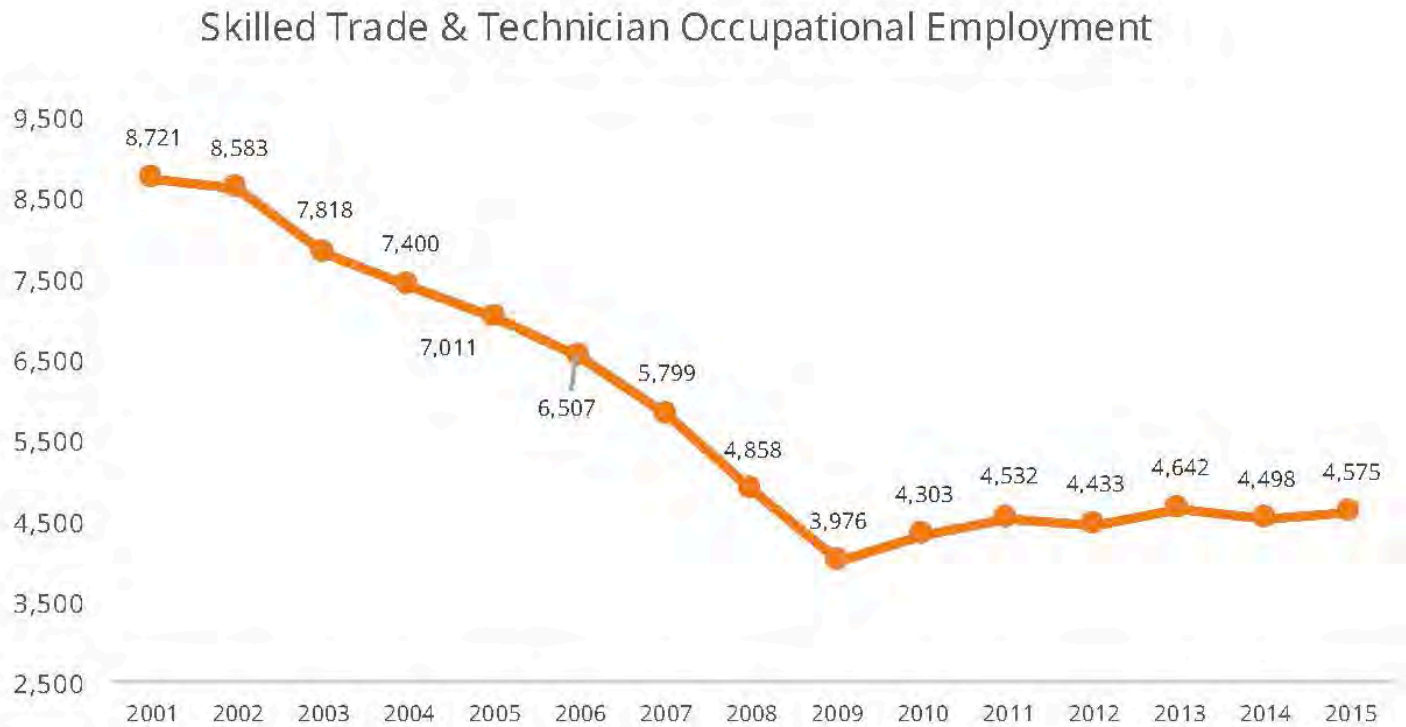
Analysis: Workforce Intelligence Network

Despite postings decreasing slightly from 335 in Q3 to 329 in Q4 (-1.8%), 2015 has been a strong indicator of demand growth for Skilled Trades occupations in Washtenaw County. Online ads typically decrease between Q3 and Q4 but this past year remained well above previous years with an average of 323 ads per quarter. Employment has been growing slowly since 2009 but is nowhere near pre-recession levels. If demand remains high, as it was in 2015, look to see employment reach new post-recession highs.

The Skilled Trades cluster has a relatively small share of postings with just 2.8% of all online ads in Washtenaw during Q4 2015.

ADVANCED MANUFACTURING

SKILLED TRADES AND TECHNICIANS: EMPLOYMENT OVER TIME



Source: EMSI

Analysis: Workforce Intelligence Network

The Skilled Trades employed 4,575 workers in Washtenaw County during 2015, up 77 individuals from the 4,498 workers in 2014 (+1.8%). While employment stopped its descent in 2009, it has generally stagnated since then. The number of workers in the Skilled Trades in Washtenaw has grown less than one percent since 2011 and in 2015 was less than the number employed in 2013. During 2015, Washtenaw County employers posted four online job ads for each net new job (not including turnover). Employers of skilled trade workers do not post online with the same intensity as other Washtenaw employers.

ADVANCED MANUFACTURING

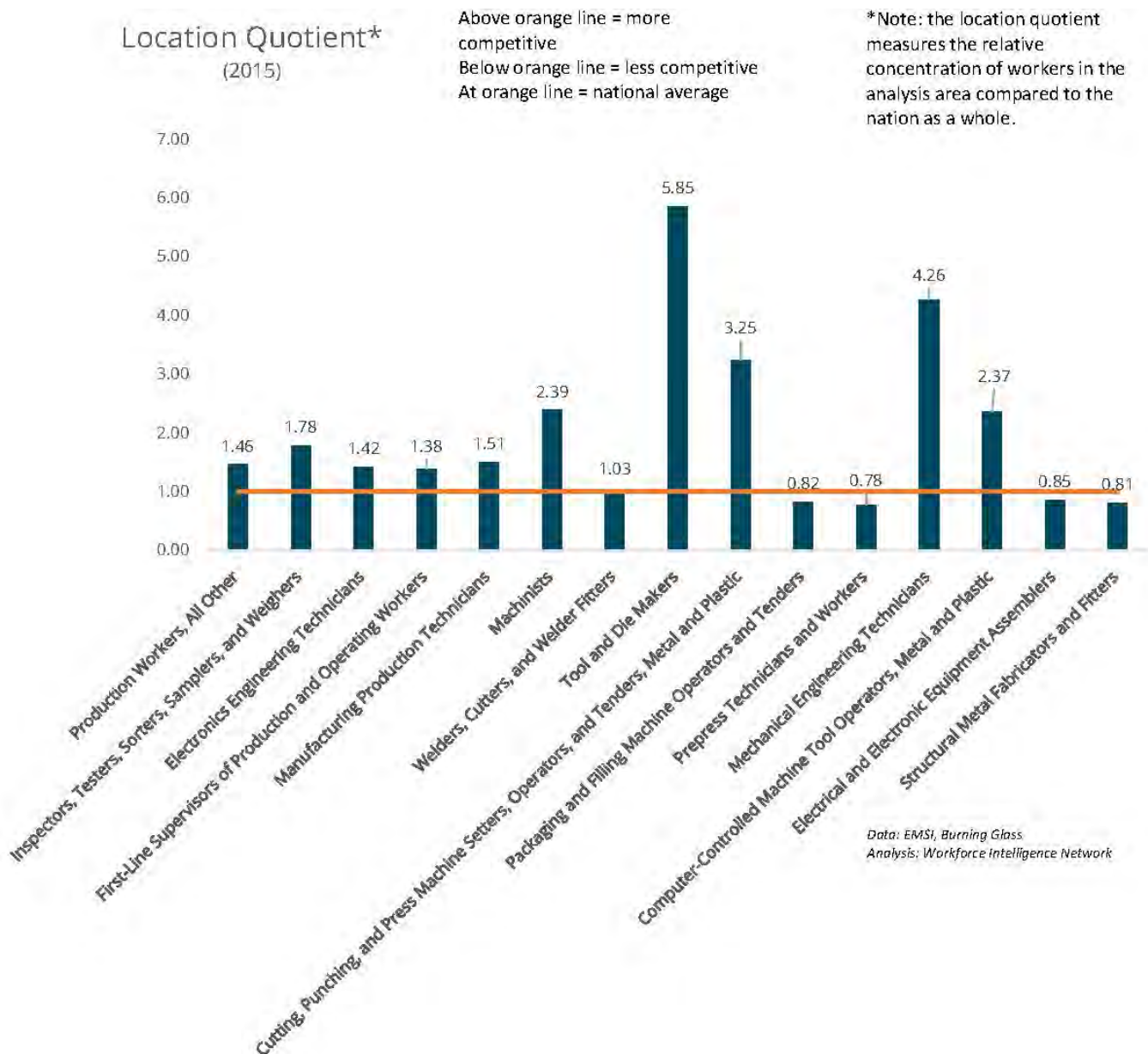
SKILLED TRADES AND TECHNICIANS: TOP 15 JOBS WAGES

ONET Code	Occupation	10th Percentile Hourly Earnings	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings	90th Percentile Hourly Earnings
51-9199	Production Workers, All Other	\$10.31	\$13.11	\$15.94	\$18.96	\$23.51
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	\$9.81	\$11.83	\$15.89	\$22.92	\$28.71
17-3023	Electronics Engineering Technicians	\$15.41	\$19.53	\$24.81	\$31.27	\$36.14
51-1011	First-Line Supervisors of Production and Operating Workers	\$17.29	\$21.96	\$29.26	\$38.23	\$46.05
17-3029	Manufacturing Production Technicians	\$16.14	\$21.60	\$29.62	\$36.20	\$45.68
51-4041	Machinists	\$12.13	\$15.41	\$19.60	\$25.32	\$30.41
51-4121	Welders, Cutters, and Welder Fitters	\$12.37	\$14.81	\$17.64	\$22.22	\$27.73
51-4111	Tool and Die Makers	\$16.71	\$20.94	\$26.86	\$32.63	\$35.60
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	\$10.26	\$12.24	\$16.09	\$22.54	\$28.04
51-9111	Packaging and Filling Machine Operators and Tenders	\$8.37	\$9.43	\$12.49	\$16.11	\$19.67
51-5111	Prepress Technicians and Workers	\$9.53	\$14.21	\$17.91	\$21.48	\$25.30
17-3027	Mechanical Engineering Technicians	\$18.03	\$22.24	\$28.58	\$34.32	\$39.82
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	\$10.63	\$12.79	\$17.88	\$22.00	\$27.37
51-2022	Electrical and Electronic Equipment Assemblers	\$8.77	\$10.20	\$12.97	\$17.91	\$23.19
51-2041	Structural Metal Fabricators and Fitters	\$10.27	\$13.82	\$17.58	\$22.28	\$27.89

Just 2 of the top 15 advanced-manufacturing skilled trades occupations in Washtenaw County have median hourly earnings less than \$15. While only a third offer \$15 or more per hour at the 10th percentile (entry-level) all offer strong wage growth with experience. Supervisors of production workers and production technicians provide the greatest upward mobility; very experienced workers (90th percentile) in these occupations can earn over \$45 per hour (\$93,600 annually). The typical Washtenaw worker in advanced-manufacturing skilled trades makes \$2.50 more hourly than workers in the same cluster nationally.

ADVANCED MANUFACTURING

SKILLED TRADES AND TECHNICIANS: TOP 15 JOBS LOCATION QUOTIENT

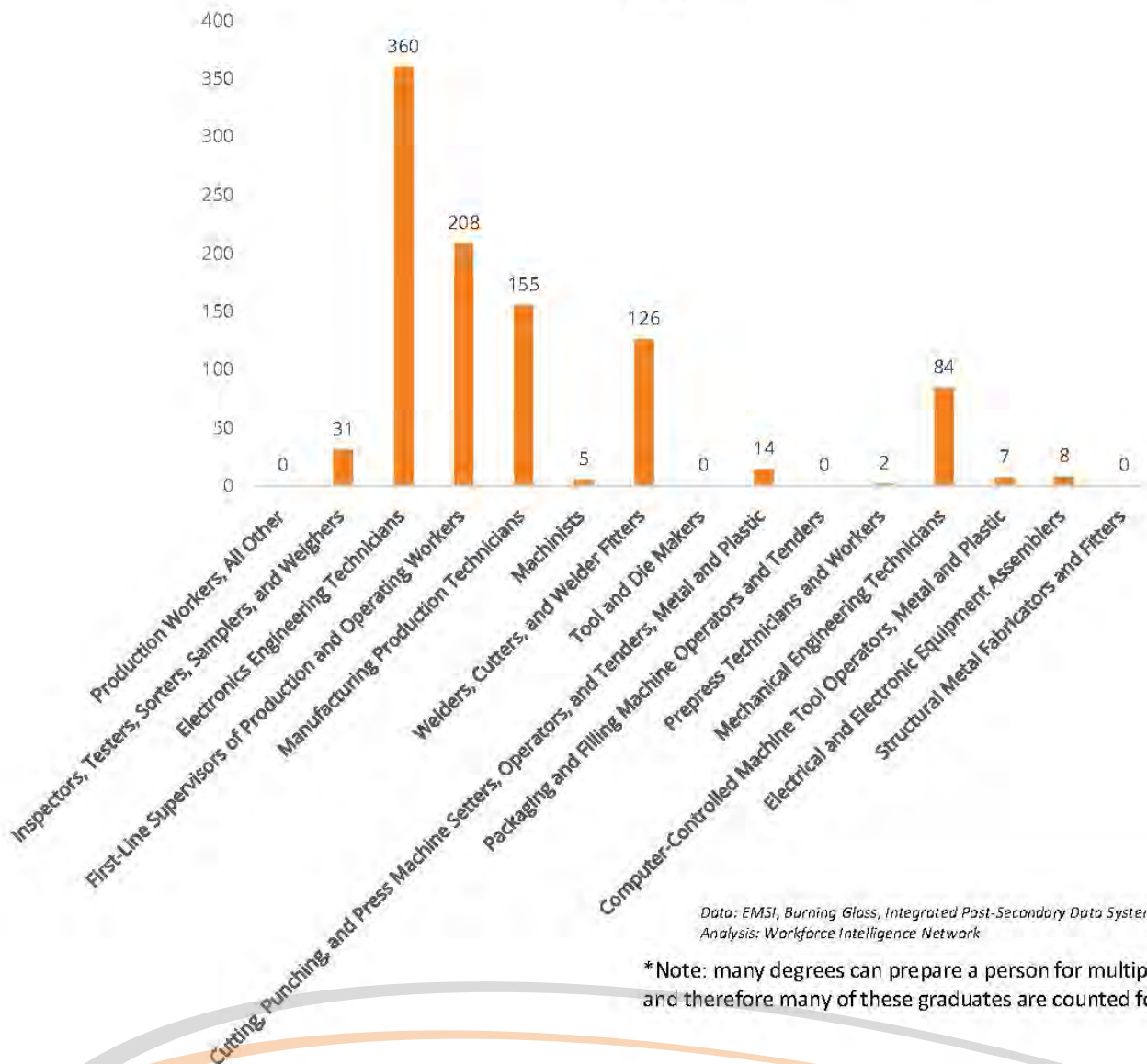


The location quotient (LQ) is a measure of relative concentration. In this case, it measures the relative concentration of workers in an occupation in a specific geography compared to the U.S. on average. Higher LQ's typically indicate that employers will have an easier time finding talent because those workers are more concentrated in the area; lower LQ's will make filling open positions more difficult. Washtenaw County has a competitive edge in tool and die makers; the county has an LQ of 5.85 for these workers indicating that the concentration here is 485% higher than the national average. The county does not have a competitive edge in prepress technicians with just 78% concentration of the national average.

ADVANCED MANUFACTURING

SKILLED TRADES AND TECHNICIANS: TOP 15 JOBS RECENT REGIONAL GRADUATES

Recent Area Grads with Degrees Related to Top Jobs*
(2014)




Due to the regional nature of the labor force in Southeast Michigan data is shown for degree and certificate completions awarded by colleges and universities from all 16 counties in the WIN partnership. While a high school degree is often a prerequisite to most skilled trades occupations, many require post-secondary training in order to begin at the entry-level. While electronics engineering technicians and supervisors of production workers boast the most 2014 graduates in the region, more are still necessary to satisfy demand in southeast Michigan. Meanwhile, degree numbers for machinists and CNC machine operators remain nearly nonexistent despite demand being high for the past several years.

ADVANCED MANUFACTURING

SKILLED TRADES AND TECHNICIANS: TOP 15 JOBS EDUCATION & TRAINING REQUIREMENTS

ONET Code	Occupation	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
51-9199	Production Workers, All Other	High school diploma or equivalent	None	Moderate-term on-the-job training
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	High school diploma or equivalent	None	Moderate-term on-the-job training
17-3023	Electronics Engineering Technicians	Associate's degree	None	None
51-1011	First-Line Supervisors of Production and Operating Workers	Postsecondary non-degree award	Less than 5 years	None
17-3029	Manufacturing Production Technicians	Associate's degree	None	None
51-4041	Machinists	High school diploma or equivalent	None	Long-term on-the-job training
51-4121	Welders, Cutters, and Welder Fitters	High school diploma or equivalent	None	Moderate-term on-the-job training
51-4111	Tool and Die Makers	High school diploma or equivalent	None	Long-term on-the-job training
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	High school diploma or equivalent	None	Moderate-term on-the-job training
51-9111	Packaging and Filling Machine Operators and Tenders	High school diploma or equivalent	None	Moderate-term on-the-job training
51-5111	Prepress Technicians and Workers	Postsecondary non-degree award	None	None
17-3027	Mechanical Engineering Technicians	Associate's degree	None	None
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	High school diploma or equivalent	None	Moderate-term on-the-job training
51-2022	Electrical and Electronic Equipment Assemblers	High school diploma or equivalent	None	Short-term on-the-job training
51-2041	Structural Metal Fabricators and Fitters	High school diploma or equivalent	None	Moderate-term on-the-job training

While just one-third of the in-demand advanced-manufacturing skilled trades occupations in Washtenaw require education beyond high school, most employers prefer workers with experience or specialized training for their open positions. All ten of the occupations that require a high school degree also require training on the job. The two occupations with the highest wage potential, supervisors and production technicians, both require post-secondary degrees.

A group of four professionals, three men and one woman, are wearing blue hard hats and business attire. They are looking at a large sheet of paper or a tablet, smiling and engaged in a collaborative discussion. The background is a bright, out-of-focus industrial or construction site.

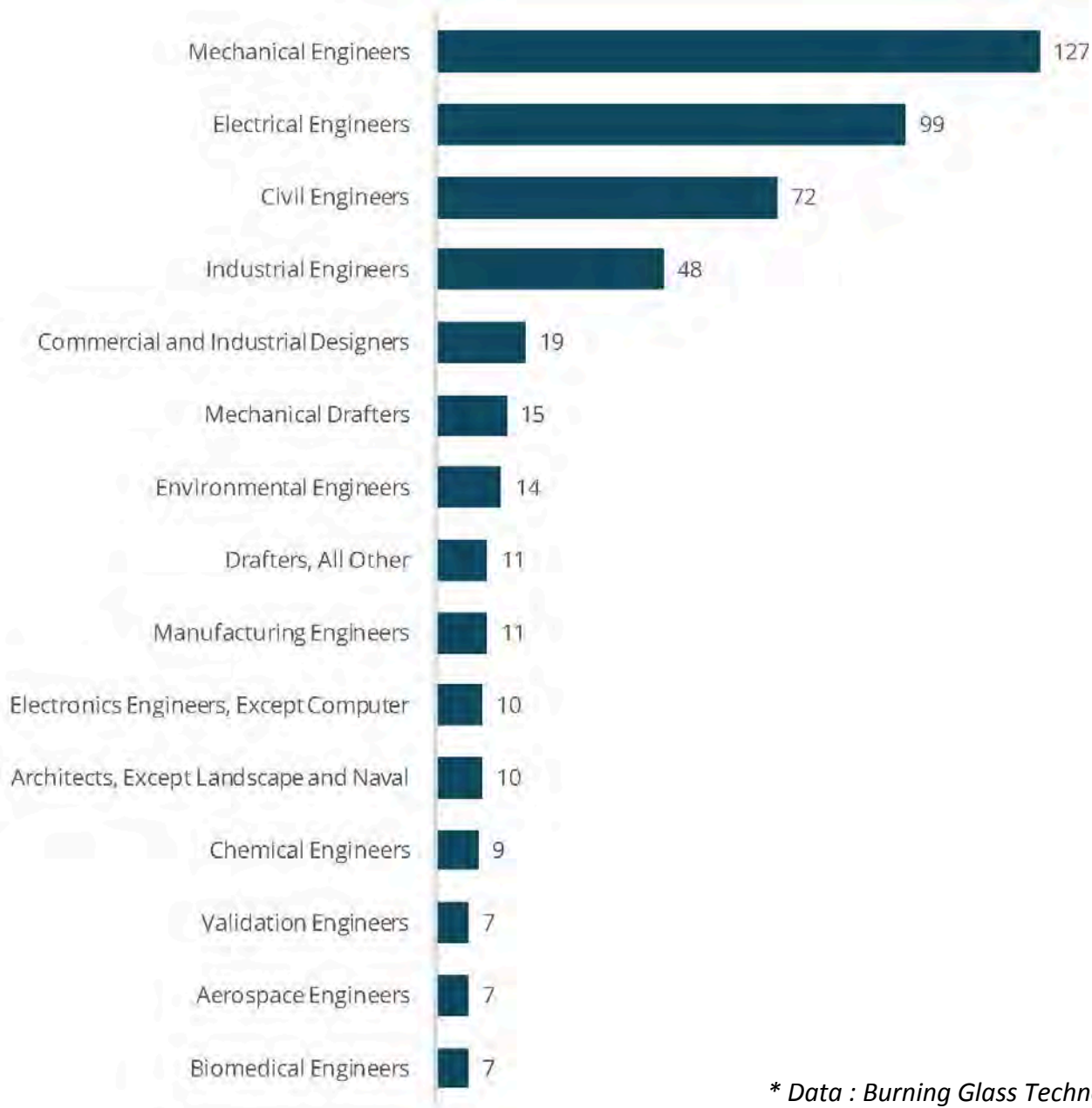
ADVANCED MANUFACTURING

ENGINEERS AND DESIGNERS

Jobs in the manufacturing industry can range from assembly and production, to skilled trades and technicians, designers and engineers, and even computer-related occupations such as software development. This section focuses on engineers & designers, which represent 5,052 employed individuals in Washtenaw during 2015. Demand for engineers in the region has been consistent, and employment has been growing quickly.

ADVANCED MANUFACTURING

ENGINEERS AND DESIGNERS : TOP JOBS

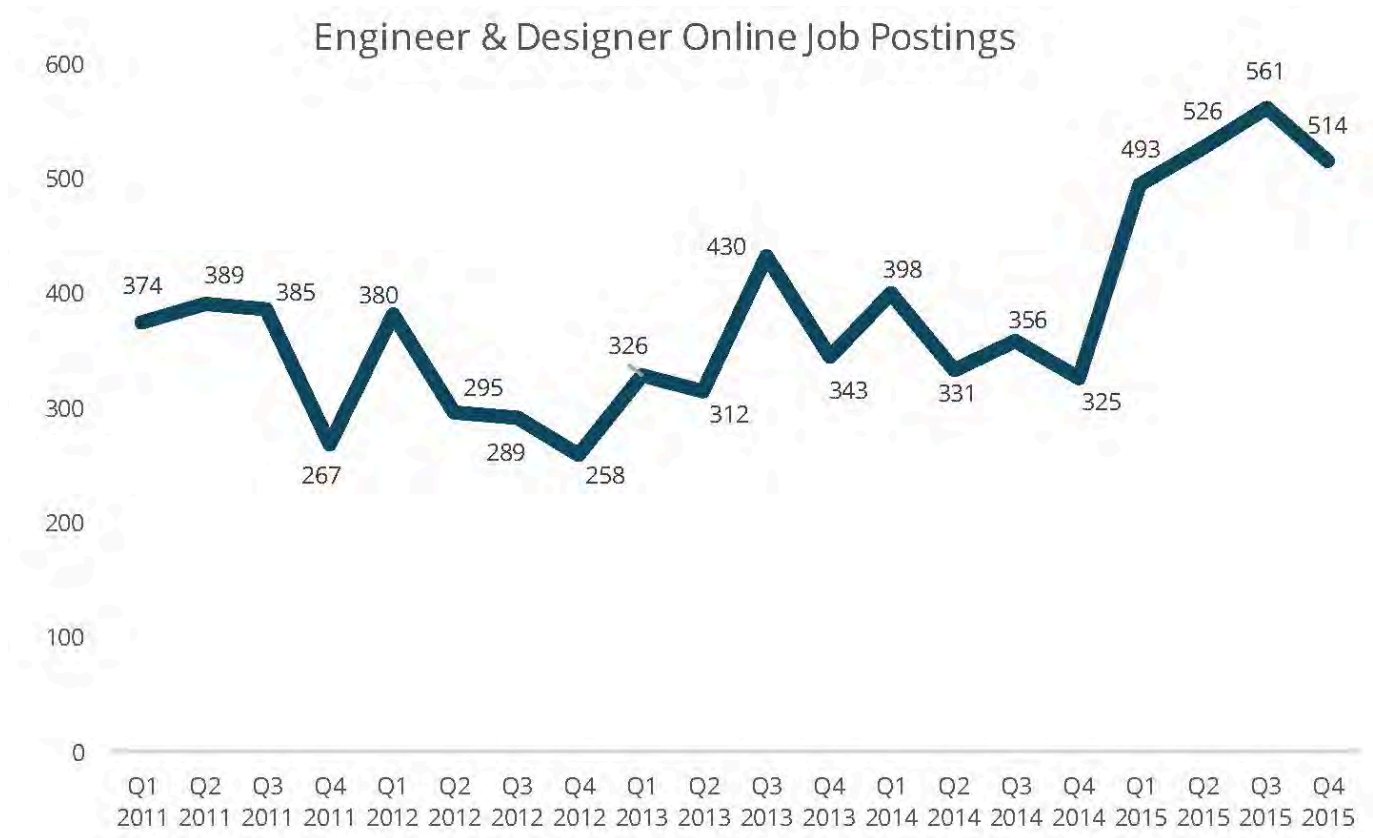


* Data : Burning Glass Technologies

The top five in-demand engineer occupations in Washtenaw County maintained their positions from Q3 to Q4 2015 despite just two seeing an increase in postings. Online ads for commercial and industrial designers decreased from 43 in Q3 to 19 in Q4 (-55.8%) possibly indicating that some employers found talent for open positions. The top four engineering jobs from Q4 2014 remained in the top four for Q4 2015. Postings for mechanical engineers nearly doubled between Q4's from 65 in 2014 to 127 in 2015. Despite a drop in postings compared to Q3, the 19 online ads for commercial and industrial designers nearly tripled the 7 ads in Q4 2014. The top four occupations in this cluster accounted for 67.3% of all engineer postings in Washtenaw during Q4 2015.

ADVANCED MANUFACTURING

ENGINEERS AND DESIGNERS : ONLINE JOB POSTINGS OVER TIME



Source: Burning Glass Technologies
Analysis: Workforce Intelligence Network

Online ads for engineers and designers decreased from 561 in Q3 to 514 in Q4 2015 (-8.4%). Online ads for this cluster typically decline in Q4. Despite the expected decline, employer demand has remained high in 2015 relative to previous years. The engineers and designers cluster accounted for 4.4% of all postings in Washtenaw during Q4 2015. As posting intensity increased in 2015, so too did employment.

ADVANCED MANUFACTURING

ENGINEERS AND DESIGNERS: EMPLOYMENT OVER TIME



Source: EMSI

Analysis: Workforce Intelligence Network

The engineers and designers occupation cluster employed 5,052 workers in 2015, up 74 individuals from the 4,978 workers in 2014 (+1.5%). Employment in Washtenaw for this cluster had been decreasing at a gradual rate since 2001 and the recession increased the level of descent. While employment has slightly rebounded since the recession low in 2009, it remains well below early 2000 levels. During 2015, Washtenaw employers posted roughly seven online ads for every new engineer and designer hire (not including turnover).

ADVANCED MANUFACTURING

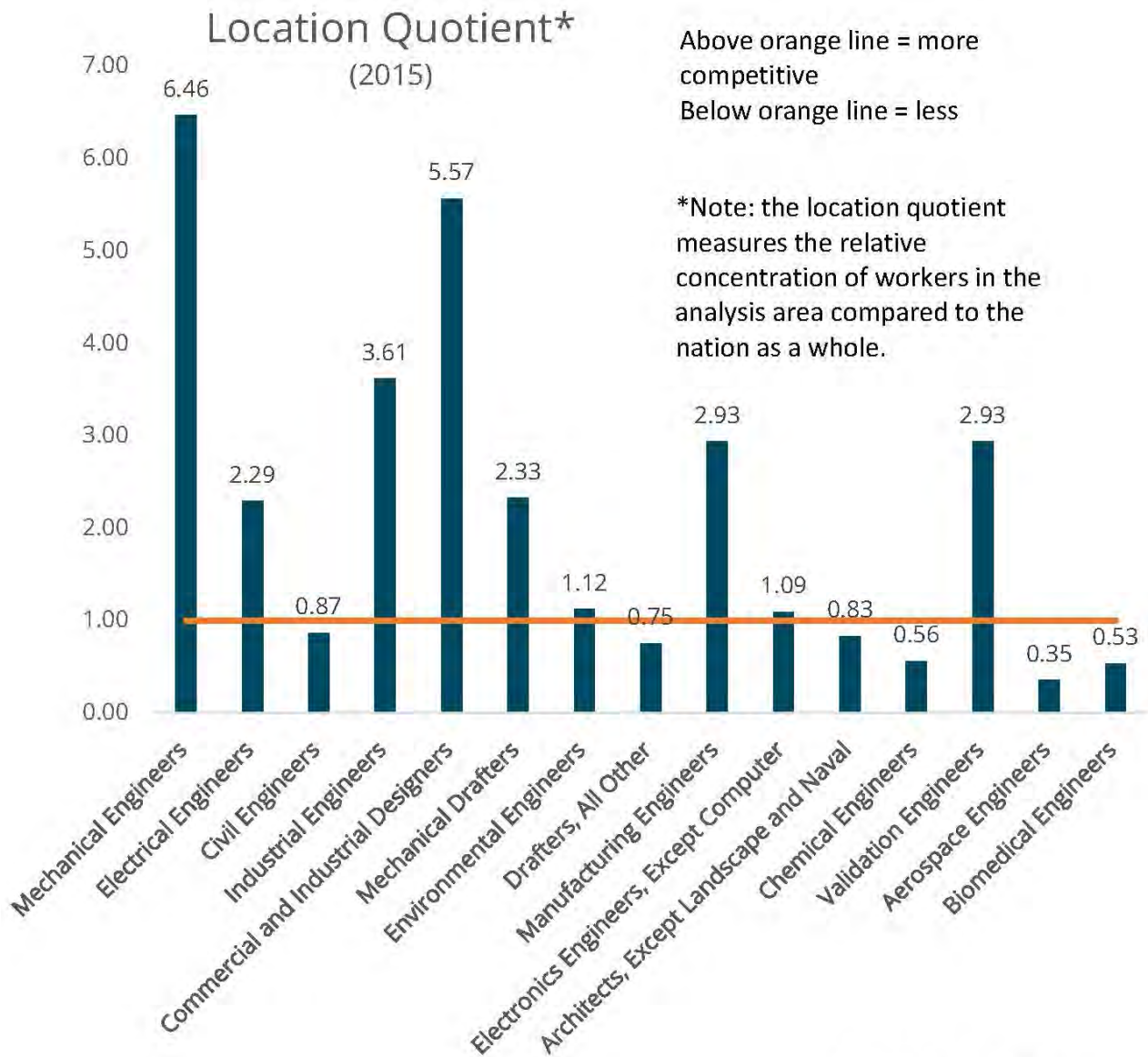
ENGINEERS AND DESIGNERS : TOP 15 JOBS WAGES

ONET Code	Occupation	10th Percentile Hourly Earnings	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings	90th Percentile Hourly Earnings
17-2141	Mechanical Engineers	\$29.77	\$36.77	\$44.46	\$53.21	\$59.58
17-2071	Electrical Engineers	\$28.63	\$34.35	\$41.89	\$49.10	\$57.09
17-2051	Civil Engineers	\$23.14	\$27.72	\$33.64	\$39.22	\$46.33
17-2112	Industrial Engineers	\$27.86	\$33.64	\$40.59	\$47.63	\$55.91
27-1021	Commercial and Industrial Designers	\$25.72	\$31.72	\$37.52	\$43.28	\$48.42
17-3013	Mechanical Drafters	\$16.44	\$20.81	\$26.26	\$32.63	\$38.29
17-2081	Environmental Engineers	\$25.94	\$35.07	\$42.71	\$50.88	\$58.52
17-3019	Drafters, All Other	\$15.97	\$17.50	\$19.97	\$25.42	\$31.05
17-2199	Manufacturing Engineers	\$24.18	\$35.80	\$44.80	\$54.72	\$65.93
17-2072	Electronics Engineers, Except Computer	\$26.28	\$31.27	\$39.29	\$46.96	\$55.15
17-1011	Architects, Except Landscape and Naval	\$20.30	\$25.98	\$32.97	\$40.22	\$49.53
17-2041	Chemical Engineers	\$27.53	\$31.53	\$37.82	\$45.31	\$54.09
17-2199	Validation Engineers	\$24.18	\$35.80	\$44.80	\$54.72	\$65.93
17-2011	Aerospace Engineers	\$32.73	\$38.94	\$45.88	\$53.82	\$63.62
17-2031	Biomedical Engineers	\$23.86	\$28.18	\$34.92	\$43.31	\$54.97

Occupations in the engineer and designer cluster offer some of the highest wages in the region; all of the most in-demand jobs offer at least \$15 per hour at the entry-level (10th percentile) while eight offer initial wages greater than \$25 per hour. Validation, aerospace and manufacturing engineers offer the greatest upward mobility with 90th percentile hourly earnings above \$60 per hour (\$124,800 annually). Wages for this cluster in Washtenaw are generally on par or slightly less than national averages.

ADVANCED MANUFACTURING

ENGINEERS AND DESIGNERS : TOP 15 JOBS LOCATION QUOTIENT



Data: EMSI, Burning Glass
Analysis: Workforce Intelligence
Network

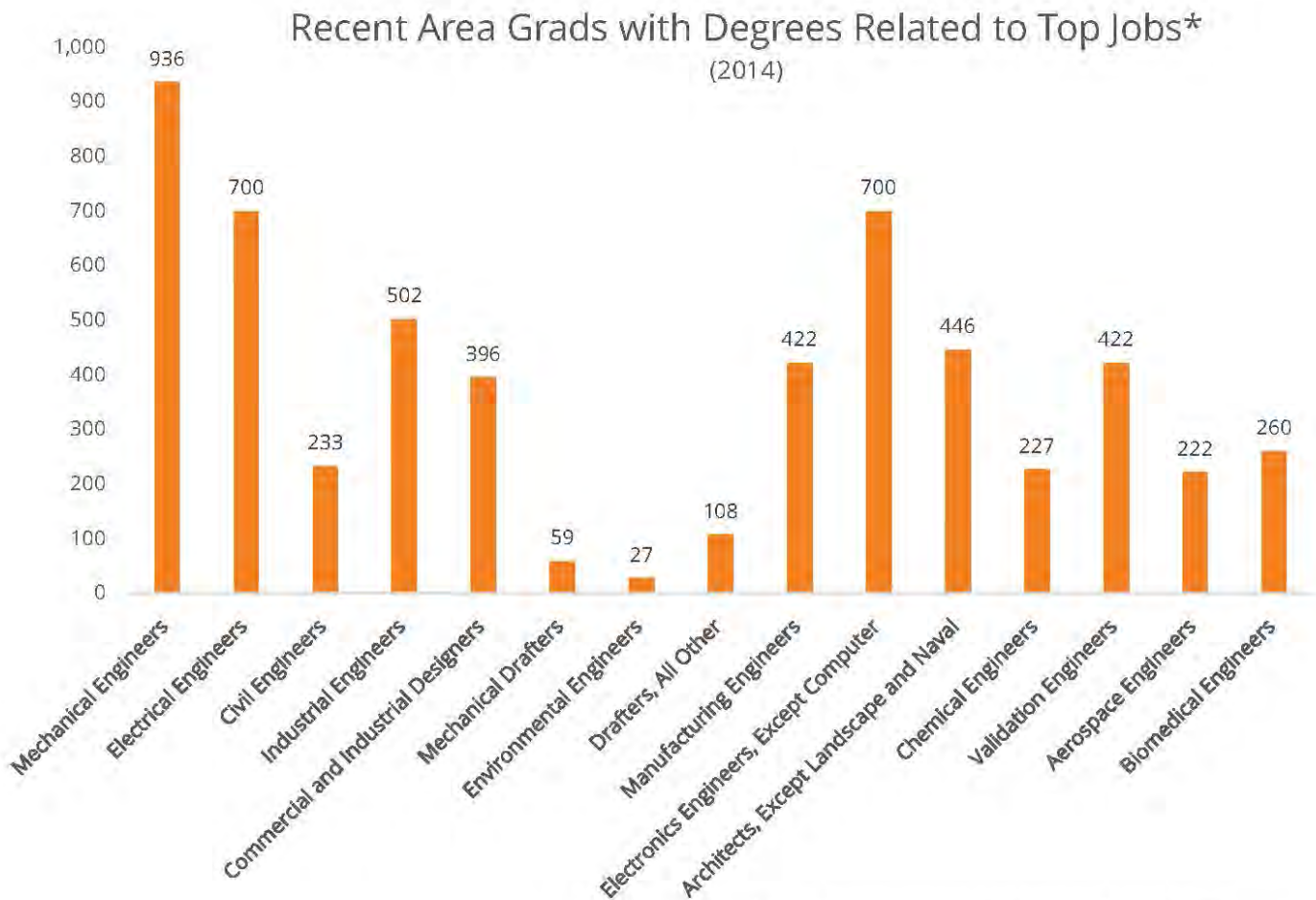
The location quotient (LQ) is a measure of relative concentration. In this case, it measures the relative concentration of workers in an occupation in a specific geography compared to the U.S. on average. Higher LQ's typically indicate that employers will have an easier time finding talent because those workers are more concentrated in the area; lower LQ's will make filling open positions more difficult. The following engineering occupations have LQ's greater than 5 in southeast Michigan, indicating that the supply of workers in the region is at least 400% higher than national averages:

- Mechanical engineers
- Commercial and industrial designers

Meanwhile, southeast Michigan has just 56% of the average concentration of chemical engineers.

ADVANCED MANUFACTURING

ENGINEERS AND DESIGNERS : TOP 15 JOBS RECENT REGIONAL GRADUATES



*Note: many degrees can prepare a person for multiple jobs and therefore many of these graduates are counted for several occupations.

Data: EMSI, Burning Glass, Integrated Post-Secondary Data System
Analysis: Workforce Intelligence Network

Due to the regional nature of the labor force in Southeast Michigan data is shown for degree and certificate completions awarded by colleges and universities from all 16 counties in the WIN partnership. With the highly advanced mathematical skills and corresponding high wages, nearly all of the top engineer and designer occupations require a BA for entry-level openings. While the two most in-demand occupations in Washtenaw boast the highest number of graduates for the region, these top jobs still need more students earning degrees to fulfill demand. For civil engineers, the third most in-demand engineer occupation in Washtenaw, there were nearly four postings in southeast Michigan in just Q4 to each graduate in 2014.

ADVANCED MANUFACTURING

ENGINEERS AND DESIGNERS : TOP 15 JOBS EDUCATION & TRAINING REQUIREMENTS

ONET Code	Occupation	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
17-2141	Mechanical Engineers	Bachelor's degree	None	None
17-2071	Electrical Engineers	Bachelor's degree	None	None
17-2051	Civil Engineers	Bachelor's degree	None	None
17-2112	Industrial Engineers	Bachelor's degree	None	None
27-1021	Commercial and Industrial Designers	Bachelor's degree	None	None
17-3013	Mechanical Drafters	Associate's degree	None	None
17-2081	Environmental Engineers	Bachelor's degree	None	None
17-3019	Drafters, All Other	Associate's degree	None	None
17-2199	Manufacturing Engineers	Bachelor's degree	None	None
17-2072	Electronics Engineers, Except Computer	Bachelor's degree	None	None
17-1011	Architects, Except Landscape and Naval	Bachelor's degree	None	Internship/residency
17-2041	Chemical Engineers	Bachelor's degree	None	None
17-2199	Validation Engineers	Bachelor's degree	None	None
17-2011	Aerospace Engineers	Bachelor's degree	None	None
17-2031	Biomedical Engineers	Bachelor's degree	None	None

Of the top 15 in-demand engineer and designer occupations in Washtenaw, 13 required a BA for entry-level openings. Drafters typically require just an Associate's Degree. Architects require an internship or residency. The highly advanced mathematical skills required to complete degrees for these occupations and their high demand help explain the high wages offered.

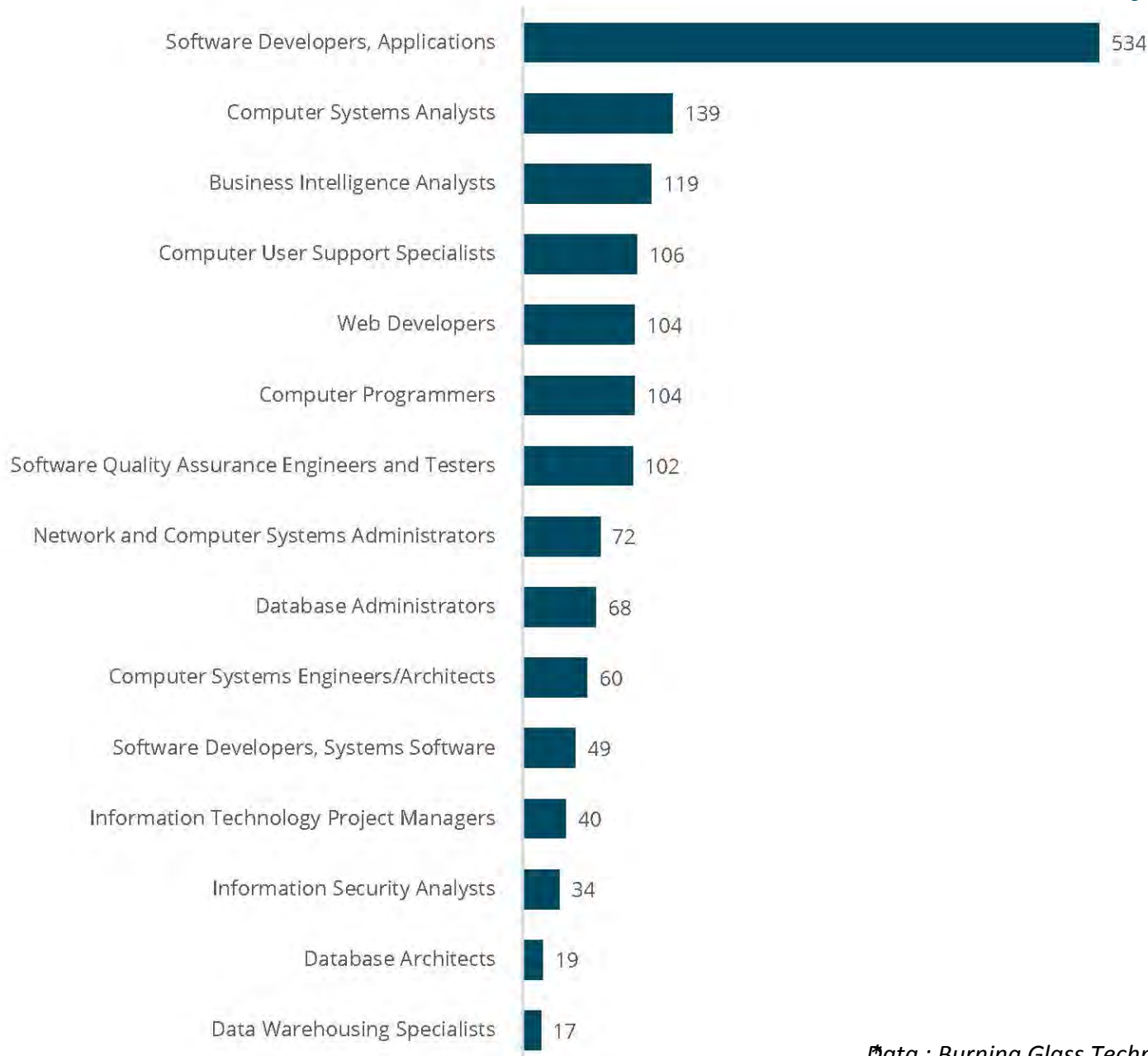


INFORMATION TECHNOLOGY

Information technology jobs include occupations that are associated with entry level, technical, and professional careers related to the design, development, support and management of hardware, software, multimedia, and systems integration services. While the information technology cluster does not currently meet the employment levels of the other clusters, it is quickly growing. In 2015, IT occupational employment was 9,061 in Washtenaw County. Top jobs in this cluster include computer support specialists, computer systems analysts, and software developers for applications.

INFORMATION TECHNOLOGY

TOP JOBS



Data : Burning Glass Technologies

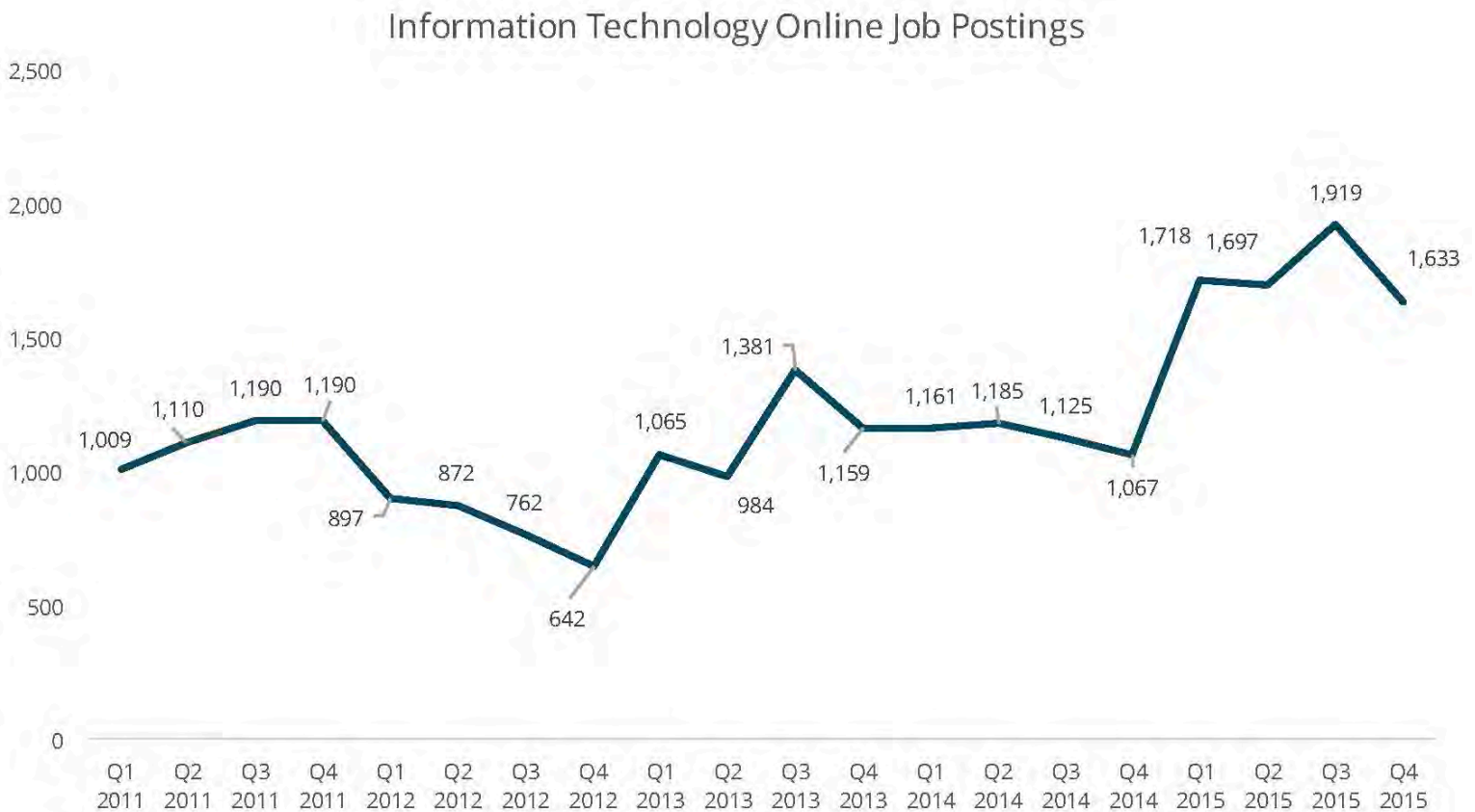
Despite postings decreasing from 684 in Q3 to 534 in Q4 2015 (-21.9%), software developers continued to dominate online ads for occupations in the IT cluster. Compared to Q4 2014, postings for this occupation increased 85.4%, indicating that employers continue to struggle to find talent. Of the top 15 in-demand IT occupations from Q4 2014, 13 remained in the list for Q4 2015. Removed from the top list were:

- Computer and information systems managers
- Computer and information research scientists

Business intelligence analysts have seen increasing demand in 2015, with postings increasing from 59 in Q4 2014 to 119 in Q4 2015 (+101.7%). Software developers for applications accounted for nearly one of every three postings for IT occupations in Washtenaw County during Q4 2015.

INFORMATION TECHNOLOGY

ONLINE JOB POSTINGS OVER TIME



Source: Burning Glass Technologies

Analysis: Workforce Intelligence Network

Online ads for IT occupations decreased from 1,919 in Q3 to 1,633 in Q4 2015 (-14.9%). Historically, this cluster experiences a decline in postings from Q3 to Q4 in Washtenaw. Overall, 2015 saw increased demand as all four quarters had a higher number of postings than previous historic records. The IT cluster accounted for 14.1% of all online ads in Washtenaw County during Q4 2015. Similar to postings, employment in IT has been rapidly increasing.

INFORMATION TECHNOLOGY

EMPLOYMENT OVER TIME



Source: EMSI

Analysis: Workforce Intelligence Network

The IT occupation cluster employed 9,061 workers in 2015, up 330 individuals (+3.8%) from the 8,731 workers in 2014. While employment declined during the early 2000's, the IT cluster was largely unaffected by the recession in Washtenaw and has been experiencing year-by-year growth since 2007. Current employment numbers remain well above pre-recession levels. Employers posted roughly five online ads in Q4 2015 per new hire in 2015 (not including turnover).

INFORMATION TECHNOLOGY

TOP 15 JOBS WAGES

ONET Code	Occupation	10th Percentile Hourly Earnings	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings	90th Percentile Hourly Earnings
15-1132	Software Developers, Applications	\$25.18	\$31.35	\$39.38	\$49.47	\$58.83
15-1121	Computer Systems Analysts	\$25.22	\$32.05	\$39.84	\$49.08	\$58.30
15-1199	Business Intelligence Analysts	\$23.42	\$30.58	\$38.80	\$48.99	\$57.12
15-1199	Computer User Support Specialists	\$23.42	\$30.58	\$38.80	\$48.99	\$57.12
15-1133	Web Developers	\$26.94	\$33.62	\$42.38	\$51.79	\$60.54
15-1141	Computer Programmers	\$23.80	\$31.38	\$41.07	\$50.08	\$58.17
15-1151	Software Quality Assurance Engineers and Testers	\$12.38	\$15.95	\$21.56	\$29.06	\$36.96
15-1134	Network and Computer Systems Administrators	\$18.03	\$21.59	\$27.32	\$33.96	\$40.35
15-1131	Database Administrators	\$23.77	\$28.94	\$34.77	\$43.65	\$51.99
15-1142	Computer Systems Engineers/Architects	\$21.59	\$27.21	\$35.57	\$43.28	\$51.30
15-1199	Software Developers, Systems Software	\$23.42	\$30.58	\$38.80	\$48.99	\$57.12
15-1199	Information Technology Project Managers	\$23.42	\$30.58	\$38.80	\$48.99	\$57.12
15-1122	Information Security Analysts	\$24.03	\$28.45	\$39.29	\$48.80	\$57.24
15-1199	Database Architects	\$23.42	\$30.58	\$38.80	\$48.99	\$57.12
15-1199	Data Warehousing Specialists	\$23.42	\$30.58	\$38.80	\$48.99	\$57.12

Occupations in the IT cluster offer very competitive wages with all but one offering hourly earnings between \$18 and \$27 at the entry level. Web developers, software developers and computer systems analysts offer the most upward mobility with 90th percentile hourly earnings greater than \$58 per hour (\$120,640 annually). IT workers in Washtenaw County earn on average six dollars less per hour than their counterparts at the national level—this could explain the systemic demand for some of these top occupations.

INFORMATION TECHNOLOGY

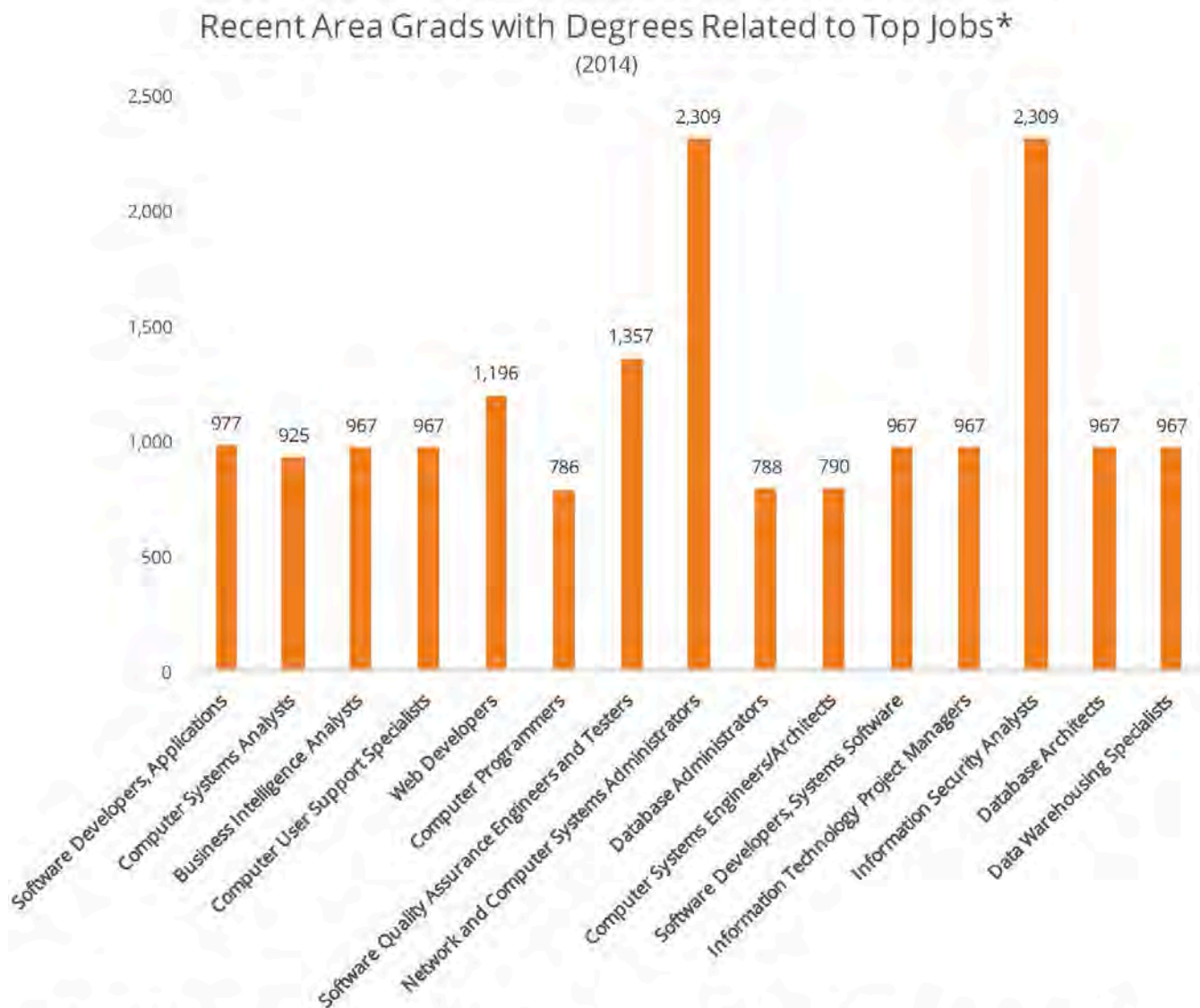
TOP 15 JOBS LOCATION QUOTIENT



The location quotient (LQ) is a measure of relative concentration. In this case, it measures the relative concentration of workers in an occupation in a specific geography compared to the U.S. on average. Higher LQ's typically indicate that employers will have an easier time finding talent because those workers are more concentrated in the area; lower LQ's will make filling open positions more difficult. Unlike other occupation clusters, IT does not boast high concentrations of workers in southeast Michigan; software quality assurance engineers have the highest concentration in the region with just a 32% higher concentration than the national average. Software developers, the most in-demand occupation across the region, has just a concentration of 90% compared to other areas of the United States.

INFORMATION TECHNOLOGY

TOP 15 JOBS RECENT REGIONAL GRADUATES



Data: EMSI, Burning Glass, Integrated Post Secondary Data System
Analysis: Workforce Intelligence Network

*Note: many degrees can prepare a person for multiple jobs and therefore many of these graduates are counted for several occupations.

Due to the regional nature of the labor force in Southeast Michigan data is shown for degree and certificate completions awarded by colleges and universities from all 16 counties in the WIN partnership. Employers typically expect prospective workers interested in IT occupations to have a Bachelor's Degree for entry-level openings and specialized STEM skills. Information security analysts had a high number of degree earners in related fields in 2014 compared to other IT occupations. Meanwhile, software developers had just 977 graduates in the region in 2014, less than the number of online postings for these workers in Washtenaw County during the second half of 2015.

INFORMATION TECHNOLOGY

TOP 15 JOBS EDUCATION & TRAINING REQUIREMENTS

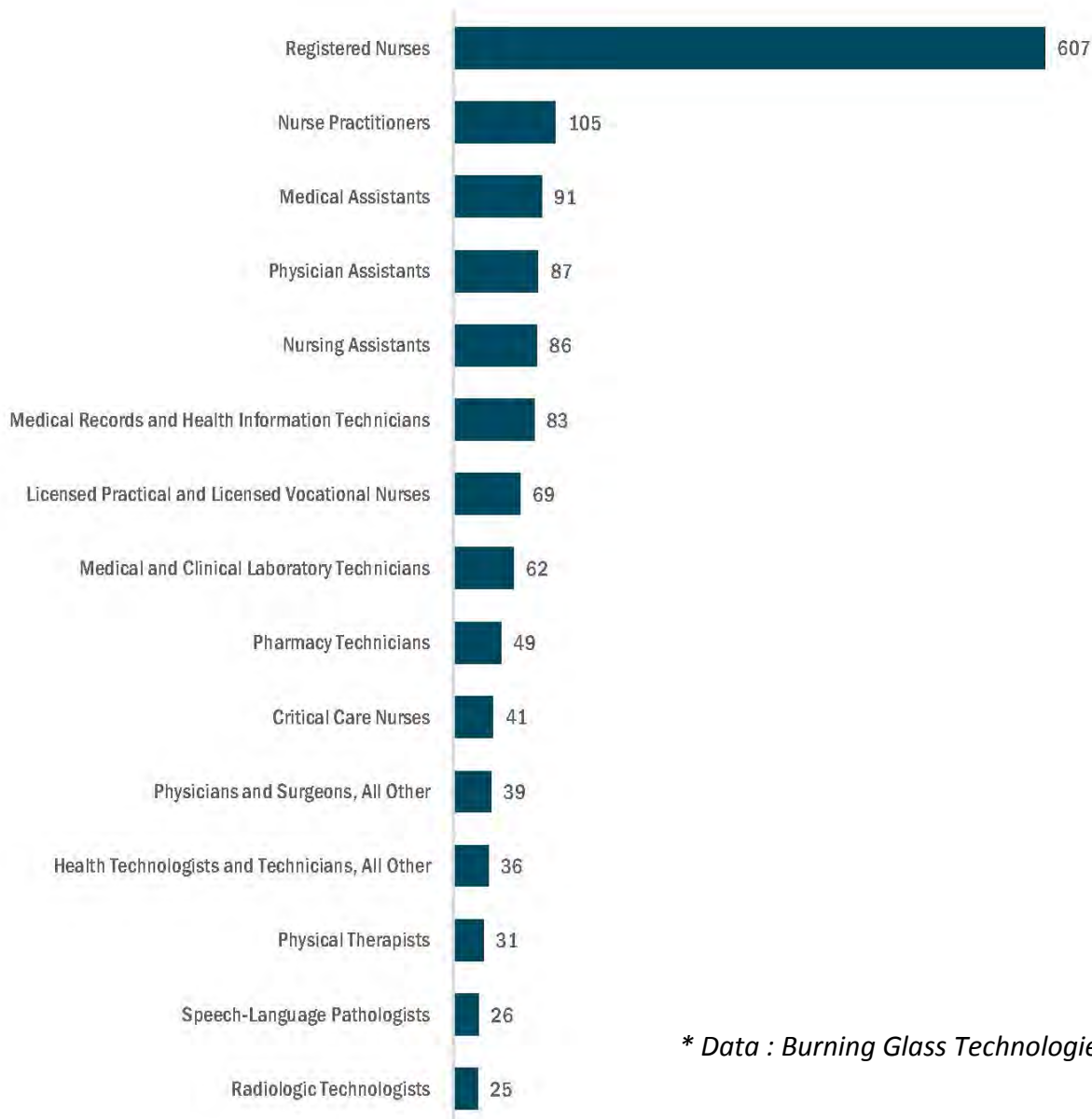
ONET Code	Occupation	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
15-1132	Software Developers, Applications	Bachelor's degree	None	None
15-1121	Computer Systems Analysts	Bachelor's degree	None	None
15-1199	Business Intelligence Analysts	Bachelor's degree	None	None
15-1199	Computer User Support Specialists	Bachelor's degree	None	None
15-1133	Web Developers	Bachelor's degree	None	None
15-1141	Computer Programmers	Bachelor's degree	Less than 5 years	None
15-1151	Software Quality Assurance Engineers and Testers	Some college, no degree	None	Moderate-term on-the-job training
15-1134	Network and Computer Systems Administrators	Associate's degree	None	None
15-1131	Database Administrators	Bachelor's degree	None	None
15-1142	Computer Systems Engineers/Architects	Bachelor's degree	None	None
15-1199	Software Developers, Systems Software	Bachelor's degree	None	None
15-1199	Information Technology Project Managers	Bachelor's degree	None	None
15-1122	Information Security Analysts	Bachelor's degree	Less than 5 years	None
15-1199	Database Architects	Bachelor's degree	None	None
15-1199	Data Warehousing Specialists	Bachelor's degree	None	None

Employers typically expect prospective workers interested in IT occupations to have a Bachelor's Degree for entry-level openings and specialized STEM skills. Software quality assurance engineers and network & computer systems administrators were the only top IT jobs requiring less than a BA. The advanced STEM skills and degrees needed in combination with the low supply of graduates not only explain the high wages but also indicate that the demand and pre-requisites should cause wages to increase in order to attract more workers in IT fields.

A photograph of two healthcare workers, a woman and a man, sitting at a desk in a clinical setting. The woman on the left is wearing red scrubs and has a name tag. The man on the right is wearing blue scrubs and is holding a pen. They are both smiling at the camera. The background is slightly blurred, showing office equipment and papers.

HEALTH CARE

WIN's health care occupation cluster includes jobs related to health care support and practitioners. This cluster is one of Southeast Michigan's largest with 31,620 employees in 2015 in Washtenaw. Employment in this cluster has been consistently growing, more health care workers needed to care for Michigan's aging population and in response to regulatory and other changes. Registered nurses are routinely the most in-demand job in this cluster.



** Data : Burning Glass Technologies*

Despite a slight decline in postings, registered nurses (RNs) continued to dominate postings for the health care cluster in Washtenaw County. Online ads decreased from 631 in Q3 to 607 in Q4 (-3.8%). Even with the recent decline, ads for RNs in Q4 2015 nearly doubled the 335 postings in Q4 2014. Demand has increased for physician assistants in 2015, with ads increasing from 35 in Q4 2014 to 87 this past quarter (+148.6%). Of the top 15 in-demand health care occupations in Q4 2014, 13 remained on Q4 2015's list. Gone from the Q4 2014 list were:

- Medical equipment preparers
- Home health aides

Registered nurses accounted for one in every three online ads for health care occupations in Washtenaw County during Q4 2015.

HEALTH CARE

ONLINE JOB POSTINGS OVER TIME

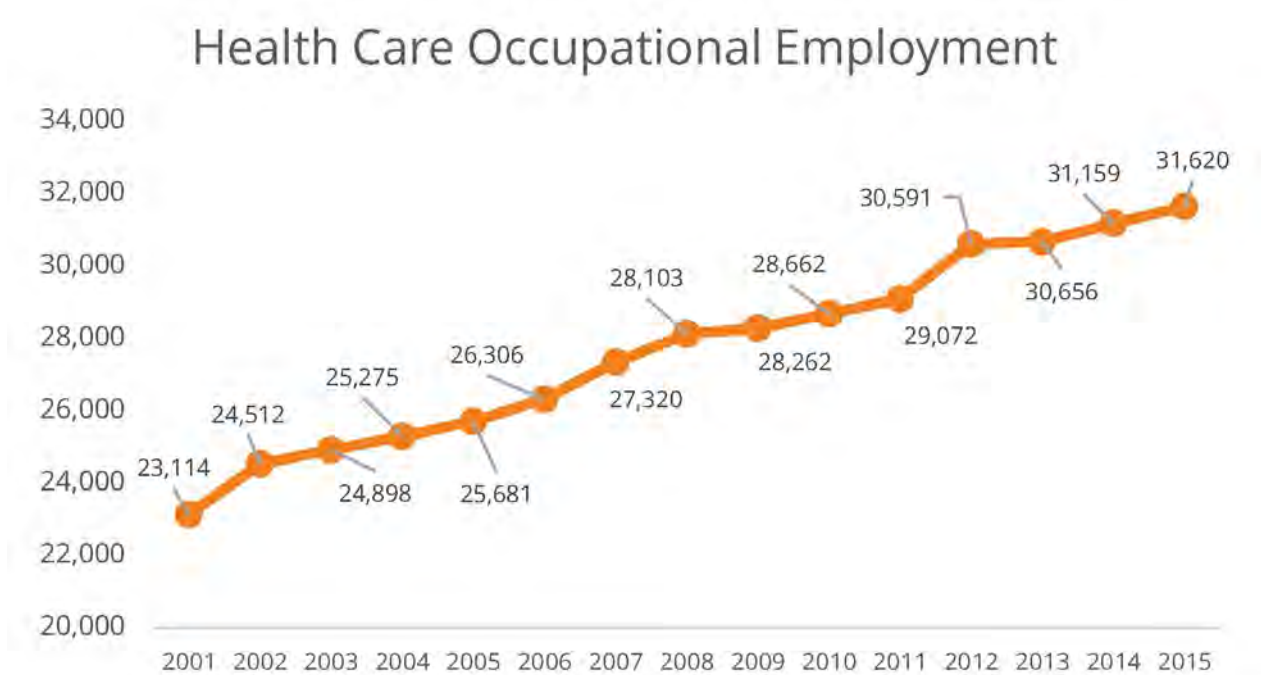


Source: Burning Glass Technologies

Online ads for occupations in the health care cluster increased from 1,790 in Q3 to 1,828 in Q4 2015 (+2.1%). While online ads have historically declined for health care in Washtenaw between Q3 and Q4, 2015 bucked that trend as employer demand continued to increase. Q4 2015 marked the fourth consecutive quarter of posting growth and a historic high for Washtenaw County. Online ads for the health care occupation cluster accounted for 15.8% of all postings in Washtenaw County during Q4 2015. Like increasing employer demand, employment for health care has been growing in the region.

HEALTH CARE

EMPLOYMENT OVER TIME



Source: EMSI

Analysis: Workforce Intelligence Network

Employment in the health care occupation cluster increased from 31,159 workers in 2014 to 31,620 in 2015 (+1.5%). The health care sector has experienced near-linear employment growth in Washtenaw since 2001. The recession did not influence health care—at least from an employment perspective—as it did with other sectors of the economy. The aging and growing population in Washtenaw County may have played a role. Health care employers in Washtenaw posted nearly four online ads during Q4 per new 2015 hire (not including turnover).

HEALTH CARE

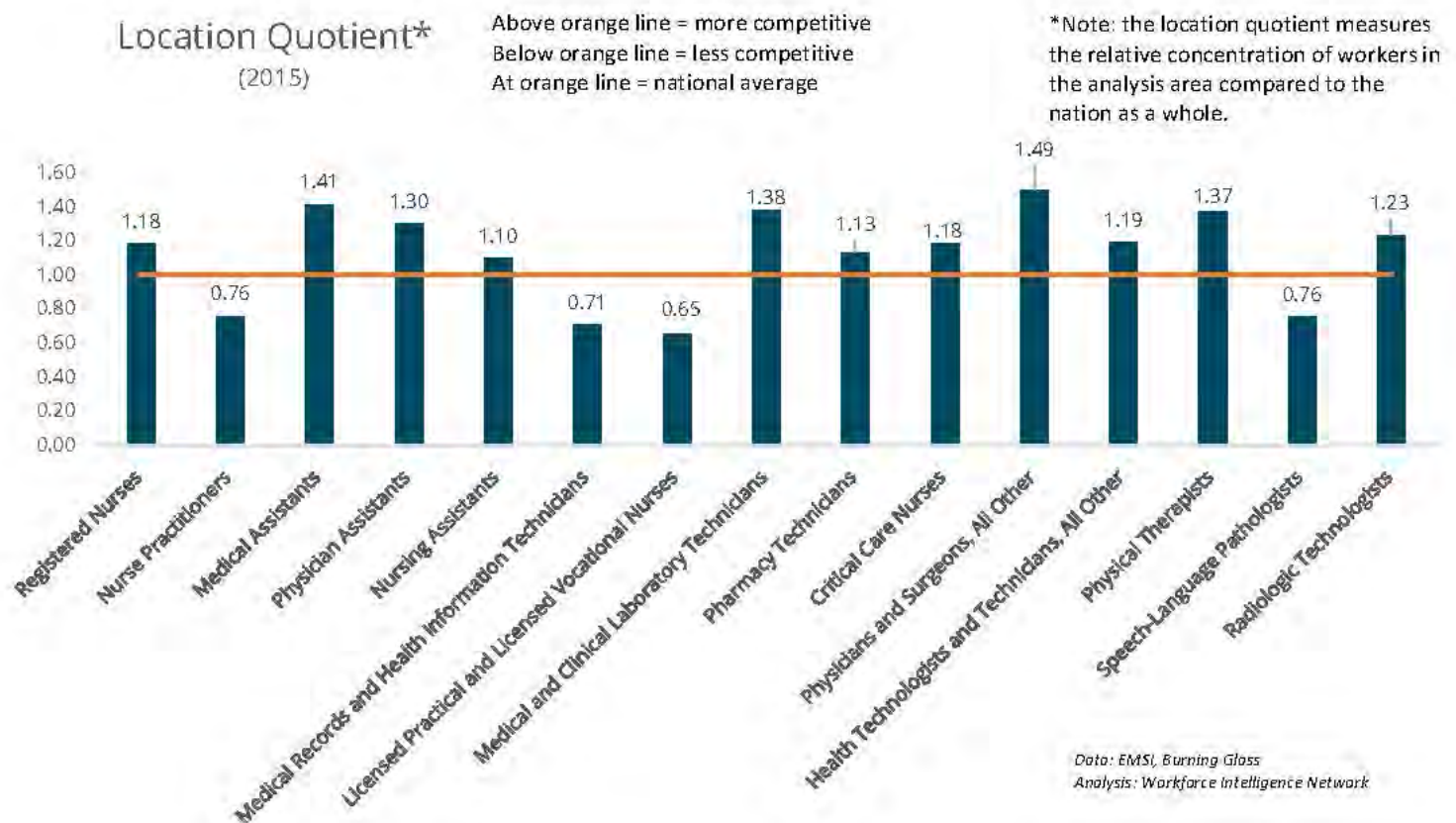
TOP 15 JOBS WAGES

ONET Code	Occupation	10th Percentile Hourly Earnings	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings	90th Percentile Hourly Earnings
29-1141	Registered Nurses	\$24.99	\$32.85	\$28.50	\$37.31	\$46.89
29-1171	Nurse Practitioners	\$33.61	\$44.63	\$39.39	\$51.83	\$58.61
31-9092	Medical Assistants	\$10.65	\$13.94	\$12.19	\$16.27	\$18.70
29-1071	Physician Assistants	\$23.49	\$45.90	\$33.18	\$54.05	\$62.10
31-1014	Nursing Assistants	\$10.13	\$13.42	\$11.69	\$15.30	\$17.31
29-2071	Medical Records and Health Information Technicians	\$11.72	\$17.80	\$14.03	\$21.92	\$25.68
29-2061	Licensed Practical and Licensed Vocational Nurses	\$17.60	\$22.71	\$19.89	\$25.74	\$28.08
29-2012	Medical and Clinical Laboratory Technicians	\$11.24	\$15.76	\$12.90	\$20.29	\$27.64
29-2052	Pharmacy Technicians	\$9.48	\$14.28	\$11.58	\$16.91	\$19.19
29-1141	Critical Care Nurses	\$24.99	\$32.85	\$28.50	\$37.31	\$46.89
29-1069	Physicians and Surgeons, All Other	\$30.16	\$81.42	\$49.14	\$96.19	\$147.67
29-2099	Health Technologists and Technicians, All Other	\$12.55	\$18.42	\$14.57	\$23.57	\$30.00
29-1123	Physical Therapists	\$27.31	\$39.33	\$32.99	\$47.40	\$62.90
29-1127	Speech-Language Pathologists	\$24.88	\$35.59	\$29.69	\$44.25	\$61.80
29-2034	Radiologic Technologists	\$18.86	\$26.07	\$22.01	\$29.84	\$34.35

Wages for health care occupations vary substantially depending on the education and skills required. The in-demand jobs offering entry-level (10th percentile) wages above \$15 per hour typically require Master's or Professional degrees. Not until the 75th percentile do all of the top health care occupations offer wages greater than \$15 per hour. Physician assistants, physicians, speech-language pathologists and physical therapists offer the greatest upward mobility but also demand the most education. The typical Washtenaw County healthcare workers earns two dollars more per hour than counterparts across the nation.

HEALTH CARE

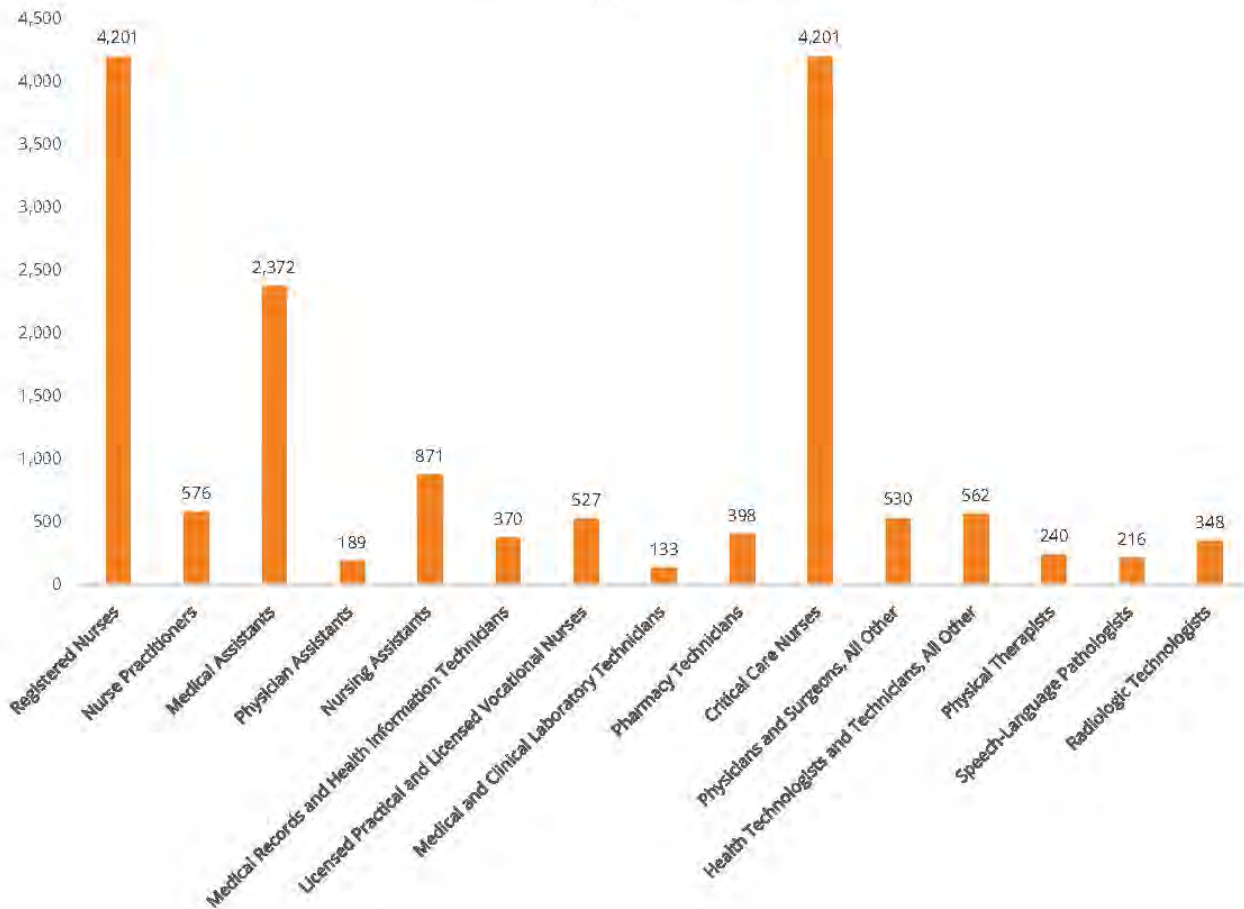
TOP 15 JOBS LOCATION QUOTIENT



The location quotient (LQ) is a measure of relative concentration. In this case, it measures the relative concentration of workers in an occupation in a specific geography compared to the U.S. on average. Higher LQ's typically indicate that employers will have an easier time finding talent because those workers are more concentrated in the area; lower LQ's will make filling open positions more difficult. Despite having a strong health care system, southeast Michigan does not boast concentrations of these workers substantially higher than U.S. averages. Physicians and surgeons have the highest LQ in the county with 1.49, or 49% higher concentration. Meanwhile nurse practitioners, the second most in-demand health care occupations, has a concentration of just 76% of the U.S. average.

TOP 15 JOBS RECENT REGIONAL GRADUATES

Recent Area Grads with Degrees Related to Top Jobs*
(2014)



*Note: many degrees can prepare a person for multiple jobs and therefore many of these graduates are counted for several

Data: EMSI, Burning Glass, Integrated Post-Secondary Data System
Analysis: Workforce Intelligence Network

Due to the regional nature of the labor force in Southeast Michigan data is shown for degree and certificate completions awarded by colleges and universities from all 16 counties in the WIN partnership. Medical assistants have a high number of graduates relative to the number of postings. While the nursing occupations seemingly have a high number of graduates, at least compared to other health care occupations, the supply of degree-earners simply does not meet the demand in the region. For example, the number of postings for RNs in southeast Michigan in Q4 2015 alone outweighed the number of nursing graduates in 2014—by more than 1,000. The most in-demand health care occupations in Washtenaw require varying levels of education depending on the specialized skills required.

HEALTH CARE

TOP 15 JOBS EDUCATION & TRAINING REQUIREMENTS

ONET Code	Occupation	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
29-1141	Registered Nurses	Associate's degree	None	None
29-1171	Nurse Practitioners	Master's degree	None	None
31-9092	Medical Assistants	Postsecondary non-degree award	None	None
29-1071	Physician Assistants	Master's degree	None	None
31-1014	Nursing Assistants	Postsecondary non-degree award	None	None
29-2071	Medical Records and Health Information Technicians	Postsecondary non-degree award	None	None
29-2061	Licensed Practical and Licensed Vocational Nurses	Postsecondary non-degree award	None	None
29-2012	Medical and Clinical Laboratory Technicians	Associate's degree	None	None
29-2052	Pharmacy Technicians	High school diploma or equivalent	None	Moderate-term on-the-job training
29-1141	Critical Care Nurses	Associate's degree	None	None
29-1069	Physicians and Surgeons, All Other	Doctoral or professional degree	None	Internship/residency
29-2099	Health Technologists and Technicians, All Other	High school diploma or equivalent	None	None
29-1123	Physical Therapists	Doctoral or professional degree	None	None
29-1127	Speech-Language Pathologists	Master's degree	None	None
29-2034	Radiologic Technologists	Associate's degree	None	None

All but two of the most in-demand health care occupations in Washtenaw require a credential beyond high school for entry-level openings. Pharmacy technicians, while only needing a high school degree, also require non-credit training. The highest paying occupations in health care require Master's or Professional Degrees and previous experience.

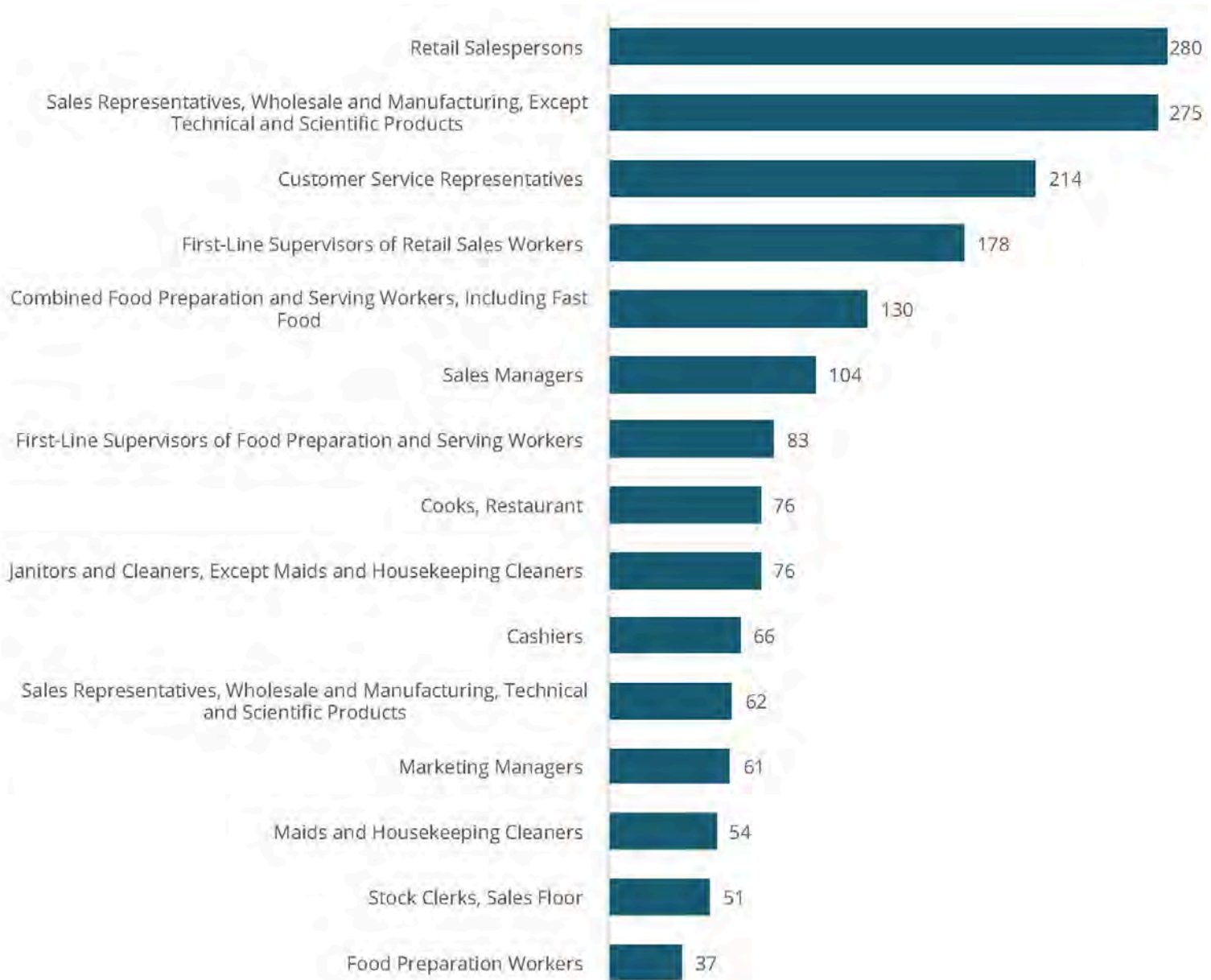


RETAIL AND HOSPITALITY

The retail and hospitality cluster is the largest occupational cluster that WIN analyzes, both in terms of employment and online job postings. This cluster is of very high importance to the region because it is the first to grow when the economy expands and the first to contract in a downturn: It is often a leading indicator. As defined by WIN, the retail and hospitality cluster encompasses all customer service occupations, with skills transferrable across the retail sector, the hotel industry, food and beverage service industry, call centers, and other areas. In 2015, 54,656 individuals were employed in retail and hospitality related occupations in Washtenaw County.

RETAIL & HOSPITALITY

TOP JOBS



* Data : Burning Glass Technologies

Despite a decline in postings from 351 in Q3 to 280 in Q4 2015 (-20.2%), retail salesperson maintained the top spot as the most in-demand retail & hospitality occupation in Washtenaw. Postings increased for all of the most in-demand occupations compared to Q4 2014, in particular for sales managers. Ads for this occupation nearly doubled from 54 in Q4 2014 to 104 this past quarter. New to the Q4 top 15 list were food preparation workers, replacing food service managers. The top five occupations in retail & hospitality accounted for nearly half of all online postings in this cluster in Washtenaw during Q4 2015.

RETAIL & HOSPITALITY

ONLINE JOB POSTINGS OVER TIME



Source: Burning Glass Technologies
Analysis: Workforce Intelligence Network

Online ads for retail & hospitality occupations decreased from 2,499 in Q3 to 2,230 in Q4 2015 (-12.1%). Historically, postings decrease in this cluster during Q4. Nonetheless, this cluster experienced substantial employer demand growth during 2015. Retail & hospitality represented the largest share of the occupation clusters analyzed by WIN with 19.3% of postings in Washtenaw County during Q4 2015. High employer demand over the past few years has corresponded to employment growth.

RETAIL & HOSPITALITY

EMPLOYMENT OVER TIME

Retail & Hospitality Occupational Employment



Source: EMSI

Analysis: Workforce Intelligence Network

Retail & hospitality employment increased from 54,098 in 2014 to 54,656 in 2015 (+1.0%). Employment in this cluster experienced decline in the mid-2000's but 2015 marked a sixth consecutive year of growth. 2015 retail & hospitality employment marked a historic high for the county as it continued to surpass pre-recession levels. Similar to other clusters in Washtenaw, retail & hospitality employers posted about four online ads in Q4 per new 2015 hire (not including turnover).

RETAIL & HOSPITALITY

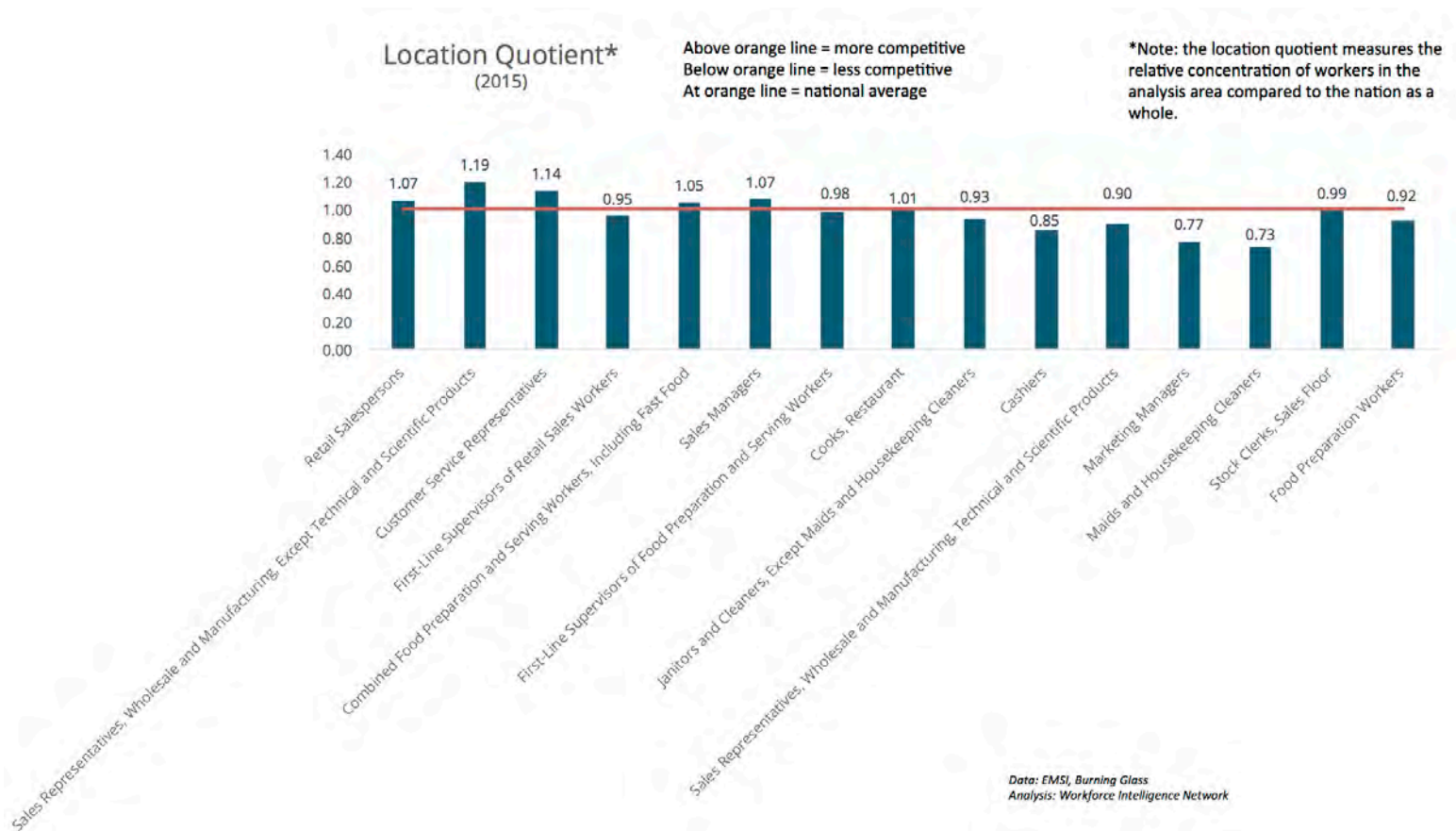
TOP 15 JOBS WAGES

ONET Code	Occupation	10th Percentile Hourly Earnings	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings	90th Percentile Hourly Earnings
41-2031	Retail Salespersons	\$8.35	\$8.98	\$10.24	\$13.13	\$19.00
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	\$12.94	\$18.83	\$27.15	\$39.50	\$55.51
43-4051	Customer Service Representatives	\$9.36	\$11.52	\$15.01	\$19.07	\$24.48
41-1011	First-Line Supervisors of Retail Sales Workers	\$11.18	\$13.60	\$17.23	\$21.87	\$27.40
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	\$8.15	\$8.52	\$9.14	\$9.92	\$12.12
11-2022	Sales Managers	\$28.89	\$38.96	\$52.65	\$70.34	\$106.63
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	\$8.92	\$10.54	\$14.22	\$19.22	\$23.99
35-2014	Cooks, Restaurant	\$8.32	\$9.14	\$10.69	\$12.73	\$14.30
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	\$8.37	\$9.47	\$11.71	\$14.97	\$18.31
41-2011	Cashiers	\$8.21	\$8.72	\$9.61	\$11.65	\$15.09
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	\$18.93	\$26.15	\$36.68	\$50.95	\$68.91
11-2021	Marketing Managers	\$33.98	\$43.88	\$56.23	\$71.85	\$108.91
37-2012	Maids and Housekeeping Cleaners	\$8.15	\$9.04	\$10.31	\$11.99	\$13.73
43-5081	Stock Clerks, Sales Floor	\$8.41	\$9.23	\$11.13	\$14.53	\$18.71
35-2021	Food Preparation Workers	\$8.25	\$9.02	\$10.72	\$13.38	\$15.69

A majority of the in-demand retail & hospitality occupations do not offer wages above \$15 per hour except for the very experienced workers (90th percentile) in these fields. The exception to this are the occupations, typically in sales, requiring a four-year degree for entry-level openings. Consequently, occupations like marketing managers and sales managers offer the most upward mobility. The typical retail & hospitality worker in Washtenaw earns one dollar more per hour on average compared to national averages.

RETAIL & HOSPITALITY

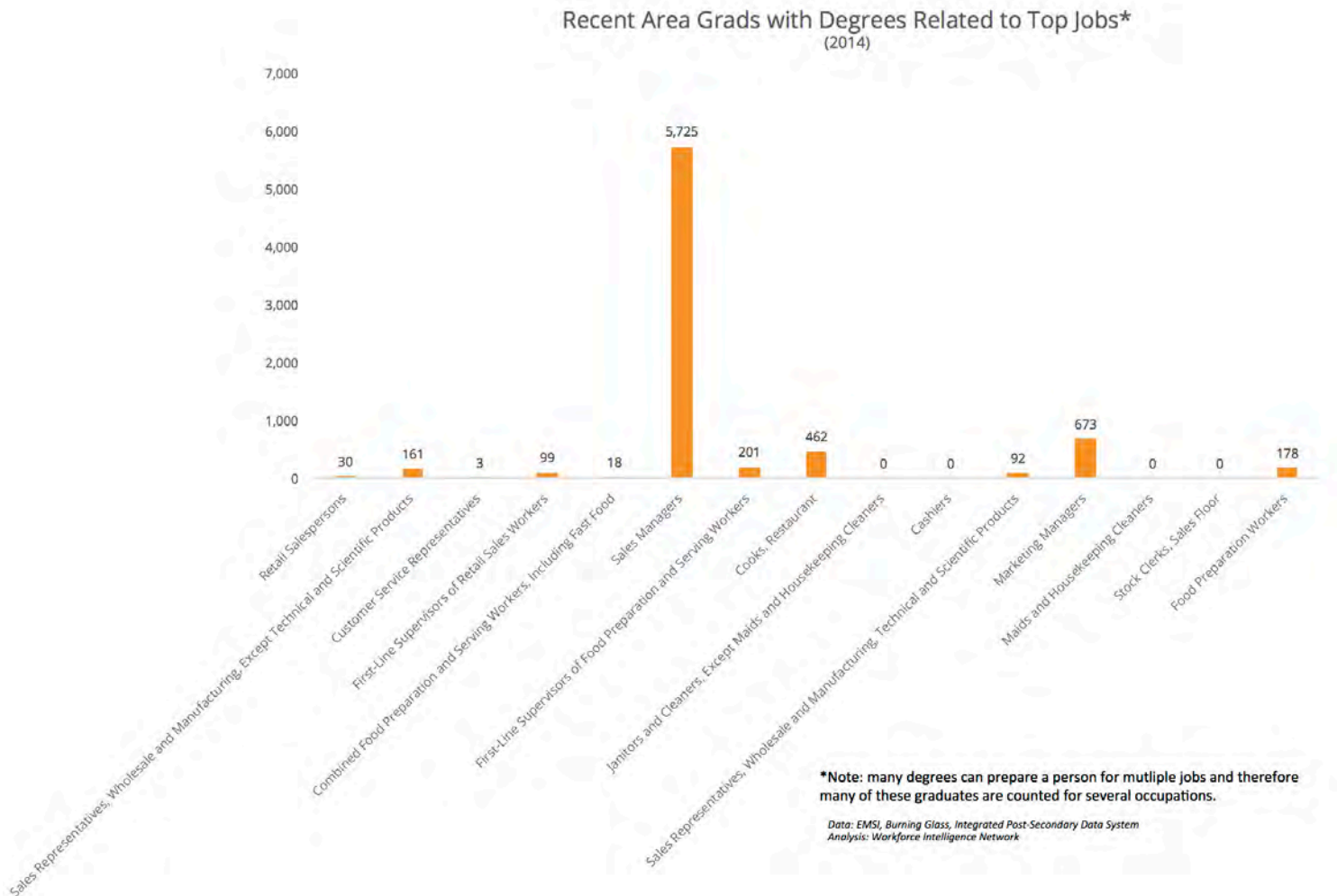
TOP 15 JOBS LOCATION QUOTIENT



The location quotient (LQ) is a measure of relative concentration. In this case, it measures the relative concentration of workers in an occupation in a specific geography compared to the U.S. on average. Higher LQ's typically indicate that employers will have an easier time finding talent because those workers are more concentrated in the area; lower LQ's will make filling open positions more difficult. Southeast Michigan has a slight competitive edge in sales representatives (non-technical products) with an LQ of 1.19, indicating that the region has a 19% higher concentration of these workers than the U.S. on average. In contrast, the region has just 77% the concentration of the U.S. for marketing managers.

RETAIL & HOSPITALITY

TOP 15 JOBS RECENT REGIONAL GRADUATES



Due to the regional nature of the labor force in Southeast Michigan data is shown for degree and certificate completions awarded by colleges and universities from all 16 counties in the WIN partnership. Most occupations in retail & hospitality do not require education beyond high school and so consequently not many have graduates with related degrees. Sales managers boast nearly 6,000 graduates for 2014. More students would be needed in degrees related to being a sales representative in order to satisfy regional demand.

RETAIL & HOSPITALITY

TOP 15 JOBS EDUCATION & TRAINING REQUIREMENTS

ONET Code	Occupation	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
41-2031	Retail Salespersons	Less than high school	None	Short-term on-the-job training
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	High school diploma or equivalent	None	Moderate-term on-the-job training
43-4051	Customer Service Representatives	High school diploma or equivalent	None	Short-term on-the-job training
41-1011	First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	Less than 5 years	None
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	Less than high school	None	Short-term on-the-job training
11-2022	Sales Managers	Bachelor's degree	Less than 5 years	None
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	High school diploma or equivalent	Less than 5 years	None
35-2014	Cooks, Restaurant	Less than high school	Less than 5 years	Moderate-term on-the-job training
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Less than high school	None	Short-term on-the-job training
41-2011	Cashiers	Less than high school	None	Short-term on-the-job training
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Bachelor's degree	None	Moderate-term on-the-job training
11-2021	Marketing Managers	Bachelor's degree	5 years or more	None
37-2012	Maids and Housekeeping Cleaners	Less than high school	None	Short-term on-the-job training
43-5081	Stock Clerks, Sales Floor	Less than high school	None	Short-term on-the-job training
35-2021	Food Preparation Workers	Less than high school	None	Short-term on-the-job training

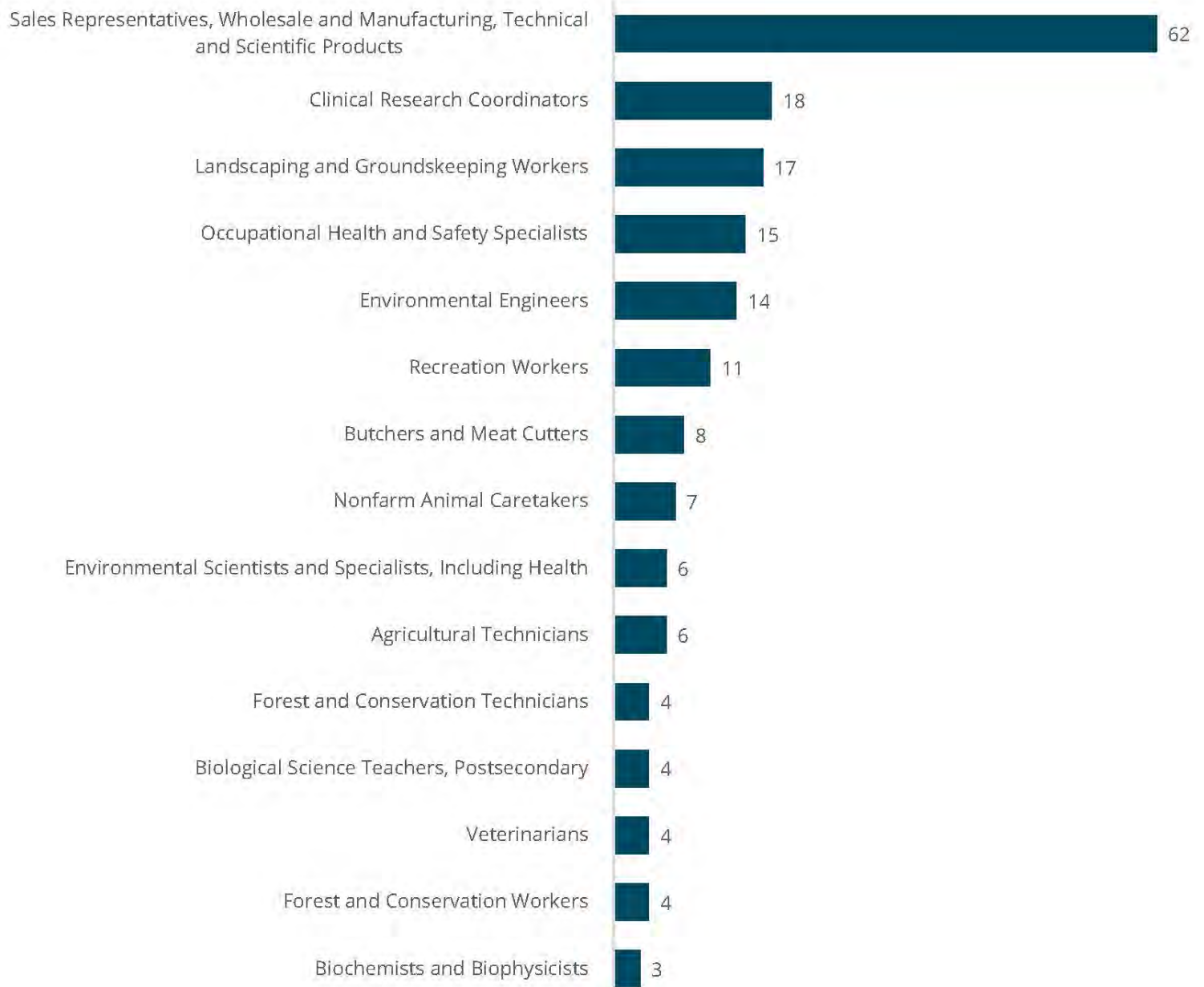
While 12 of the top 15 retail & hospitality occupations require a high school degree or less, most require non-credit training and employers often prefer workers with previous experience. The high paying managerial occupations and sales positions related to scientific products require Bachelor's Degrees.



AGRICULTURE

WIN's agriculture cluster brings together occupations that require knowledge of the farming, livestock, the environment, and natural sciences. Occupations range from farm workers, to environmental engineers, to meat butchers, and recreation workers. In 2015, 22,244 individuals were employed in the agriculture cluster in Washtenaw County.

TOP JOBS

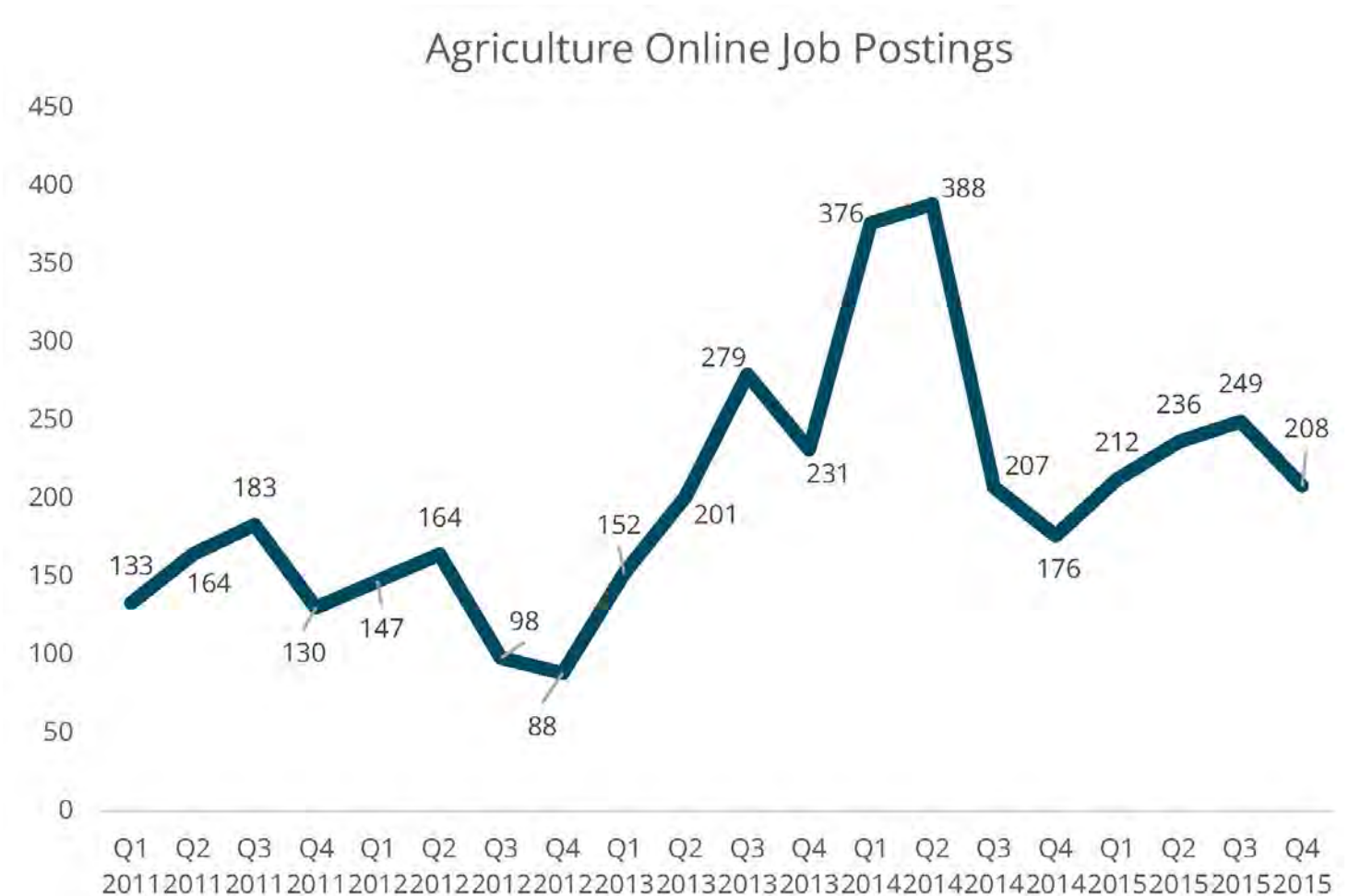


* Data : Burning Glass Technologies

Despite online ads decreasing from 72 in Q3 to 62 in Q4 2015 (-13.9%) sales representatives (scientific products) maintained the top position in the agriculture cluster. Similarly, environmental engineers had postings decrease from 20 in Q3 to 14 in Q4 (-30%). Clinical research coordinators continued to be one of the most in-demand occupations in the agriculture cluster. Postings for sales representatives (scientific products) accounted for nearly one in every three agriculture-related ads.

AGRICULTURE

ONLINE JOB POSTINGS OVER TIME



Source: Burning Glass Technologies

Analysis: Workforce Intelligence Network

Following three consecutive quarters of growth, postings declined in Q4 2015 to 208, down from 249 in Q3 (-16.5%). Online ads historically decline between Q3 and Q4 for agriculture occupations. The agriculture cluster accounted for a 1.8% share of all online ads in Washtenaw during Q4 2015. Postings remain high relative to 2011-2013, and could explain the increasing employment since then.

AGRICULTURE

EMPLOYMENT OVER TIME



Source: EMSI

Analysis: Workforce Intelligence Network

Employment increased from 21,634 in 2014 to 22,244 in 2015 (+2.8%). Agriculture employment in Washtenaw has been growing slowly but steadily since 2001. This sector of the economy was largely unaffected by the recession, at least in terms of employment. Washtenaw employers for agriculture occupations posted one online ad per three new net jobs (not including turnover), most likely indicating that most employers use other methods than online boards to find talent.

AGRICULTURE

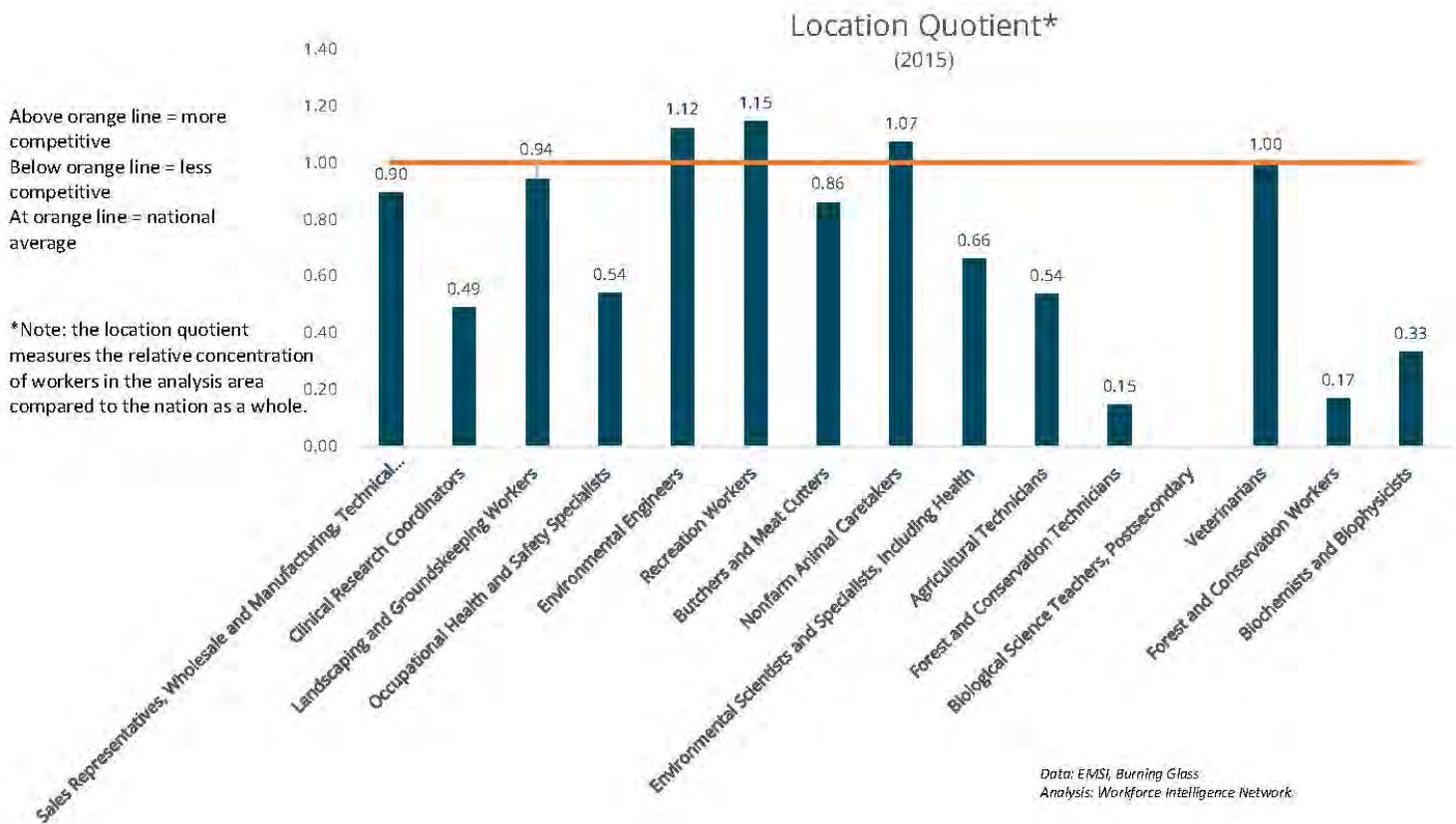
TOP 15 JOBS WAGES

ONET Code	Occupation	10th Percentile Hourly Earnings	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings	90th Percentile Hourly Earnings
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	\$18.93	\$26.15	\$36.68	\$50.95	\$68.91
11-9121	Clinical Research Coordinators	\$31.71	\$38.02	\$47.73	\$60.17	\$83.65
37-3011	Landscaping and Groundskeeping Workers	\$8.25	\$9.40	\$10.70	\$13.27	\$16.93
29-9011	Occupational Health and Safety Specialists	\$20.67	\$24.13	\$31.95	\$37.68	\$44.85
17-2081	Environmental Engineers	\$25.94	\$35.07	\$42.71	\$50.88	\$58.52
39-9032	Recreation Workers	\$8.21	\$8.88	\$10.14	\$12.46	\$15.56
51-3021	Butchers and Meat Cutters	\$9.33	\$11.41	\$14.58	\$18.20	\$22.00
39-2021	Nonfarm Animal Caretakers	\$8.49	\$9.11	\$10.11	\$12.18	\$15.01
19-2041	Environmental Scientists and Specialists, Including Health	\$20.90	\$24.43	\$31.33	\$39.84	\$50.95
19-4011	Agricultural Technicians	\$10.91	\$13.09	\$17.21	\$21.11	\$26.11
19-4093	Forest and Conservation Technicians	\$12.33	\$14.54	\$18.10	\$21.78	\$25.70
25-1042	Biological Science Teachers, Postsecondary	na	na	na	na	na
29-1131	Veterinarians	\$31.97	\$37.52	\$49.64	\$58.97	\$66.59
45-4011	Forest and Conservation Workers	\$10.44	\$11.23	\$14.41	\$17.84	\$20.76
19-1021	Biochemists and Biophysicists	\$20.93	\$26.89	\$39.57	\$51.09	\$65.49

Wages vary substantially for agriculture occupations in the region, mostly depending on the education required. Nine of the top occupations offer a wage greater than \$15 per hour at the median level. Clinical research coordinators and veterinarians offer the most upward mobility in terms of wages. The typical Washtenaw agriculture worker earns \$34 per hour while the national average is \$21 (+61.9%).

AGRICULTURE

TOP 15 JOBS LOCATION QUOTIENT



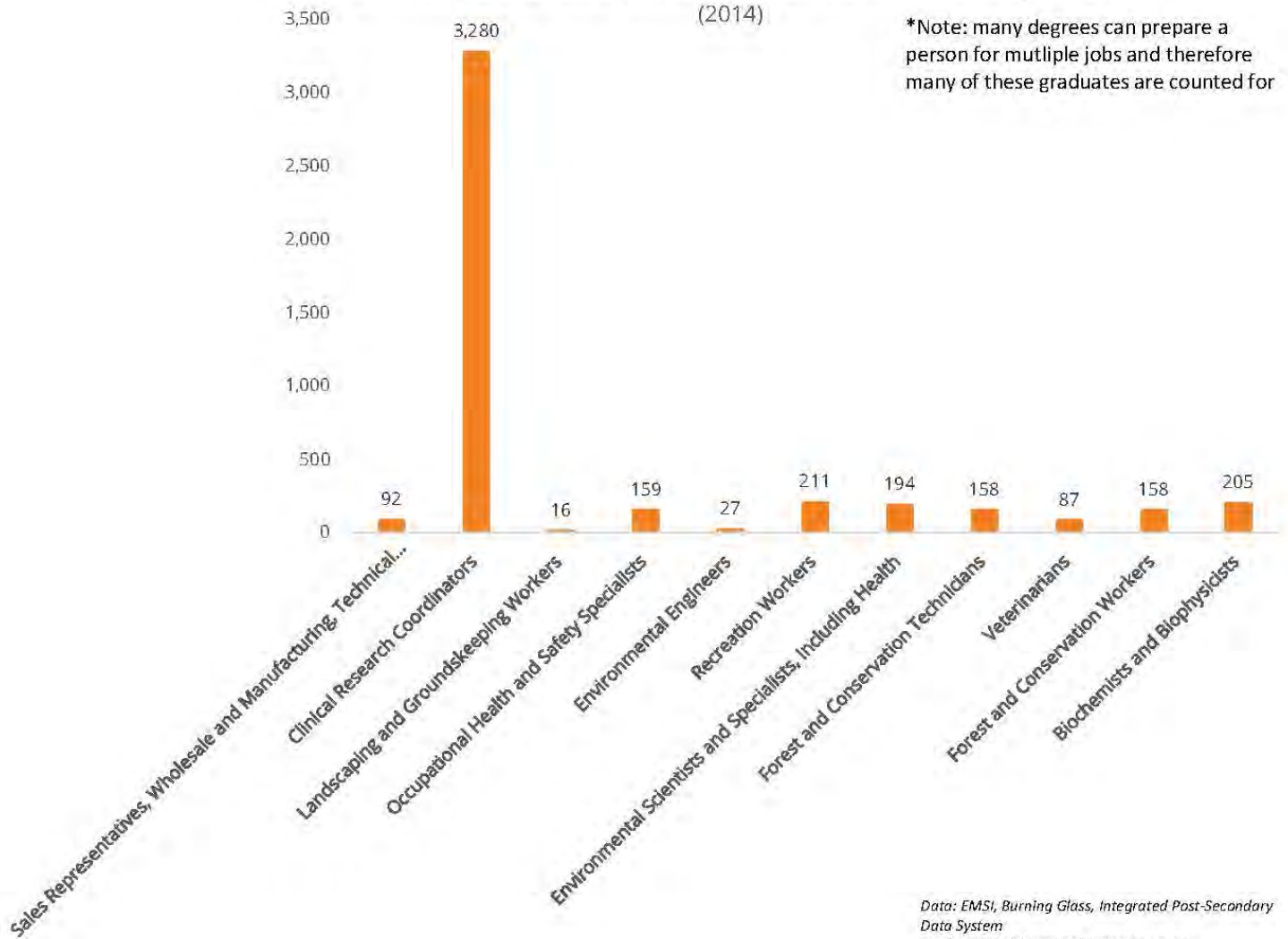
The location quotient (LQ) is a measure of relative concentration. In this case, it measures the relative concentration of workers in an occupation in a specific geography compared to the U.S. on average. Higher LQ's typically indicate that employers will have an easier time finding talent because those workers are more concentrated in the area; lower LQ's will make filling open positions more difficult. Of the most in-demand agriculture occupations, recreation workers have the highest LQ in the region with a 15% greater concentration than the national average. In contrast, clinical research coordinators have just 49% the concentration of the U.S. average.

TOP 15 JOBS RECENT REGIONAL GRADUATES

Recent Area Grads with Degrees Related to Top Jobs*

(2014)

*Note: many degrees can prepare a person for multiple jobs and therefore many of these graduates are counted for



Data: EMSI, Burning Glass, Integrated Post-Secondary Data System
Analysis: Workforce Intelligence Network

Due to the regional nature of the labor force in Southeast Michigan data is shown for degree and certificate completions awarded by colleges and universities from all 16 counties in the WIN partnership. Since the education requirements for agriculture occupations vary substantially, so too does the number of graduates related to the top jobs. Clinical research coordinators have a high number of graduates with related degrees compared to the relative low number of postings. The other occupations tend to have enough graduates to satisfy demand.

AGRICULTURE

TOP 15 JOBS EDUCATION & TRAINING REQUIREMENTS

ONET Code	Occupation	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Bachelor's degree	None	Moderate-term on-the-job training
11-9121	Clinical Research Coordinators	Bachelor's degree	5 years or more	None
37-3011	Landscaping and Groundskeeping Workers	Less than high school	None	Short-term on-the-job training
29-9011	Occupational Health and Safety Specialists	Bachelor's degree	None	Short-term on-the-job training
17-2081	Environmental Engineers	Bachelor's degree	None	None
39-9032	Recreation Workers	Bachelor's degree	None	None
51-3021	Butchers and Meat Cutters	Less than high school	None	Long-term on-the-job training
39-2021	Nonfarm Animal Caretakers	Less than high school	None	Short-term on-the-job training
19-2041	Environmental Scientists and Specialists, Including Health	Bachelor's degree	None	None
19-4011	Agricultural Technicians	Associate's degree	None	Moderate-term on-the-job training
19-4093	Forest and Conservation Technicians	Associate's degree	None	None
25-1042	Biological Science Teachers, Postsecondary	#N/A	#N/A	#N/A
29-1131	Veterinarians	Doctoral or professional degree	None	None
45-4011	Forest and Conservation Workers	High school diploma or equivalent	None	Moderate-term on-the-job training
19-1021	Biochemists and Biophysicists	Doctoral or professional degree	None	None

While the education required varies for different agriculture occupations, a majority require either previous experience or specialized training. The highest paying agriculture jobs tend to require a Bachelor's or Doctoral degree.

The background of the page is a blurred cityscape with warm, golden-yellow and orange tones. Overlaid on the left side are several thick, wavy, translucent lines in orange, dark blue, and yellow, which curve upwards and then downwards, creating a dynamic, flowing effect.

SECTION FOUR

DATA NOTES AND SOURCES

DATA NOTES AND SOURCES

SPECIAL DATA NOTE

- Due to changes in Burning Glass's aggregation, parsing, and deduplication methods implemented in December 2014, data from previously released reports should not be compared to data in reports starting in Q4 2014 and moving forward. For the Q4 2014 report, the WIN team re-gathered and analyzed all of the data (postings from 2011 through 2014) to ensure that all numbers are up-to-date. If you would like information on the differences between the updated data and data from previous reports, please contact WIN's Research Director Colby Spencer Cesaro at colby.cesaro@win-semich.org.
- Wage, location quotient, completion, and education requirement data is shown for the 16 county region that is part of the WIN partnership.
- All numbers included in this report are the correct and updated data.
- Wage and educational attainment data available varies depending on the occupation. All wage and educational attainment data provided is for the 6-digit SOC code. Some 6-digit codes do not have education or wage data available, in this case we leave the information blank.
- Educational attainment data available refers to the share of the current workforce in each bracket, not what is shown in postings. Employers may require different educational attainment than what is in this report.
- Quarterly reports: Due to a data update in Burning Glass Technologies' Labor Insight tool, comparisons should not be made between data from each quarterly report and the annual review data should not be compared to data from previous quarterly reports.
- Adjustments to the labor force information were also made to reflect and incorporate updated inputs, re-estimation, and controlling to new statewide totals. Much of the information related to monthly and quarterly employment is updated several months after the initial release. More information can be found here: <http://www.bls.gov/lau/launews1.htm>
- This report uses \$15 as a "living wage" estimate. Any job paying more than this is considered to pay at least a living wage. Below \$15 is less than a living wage. This definition is based on a median household income in Michigan which is close to \$50,000 per year. If we assume that most homes have two income earners and both earn at least \$15 per hour, then that household's annual income would be at least \$62,000 putting these jobs above the median.

DATA NOTES AND SOURCES

UNDERSTANDING DEMAND VS EMPLOYMENT

- Employment refers to actual employment numbers—the number of people in jobs—in targeted industries or occupations.
- Demand refers to statistics derived from employer job postings, which indicate the potential for employment but may or may not materialize into actual jobs.
- Job posting-related demand, as presented in this report, is measured by online job postings. Employer demand may be larger than what is highlighted in this report if employers find talent by other means.

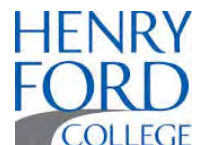
DATA SOURCES

- Labor market demand data for this report was compiled using Burning Glass Technologies' Labor Insight Tool, and analyzed by the Workforce Intelligence Network. Other data sources include, the Bureau of Labor Statistics, and Economic Modeling Specialists Inc. (EMSI). Check out our website <http://www.win-semich.org> for more data and detailed information about our sources.

UNDERSTANDING CLUSTERS

- Rather than focusing on talent demand within industries (types of firms), WIN generally emphasizes exploring talent demand based on occupations, including the skills, educational credentials, and experience needed to work in them.
- WIN research examines industry data, as the health of companies can be useful for economic development purposes. However, shifting focus from industry to occupation is important as different types of occupations with extremely different skillsets may work within and across industries. For example, accountants, computer specialists, and engineers all may work in the manufacturing industry.
- By clustering occupations, the talent system can identify employer demand for particular skillsets across multiple industry types and develop a response through training and pipeline development to meet that demand.

BOARD ORGANIZATIONS



FOR MORE INFORMATION ABOUT RESEARCH AND DATA,
VISIT OUR WEBSITE:
WWW.WIN-SEMICH.ORG/DATA-RESEARCH

