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Occupational Employment and Wages For Selected Engineering Occupations in Michigan's Metropolitan Areas – May 2014

A total of 38,700 mechanical engineers were employed in Michigan in 2014, the U.S. Bureau of Labor Statistics reported today. Industrial, electrical, and civil engineers held nearly 37,000 additional jobs in the state. Regional Commissioner Charlene Peiffer noted that the Detroit-Warren-Livonia Metropolitan Statistical Area (the Detroit MSA) employed the largest number of mechanical engineers and was the only area to record an average (mean) wage significantly above the U.S. average for this occupation among the 15 MSAs in the state. (See [table A](#) and [table B](#)) For comprehensive definitions of metropolitan statistical areas and metropolitan divisions in Michigan, please see [Technical Note](#).)

The Detroit MSA had a combined employment of 52,220 in the four selected engineering occupations, of which 30,380 were mechanical engineers. Warren-Troy-Farmington Hills (the Warren MD), one of the area's two metropolitan divisions, employed 31,470 in the four engineering occupations combined. Detroit-Livonia-Dearborn (the Detroit MD), Detroit's other metropolitan division, had 20,750 jobs in the four occupations. Grand Rapids-Wyoming and Ann Arbor had a combined employment of 4,340 and 3,100, respectively, for the four occupations. Combined employment was less than 3,000 in each of the remaining areas for which data were available for the four occupations. (See [table B](#).)

Location quotients (LQ's) allow us to explore the occupational make-up of a metropolitan area by comparing the composition of jobs in an area relative to the national average. For example, a location quotient of 2.0 indicates that an occupation accounts for twice the share of employment in the area than it does nationally.

Several of Michigan's areas had some of the highest LQ's in the country for mechanical engineers and industrial engineers. For mechanical engineers, the Warren MD had a LQ of 8.4, meaning mechanical engineers were employed in this area at 8.4 times the national rate. The Detroit MD had a LQ of 7.8 for mechanical engineers. Niles-Benton Harbor (5.9), Ann Arbor (3.4), and Saginaw-Saginaw Township North (3.4) also had some of the highest LQs in the nation for mechanical engineers. Areas with high location quotients for industrial engineers included Holland-Grand Haven (7.4), Monroe (6.3), and the Detroit MD (4.6).

Table A. Average (mean) annual wages for selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2014

Area	Mechanical Engineers	Industrial Engineers	Electrical Engineers	Civil Engineers
United States.....	\$87,140	\$85,110	\$95,780	\$87,130
Michigan.....	88,730	80,040*	85,880*	70,590*
Ann Arbor.....	89,240	77,690*	96,940	70,670*
Battle Creek.....	86,520	68,250*	86,150*	79,050*
Bay City.....	89,480	64,700*	80,850*	77,040*
Detroit-Warren-Livonia.....	92,570*	86,030	88,300*	69,550*
Detroit-Livonia-Dearborn.....	93,850*	88,090	91,350*	71,240*
Warren-Troy-Farmington Hills.....	91,810*	84,270	86,080*	68,610*
Flint.....	75,310*	82,970	(¹)	73,950*
Grand Rapids-Wyoming.....	70,010*	75,870*	84,230*	70,120*
Holland-Grand Haven.....	66,860*	69,060*	69,400*	75,040*
Jackson.....	66,980*	74,890*	78,490*	86,690
Kalamazoo-Portage.....	79,440*	72,770*	82,240*	61,930*
Lansing-East Lansing.....	69,690*	64,560*	100,430	73,080*
Monroe.....	75,760*	83,550	(¹)	79,570*
Muskegon-Norton Shores.....	72,910*	63,660*	(¹)	56,980*
Niles-Benton Harbor.....	76,490*	72,280*	71,860*	78,260
Saginaw-Saginaw Township North.....	74,570*	65,020*	71,550*	67,990*
South Bend-Mishawaka.....	75,190*	88,230	64,800*	69,390*

(¹) Data not available.

Note: An asterisk indicates that the mean annual wage for this area is significantly different from the national average of all areas at the 90-percent confidence level.

Earnings for mechanical engineers in Michigan’s metropolitan areas

Mechanical engineers in the Detroit MSA earned an average (mean) wage of \$92,570 per year, the only MSA in the state with wages measurably above the U.S. average of \$87,140. Eleven metropolitan areas had average wages for this occupation that were significantly lower than the national average, including Kalamazoo-Portage (\$79,440), Grand Rapids-Wyoming (\$70,010), and Holland-Grand Haven (\$66,860). Mechanical engineers in the remaining three areas earned wages that were not measurably different from the U.S. average.

Earnings for industrial engineers in Michigan’s metropolitan areas

Eleven metropolitan areas had mean annual wages for industrial engineers that were significantly lower than the U.S. average of \$85,110. Ann Arbor (\$77,690), Grand Rapids-Wyoming (\$75,870), and Lansing-East Lansing (\$64,560) were among those areas. Wages were not measurably different from the national average for industrial engineers in the remaining four areas.

Earnings for electrical engineers in Michigan’s metropolitan areas

Electrical engineers in 10 metropolitan areas for which data were available had annual wages that were significantly lower than the \$95,780 U.S. average. South Bend-Mishawaka (\$64,800), Holland-Grand Haven (\$69,400), and Saginaw-Saginaw Township North (\$71,550) were among the lower-paying areas. Wages were not measurably different from the national average in Ann Arbor and Lansing-East Lansing.

Earnings for civil engineers in Michigan's metropolitan areas

Wages for civil engineers were significantly below the national average of \$87,130 in 13 of the 15 areas in Michigan. These areas included Lansing-East Lansing (\$73,080), Grand Rapids-Wyoming (\$70,120), and the Detroit MSA (\$69,550). Civil engineers in two areas earned wages that were not measurably different from the national average for this occupation.

Table B. Employment of selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2014

Area	Mechanical Engineers		Industrial Engineers		Electrical Engineers		Civil Engineers	
	Total employment	Location quotient	Total employment	Location quotient	Total employment	Location quotient	Total employment	Location quotient
United States.....	270,700	1.0	236,990	1.0	174,550	1.0	263,460	1.0
Michigan.....	38,700	4.7	22,390	3.1	8,580	1.6	5,820	0.7
Ann Arbor.....	1,410	3.4	1,280	3.6	250	0.9	170	0.4
Battle Creek.....	220	2.0	300	3.1	40	0.5	50	0.5
Bay City.....	100	1.4	70	1.1	30	0.7	70	1.0
Detroit-Warren-Livonia.....	30,380	8.2	12,640	3.9	6,200	2.6	3,000	0.8
Detroit-Livonia-Dearborn.....	11,250	7.8	5,810	4.6	2,610	2.8	1,080	0.8
Warren-Troy-Farmington Hills.....	19,130	8.4	6,820	3.4	3,590	2.4	1,930	0.9
Flint.....	160	0.6	230	1.0	(¹)	(¹)	80	0.3
Grand Rapids-Wyoming.....	1,270	1.6	2,010	2.8	530	1.0	530	0.7
Holland-Grand Haven.....	680	3.0	1,460	7.4	(¹)	(¹)	180	0.8
Jackson.....	280	2.5	(¹)	(¹)	200	2.7	290	2.6
Kalamazoo-Portage.....	500	1.9	350	1.5	90	0.5	150	0.6
Lansing-East Lansing.....	520	1.3	430	1.2	90	0.3	510	1.3
Monroe.....	140	1.8	430	6.3	(¹)	(¹)	40	0.5
Muskegon-Norton Shores.....	270	2.2	260	2.4	(¹)	(¹)	60	0.5
Niles-Benton Harbor.....	680	5.9	100	0.9	50	0.7	40	0.4
Saginaw-Saginaw Township North.....	570	3.4	320	2.2	180	1.7	60	0.4
South Bend-Mishawaka.....	480	1.9	320	1.5	50	0.3	30	0.1

(¹) Data not available.

These statistics are from the Occupational Employment Statistics (OES) survey, a federal-state cooperative program between BLS and State Workforce Agencies, in this case, the Michigan State Department of Technology, Management and Budget, and the Indiana Department of Workforce Development.

OES wage and employment data for civil, electrical, industrial, and mechanical engineers in the state and metropolitan areas were compared to their respective national averages based on statistical significance testing. Only those occupations with wages or employment shares above or below the national wage or share after testing for significance at the 90-percent confidence level meet the criteria.

Note: A value that is statistically different from another does not necessarily mean that the difference has economic or practical significance. Statistical significance is concerned with the ability to make confident statements about a universe based on a sample. It is entirely possible that a large difference between two values is not significantly different statistically, while a small difference is, since both the size and heterogeneity of the sample affect the relative error of the data being tested.

Technical Note

The Occupational Employment Statistics (OES) survey is a semiannual mail survey measuring occupational employment and wage rates for wage and salary workers in nonfarm establishments in the United States. Guam, Puerto Rico, and the Virgin Islands are also surveyed, but their data are not included in the national estimates. OES estimates are constructed from a sample of about 1.2 million establishments. Forms are mailed to approximately 200,000 sampled establishments in May and November each year. May 2014 estimates are based on responses from six semiannual panels collected over a 3-year period: May 2014, November 2013, May 2013, November 2012, May 2012, and November 2011. The overall national response rate for the six panels is 74.3 percent based on establishments and 70.5 percent based on weighted sampled employment. The unweighted employment of sampled establishments across all six semiannual panels represents approximately 57.1 percent of total national employment. (Response rates are slightly lower for these estimates due to the federal shutdown in October 2013.) For more information about OES concepts and methodology, go to www.bls.gov/news.release/ocwage.tn.htm.

The OES survey provides estimates of employment and hourly and annual wages for wage and salary workers in 22 major occupational groups and 821 detailed occupations for the nation, states, metropolitan statistical areas, metropolitan divisions, and nonmetropolitan areas. In addition, employment and wage estimates for 94 minor groups and 458 broad occupations are available in the national data. OES data by state and metropolitan/nonmetropolitan area are available from www.bls.gov/oes/current/oesrcst.htm and www.bls.gov/oes/current/oesrcma.htm, respectively.

The May 2014 OES estimates are based on the 2010 Standard Occupational Classification (SOC) system and the 2012 North American Industry Classification System (NAICS). Information about the 2010 SOC is available on the BLS website at www.bls.gov/soc and information about the 2012 NAICS is available at www.bls.gov/bls/naics.htm.

Metropolitan area definitions

The substate area data published in this release reflect the standards and definitions established by the U.S. Office of Management and Budget.

- **Ann Arbor, Mich. Metropolitan Statistical Area (MSA)** includes Washtenaw County in Michigan.
- **Battle Creek, Mich. MSA** includes Calhoun County in Michigan.

- **Bay City, Mich. MSA** includes Bay County in Michigan.
- **Detroit-Warren-Livonia, Mich. MSA** includes the following:
 - **Detroit-Livonia-Dearborn, Mich. Metropolitan Division (MD)** includes Wayne County in Michigan.
 - **Warren-Troy-Farmington, Mich. MD** includes Lapeer, Livingston, Macomb, Oakland and St. Clair Counties in Michigan.
 - **Flint, Mich. MSA** includes Genesee County in Michigan.
 - **Grand Rapids-Wyoming, Mich. MSA** includes Barry, Ionia, Kent, and Newaygo Counties in Michigan.
 - **Holland-Grand Haven, Mich. MSA** includes Ottawa County in Michigan.
 - **Jackson, Mich. MSA** includes Jackson County in Michigan.
 - **Kalamazoo-Portage, Mich. MSA** includes Kalamazoo and Van Buren Counties in Michigan.
 - **Lansing-East Lansing, Mich. MSA** includes Clinton, Eaton, and Ingham Counties in Michigan.
 - **Monroe, Mich. MSA** includes Monroe County in Michigan.
 - **Muskegon-Norton Shores, Mich. MSA** includes Muskegon County in Michigan.
 - **Niles-Benton Harbor, Mich. MSA** includes Berrien County in Michigan.
 - **Saginaw-Saginaw Township North, Mich. MSA** includes Saginaw County in Michigan.
 - **South Bend-Mishawaka, Ind.-Mich. MSA** includes Cass County in Michigan and St. Joseph County in Indiana.

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