



**For Release: Thursday, May 31, 2018**

**18-604-CHI**

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## **Occupational Employment and Wages For Selected Engineering Occupations in Michigan's Metropolitan Areas — May 2017**

Among the 15 metropolitan areas located entirely or partially in Michigan, 10 areas had annual mean wages that were significantly below the national average for electrical engineers and mechanical engineers, the U.S. Bureau of Labor Statistics reported today. Nine areas had below-average wages for industrial engineers. Civil engineers in eight areas had wages that were significantly below the national average. Assistant Commissioner for Regional Operations Charlene Peiffer noted that three metropolitan areas—Ann Arbor, Detroit-Warren-Dearborn, and Flint—had annual wages that were significantly higher than the national average for industrial engineers. Nationwide, the average (mean) wage for mechanical engineers was \$91,500; for industrial engineers, \$90,340; for electrical engineers, \$99,580; and for civil engineers, \$91,790. (See [table A](#). For comprehensive definitions of metropolitan areas in Michigan, please see the [Technical Note](#).)

**Table A. Average (mean) annual wages for selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2017**

Area	Mechanical engineers	Industrial engineers	Electrical engineers	Civil engineers
United States .....	\$91,500	\$90,340	\$99,580	\$91,790
Michigan .....	90,850	88,330*	88,250*	80,000*
Ann Arbor .....	84,850*	95,220*	86,710*	91,500
Battle Creek.....	101,040	87,030	70,660*	(1)
Bay City .....	82,500	92,250	(1)	(1)
Detroit-Warren-Dearborn.....	94,690*	92,900*	90,680*	80,690*
Detroit-Dearborn-Livonia .....	96,380*	90,610	92,780*	90,210
Warren-Troy-Farmington Hills .....	93,830	93,940*	89,460*	77,790*
Flint.....	78,670*	93,860*	101,120	65,880*
Grand Rapids-Wyoming.....	72,920*	75,250*	75,190*	73,490*
Jackson .....	90,610	78,130*	100,980	91,360
Kalamazoo-Portage.....	75,900*	80,410*	87,720*	72,500*
Lansing-East Lansing.....	78,120*	85,240*	79,530*	78,650*
Midland.....	64,480*	98,250	(1)	(1)
Monroe .....	80,850*	76,920*	70,180*	61,740*
Muskegon.....	74,990*	73,710*	81,010*	80,430
Niles-Benton Harbor.....	94,400	86,290*	98,180	(1)
Saginaw.....	79,100*	78,080*	91,130*	67,550*
South Bend-Mishawaka .....	72,200*	77,740*	78,370*	72,420*

Footnotes:

(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.

Total employment for the four selected engineering occupations in Michigan was 91,650. Sixty-nine percent (63,020) of the combined state employment in the selected occupations was located in the Detroit-Warren-Dearborn metropolitan area (the Detroit MSA). The Grand Rapids-Wyoming area had a total employment of 8,610 for the four engineering occupations. In each of the remaining areas for which data were available for the four occupations, total employment was less than 3,500. (See [table B.](#))

**Table B. Employment of selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2017**

Area	Mechanical engineers	Industrial engineers	Electrical engineers	Civil engineers
United States.....	291,290	265,520	183,370	298,910
Michigan .....	44,680	28,460	10,280	8,230
Ann Arbor .....	1,060	1,860	230	260
Battle Creek.....	330	210	110	50
Bay City .....	60	70	(1)	(1)
Detroit-Warren-Dearborn.....	33,100	17,500	6,940	5,480
Detroit-Dearborn-Livonia .....	11,140	5,460	2,540	1,280
Warren-Troy-Farmington Hills .....	21,970	12,040	4,390	4,200
Flint.....	170	360	160	40
Grand Rapids-Wyoming.....	3,750	3,380	930	550
Jackson .....	1,070	340	380	150
Kalamazoo-Portage.....	780	480	100	140
Lansing-East Lansing.....	780	610	240	660
Midland.....	100	140	(1)	(1)
Monroe .....	240	110	(1)	(1)
Muskegon.....	280	410	50	100
Niles-Benton Harbor.....	890	290	200	(1)
Saginaw.....	160	450	90	160
South Bend-Mishawaka .....	220	350	80	170

Footnotes:

(1) Data not available.

Location quotients (LQs) 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 metropolitan areas had high LQs for mechanical engineers and industrial engineers. For instance, the Jackson and the Detroit MSA had LQs for mechanical engineers of 8.8 and 8.2, respectively, indicating that this occupation was employed at 8.8 times the national rate in Jackson and 8.2 times the national rate in the Detroit MSA. Niles-Benton Harbor (7.0), Grand Rapids-Wyoming (3.3), and Monroe (3.1) also had high LQs for mechanical engineers. High LQ areas for industrial engineers included the Detroit MSA (4.8), Ann Arbor (4.7), Muskegon (3.6), and Grand Rapids-Wyoming (3.3). The Jackson area had an LQ of 5.0 for electrical engineers. (See [table C.](#))

**Table C. Location quotients of selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2017**

Area	Mechanical engineers	Industrial engineers	Electrical engineers	Civil engineers
United States.....	1.0	1.0	1.0	1.0
Michigan .....	5.1	3.6	1.9	0.9
Ann Arbor .....	2.4	4.7	0.8	0.6
Battle Creek.....	2.9	2.1	1.5	0.5
Bay City .....	0.8	1.1	(1)	(1)
Detroit-Warren-Dearborn.....	8.2	4.8	2.7	1.3
Detroit-Dearborn-Livonia .....	7.4	4.0	2.7	0.8

Note: See footnotes at end of table.

**Table C. Location quotients of selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2017 - Continued**

Area	Mechanical engineers	Industrial engineers	Electrical engineers	Civil engineers
Warren-Troy-Farmington Hills .....	8.7	5.3	2.8	1.6
Flint.....	0.6	1.4	0.9	0.1
Grand Rapids-Wyoming .....	3.3	3.3	1.3	0.5
Jackson .....	8.8	3.1	5.0	1.2
Kalamazoo-Portage.....	2.7	1.9	0.6	0.5
Lansing-East Lansing.....	1.8	1.5	0.9	1.5
Midland.....	1.4	2.2	(1)	(1)
Monroe .....	3.1	1.6	(1)	(1)
Muskegon.....	2.2	3.6	0.7	0.8
Niles-Benton Harbor.....	7.0	2.5	2.5	(1)
Saginaw.....	0.9	2.9	0.9	0.9
South Bend-Mishawaka .....	0.8	1.4	0.5	0.6

Footnotes:

(1) Data not available.

### **Wages for mechanical engineers in Michigan’s metropolitan areas**

In 10 metropolitan areas, mechanical engineers had annual wages that were significantly lower than the U.S. average of \$91,500, ranging from \$84,850 in Ann Arbor to \$64,480 in Midland. The Detroit MSA had wages significantly above the national average at \$94,690. Mechanical engineers in the remaining areas earned wages that were not measurably different from the national average for this occupation.

### **Wages for industrial engineers in Michigan’s metropolitan areas**

Industrial engineers in Ann Arbor (\$95,220), Flint (\$93,860), and the Detroit MSA (\$92,900) had annual average wages significantly above the U.S. average of \$90,340. Nine metropolitan areas had wages that were measurably lower than the national average, ranging from \$86,290 in the Niles-Benton Harbor area to \$73,710 in Muskegon. Industrial engineers in the remaining areas earned wages that were not significantly different from the national average.

### **Wages 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 below the national average of \$99,580. Wages in these metropolitan statistical areas ranged from \$91,130 in Saginaw to \$70,180 in Monroe. Electrical engineers in the remaining areas where data were available earned wages that were not measurably different from the national average for this occupation.

### **Wages for civil engineers in Michigan’s metropolitan areas**

Civil engineers in eight metropolitan areas for which data were available had annual wages that were significantly lower than the U.S. average of \$91,790. Wages in these eight areas ranged from \$80,690 in the Detroit MSA to \$61,740 in Monroe. Civil engineers in the three remaining areas where data were available earned wages that were not measurably different from the national average.

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 Department of Technology, Management and Budget, and the Indiana Department of Workforce Development.

## 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 survey measuring occupational employment and wage rates for wage and salary workers in nonfarm establishments in the United States. The OES data available from BLS include cross-industry occupational employment and wage estimates for the nation; over 650 areas, including states and the District of Columbia, metropolitan statistical areas (MSAs), metropolitan divisions, nonmetropolitan areas, and territories; national industry-specific estimates at the NAICS sector, 3-, 4-, and selected 5- and 6-digit industry levels; and national estimates by ownership across all industries and for schools and hospitals. OES data are available at [www.bls.gov/oes/tables.htm](http://www.bls.gov/oes/tables.htm).

OES estimates are constructed from a sample of about 1.2 million establishments. Each year, two semiannual panels of approximately 200,000 sampled establishments are contacted, one panel in May and the other in November. Responses are obtained by mail, Internet or other electronic means, email, telephone, or personal visit. The May 2017 estimates are based on responses from six semiannual panels collected over a 3-year period: May 2017, November 2016, May 2016, November 2015, May 2015, and November 2014. The overall national response rate for the six panels, based on the 50 states and the District of Columbia, is 72 percent based on establishments and 68 percent based on weighted sampled employment. The unweighted employment of sampled establishments across all six semiannual panels represents approximately 58 percent of total national employment. For more information about OES concepts and methodology, go to [www.bls.gov/oes/current/oes\\_tec.htm](http://www.bls.gov/oes/current/oes_tec.htm).

The May 2017 OES estimates are based on the 2010 Standard Occupational Classification (SOC) system and the 2017 North American Industry Classification System (NAICS). Information about the 2010 SOC is available on the BLS website at [www.bls.gov/soc](http://www.bls.gov/soc) and information about the 2017 NAICS is available at [www.bls.gov/bls/naics.htm](http://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-Dearborn, Mich. MSA** includes the following:
  - **Detroit-Dearborn-Livonia, Mich. Metropolitan Division (MD)** includes Wayne County in Michigan.
  - **Warren-Troy-Farmington Hills, 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, Kent, Montcalm, and Ottawa Counties 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.
- **Midland, Mich. MSA** includes Midland County in Michigan.
- **Monroe, Mich. MSA** includes Monroe County in Michigan.
- **Muskegon, Mich. MSA** includes Muskegon County in Michigan.
- **Niles-Benton Harbor, Mich. MSA** includes Berrien County in Michigan.
- **Saginaw, Mich. MSA** includes Saginaw County in Michigan.
- **South Bend-Mishawaka, Ind.-Mich. MSA** includes Cass County in Michigan and St. Joseph County in Indiana.