

MICHIGAN'S 2016 ANNUAL ECONOMIC ANALYSIS

September 2017



STATE OF MICHIGAN
Department of Technology, Management & Budget
Bureau of Labor Market Information and Strategic Initiatives

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IT'S BIGGER THAN DATA.

The Bureau of Labor Market Information and Strategic Initiatives is the official source for high-quality demographic and labor market information for the state of Michigan and its regions. We administer the state's federal-state cooperative programs with the Bureau of Labor Statistics (BLS) and the Census Bureau and produce high-quality information and analysis through grants from the U.S. Department of Labor and from partner agencies in the state of Michigan. We provide our national, state, and local partners and customers with accurate, objective, reliable, timely, accessible, and transparent information and insights.



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STATE OF MICHIGAN

DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET
LANSING

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September 1, 2017

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Chair Alyea and Director Stokes:

On behalf of the Department of Technology, Management and Budget (DTMB), Bureau of Labor Market Information and Strategic Initiatives (LMISI), I am happy to present to you Michigan's 2016 Annual Economic Analysis. As you may know, this report satisfies one of our requirements under the Workforce Information Grant (WIG) we receive from the U.S. Department of Labor's Employment and Training Administration (ETA).

This comprehensive report covers a variety of workforce and demographic topics. This year, we discuss trends in the state's labor force, industries, wages, demographics, labor supply, and employment projections.

We hope the information and analysis found in this report supports the planning and policy-making efforts of Michigan's businesses, workforce developers, educators, and economic developers. As always, we welcome your feedback and look forward to our continued collaboration.

Sincerely,

A handwritten signature in blue ink that reads "Jason S. Palmer".

Jason S. Palmer, JD, PhD

Director

DTMB, Bureau of Labor Market Information and Strategic Initiatives

EXECUTIVE SUMMARY

LABOR FORCE, EMPLOYMENT, AND UNEMPLOYMENT

- 2016 was a positive year for the Michigan labor market. Labor force expansion accelerated, employment growth was strong, and the jobless rate fell to 4.9 percent.
- Michigan's unemployment rate declined in 2016 for the seventh consecutive year.
- Michigan ranked 27th lowest nationally in 2016 in the rate of unemployment, a marked improvement from earlier in the decade.
- Labor underutilization is still an issue in Michigan, impacting workers marginally attached to the labor market or working part-time involuntarily.
- Michigan population groups with above average rates of unemployment include youth, minorities, and persons with limited educational attainment.
- One key trend is the aging of the Michigan workforce. Increased retirements and a smaller share of residents in the prime working age categories could lead to labor shortages.

INDUSTRY TRENDS

- Payroll jobs in Michigan rose in 2016 for the sixth consecutive year, up by 82,100, or nearly 2.0 percent. This increase brought total jobs in 2016 to 4.3 million, approaching levels last seen in 2006.
- Job growth over the year occurred in most major industry sectors, and was led by a 4.9 percent advance in jobs in *Construction*.
- Since 2011, Michigan's jobs rose by 9.5 percent, essentially matching national trends.
- Michigan ranked 1st or 2nd among states nationally in the number of *Manufacturing* jobs added each year since 2012.
- Despite surpassing the pre-recessionary level of 4.3 million jobs, Michigan is still 7.5 percent below the statewide peak of jobs set in the year 2000.
- Since 2013, broad Michigan industry sectors that pay workers above average wage rates have recorded somewhat higher job growth than industries with lower than average wages.

WAGES AND INCOME

- Michigan's 2016 average annual wage (AAW) stood at \$50,947, an increase of 1.8 percent from 2015. This was higher than the national rate of 1.3 percent.
- The industries with the highest wage growth in 2016 were: *Arts, entertainment and recreation* (5.5 percent), *Agriculture, forestry, fishing and hunting* (4.8 percent), *Accommodation and food services* (3.3 percent), and *Real estate, rental and leasing* (3.3 percent).
- Michigan's 2016 per capita personal income of \$44,347 ranked 31st among all states, below the national average of \$49,571. However, Michigan ranked 10th among all states in 2016 in per capita personal income growth with a rate of 3.5 percent, above the national rate of 2.9 percent.
- Fifty-eight percent of the 4.2 million jobs in Michigan made under \$20.00 per hour in 2016. This breaks down to 750,000 people (18 percent) with jobs earning less than \$10.00 per hour and 1.7 million workers (40 percent) that made between \$10.00 and \$20.00.
- Michigan's median wage for all occupations was \$17.32 in 2016. Higher median wages were paid for careers that were related to STEM (\$36.88), professional trades (\$21.43), and jobs that typically require educational attainment beyond a high school diploma.
- Michigan's January 2017 minimum wage increase from \$8.50 to \$8.90 per hour affected an estimated 250,000 people working in the lowest paying occupations. In 2018, the state's minimum wage will increase to \$9.25 per hour, a rate that is higher than that paid by nearly 475,000 jobs in Michigan in 2016.

DEMOGRAPHIC WORKFORCE TRENDS IN MICHIGAN

- Michigan's population has returned to positive year-to-year changes. While small, these increases are a vital improvement over the population losses that were seen in the state between 2004 and 2011.
- Michigan has a greater proportion of persons 50 years of age and over than the nation overall, which contributes to the state's median age being nearly two years older than the nation's.

- Michigan's population is projected to increase over the next two decades, largely due to migration that is expected to fill jobs currently held by the state's Baby Boomers, who are expected to enter retirement over the period.
- Michigan continues to see out-migration of the population aged between 25 and 34 who hold a Bachelor's degree or higher. However, with the exception of 2013, the migration of this group since 2010 seems to have settled at a level less than that experienced in the period from 2005 to 2010.
- While experienced at varying levels across the entire state, poverty is particularly concentrated in Michigan's large population centers.

aged 45 to 64, and has further risen to 31 percent of those aged 24 to 44 in Michigan.

- Statewide migration of young workers with at least a Bachelor's degree shows a pattern of net out-migration over the past five years, culminating in a five-year low of almost negative eight percent in 2015. Since 2011, almost 30,000 more young Bachelor's degree holders have left the state than have entered it.
- Michigan has 462,750 jobs in professional trade occupations, which is 11 percent of all jobs in Michigan. Michigan also has a strong STEM sector, as it ranks 8th nationally by concentration, with two cities, Ann Arbor and Detroit, ranking highly, 10th and 29th respectively.

LABOR SUPPLY

- The total number of graduates from Michigan public high schools declined every year from 2012 to 2016. However, this trend is consistent with population trends seen statewide of a declining demographic of young people.
- After declining from 2012 to 2014, the number of individuals completing registered apprenticeship programs has continued to rebound, and in 2016 was only 12 percent below the peak in 2012.
- The number of Michigan students earning post-secondary credentials has decreased annually since 2012, mirroring a similar trend among those earning post-secondary certificates or Associate's degrees. In contrast, the number of students earning a Bachelor's degree has actually increased each of the past five years.
- Michigan lags behind the United States overall in the percentage of residents with a Bachelor's degree or higher, 26 to 29 percent, but is four percentage points above the national average in residents with at least a high school diploma (88 to 84 percent, respectively).
- Michigan has been increasing in educational attainment over time, with an increase in the percentage of the population having a Bachelor's degree or higher growing in each younger age group. Of the oldest age group, those over 65, 21 percent have acquired a Bachelor's degree or higher, which increased to 26 percent of those

EMPLOYMENT PROJECTIONS

- Michigan is expected to add over 327,000 new jobs between 2014 and 2024, registering modest job growth at an average rate of 0.7 percent per year and similar to the expected national average employment growth rate of 0.6 percent for the same period.
- *Health care and social assistance* is expected to lead Michigan's industry job growth through 2024. Nearly one in four new jobs statewide is expected to come from expansion in this sector, and the 12.4 percent total projected job gain in this sector (1.2 percent annually) should significantly outpace the overall average in Michigan.
- Occupations requiring higher levels of education and training, such as those found in *Computer and mathematical*, *Healthcare support*, and *Architecture and engineering*, are expected to drive much of the new job growth in Michigan through 2024. However, many of the state's occupations that require less education are projected to provide numerous job opportunities due to the need to fill openings that are expected to arise out of replacement needs.
- *Michigan's Hot 50*, the *Going Pro* campaign, and STEM analysis provide examples of specific occupations projected to provide significant job opportunities between 2014 and 2024. These occupations cover a variety of skill levels and occupational groups and each provide above-average wages to Michigan workers.



LABOR FORCE, EMPLOYMENT, AND UNEMPLOYMENT

CHAPTER HIGHLIGHTS

- 2016 was a positive year for the Michigan labor market. Labor force expansion accelerated, employment growth was strong, and the jobless rate fell to 4.9 percent.
- Michigan's unemployment rate declined in 2016 for the seventh consecutive year.
- Michigan ranked 27th lowest nationally in 2016 in the rate of unemployment, a marked improvement from earlier in the decade.
- Labor underutilization is still an issue in Michigan, impacting workers marginally attached to the labor market or working part-time involuntarily.
- Michigan population groups with above average rates of unemployment include youth, minorities, and persons with limited educational attainment.
- One key trend is the aging of the Michigan workforce. Increased retirements and a smaller share of residents in the prime working age categories could lead to labor shortages.

RECENT MICHIGAN TRENDS

Michigan's labor market situation in 2016 was solid. The state's annual jobless rate declined by a half percentage point from 5.4 percent in 2015 to 4.9 percent in 2016. With the 2016 annual rate reduction, Michigan's annual unemployment rate fell for the seventh consecutive year dating back to 2010. From the recent annual peak rate of 13.7 percent recorded in 2009, the state's annual rate dropped by 8.8 percentage points. Michigan's 2016 jobless rate was tied for the fifth lowest recorded since 1976.

Michigan in 2015 and 2016 entered a rare period for the state, with unemployment rates comparable to the national rates. Prior to 2015, Michigan's rates were similar (or below) the national rates in only one other time frame in the current series. From 1993 through 2000, Michigan and the United States displayed comparable unemployment rates. In recessionary periods (1980-1982, 1991, 2001, and 2007-2009), Michigan's jobless rates jumped well above the national rates. From 2003 to 2006,

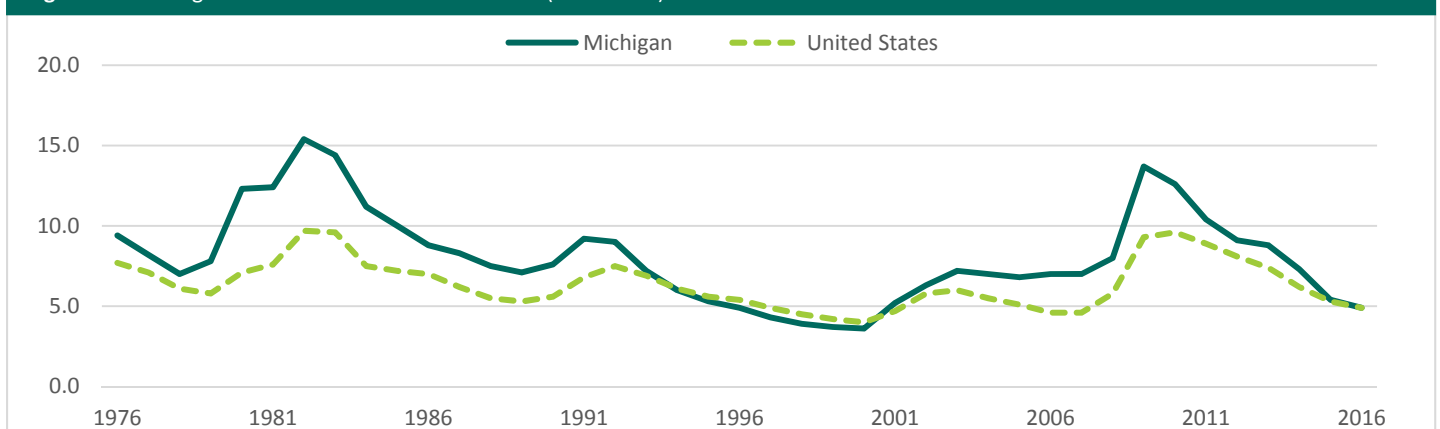
Michigan's rates plateaued at around 7.0 percent while the United States rates declined from 6.0 percent in 2003 to 4.6 percent in 2006. Generally, in non-recessionary periods, Michigan's rates remained above United States rates primarily due to various periods of restructuring within the state's auto industry.

EMPLOYMENT AND LABOR FORCE

During 2016, total employment rose by 99,000, or 2.2 percent in the state, which was stronger than the national growth rate of 1.7 percent over the same period. 2016 marked the third consecutive year that Michigan's annual total employment advances topped 90,000.

From 2010 to 2016, total employment rose in Michigan by 405,000, or 9.7 percent, which outpaced the national growth rate of 8.9 percent over the same period. However, Michigan's 2016

Figure 1-1. Michigan and United States Jobless Rates (1976-2016)



Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

Figure 1-2. Michigan's Total Employment – Annual Increase (2011-2016)

| Year | Total Employment Gain | Percentage Gain |
|------|-----------------------|-----------------|
| 2016 | 99,000 | 2.2% |
| 2015 | 91,000 | 2.1% |
| 2014 | 99,000 | 2.3% |
| 2013 | 63,000 | 1.5% |
| 2012 | 48,000 | 1.2% |
| 2011 | 4,000 | 0.1% |

Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

total employment level remains well below the record high count of 4,996,000 posted in 2000.

Like total employment, Michigan workforce levels have been trending upward recently. The labor force is the sum of all employed persons and the number of unemployed. Michigan's labor force increased by 80,000, or 1.7 percent from 2015 to 2016, while the national workforce grew by 1.3 percent.

However, Michigan's recent annual labor force gains did not occur until several years after the state began recording annual advances in total employment, and these labor force increases have been much more modest than the state's total employment additions.

Since 2010, the state's workforce moved upward by only 38,000 or 0.8 percent, well below the United States growth rate of 3.4 percent over the same period.

Although the strong 2016 labor force gain of 80,000, or 1.7 percent, may bode well for short-term trends in Michigan, the 2016 total of 4,837,000 remains far below pre-recession levels.

Figure 1-3. Michigan's Labor Force – Annual Changes (2011-2016)

| Year | Labor Force Change | Percentage Gain |
|------|--------------------|-----------------|
| 2016 | 80,000 | 1.7% |
| 2015 | 3,000 | 0.1% |
| 2014 | 26,000 | 0.5% |
| 2013 | 55,000 | 1.2% |
| 2012 | -12,000 | -0.3% |
| 2011 | -114,000 | -2.4% |

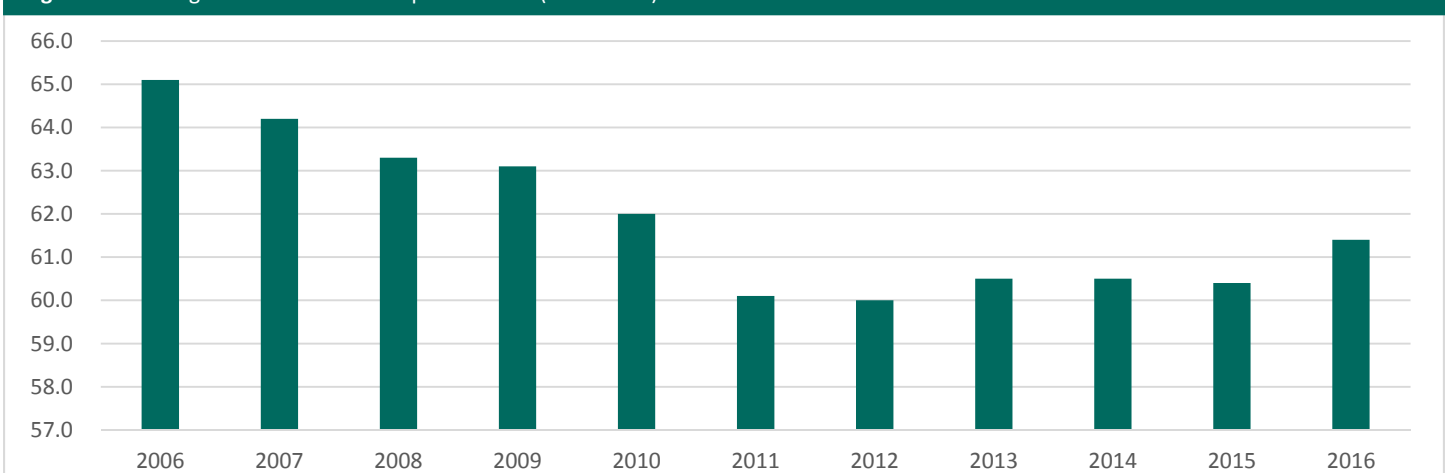
Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

From 2006 to 2016, Michigan's labor force fell by 174,000, or 3.5 percent. Total employment in 2016 was 60,000, or 1.3 percent below 2006 levels.

Related to the state's labor force, an additional indicator of labor market health is the state's Labor Force Participation Rate (LFPR). The LFPR is the share of the state's 16 and older civilian non-institutionalized population that is active in the labor force.

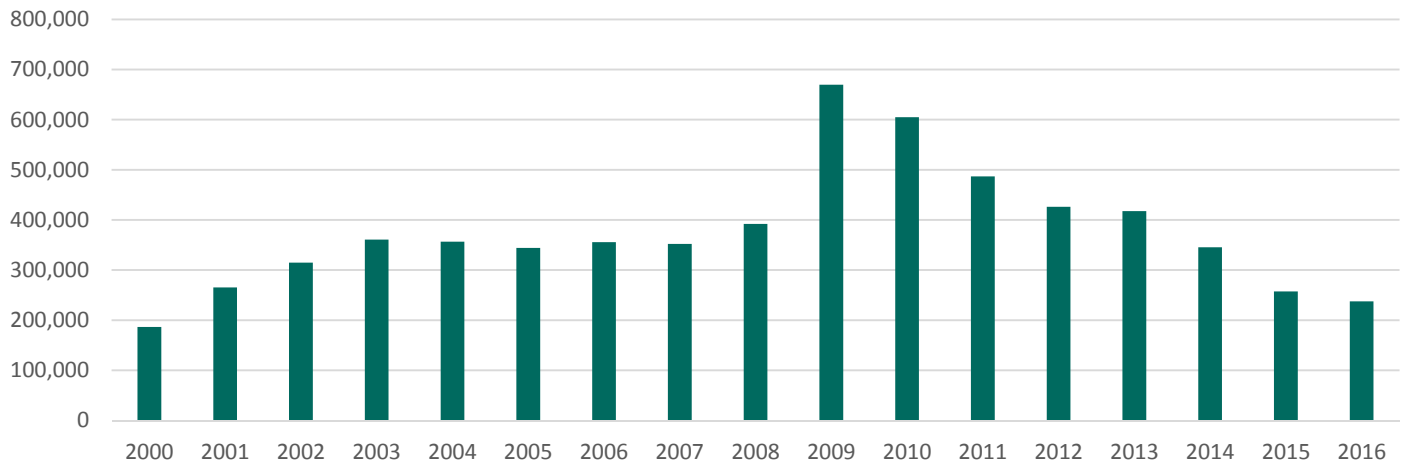
Michigan's LFPR, although up over the year in 2016, has not recovered to pre-Great Recession levels. Michigan's participation rates were trending downward prior to the recession, from a record state high of 68.7 percent in 2000. Along with the major impact the Great Recession had on the state's labor market, a good portion of the LFPR's decline over the past decade has been due to the aging of the Michigan labor pool. With large numbers of workers retiring or nearing retirement, labor force participation will be held down into the next decade.

Figure 1-4. Michigan Labor Force Participation Rates (2006-2016)



Source: U.S. Bureau of Labor Statistics, Current Population Survey

Figure 1-5. Number of Unemployed in Michigan (2000-2016)



Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

UNEMPLOYED

The number of unemployed in Michigan declined moderately from 2015 to 2016 after recording enormous drops in the post-recession recovery period.

In the aftermath of the 2001 recession, precipitated by restructuring in the state’s auto industry, the number of unemployed in the state plateaued at about 350,000 from 2003 through 2007. With the advent of the Great Recession, the number of unemployed nearly doubled from 2007 to 2009 in

Michigan. From the trough of the recession in 2009 to 2016, the number of unemployed in the state fell by 432,000, or 65 percent. Unemployed levels in 2015 and 2016 were the lowest for the state since 2000.

JOBLESS RATE

From mid-year 2015 through 2016, Michigan’s unemployment rate remained within the narrow band of 4.8 to 5.2 percent. The rates have essentially been flat over the last year and a half due to the continued entry and re-entry of unemployed individuals into the state’s workforce as job prospects continue to improve.

It is important to note that an improving economy since the Great Recession does not explain all of the variations observed in Michigan unemployment rates since 2010. A number of dynamics have been in play over those years, including:

(2010-2011) Labor force withdrawal: A large number of Michigan residents pulled out of the state’s workforce during the Great Recession. Many of these potential workers stopped looking for work because they believed there were no jobs available. A large portion of the state jobless rate reductions that occurred in the first years of the post-recession period was due to continued labor force withdrawal.

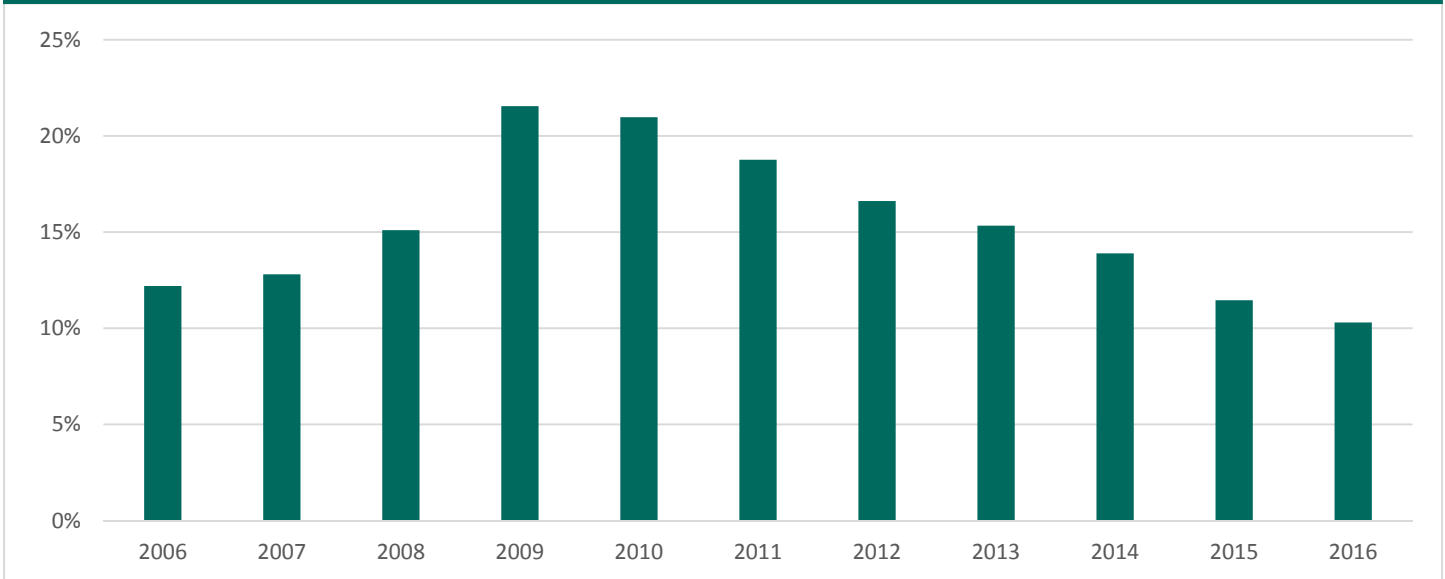
(2012-2014) Modest employment gains: Beginning around 2012, employment in Michigan began to rise modestly, however it wasn’t until 2013 that the state’s labor force began to expand. This meant that jobless rates finally began to fall primarily due to job gains.

Figure 1-6. Michigan’s Unemployment Rate Rankings

| Year | Rate (percent) | Rank |
|------|----------------|------|
| 2016 | 4.9 | 27 |
| 2015 | 5.4 | 30 |
| 2014 | 7.3 | 46 |
| 2013 | 8.8 | 46 |
| 2012 | 9.1 | 43 |
| 2011 | 10.4 | 46 |
| 2010 | 12.6 | 49 |
| 2009 | 13.7 | 50 |
| 2008 | 8.0 | 50 |
| 2007 | 7.0 | 50 |
| 2006 | 7.0 | 50 |
| 2005 | 6.8 | 47 |
| 2004 | 7.0 | 48 |
| 2003 | 7.2 | 47 |
| 2002 | 6.3 | 42 |
| 2001 | 5.2 | 39 |
| 2000 | 3.6 | 17 |

Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

Figure 1-7. Michigan U-6 (2006-2016)



Source: U.S. Bureau of Labor Statistics, Current Population Survey

(2015-2016) Continued jobless rate reductions with faster workforce growth: With continued statewide employment gains and a corresponding acceleration of labor market entry, Michigan's unemployment rates continued to fall, reaching 4.9 percent in 2016.

MICHIGAN'S UNEMPLOYMENT RATE RANKINGS

Unemployment rate rankings show how Michigan's yearly rates compare to other states. As of 2016, Michigan's jobless rate was in the middle range of states, as it matched the national rate of 4.9 percent. Prior to 2015, Michigan's annual jobless rates were generally among the highest in the nation dating back to 2001.

A MEASURE OF UNDEREMPLOYMENT

An important indicator of labor market slack is a specific measure of labor underutilization known as the U-6 rate. This indicator reflects not just the unemployed, but other persons as well with underemployment issues. The U-6 counts:

- the number of unemployed
- the number of persons marginally attached to the labor force
- persons who are involuntary part-time workers

Marginally attached workers are an important group, because they represent a potential labor supply that is not currently utilized. These are persons who are not currently looking for a job but who want a job, who are available for work, and who have looked for a job sometime in the prior 12 months.

Involuntary part-time workers are individuals working part time because their hours have been cut, or those working part-time who would prefer full-time work.

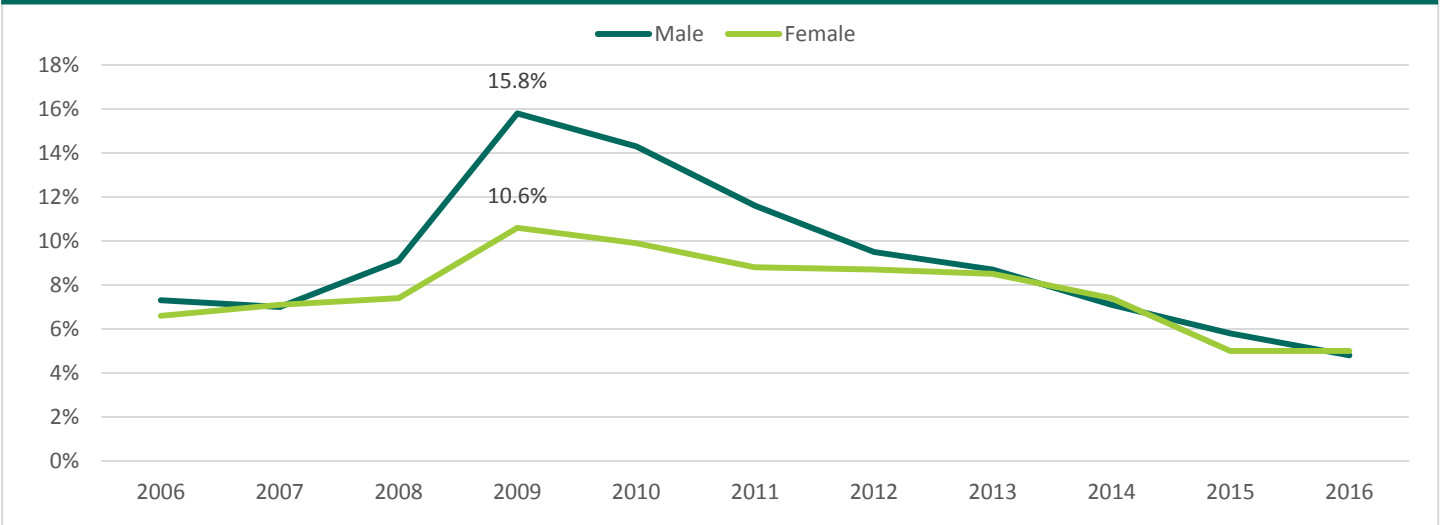
Michigan's U-6 rate peaked in 2009 at just over 21 percent. However, by 2015, the U-6 fell below pre-recession rates and stood at just over 10 percent in 2016. The involuntary part-time component to the U-6 fell dramatically since 2009. In 2009, involuntary part-time workers numbered 329,000 in Michigan, but dropped sharply to 210,000 by 2016, for a drop of 119,000 or 36 percent. The number of marginally attached workers in Michigan has dropped by half since the 2009-2012 period from around 111,000 to about 58,000 in 2016.

DEMOGRAPHICS OF THE UNEMPLOYED

In addition to an understanding of the labor market trends in Michigan in recent years, it is also important to examine the demographic characteristics of the unemployed. Labor force demographics for Michigan are available from the Current Population Survey, which is a product of the Bureau of Labor Statistics (BLS) in conjunction with the U.S. Census Bureau.

Figure 1-8 provides a comparison of Michigan unemployment rates by gender and shows that male and female unemployment rates were similar in Michigan in the pre- and post-recession periods. However, during the Great Recession, increased unemployment was most pronounced for males. This was primarily due to the fact that male-dominated industries like

Figure 1-8. Michigan Jobless Rates by Gender



Source: U.S. Bureau of Labor Statistics, Current Population Survey

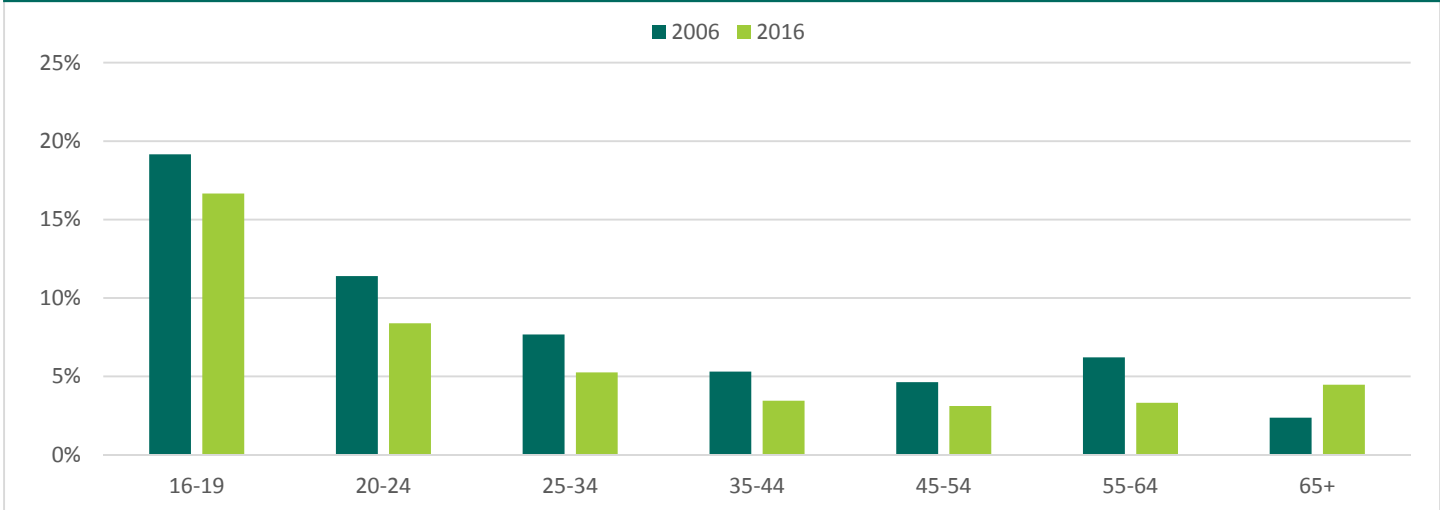
Manufacturing and Construction recorded some of the sharpest job reductions relative to other industry sectors over this period.

Figure 1-9 displays jobless rates for the various age groups in Michigan. Michigan’s overall unemployment rate in 2006 was 7.0 percent, which was 2.1 percentage points above the 2016 annual rate of 4.9 percent. Unemployment rates for most age categories followed the statewide trend. Jobless rates fell a bit faster than average for those aged under 35 and 55-64, but less so for those aged 35-54. Those who are 65 and older actually recorded a jobless rate increase of 2.1 percentage points from 2006 to 2016.

Some of these jobless rate changes by age category can be explained by shifts in workforce size. The unemployment rate hike in the 65 and older age group coincided with a large jump in this age group’s labor force. From 2006 to 2016, the 65+ labor force increased by 69 percent. With many more 65 and older workers actively seeking employment, the jobless rate was pushed up to 4.5 percent in 2016. Michigan’s overall labor force from 2006 to 2016 fell by 240,000, or a loss of 4.7 percent.

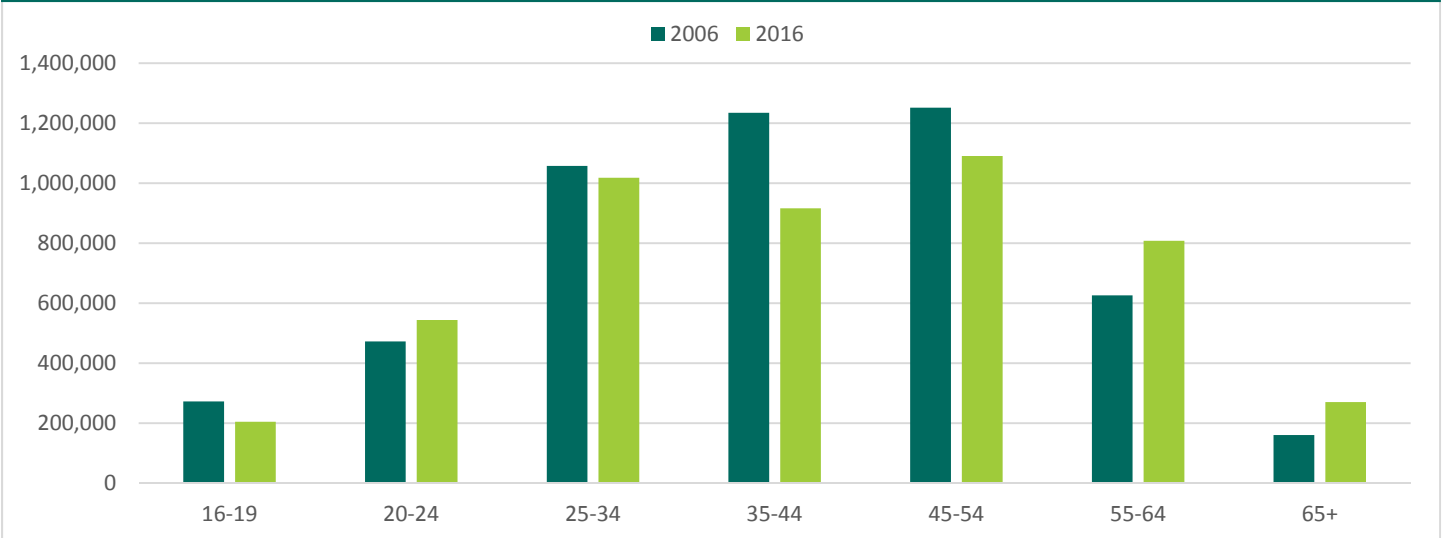
Two age groups have borne the brunt of the state’s large labor force withdrawal since 2006; the 35-44 and 45-54 cohorts. These two age groups make up two-thirds of what are considered the prime working age population. The other prime

Figure 1-9. Michigan Jobless Rates by Age Group



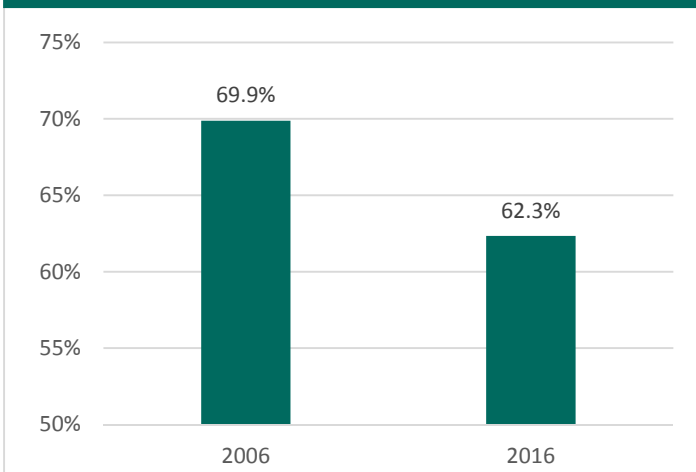
Source: U.S. Bureau of Labor Statistics, Current Population Survey

Figure 1-10. Michigan Workforce by Age Group



Source: U.S. Bureau of Labor Statistics, Current Population Survey

Figure 1-11. Michigan's Prime Working Age (25-54) as a Percent of the State's Total Labor Force 2006 and 2016



Source: U.S. Bureau of Labor Statistics, Current Population Survey

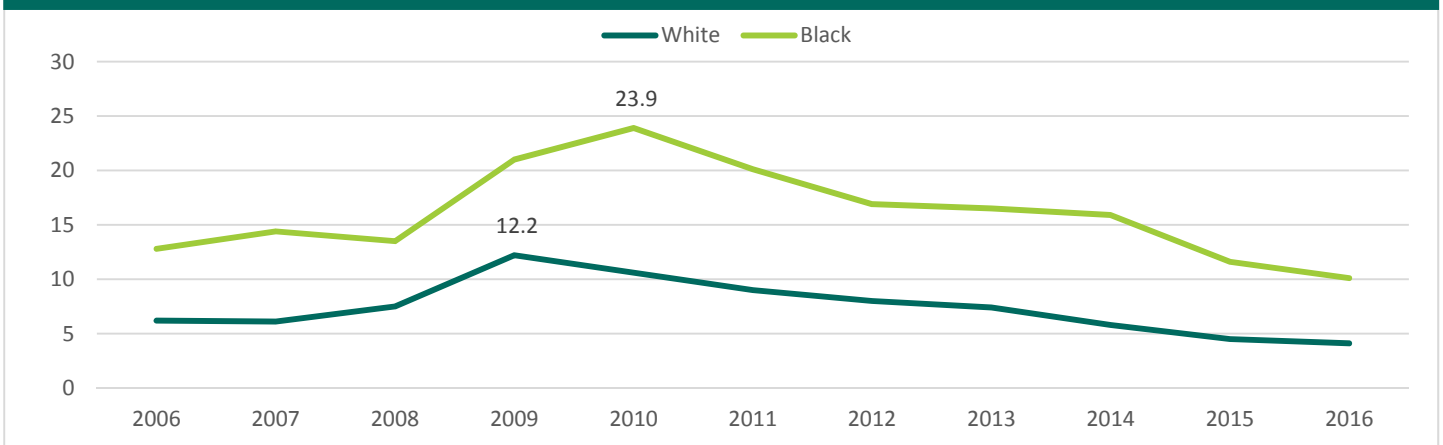
working age group, 25-34 year olds, recorded little change in workforce size from 2006 to 2016.

Like the 65 and older group, the 55-64 age cohort posted a large labor force gain over this period. The large labor force advances in both the 55-64 and 65 and over groupings illustrate the aging of the Michigan workforce as the Baby Boomer generation nears retirement age.

TRENDS TO WATCH

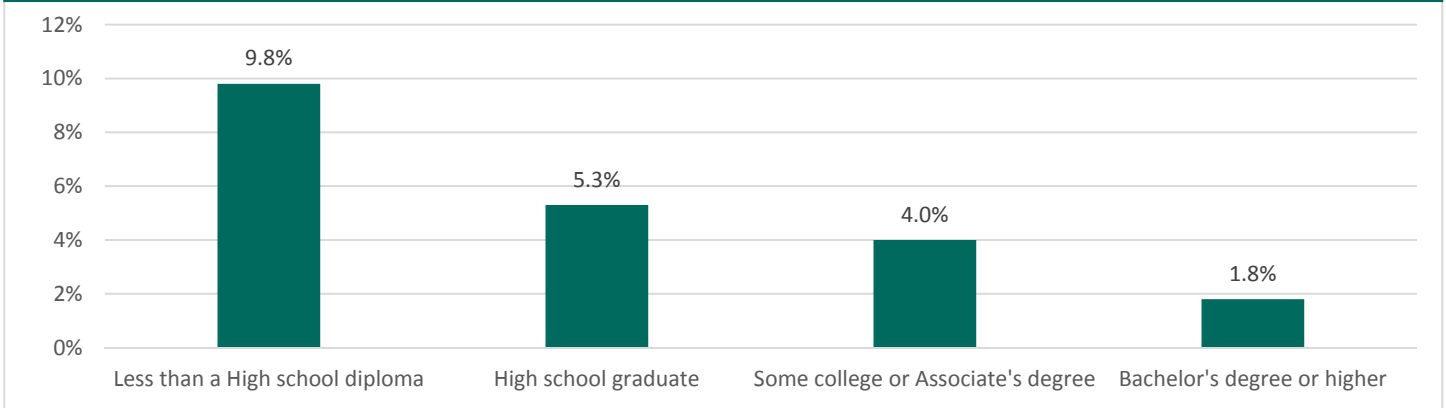
One important trend to watch in the near future is the aging of the Michigan workforce. The share of the workforce in the prime working ages has fallen in the last ten years and will likely continue to fall. Yet, the share of the population 65 and older will rise rapidly in Michigan, and the rate of participation of older

Figure 1-12. Michigan Workforce Jobless Rates by Race



Source: U.S. Bureau of Labor Statistics, Current Population Survey

Figure 1-13. Michigan Jobless Rates by Educational Attainment 2016



Source: U.S. Bureau of Labor Statistics, Current Population Survey

workers has historically been well below average. Crucially, the fact that there will be more workers in future years retiring and moving out of the state labor pool than younger workers entering the job market has the potential to result in labor shortages.

Beyond the aging of the workforce, another important trend that requires attention is the labor market performance of specific populations. Despite recent improvements in the Michigan economy, labor market data clearly show that certain segments of the state labor market still have challenges. In particular, youth, minorities, and persons with lower levels of educational attainment consistently register higher than average rates of unemployment in Michigan.

JIM RHEIN
ECONOMIC SPECIALIST

INDUSTRY TRENDS

CHAPTER HIGHLIGHTS

- Payroll jobs in Michigan rose in 2016 for the sixth consecutive year, up by 82,100, or nearly 2.0 percent. This increase brought total jobs in 2016 to 4.3 million, approaching levels last seen in 2006.
- Job growth over the year occurred in most major industry sectors, and was led by a 4.9 percent advance in jobs in *Construction*.
- Since 2011, Michigan's jobs rose by 9.5 percent, essentially matching national trends.
- Michigan ranked 1st or 2nd among states nationally in the number of *Manufacturing* jobs added each year since 2012.
- Despite surpassing the pre-recessionary level of 4.3 million jobs, Michigan is still 7.5 percent below the statewide peak of jobs set in the year 2000.
- Since 2013, broad Michigan industry sectors that pay workers above average wage rates have recorded somewhat higher job growth than industries with lower than average wages.

MICHIGAN 2016 NONFARM JOB TRENDS

Total nonfarm employment in Michigan grew by 82,100 during 2016 (+1.9 percent) to 4,325,600. This was slightly above the 1.7 percent job advance nationally for this period. In Michigan, 2016 marked the sixth consecutive year of payroll job expansion with 10 of the state's 11 broad industry sectors contributing. The 1.9 percent job gain in 2016 exceeded the prior year rate of job expansion and was similar to the trends from 2012-2014.

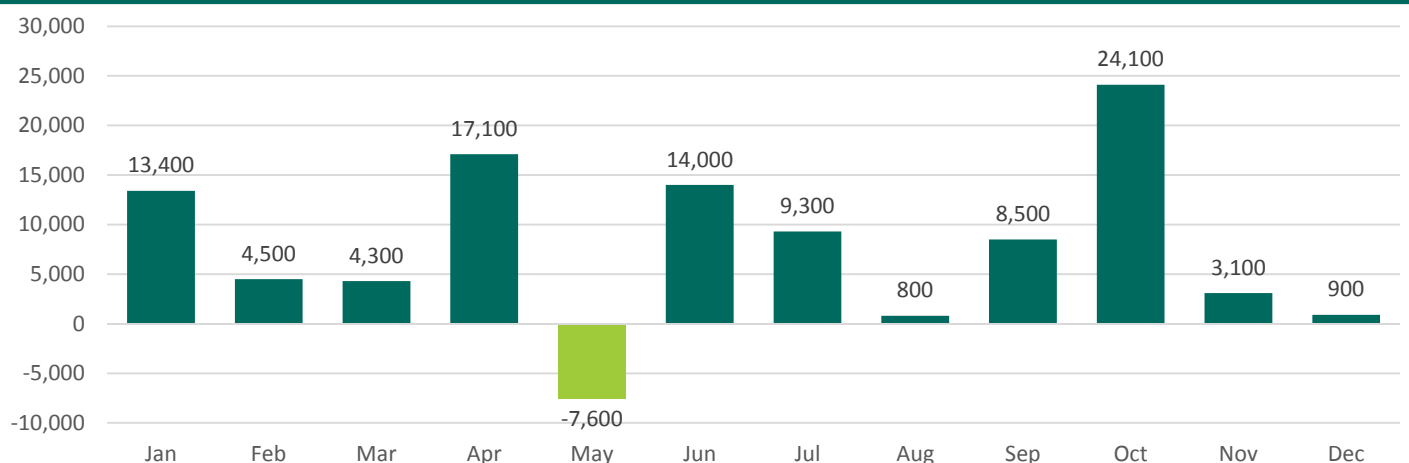
The 2016 performance was fairly balanced between the first and second half of the year. Between January and June, on a seasonally adjusted basis, total Michigan nonfarm payroll jobs grew by 45,700. Job levels rose by a very similar 46,700 in the second half of 2016 (July through December). Job growth during 2016 averaged 7,700 jobs per month, with May reporting the only seasonally adjusted monthly job decline. The largest seasonally adjusted monthly job hike occurred in October (+24,100 jobs). Gains were broad based in October, but were

notably strong in *Food services and drinking places* and *Construction*.

The broad Michigan industry sectors that led the stronger rate of job additions in 2016 included *Financial activities*, *Education and health services*, *Leisure and hospitality*, and *Other services*. Employment in the first three major industry groups experienced an increased rate of growth during 2016, while *Other services* reversed two years of job declines.

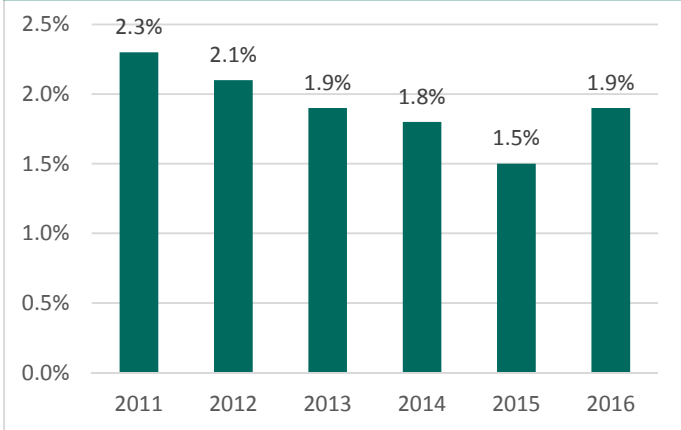
One limiting factor on nonfarm employment expansion during 2016 was the continued slow down in job growth in the state's *Transportation equipment manufacturing* industry. Post-recession annual job advances in this sector reached a peak of 10.6 percent in 2011, but have steadily moderated since then to a job gain of only 3.6 percent in 2016. The healthy auto sector has added over 43,000 jobs to the Michigan economy since 2011, but as the economic recovery has matured the pace of job gains have slowed.

Figure 2-1. Michigan Monthly Job Change 2016



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

Figure 2-2. Michigan Annual Job Growth (%) (2011-2016)



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

SELECT INDUSTRIES WITH ABOVE AVERAGE JOB GROWTH IN 2016

Construction

The fastest rate of job growth in Michigan took place in the *Construction* sector (+4.9 percent). The three component sectors of *Construction of buildings* (+7.6 percent), *Heavy and civil engineering construction* (+4.9 percent), and *Specialty trade contractors* (+4.0 percent) all contributed to this gain. In comparison, *Construction* payrolls nationally grew by 3.9 percent during 2016, falling short of the statewide pace.

Leisure and Hospitality

This broad sector added 12,000 jobs in 2016 for a strong 2.9 percent growth rate. Nearly all of these jobs were added in the *Accommodation and food services* subsector (+10,900 jobs), and key to this growth was significant job expansion in *Restaurants and other eating places*. Employers in the *Arts, entertainment, and recreation* subgroup added 1,100 jobs during the year. Nationally, employment rose by a similar 3.0 percent in 2016.

Financial Activities

Employment in the *Financial activities* sector rose by 5,700 in 2016 (+2.7 percent). This marked the 6th consecutive year of job growth in this broad industry group. Both the *Finance and insurance* (+4,200 jobs) and *Real estate and rental and leasing* (+1,500 jobs) sectors contributed to this expansion. Nationally, employment levels advanced by 2.0 percent.

Manufacturing

Employment levels in the *Manufacturing* sector rose by 12,600, or 2.1 percent. This was significantly above the 0.1 percent growth nationally. Payroll gains were recorded in both the *Durable goods* (+7,700 jobs, +1.7 percent) and *Non-durable goods* (+4,800 jobs, +3.4 percent) subsectors. The state's key *Transportation equipment manufacturing* sector added 6,200 jobs (+3.6 percent) during 2016 while employers in the *Furniture and related products manufacturing* industry added 900 jobs (+4.4 percent). Notable job growth in the *Nondurables* sector was reported in *Food manufacturing* (+1,600 jobs, +4.7 percent) and the automotive-related *Plastics product manufacturing* (+1,600 jobs, +4.6 percent).

Professional and Business Services

Payrolls in the broad sector moved up by 12,700 or 2.0 percent in 2016, an increase similar to 2015 and 2014. The largest job gains were reported in the *Professional and business services* subsector (+9,100). The employment growth in this industry was driven by the automotive-related component industries of *Architectural, engineering, and related services* (+3,000 jobs) and *Computer systems design and related services* (+1,300 jobs). *Management of companies and enterprises* and *Temporary help services* were examples of other component industries with annual job additions as well. Nationally, jobs in this broad sector grew by 2.6 percent in 2016.

Education and Health Services

Job levels increased by 12,800 or 2.0 percent in this broad sector during 2016. All of this growth took place in the *Health care and social assistance* (+13,700 jobs) subsector. The majority of these gains were in *Hospitals* (+6,100 jobs) and *Ambulatory health care services* (+4,100 jobs). Payrolls in the *Educational services* subsector declined modestly by 900 during the year. Nationally, total nonfarm employment rose by 2.7 percent in 2016.

Figure 2-3. Major Sector Employment: Annual Average 2015 and 2016

| Industry | Employment | | Change | |
|----------------------------------|------------|-----------|--------|---------|
| | 2015 | 2016 | Level | Percent |
| Total Nonfarm | 4,243,500 | 4,325,600 | 82,100 | 1.9% |
| Construction | 148,300 | 155,600 | 7,300 | 4.9% |
| Leisure and Hospitality | 413,700 | 425,700 | 12,000 | 2.9% |
| Financial Activities | 207,200 | 212,900 | 5,700 | 2.7% |
| Manufacturing | 587,600 | 600,200 | 12,600 | 2.1% |
| Professional & Business Services | 637,300 | 650,000 | 12,700 | 2.0% |
| Education & Health Services | 652,000 | 664,800 | 12,800 | 2.0% |
| Information | 56,600 | 57,500 | 900 | 1.6% |
| Other Services | 167,300 | 169,600 | 2,300 | 1.4% |
| Trade, Transportation, Utilities | 771,600 | 781,600 | 10,000 | 1.3% |
| Government | 594,100 | 600,700 | 6,600 | 1.1% |
| Mining and Logging | 7,700 | 7,200 | -500 | -6.5% |

Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

SELECT INDUSTRIES WITH BELOW AVERAGE JOB GROWTH IN 2016

Other Services

The employment level in this broad sector grew by 2,300, or 1.4 percent during 2016 and job gains in *Personal and laundry services* (+1,800 jobs) and *Repair and maintenance* (+1,300 jobs) outpaced a decline in *Religious, grantmaking, civic, and similar organizations* (-800 jobs). This was the largest yearly advance in jobs in this broad sector since 2002. Nationally, payrolls rose by 1.1 percent in 2016.

Trade, Transportation, and Utilities

Job levels in this broad industry sector advanced in Michigan by 9,900 or 1.3 percent in 2016. This matched the national job growth rate. In Michigan, the *Retail trade* subsector recorded the largest gains (+4,700 jobs, +1.0 percent) followed by *Transportation, warehousing, and utilities* (+2,800 jobs, +2.1 percent), and *Wholesale trade* (+2,500 jobs, +1.5 percent). Within the *Retail* sector the largest job advances were reported in *General merchandise stores*, *Health and personal care stores*, and *Motor vehicle parts and parts dealers*. Other subsectors to record notable job additions in 2016 included *Merchant wholesalers, nondurable goods* (+1,200 jobs), *Merchant wholesalers, durable goods* (+1,100 jobs), and *Truck transportation* (+1,000 jobs).

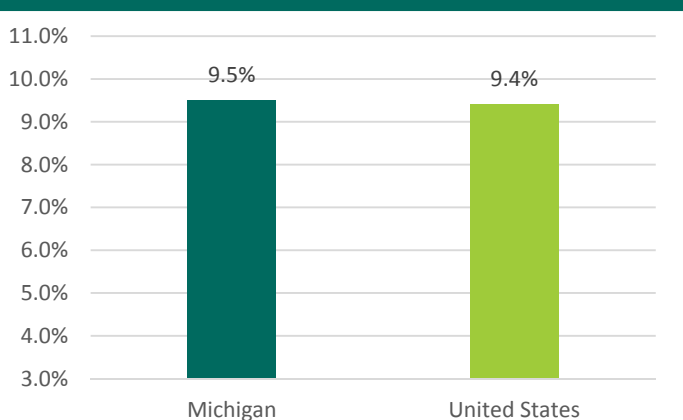
Government

Public sector payrolls increased by 6,500, or 1.1 percent in 2016. Nearly half of these jobs were added in the *State government educational services sector* (+3,200 jobs). Nationally, employment levels moved higher by 0.9 percent in 2016.

Mining and Logging

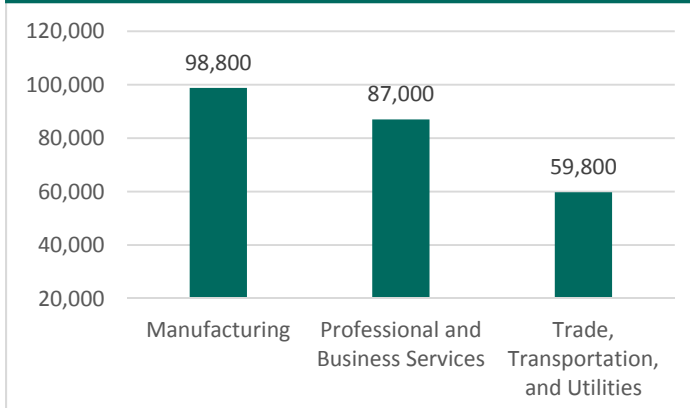
The *Mining and logging* sector recorded a 6.5 percent decline in employment due to a major mine closure in 2016. Michigan's job reduction in this sector was significantly lower than the 16.7 percent retrenchment nationally, which reflected job cuts in the oil and gas industry.

Figure 2-4. Michigan vs. United States 5 Year Job Growth (2011-2016)



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

Figure 2-5. Top 3 Michigan Industries – 5-year Net Job Additions



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

MICHIGAN JOB GROWTH OVER THE LAST FIVE YEARS

Over the past five years, total nonfarm jobs in Michigan advanced by 373,500, or 9.5 percent. This was similar to the 9.4 percent growth nationally during this time period. In Michigan, the top three broad industry sectors with the most job additions during this period were *Manufacturing* (+98,800 jobs), *Professional and business services* (+87,000 jobs), and *Trade, transportation, and utilities* (+59,800 jobs).

Over the past five years, Michigan has been a top performer nationally in the creation of manufacturing jobs. In numeric terms, Michigan has ranked either first or second in the total number of manufacturing jobs added each year since 2012. In terms of percent manufacturing job expansion, Michigan ranked in the top five states in the years 2012, 2013, and 2014, and ranked sixth and seventh in the years 2015 and 2016, respectively.

Figure 2-6. Michigan Ranking Among 50 States Manufacturing Job Growth

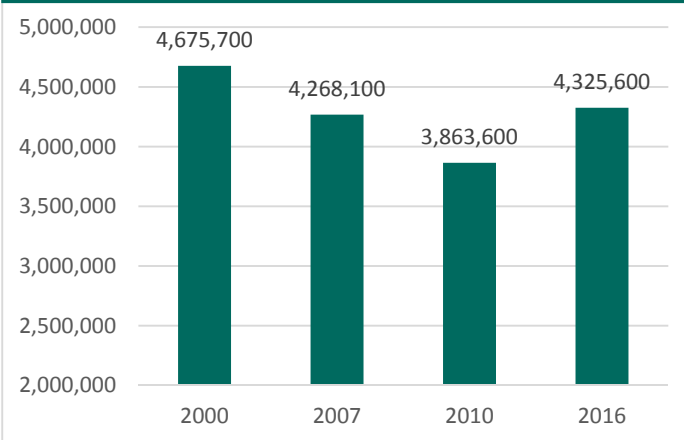
| Year | Ranking | |
|------|----------------|----------------|
| | Numeric Growth | Percent Growth |
| 2016 | 1 | 7 |
| 2015 | 2 | 6 |
| 2014 | 1 | 1 |
| 2013 | 1 | 4 |
| 2012 | 2 | 2 |

Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

MICHIGAN JOB RECOVERY SINCE THE RECESSION

On an annual average basis, total nonfarm employment reached 4,325,600 in 2016 and finally surpassed the pre-recession 2007 level of 4,268,100 jobs. However, despite this 2016 milestone,

Figure 2-7. Michigan Total Nonfarm Job Levels

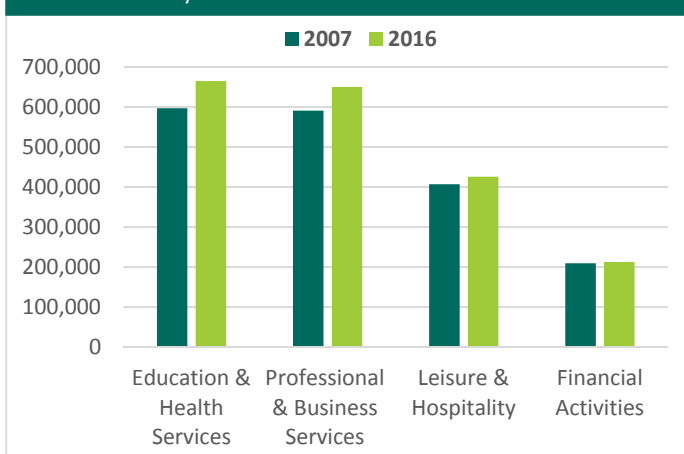


Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

payroll jobs in Michigan still remained 350,200 (-7.5 percent) below the peak level of 4,675,700 in the year 2000.

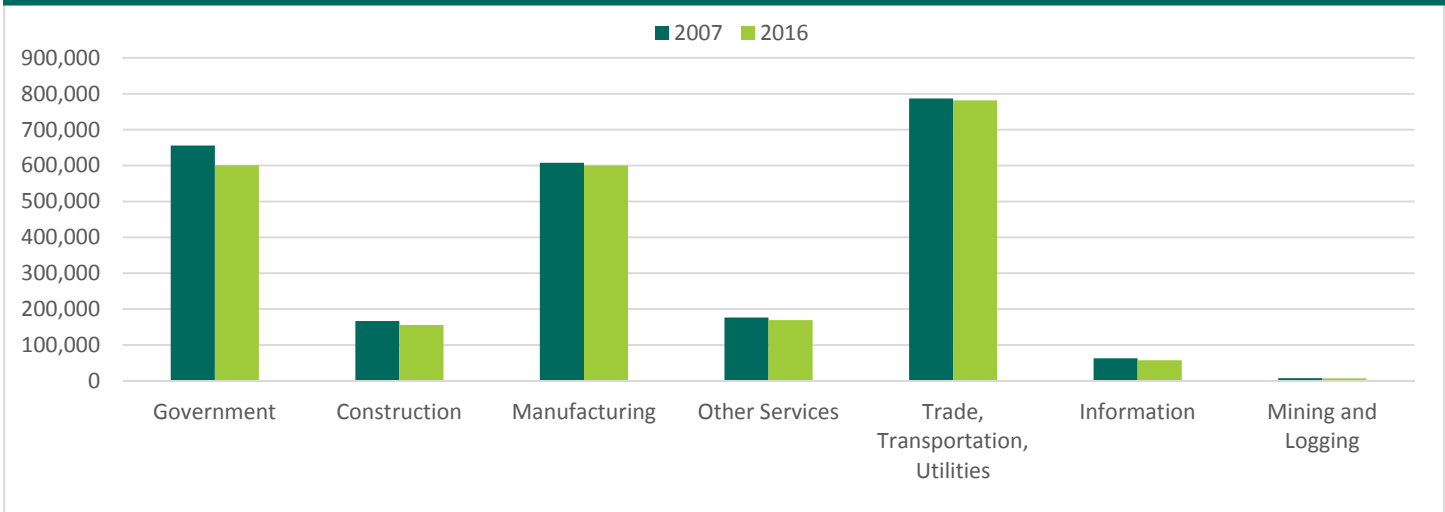
Four of the state's 11 broad industry sectors have surpassed their pre-recession 2007 employment levels. These include *Education and health services* (+68,200 jobs), *Professional and business services* (+59,200 jobs), *Leisure and hospitality* (+18,700 jobs), and *Financial activities* (+3,400 jobs). In the *Financial activities* group, all of the job expansion above pre-recession levels took place in the *Finance and insurance* subsector (+3,800 jobs). The three subsectors of *Professional and business services* (+38,300 jobs), *Administrative and support and waste management services* (+18,700 jobs), and *Management of companies and enterprises* (+2,200 jobs) all contributed to the recovery in the *Professional and business services* broad sector. The subsector of *Health care and social assistance* (+73,000 jobs) was responsible for the job growth in

Figure 2-8. Michigan Industry Sectors with 2016 Jobs Above Pre-Recessionary Levels



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

Figure 2-9. Industry Sectors with 2016 Jobs below Pre-Recessionary Levels



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

Education and health services, while Accommodation and food services (+22,900 jobs) posted all the gains in Leisure and hospitality.

However, the majority of broad industry sectors in Michigan had 2016 job levels that continued to lag behind 2007 pre-recessionary job counts. These major industry sectors included *Government* (-55,000 jobs), *Construction* (-11,100 jobs), *Manufacturing* (-7,400 jobs), *Other services* (-6,900 jobs), *Trade, transportation, utilities* (-5,500 jobs), *Information* (-5,500 jobs), and *Mining and logging* (-500 jobs). In percentage terms, the Michigan major industry sectors that are closest to pre-recession employment levels are *Manufacturing* (1.2 percent below) and *Trade, transportation, utilities* (0.7 percent below). The broad sectors with the widest gap are *Information* (8.7 percent below) and *Government* (8.4 percent below).

JOB GROWTH IN ABOVE AVERAGE WAGE VS. BELOW AVERAGE WAGE SECTORS

The number of broad industry sectors in Michigan with average weekly wages (AWW) above and below the average for all private sector industries is nearly evenly divided with six broad sectors reporting an above average AWW and five major sectors with an AWW below the statewide value. The *Goods producing* industries of *Construction* and *Manufacturing* are sectors with a higher than average AWW while the *Natural resources and mining* industry has an AWW below the statewide average. The *Service providing* group is evenly split with four sectors in each category.

Figure 2-10 presents those industries in Michigan with an average weekly wage that is above the statewide average for all private sector industries for the year 2016, while Figure 2-11 presents those industries in Michigan with an average weekly wage that is below the statewide average.

Figure 2-10. Industry Sectors with Above Average Weekly Wages (AWW)

| Industry Sector | AWW 2016 | Employment Change (2013-2016) | |
|--------------------------------------|------------|-------------------------------|---------|
| | | Level | Percent |
| Total, All Private Sector Industries | \$975.00 | 213,800 | 6.1% |
| Construction | \$1,136.00 | 22,100 | 16.5% |
| Manufacturing | \$1,254.00 | 53,600 | 9.8% |
| Professional and Business Services | \$1,247.00 | 37,400 | 6.1% |
| Financial Activities | \$1,297.00 | 10,000 | 4.9% |
| Information | \$1,314.00 | 2,100 | 4.0% |
| Government | \$1,009.00 | 2,100 | 0.4% |

Source: U.S. Bureau of Labor Statistics, Current Employment Statistics and Quarterly Census of Employment and Wages

Figure 2-11. Industry Sectors with Below Average Weekly Wages (AWW)

| Industry Sector | AWW 2016 | Employment Change (2013-2016) | |
|--------------------------------------|----------|-------------------------------|---------|
| | | Level | Percent |
| Total, All Private Sector Industries | \$975.00 | 213,800 | 6.1% |
| Leisure and Hospitality | \$366.00 | 27,500 | 6.9% |
| Trade, Transportation, Utilities | \$854.00 | 37,500 | 5.0% |
| Education and Health Services | \$917.00 | 25,400 | 4.0% |
| Other Services | \$609.00 | -900 | -0.5% |
| Natural Resources and Mining | \$722.00 | -900 | -11.3% |

Source: U.S. Bureau of Labor Statistics, Current Employment Statistics and Quarterly Census of Employment and Wages

This data shows that Michigan job growth in recent years has been slightly faster among above average wage industries. Sectors with an above average AWW have added more jobs since 2013 than those with a below average AWW.

Between 2013 and 2016, private sector total nonfarm employment expanded in Michigan by 213,800, or 6.1 percent.

- The industry sectors with an above average AWW combined for 125,200 of this total for a growth rate of 8.1 percent.
- The major industry groups with a below average AWW added 88,600 jobs for a growth rate of 4.5 percent during this period.

INDUSTRY JOB CONCENTRATION

A common method to show the concentration of industry employment is to use a location quotient (LQ). A location quotient is a ratio that compares the concentration of a variable within a specific area to the concentration of that variable in a reference area. In this case, the comparison is the Michigan share of total jobs in a specific industry to the share nationally. If

Figure 2-12. Location Quotients by Major Industry Sector - Michigan

| Major Industry Sector | Location Quotient 3 rd Quarter 2016 |
|--------------------------------------|---|
| Manufacturing | 1.63 |
| Professional and Business Services | 1.07 |
| Other Services | 1.04 |
| Education and Health Services | 0.99 |
| Trade, Transportation, and Utilities | 0.96 |
| Leisure and Hospitality | 0.92 |
| Government | 0.87 |
| Financial Activities | 0.83 |
| Construction | 0.80 |
| Natural Resources and Mining | 0.75 |
| Information | 0.68 |

Source: U.S. Bureau of Labor Statistics

the LQ in an industry is equal to 1.0, then the industry job share in Michigan is the same as the nation. If the LQ is greater than 1.0, then Michigan has a higher share of jobs in a given industry than the nation.

An understanding of specific industries in Michigan with above average and below average concentrations of jobs is important. It helps explain relative wage levels in the state, and can shed light on the cyclical nature of the state economy and its reaction to economic downturns.

The location quotient analysis quantifies what many know intuitively; that the *Manufacturing* industry supplies a much higher share of jobs to the Michigan economy than it does nationally. This is reflected by a very high LQ of 1.63. The unusual concentration of jobs locally in *Manufacturing* somewhat distorts the location quotients in most other industries, resulting in a smaller concentration of jobs than the nation in seven broad industry sectors and essentially the same concentration in *Education and health services*. *Professional and business services* and *Other services* have slightly higher concentrations of jobs in Michigan than in the United States.

Looking at more detailed Michigan industry sectors (3-digit NAICS code) that employ 5,000 or more workers, the top five

Figure 2-13. Highest Relative Job Share by Detailed Michigan Industry Sector

| Detailed Industry Sector | Location Quotient 3 rd Quarter 2016 |
|--|---|
| Transportation Equipment Manufacturing | 3.73 |
| Machinery Manufacturing | 2.25 |
| Plastics and Rubber Products Manufacturing | 1.97 |
| Primary Metals Manufacturing | 1.97 |
| Fabricated Metals Products Manufacturing | 1.89 |
| Furniture and Related Products | 1.88 |

Source: U.S. Bureau of Labor Statistics

Figure 2-14. Industries with Low Relative Michigan Job Share and High Forecast National Job Growth

| Detailed Industry Sector | Location Quotient 3 rd Quarter 2016 | Forecast U.S. Job Growth (2014-2024) |
|--|---|---|
| Accommodation | 0.74 | 7.0% |
| Other Information Services | 0.69 | 15.2% |
| Social Assistance | 0.64 | 9.8% |
| Motion Picture and Sound Recording Industries | 0.52 | 10.3% |
| Securities, Commodity Contracts, and Other Financial Investments | 0.45 | 22.4% |

Source: U.S. Bureau of Labor Statistics

industries by location quotient are all related to the automotive sector. The very high LQ of 3.73 for the auto industry in Michigan largely explains the *Manufacturing* share. Michigan also has a significantly larger share of employment in the *Furniture and related products* industry compared to the national share.

The automotive and related industries included *Transportation equipment manufacturing*, *Machinery manufacturing*, *Plastics and rubber products*, and *Primary and Fabricated metals*. Combined, these industries supplied 396,000 jobs in Michigan which was 9.2 percent of total nonfarm employment during 2016. During 2016, *Transportation equipment manufacturing* (+6,200 jobs) and *Plastic and rubber products* (+1,800 jobs) gained employment while payrolls in *Machinery manufacturing* (-200 jobs), *Primary metals manufacturing* (-600 jobs), and *Fabricated metals products manufacturing* (-1,000 jobs) contracted. Employment levels advanced by 900 in the *Furniture and related products* industry in 2016.

What about industry sectors in Michigan with a relatively low current job concentration, but a positive future national job outlook? Figure 2-14 lists five industry sectors that employ more than 5,000 workers and have a share of employment in Michigan that is well below the United States average. Since these sectors have positive expected future job performance nationally through 2024 and are currently underrepresented in Michigan, job development in these industries could be successful over the long-term.

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ECONOMIC SPECIALIST

WAGES AND INCOME

CHAPTER HIGHLIGHTS

- Michigan's 2016 average annual wage (AAW) stood at \$50,947, an increase of 1.8 percent from 2015. This was higher than the national rate of 1.3 percent.
- The industries with the highest wage growth in 2016 were: *Arts, entertainment and recreation* (5.5 percent), *Agriculture, forestry, fishing and hunting* (4.8 percent), *Accommodation and food services* (3.3 percent), and *Real estate, rental and leasing* (3.3 percent).
- Michigan's 2016 per capita personal income of \$44,347 ranked 31st among all states, below the national average of \$49,571. However, Michigan ranked 10th among all states in 2016 in per capita personal income growth with a rate of 3.5 percent, above the national rate of 2.9 percent.
- Fifty-eight percent of the 4.2 million jobs in Michigan made under \$20.00 per hour in 2016. This breaks down to 750,000 people (18 percent) with jobs earning less than \$10.00 per hour and 1.7 million workers (40 percent) that made between \$10.00 and \$20.00.
- Michigan's median wage for all occupations was \$17.32 in 2016. Higher median wages were paid for careers that were related to STEM (\$36.88), professional trades (\$21.43), and jobs that typically require educational attainment beyond a high school diploma.
- Michigan's January 2017 minimum wage increase from \$8.50 to \$8.90 per hour affected an estimated 250,000 people working in the lowest paying occupations. In 2018, the state's minimum wage will increase to \$9.25 per hour, a rate that is higher than that paid by nearly 475,000 jobs in Michigan in 2016.

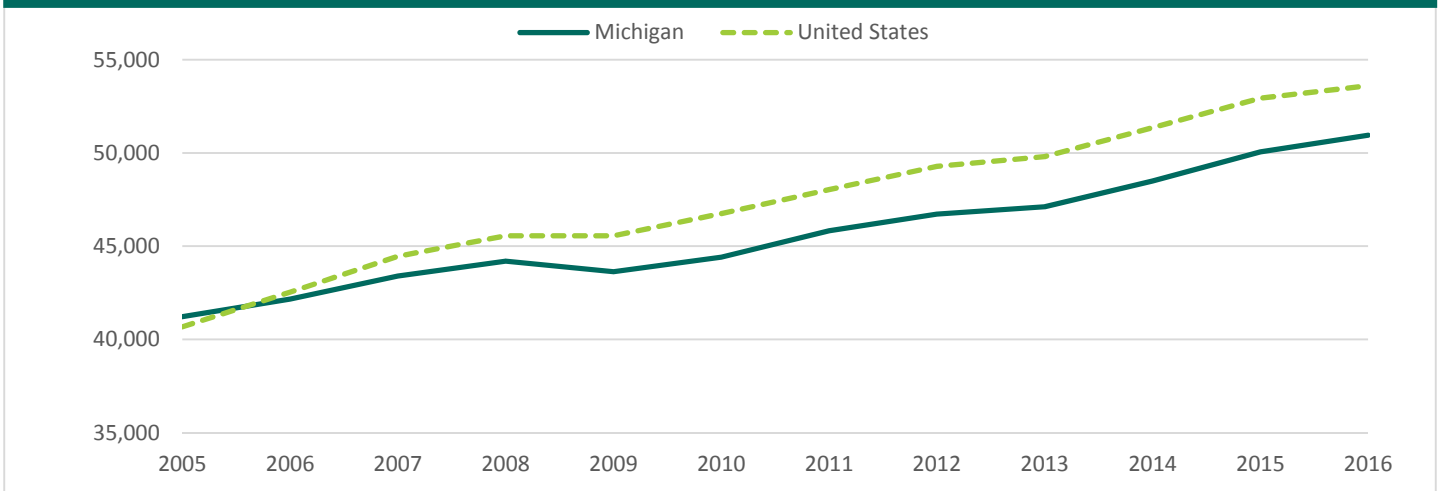
AVERAGE ANNUAL WAGE TRENDS IN MICHIGAN AND THE UNITED STATES

Michigan's 2016 average annual wage (AAW) was \$50,947, up from the \$50,062 the prior year.¹ This represents growth of 1.8 percent, slightly faster growth than seen nationally (1.3 percent). Over the last three years, increases in annual earnings in Michigan averaged 2.7 percent, just over the nation at 2.5 percent. Wages in the private sector in Michigan grew by 1.9

percent in 2016, while pay in the public sector expanded at a slightly lower pace of 1.2 percent.

Figure 3-1 shows that the wages for Michigan workers were slightly higher than wages nationally in 2005, but since then have slid below the national average. From 2005 to 2008, the Michigan AAW grew at a far slower rate than the nation, averaging two percent compared to the national growth at four percent. Michigan's wages then registered a decline of 1.3

Figure 3-1. Average Annual Wage: Michigan and the United States (2005-2016)



Source: U.S. Bureau of Labor Statistics, Bureau of Labor Market Information and Strategic Initiatives, Quarterly Census of Employment and Wages

¹ The AAW is based on remuneration paid to workers covered or subject to the state's unemployment insurance tax law. Annual average wages are derived by dividing total annual wages by annual average employment. The AAW includes both full-time and part-time workers, as well as private and public sector employees. Industries characterized by a high proportion of lower paid occupations and part-time workers will show AAW levels appreciably less than the

industries with higher paid occupations and typified by full-time staff. AAW will also be influenced by work stoppages, labor turnover, retroactive payments, seasonal factors, and bonus payments.

percent in 2009 due to the Great Recession and restructuring in the automotive industry, while there was no change for the nation. Since 2010, Michigan's annual wage growth has averaged 2.2 percent, trending closely with the nation's average growth of 2.4 percent. Largely due to the multiple years of sub-national growth between 2005 and 2009, Michigan's AAW at \$50,947 lags the nation (\$53,611) by 5.0 percent.

The top five states with the highest average annual wage in the nation are the District of Columbia (\$89,472), New York (\$67,943), Massachusetts (\$67,429), Connecticut (\$65,875) and California (\$62,947). Michigan has consistently ranked 19th over the last three years.

INDUSTRY SECTOR WAGES AND GROWTH

One important explanation for a higher national wage compared to that in the state is the role of industry sectors. In particular, there were four sectors in 2016 where the average annual wage was more than 30 percent higher nationally than that in Michigan. These sectors are: *Information* (44 percent above the

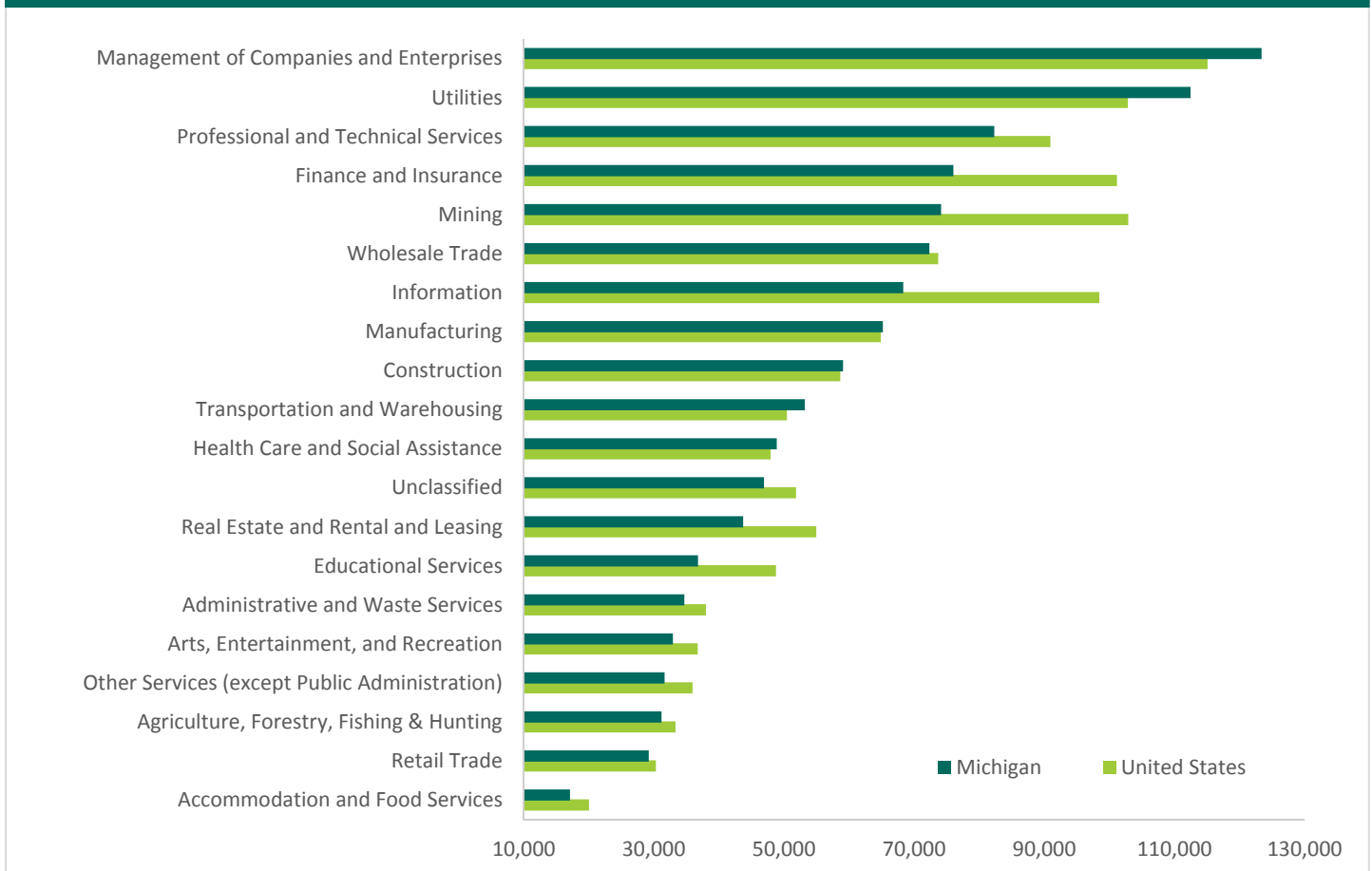
Michigan wage), *Mining* (39 percent), *Finance and insurance* (33 percent) and *Educational services* (33 percent). Overall, there were 14 out of 20 sectors where the national wage exceeded Michigan's.

Figure 3-2 shows the 2016 AAW by industry sector for Michigan and the United States. Michigan's AAW was above the nation's in *Utilities* (nine percent above the national wage), *Management of companies and enterprises* (seven percent), *Transportation and warehousing* (six percent), *Health care and social assistance* (two percent), *Manufacturing* (one percent) and *Construction* (one percent).

Michigan's private sector AAW growth rate for 2016 was at 1.9 percent, below the 3.2 percent recorded in 2015. There were 14 industry sectors that exceeded the state average growth rate, while six sectors were below it.

The sectors where Michigan recorded a higher wage growth rate than the nation are *Management of companies and enterprises*

Figure 3-2. Average Annual Wage by Sector



Source: U.S. Bureau of Labor Statistics, Bureau of Labor Market Information and Strategic Initiatives, Quarterly Census of Employment and Wages

Figure 3-3. Growth in Average Annual Wage by Sector (2016)



Source: U.S. Bureau of Labor Statistics, Bureau of Labor Market Information and Strategic Initiatives, Quarterly Census of Employment and Wages

(1.6 percent), *Arts, entertainment and recreation* (5.5 percent), *Real estate and rental and leasing* (3.3 percent), *Transportation and warehousing* (2.6 percent), and *Finance and insurance* (2.4 percent), all of which had growth rates at least 1.5 percentage points above the national rate. Notably, the sectors with the highest growth rates for Michigan were recorded in low-wage service sectors that would have been affected by recent increases in the state minimum wage.

Industry sectors that recorded the lowest wage growth rates were *Mining* (-2.2 percent), *Manufacturing* (0.1 percent), *Utilities* (0.2 percent), and *Health care and social assistance* (1.2 percent).

PER CAPITA INCOME

In addition to the average annual wage, a more comprehensive measure of income is per capita personal income. In addition to wages and salaries, this measure also includes income from owning a home or business, ownership of financial assets, and both domestic and foreign income.

Preliminary 2016 figures estimate Michigan's per capita personal income at \$44,347, which was 11 percent below the national average per capita income of \$49,571. Michigan ranked 31st among the 50 states and the District of Columbia (D.C.) in per capita personal income and it has not been above the national average since 1999. The five top ranking states were D.C., Connecticut, Massachusetts, New Jersey, and New York, averaging \$66,853.

The bottom five states were Alabama, Idaho, New Mexico, West Virginia, and Mississippi, averaging \$42,156. In terms of growth in per capita income, Michigan fared better with a growth rate of 3.5 percent in 2016, a higher growth rate than the national average at 2.9 percent and ranking 10th among the states.

Figure 3-4. Per Capita Personal Income (2000-2016)

| Year | Michigan | United States | MI % Change | U.S. % Change | MI Rank | MI % Change Rank |
|------|----------|---------------|-------------|---------------|---------|------------------|
| 2016 | \$44,347 | \$49,571 | 3.5% | 2.9% | 31 | 10 |
| 2015 | \$42,833 | \$48,190 | 4.6% | 3.7% | 32 | 6 |
| 2014 | \$40,942 | \$46,464 | 4.4% | 4.4% | 34 | 16 |
| 2013 | \$39,214 | \$44,493 | 1.3% | 0.5% | 35 | 11 |
| 2012 | \$38,699 | \$44,282 | 3.5% | 4.3% | 38 | 33 |
| 2011 | \$37,400 | \$42,461 | 6.2% | 5.4% | 36 | 14 |
| 2010 | \$35,204 | \$40,277 | 3.6% | 2.3% | 38 | 7 |
| 2009 | \$33,966 | \$39,376 | -4.7% | -4.2% | 40 | 36 |
| 2008 | \$35,644 | \$41,082 | 2.7% | 3.2% | 37 | 36 |
| 2007 | \$34,691 | \$39,821 | 3.1% | 4.4% | 38 | 44 |
| 2006 | \$33,638 | \$38,144 | 2.5% | 6.2% | 36 | 50 |
| 2005 | \$32,813 | \$35,904 | 2.0% | 4.6% | 26 | 45 |
| 2004 | \$32,167 | \$34,316 | 2.8% | 5.0% | 25 | 45 |
| 2003 | \$31,306 | \$32,692 | 1.9% | 2.8% | 24 | 40 |
| 2002 | \$30,729 | \$31,815 | -0.2% | 0.9% | 23 | 44 |
| 2001 | \$30,786 | \$31,540 | 1.3% | 3.1% | 20 | 48 |
| 2000 | \$30,391 | \$30,602 | 6.1% | 6.9% | 16 | 28 |

Source: U.S. Department of Commerce, Bureau of Economic Analysis (Updated March 2017)

OCCUPATIONAL WAGES

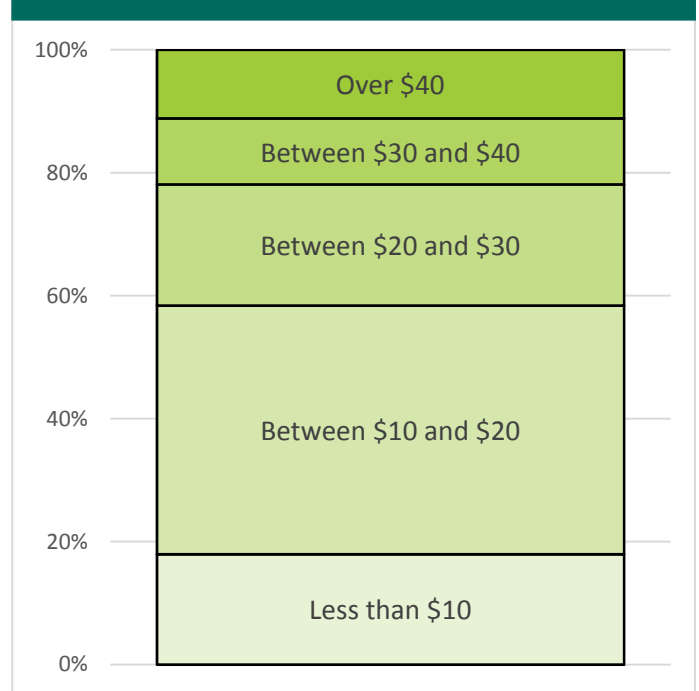
In addition to industries, examining wages across different types of occupations reveals a number of insights about the Michigan labor market. Wage and employment estimates for over 800 detailed occupations are produced by the Occupational Employment Statistics (OES) program, a federal-state cooperative program between state labor market information offices and the Bureau of Labor Statistics (BLS). This program conducts a semiannual mail survey sent to approximately 200,000 nonfarm establishments nationwide, including 6,000 firms in Michigan. Estimates from this survey are used to show wage ranges for detailed occupations and also for the overall occupations in each state, broad occupational groups, and custom groups, like STEM occupations, professional trades, and occupations by their typical education requirements.

Figure 3-5 displays the distribution of wages across all jobs in the Michigan labor market in 2016. Of the 4.2 million jobs in Michigan, 40 percent, or 1.7 million jobs, paid between \$10 and \$20 per hour, constituting the largest group, while 18 percent paid less than \$10 per hour. For the jobs earning above \$20 per hour, there were about 20 percent paying between \$20 and \$30 and another 22 percent paying more than \$30 per hour.

MICHIGAN'S MEDIAN WAGE

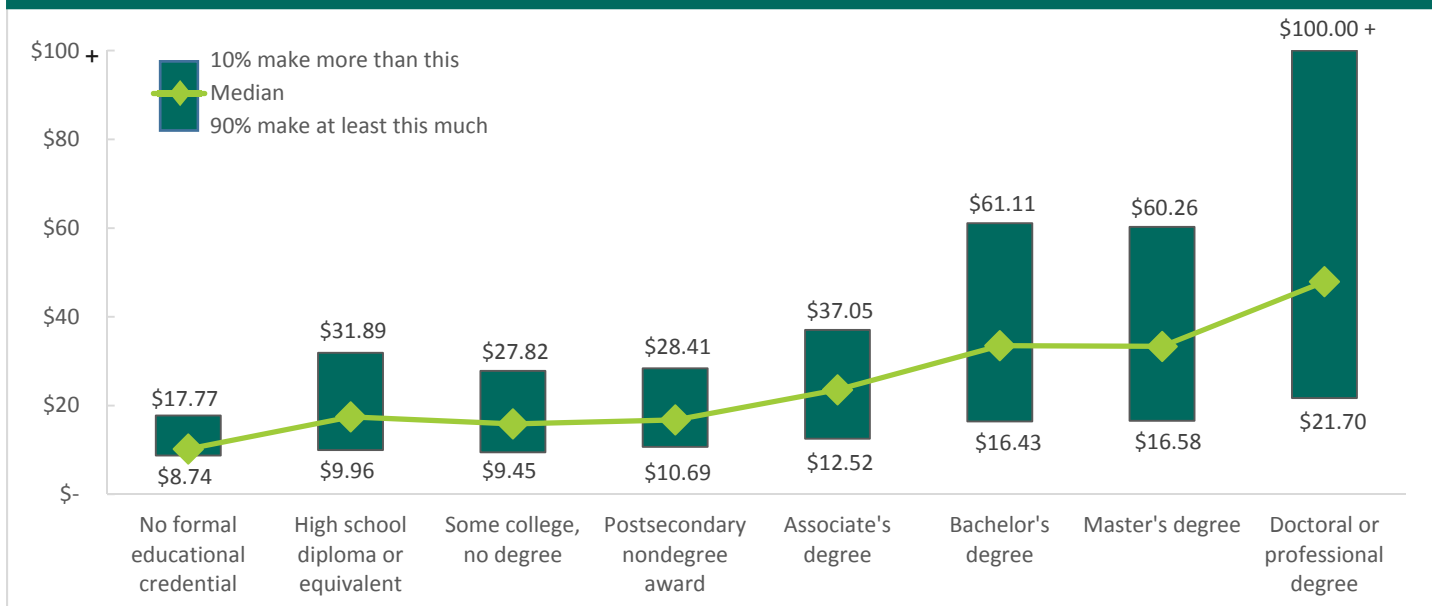
Michigan's median wage across all occupations was \$17.32 in 2016, ranking 24th nationally. It was slightly lower than the United States median wage of \$17.81 for all occupation median wages. Since 2010, Michigan's median wage for all occupations

Figure 3-5. Wages Earned for 4.2 Million Jobs in Michigan (2016)



Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics

Figure 3-6. Michigan Wages by Typical Entry-Level Educational Requirement (2016)



Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics

has ranked in the top 25 highest paying states. This represents a decline since the previous decade, when Michigan ranked among the top 15 states.

The OES estimates categorize occupations into 22 different major groups. In Michigan, the 2016 median wage was higher than the same group nationally in only five of these groups: *Construction and extraction occupations; Farming, fishing, and forestry; Protective service; Community and social service; and Production.* In those occupational groups where the United States had a higher median wage, the largest differences were seen in *Computer and mathematical occupations; Legal; and Life, physical, and social science.*

WAGES BY EDUCATION

Median wages vary greatly by the level of education typically required to perform a job, and were generally higher for occupations with higher entry-level educational requirements. For instance, occupations requiring a high school diploma earned a median wage of \$17.44 per hour, while those requiring an Associate's degree earned \$23.56 and those requiring a Bachelor's degree earned \$33.49. The range of wages also increased as occupations required more education, showing that even if people are hired into an occupation at a lower wage, there is increased opportunity for wage increases (Figure 3-6).²

² The large wage range for the Doctor and Professional degrees is due to lower paid number of hospital interns and residents finishing their requirements to be fully licensed doctors.

MICHIGAN STEM OCCUPATIONS

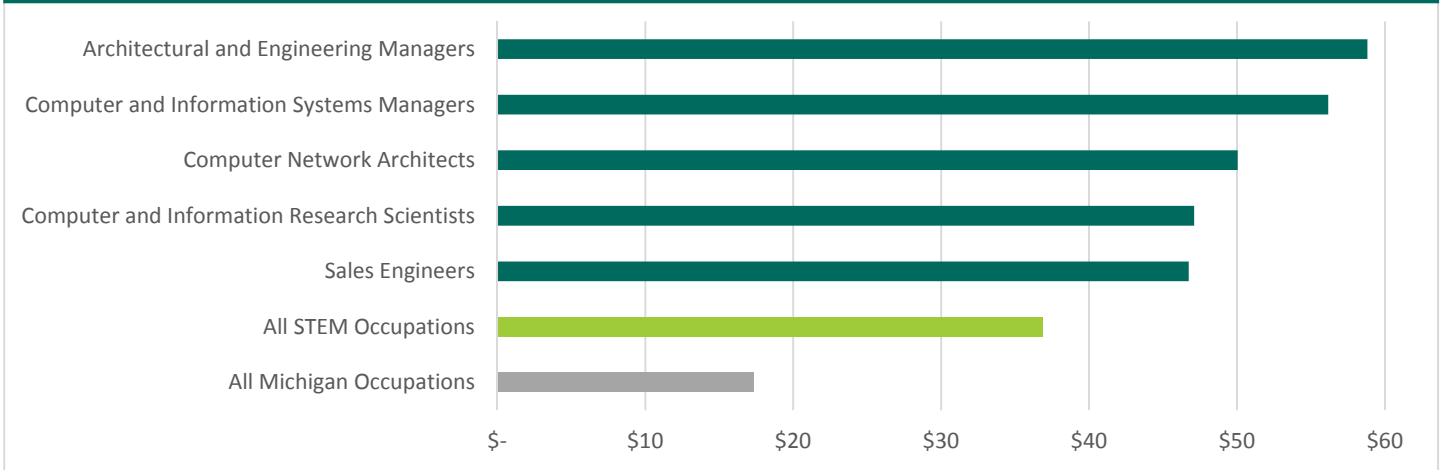
One group of occupations that play a critical role in the Michigan labor market are those in *Science, Technology, Engineering, and Mathematics* (STEM). The Bureau of Labor Statistics categorizes 100 different standard occupations as STEM related. The median wage for all STEM occupations in Michigan was \$36.88 per hour, more than double the statewide median wage. Among the top paying STEM occupations in Michigan were: *Architectural and engineering managers* (\$58.81), *Computer and information systems managers* median (\$56.17), and *Computer network architects* (\$50.04). In fact, 98 of the 100 STEM occupations in Michigan paid a median wage above Michigan's all-occupation median wage of \$17.32.

MICHIGAN PROFESSIONAL TRADES OCCUPATIONS

Similar to STEM jobs, Michigan's professional trades occupations also paid higher wages than was typical for all occupations. With a median hourly wage of \$25.17, these occupations often do not require a four-year degree, but usually pay \$4 to \$5 per hour more than other occupations that do not require a degree. These occupations can be found in multiple industries including *Manufacturing, Construction, Information Technology, and Healthcare.*³ As displayed in Figure 3-8,

³ More information on Professional Trades occupations can be found on the Going Pro website: <http://mitalent.org/skilled-trades>

Figure 3-7. Select STEM Occupations with High Median Wages in Michigan



Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics

several professional trades occupations earn median wages higher than \$35 per hour.

MINIMUM WAGES IN MICHIGAN

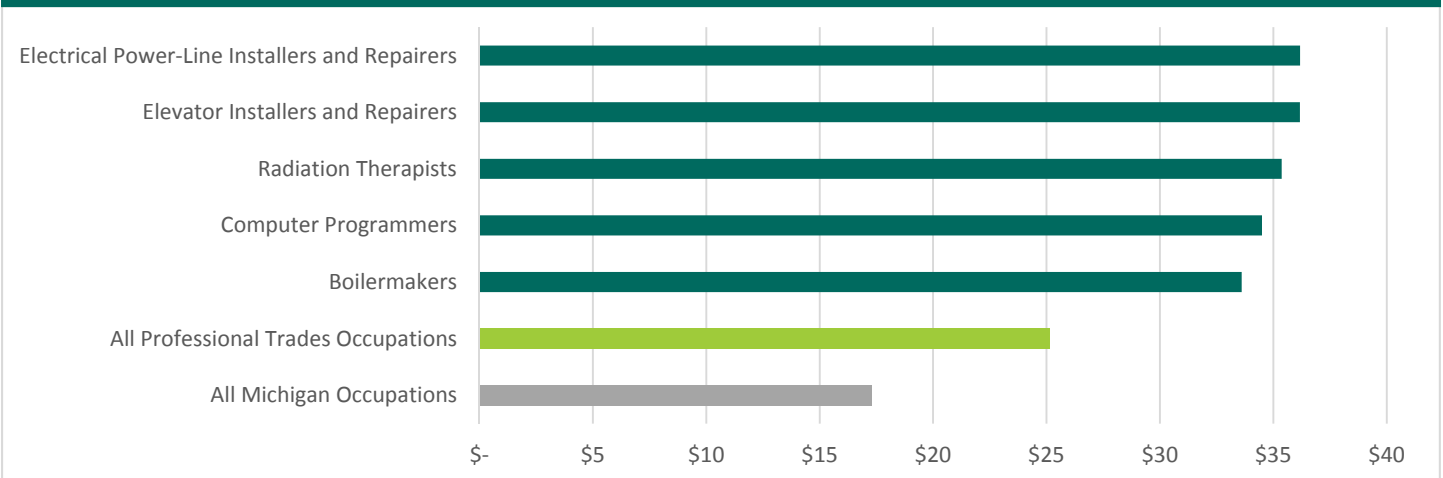
Michigan Public Act 138 of 2014, also known as the Workforce Opportunity Wage Act, was put into effect on May 27, 2014. The Act was likely behind increasing wages and provided a blueprint for wage increases targeted at raising the incomes of many low wage earners in the state of Michigan.

The increase in Michigan's minimum wage has been seen since 2006, when a rise in wages took effect, shifting from \$5.15 to \$6.95 per hour, marking a key difference between federal and state minimum wages. Since 2006, the minimum wage has not been the same for more than five years at a time. This movement was further enhanced by the Workforce Opportunity

Wage Act, which covers various provisions affecting standard minimum wage earners, tipped employees, and employees in training.

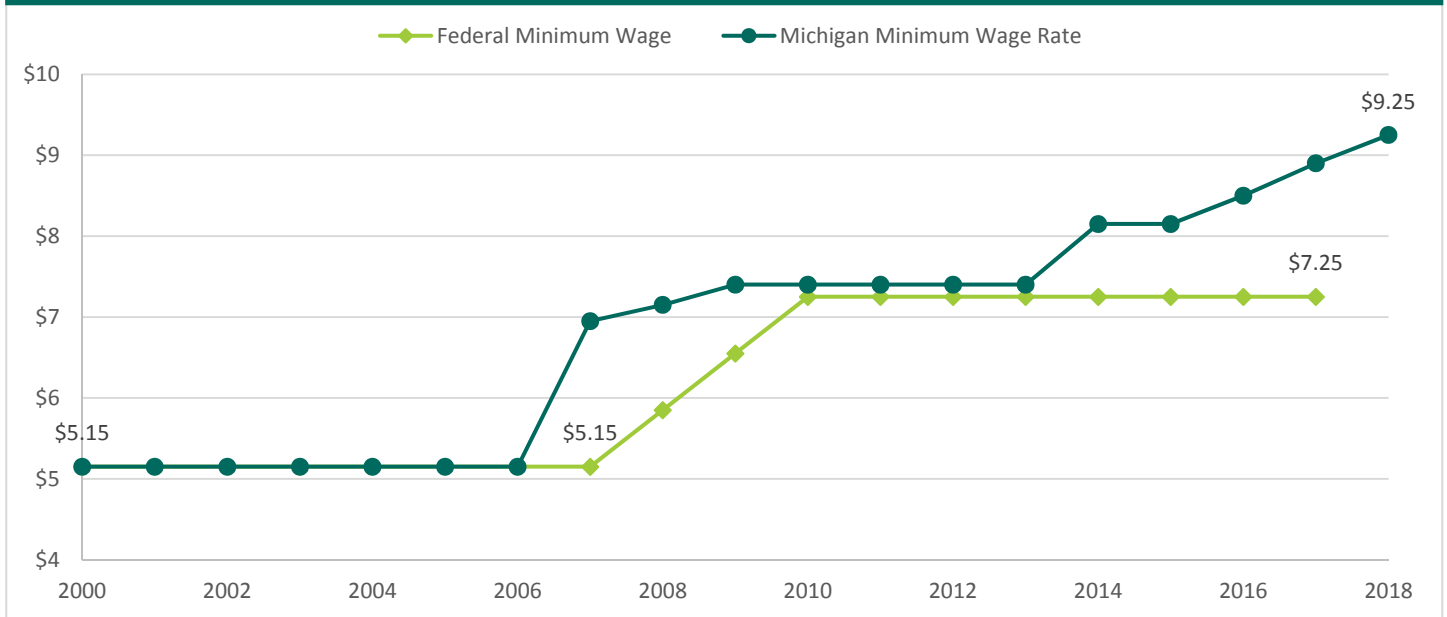
The most recent increase in Michigan's minimum wage occurred in January 2017. This increase from \$8.50 to \$8.90 per hour affected an estimated 250,000 people working in the lowest paying occupations in the state. These occupations include many of those in retail and service work such as *Combined food preparation and serving workers*, including *Fast food*; *Retail salespersons*; *Waiters and waitresses*; *Cashiers*; and *Stock clerks*. Many of these same workers will be affected again when Michigan's minimum wage increases to \$9.25 in January of 2018.

Figure 3-8. The Top 5 Highest Median Hourly Wages for Professional Trades Occupations



Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics

Figure 3-9. Federal and State Minimum Wage Compared (2000-2018)



Source: U.S. Department of Labor

Nearly 475,000 Michigan workers were in occupations that made less than \$9.25 per hour in 2016.

Further increases to the Michigan minimum wage law will be contingent upon the regional Consumer Price Index (CPI) and the state’s unemployment rate, which cannot reach or exceed 8.5 percent in the year previous to establishing another raise. To understand and adhere to all provisions provided by the Workforce Opportunity Wage Act, online resources are available at www.michigan.gov/wagehour.

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DEMOGRAPHIC WORKFORCE TRENDS IN MICHIGAN

CHAPTER HIGHLIGHTS

- Michigan's population has returned to positive year-to-year changes. While small, these increases are a vital improvement over the population losses that were seen in the state between 2004 and 2011.
- Michigan has a greater proportion of persons 50 years of age and over than the nation overall, which contributes to the state's median age being nearly two years older than the nation's.
- Michigan's population is projected to increase over the next two decades, largely due to migration that is expected to fill jobs currently held by the state's Baby Boomers, who are expected to enter retirement over the period.
- Michigan continues to see out-migration of the population aged between 25 and 34 who hold a Bachelor's degree or higher. However, with the exception of 2013, the migration of this group since 2010 seems to have settled at a level less than that experienced in the period from 2005 to 2010.
- While experienced at varying levels across the entire state, poverty is particularly concentrated in Michigan's large population centers.

POPULATION TREND

Michigan has seen fluctuations in population, and that is especially the case since the turn of the 21st century. The state's population was increasing but began to slow and eventually reverse when the effects of significant economic issues began to take their toll on the state. As can be seen in Figure 4-1, Michigan's population peaked in 2004 at just over 10 million. It then began to decline, which it did for the remainder of the decade and beyond. The state's population has since seen five years of small population increases.

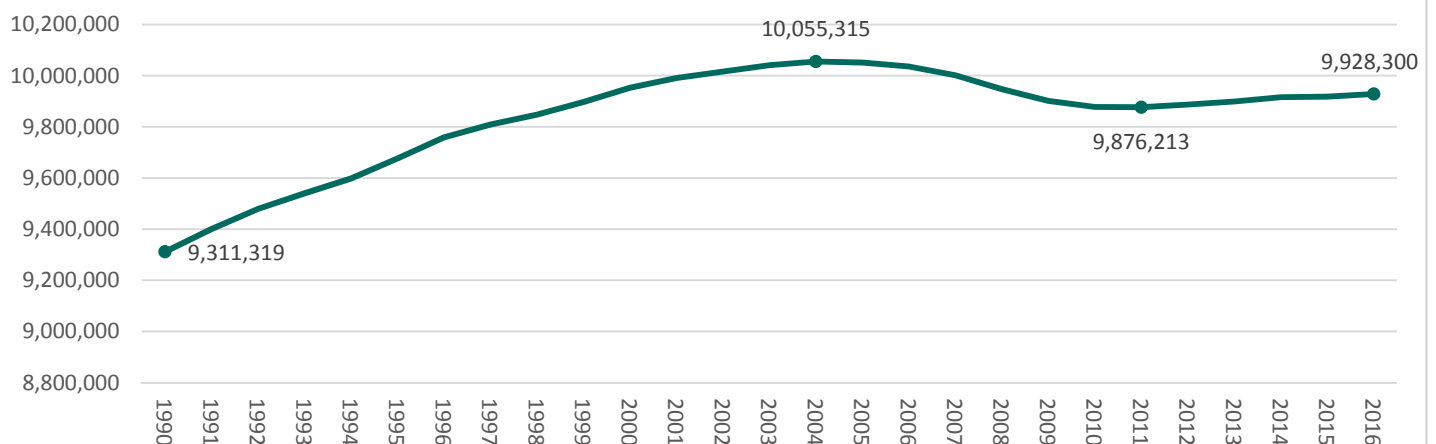
POPULATION STRUCTURE

The structure of a population is critical to the health of any labor market, as it demonstrates where impending shortages or surpluses may exist. As can be seen in the population pyramid in Figure 4-2, both Michigan and the United States have bulges

that represent the two largest generations, the Baby Boomers (roughly 50-70 years) and the Millennials (early 20s to mid-30s). Though the bulges are larger in Michigan than the nation, the proportional reductions are deeper in Michigan.

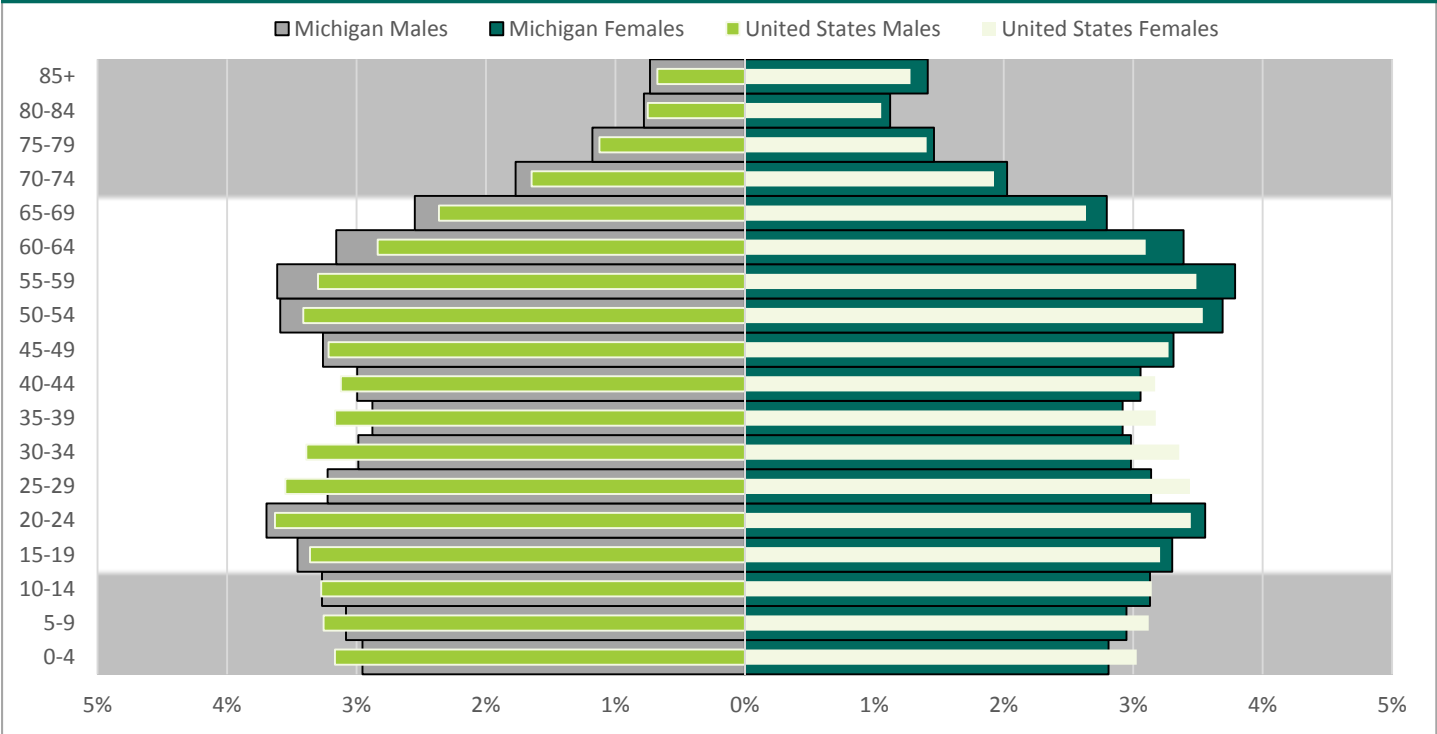
The 25-44 age groups represent the state's population in the early and mid-career age ranges, and there is a noticeable reduction in these age groups. The reductions represent populations that have migrated at various points either in their early career, post college or graduate school, or past high school. It is difficult to ascertain the degree to which each of these migration points are contributing to the reduction in the 25-44 age group, but each will contribute to some degree. One of the issues that makes it difficult to pinpoint the biggest contributor to the missing population is the way that any post high school migration and early career migration will be masked to some degree by the draw of the state's top tier post-

Figure 4-1. Population Trend (1990-2016)



Source: U.S. Census Bureau, 2000 and 2010 Intercensal Estimates, 2016 Population Estimates

Figure 4-2. Michigan and United States Population Structure 2015



Source: U.S. Census Bureau, 2015 Population Estimates

secondary educational institutions. The persons migrating into the state for college may replace the persons leaving, but these replacement residents are usually only temporary residents as they do not necessarily intend to make Michigan their permanent home after they complete their education. This dynamic can be best seen in the sharp decline in the proportions between the 20-24 and 25-29 age groups. This is when the majority of traditional college students will have completed their education and subsequently moved on to either graduate school or their first career opportunity.

Beyond the reduction in the 25-44 age group, a significant aspect of the state's age structure is the large proportion of the population that are in the 50 and over age groups. The elevated levels in these age groups serve to raise the state's median age, making it nearly two years higher than the nation's overall. The combination of the reduced levels of 25-44 and elevated 55 and older will serve to explain the projected population increases that are expected moving forward, which will be discussed in the next section.

Beyond raising the median age for the state, the higher proportional share of older persons will have a significant effect on how the state will need to allocate resources and provide services in the near and longer terms.

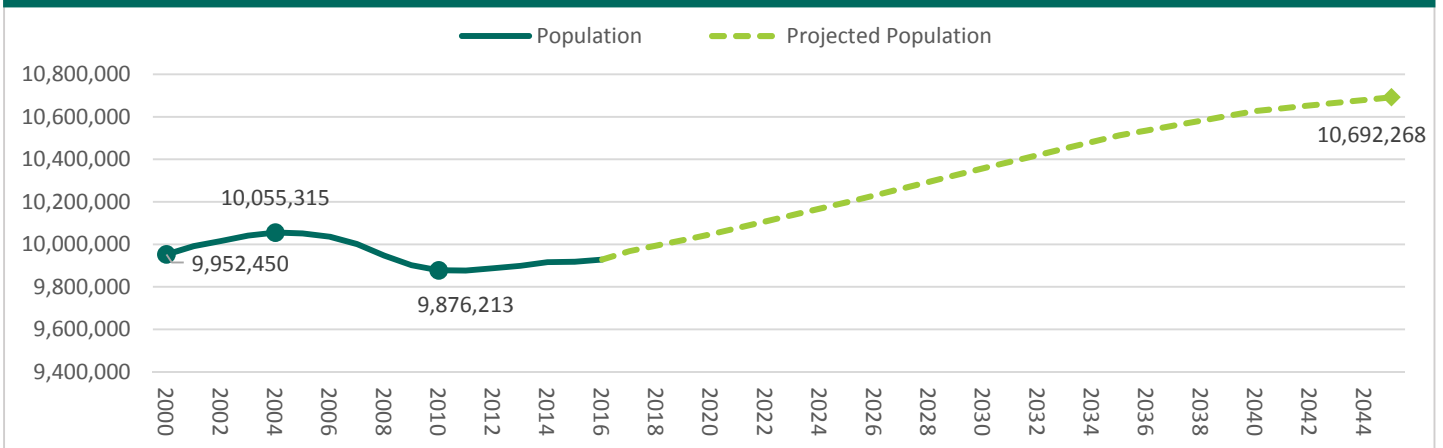
POPULATION PROJECTIONS AND COMPONENTS OF CHANGE

The population for the state is expected to increase. With current trends in place, the state will likely see an increase to about 10 million residents around 2020, and possibly surpassing the peak population of 10,055,315 around the middle to later part of the next decade.

The way populations change are always through the interaction of natural change (births minus deaths) and net migration. Given the increasing number of older persons and decreasing birth rates, Michigan population increases will be primarily through migration and not natural change.

While migration will be the primary driver of the population increases expected over the next two decades, the reason significant migration is expected relates to the structure of the population as shown in Figure 4-2. The large proportion of the population that has and will be crossing the 65 years mark over the projection period are expected to be retiring and creating openings in a variety of positions. As those workers retire, they will need to be replaced and with our current low unemployment, those job openings will likely produce labor shortages. It is reasonable to expect that those openings will be filled by

Figure 4-3. Population Projections to 2045



Source: U.S. Census Bureau, 2010 Intercensal Estimates, 2016 Population Estimates; MDOT and U-M's Institute for Research on Labor, Employment, and the Economy (IRLEE)

persons in the 25-44 age groups, which are proportionally lower in Michigan than the nation overall. These new workers may have a moderating effect on Michigan's increasing median age and declining raw birth numbers, but they will not change the long term fertility patterns that have been trending downward.

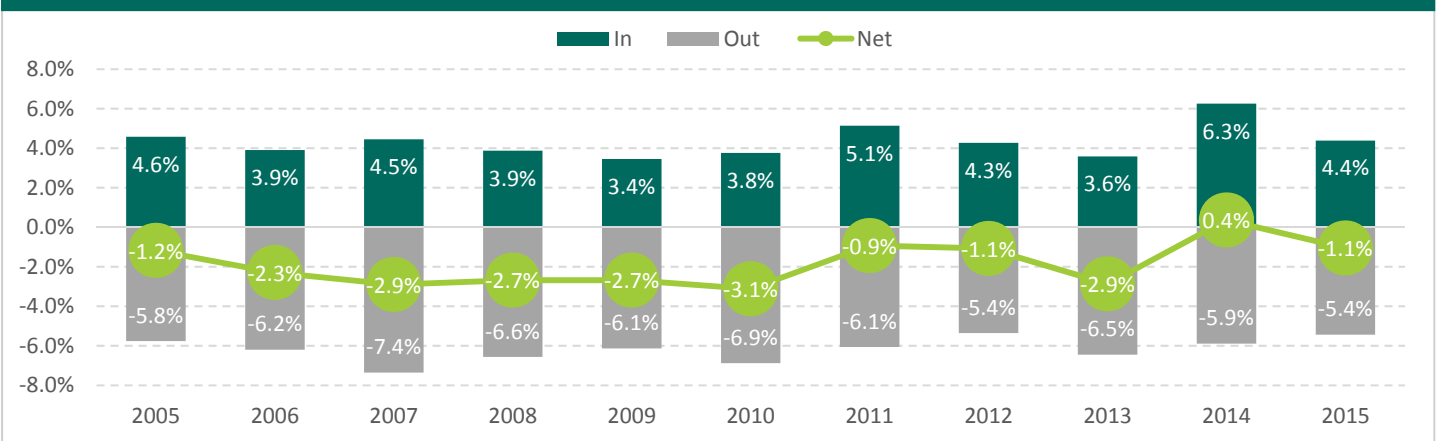
MIGRATION OF THE YOUNG KNOWLEDGE POPULATION

Migration of young persons, between 25 and 34 years, with a Bachelor's degree or higher has been a concern for Michigan for a number of years given the difficult economic times that have been a part of Michigan's recent history. This is an important group to watch as they will form the basis of the next generation of workers that will fill the high-tech jobs that are part of the new knowledge economy.

Migration in this group has been negative over the period 2005-2015 with the exception of a small net in-migration in 2014. The degree of loss has varied from year to year, as would be expected, but the loss has been generally between one and two percent per year. The proportional loss in this age group has been higher over the period among the members with a Bachelor's degree or higher than it was among members of this age group with lower levels of educational attainment, except for that single year of positive net migration in 2014.

Attracting this group is important to the future population outlook as seen in Figure 4-3, but it is also important when considering the labor force outcomes of this group. According to data from the U.S. Census Bureau, persons in this group participate in the labor force at a much higher rate than those with lower levels of educational attainment: 89.5 percent versus 77.8 percent, respectively. Similarly, those with a Bachelor's degree or higher have lower unemployment and also command higher salaries,

Figure 4-4. Migration of Population Ages 25-34 with Bachelor's Degree or Higher



Source: U.S. Census Bureau, 2010-2015 American Community Survey, 1-year PUMS

Figure 4-5. Labor Force Status by Age in 2015

| Age | Total | Labor Force Participation Rate | Unemployment Rate |
|------------------------------|-----------|--------------------------------|-------------------|
| Population 16 years and over | 7,982,332 | 61.0% | 7.2% |
| 16 to 19 years | 541,587 | 43.2% | 20.4% |
| 20 to 24 years | 712,398 | 77.5% | 12.1% |
| 25 to 29 years | 628,727 | 81.8% | 8.3% |
| 30 to 34 years | 592,831 | 81.6% | 7.3% |
| 35 to 44 years | 1,175,407 | 82.1% | 5.9% |
| 45 to 54 years | 1,375,302 | 78.7% | 5.3% |
| 55 to 59 years | 730,014 | 67.5% | 4.5% |
| 60 to 64 years | 655,425 | 49.1% | 3.6% |
| 65 to 74 years | 908,606 | 20.6% | 3.9% |
| 75 years and over | 662,035 | 4.8% | 3.5% |

Source: U.S. Census Bureau, 2015 American Community Survey, 1-year Estimates

with a median annual wage of \$41,000 versus \$23,000 for those with lower levels of educational attainment.

CHARACTERISTICS OF THE WORKFORCE

The prime working age population, those between 25 and 54, have a labor force participation rate that is higher than those in other age groups, averaging over 80 percent. The data in Figure 4-5 point to considerably higher unemployment among the age groups under 25 years, which may stem from a variety of causes including lower levels of workforce experience, lower levels of educational attainment, and schedule limitations related to pursuit of secondary and post-secondary educational opportunities. Those in the oldest age groups tend to have the lowest unemployment rates, but those are accompanied with the lowest levels of labor force participation.

When looking at the traditional workforce in Figure 4-6, those between 25 and 64, it is clear that there is a positive relationship between levels of educational attainment and participation in the labor force. In addition to participating in the labor force at higher levels, those with a Bachelor's degree or higher also experience unemployment at less than half the rate of those with only some college or an Associate's degree and at a fraction the rate with lower levels of educational attainment.

In addition to age and educational attainment, disability status also plays an important role in the labor market status of Michigan's residents. Individuals with a disability face many challenges in the workforce. In 2015, there were nearly 740,000 persons over 16 years of age having a disability, they constitute a sizable proportion of the population over 16 years of age at 9.3 percent. This group has significant barriers to employment which is evident in their labor force participation rate of 36.5 percent. When this group does participate in the labor force they experience unemployment at much higher levels than the general population with an unemployment rate of 15.3 percent. The U.S. Census Bureau defines a disability broadly in these data to include any long-lasting physical, mental, or emotional condition that can make it difficult for a person to do activities such as walking, climbing stairs, dressing, bathing, learning, or remembering.

POVERTY

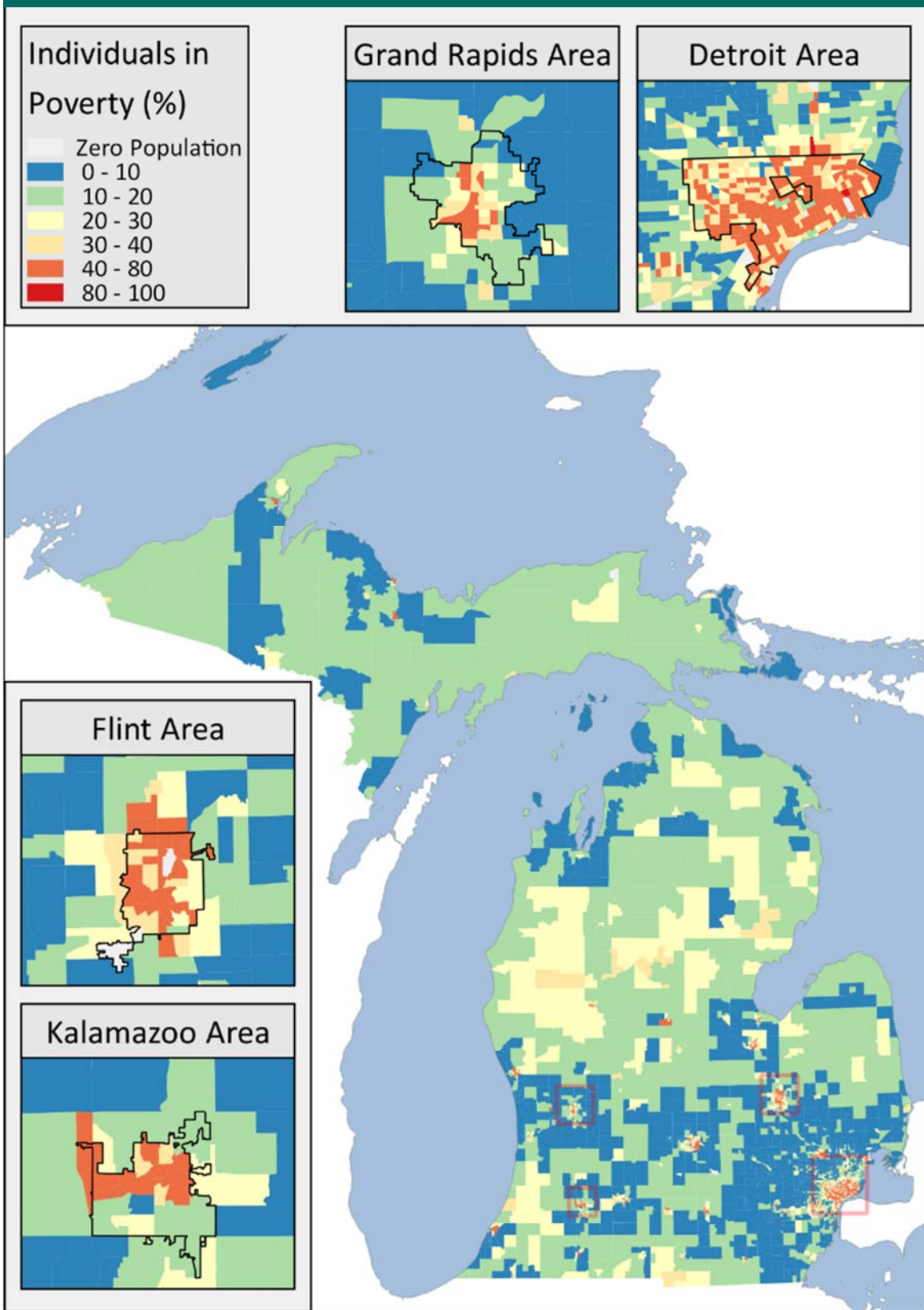
Poverty is distributed across the state to varying degrees. The poverty rate experienced by different areas is very important, as different rates have ramifications that are felt beyond the individual and family level. Poverty rates that are considered particularly important are the 20 and 40 percent marks. Census tracts with poverty of 20 percent are considered low-

Figure 4-6. Labor Force Status by Educational Attainment in 2015

| | Total | Labor Force Participation Rate | Unemployment Rate |
|---|-----------|--------------------------------|-------------------|
| Population 25 to 64 years | 5,157,706 | 74.8% | 5.9% |
| Less than high school graduate | 441,538 | 51.7% | 14.0% |
| High school graduate (includes equivalency) | 1,413,229 | 67.4% | 8.6% |
| Some college or Associate's degree | 1,800,395 | 77.4% | 5.6% |
| Bachelor's degree or higher | 1,502,544 | 85.7% | 2.7% |

Source: U.S. Census Bureau, 2015 American Community Survey, 1-year Estimates

Figure 4-7. Distribution of Poverty over the Period 2011-2015



Source: U.S. Census Bureau, 2015 American Community Survey, 5-year Estimates; U.S. Census Bureau, TIGER Shapefiles

income areas, and 40 percent is generally considered to be a marker of areas with concentrated poverty.

When looking at the state, it is clear that there are large areas that are experiencing low-incomes, as defined by the prevalence of poverty. While not exclusively so, many if not most of the census tracts that can be described as experiencing concentrated poverty tend to be in the state's cities, as can be seen in Figure 4-6. These rates of poverty are important not only because of the effects at the individual and family level, but because of the recognition that the effects of poverty concentration spill over into surrounding areas.

ERIC GUTHRIE
STATE DEMOGRAPHER

LABOR SUPPLY

CHAPTER HIGHLIGHTS

- The total number of graduates from Michigan public high schools declined every year from 2012 to 2016. However, this trend is consistent with population trends seen statewide of a declining demographic of young people.
- After declining from 2012 to 2014, the number of individuals completing registered apprenticeship programs has continued to rebound, and in 2016 was only 12 percent below the peak in 2012.
- The number of Michigan students earning post-secondary credentials has decreased annually since 2012, mirroring a similar trend among those earning post-secondary certificates or Associate’s degrees. In contrast, the number of students earning a Bachelor’s degree has actually increased each of the past five years.
- Michigan lags behind the United States overall in the percentage of residents with a Bachelor’s degree or higher, 26 to 29 percent, but is four percentage points above the national average in residents with at least a high school diploma (88 to 84 percent, respectively).
- Michigan has been increasing in educational attainment over time, with an increase in the percentage of the population having a Bachelor’s degree or higher growing in each younger age group. Of the oldest age group, those over 65, 21 percent have acquired a Bachelor’s degree or higher, which increased to 26 percent of those aged 45 to 64, and has further risen to 31 percent of those aged 24 to 44 in Michigan.
- Statewide migration of young workers with at least a Bachelor’s degree shows a pattern of net out-migration over the past five years, culminating in a five-year low of almost negative eight percent in 2015. Since 2011, almost 30,000 more young Bachelor’s degree holders have left the state than have entered it.
- Michigan has 462,750 jobs in professional trade occupations, which is 11 percent of all jobs in Michigan. Michigan also has a strong STEM sector, as it ranks 8th nationally by concentration, with two cities, Ann Arbor and Detroit, ranking highly, 10th and 29th respectively.

HIGH SCHOOL GRADUATES AND COLLEGE ENROLLMENT

The Michigan secondary and post-secondary education systems are integral to developing the talent resources that are so important to the state economy, and this chapter reveals a number of different metrics that examine the supply of workers in the Michigan labor market. The first of these, high school graduation levels, provides information about the supply of workers who will soon be entering the labor force and/or pursuing additional education at the post-secondary level.

Figure 5-1 shows that the number of public high school graduates in Michigan has been declining slightly since 2011. The most recent data available, academic year 2015-2016, demonstrates that the number of high school graduates is now

three percent lower than in 2011. The declines seen in the data are consistent with demographic characteristics seen in Michigan for high-school age cohorts; young graduate-age population is less in subsequent cohorts to 2012 during this period.

A breakdown of high school graduate levels by gender indicates that females have consistently made up a slightly larger portion of graduating students per year than males for the past five years. The academic year with the largest female-to-male ratio of graduates is 2013-2014, where 51.2 percent of graduates were female as compared to 48.8 percent male.

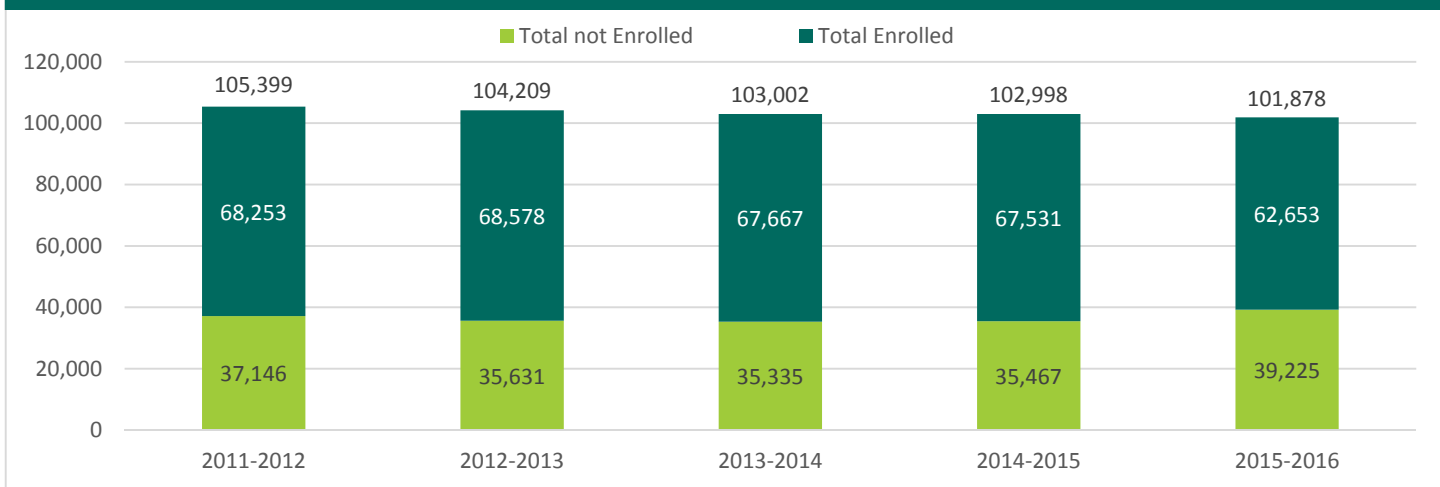
College enrollment of graduating seniors can provide an indication of incoming labor supply, as a portion of graduating seniors who choose not to enroll in college will soon be entering

Figure 5-1. Total Michigan High School Graduates (2011-2016)

| Year | Total Graduates | Male | Female | Percent Male | Percent Female |
|-----------|-----------------|--------|--------|--------------|----------------|
| 2015-2016 | 101,878 | 50,382 | 51,496 | 49.5% | 50.5% |
| 2014-2015 | 102,998 | 50,631 | 52,367 | 49.2% | 50.8% |
| 2013-2014 | 103,002 | 50,251 | 52,751 | 48.8% | 51.2% |
| 2012-2013 | 104,209 | 51,452 | 52,757 | 49.4% | 50.6% |
| 2011-2012 | 105,399 | 51,883 | 53,516 | 49.2% | 50.8% |

Source: Michigan Center for Educational Performance and Information (CEPI)

Figure 5-2. High School Graduates Enrolled in College Six Months after Graduation



Source: Michigan Center for Educational Performance and Information (CEPI)

the Michigan workforce. As seen in Figure 5-2, over half of graduating seniors consistently choose to enroll in a postsecondary program after matriculating from high school. The most recent data demonstrates a four percentage point decline in college enrollment from the five-year high of 65.8 percent during the 2012-2013 school year.

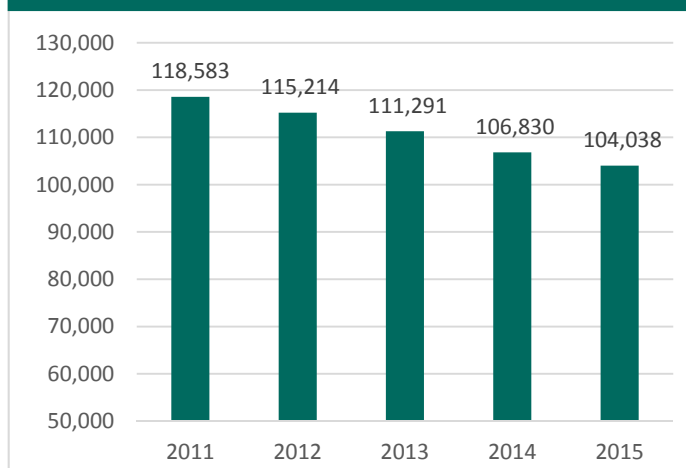
CAREER AND TECHNICAL EDUCATION (CTE)

Career and Technical Education, or CTE, programs are a series of courses that provide training to both youth and adults for a wide range of in-demand careers. They are short-term programs designed to equip participants with either the relevant technical knowledge regarding the field of their choosing, or with the skills to move on to further education in pursuit of a career in said field. Upon completion, CTE programs provide a certificate,

college credit, or other form of industry-recognized credential to program completers.

Figure 5-3 displays the total number of enrollees in secondary CTE programs. Statewide, enrollment in these programs declined every year from 2011 to 2015 and these enrollment declines averaged approximately three percent per year. A closer look into the data present on Michigan’s CTE website reveals the most popular fields of study for secondary CTE programs are overwhelmingly *Business, Management and Administration*, and *Marketing, Sales, and Services*, with approximately fifteen thousand enrollees statewide in 2015. Other popular fields of study include *Health Science*, and *Transportation, Distribution, and Logistics*, with about eleven thousand and eight thousand enrollees in 2015, respectively.

Figure 5-3. Total CTE Enrollees in Michigan (2011-2015)



Source: Michigan Center for Educational Performance and Information (CEPI)

APPRENTICESHIPS

Registered apprenticeship programs are another valuable tool in training skilled workers for the Michigan labor market. Registered apprenticeships are work-based and post-secondary

Figure 5-4. Michigan Registered Apprenticeships Begin Rebounding

| Year | Active | Completers |
|------|--------|------------|
| 2016 | 13,753 | 1,116 |
| 2015 | 11,802 | 878 |
| 2014 | 9,517 | 765 |
| 2013 | 8,539 | 1,034 |
| 2012 | 8,083 | 1,275 |
| 2011 | 8,181 | 1,255 |
| 2010 | 7,854 | 1,202 |

Source: U.S. Department of Labor, Office of Apprenticeship

Figure 5-5. MI Top Occupations by Apprenticeship Completers (2010-2015)

| Occupation | Completers |
|---|------------|
| Electricians | 1,336 |
| Plumbers, Pipefitters, and Steamfitters | 941 |
| Carpenters | 380 |
| Millwrights | 320 |
| Sheet Metal Workers | 316 |

Source: U.S. Department of Labor, Office of Apprenticeship

on-the-job learning positions that not only train skilled workers for the Michigan labor market, but they also offer Michigan

workers high-wage, high-demand job opportunities that do not require a Bachelor's degree.¹

Completed apprenticeships are primarily concentrated in two industries: *Construction* and *Manufacturing*. They are the only two sectors to consistently have over 100 completers each year, with *Construction* having over 500 completers.

The notion that measuring apprenticeships provides a better understanding of the incoming labor supply of professional trade jobs is evidenced by an examination of the top occupations by completer. All are professional trade positions, with *Electricians* and *Plumbers* leading the way by a wide margin.

As might be expected, there is a large disparity in completers by gender, with men completing 94 percent of all programs since 2010. However, there was an uptick in the number of registered

active female apprentices in 2015. From 2010 to 2014 active female apprenticeships ranged from three to five percent, but in 2015 rose to 12 percent.

POSTSECONDARY EDUCATIONAL ATTAINMENT OF RECENT GRADUATES

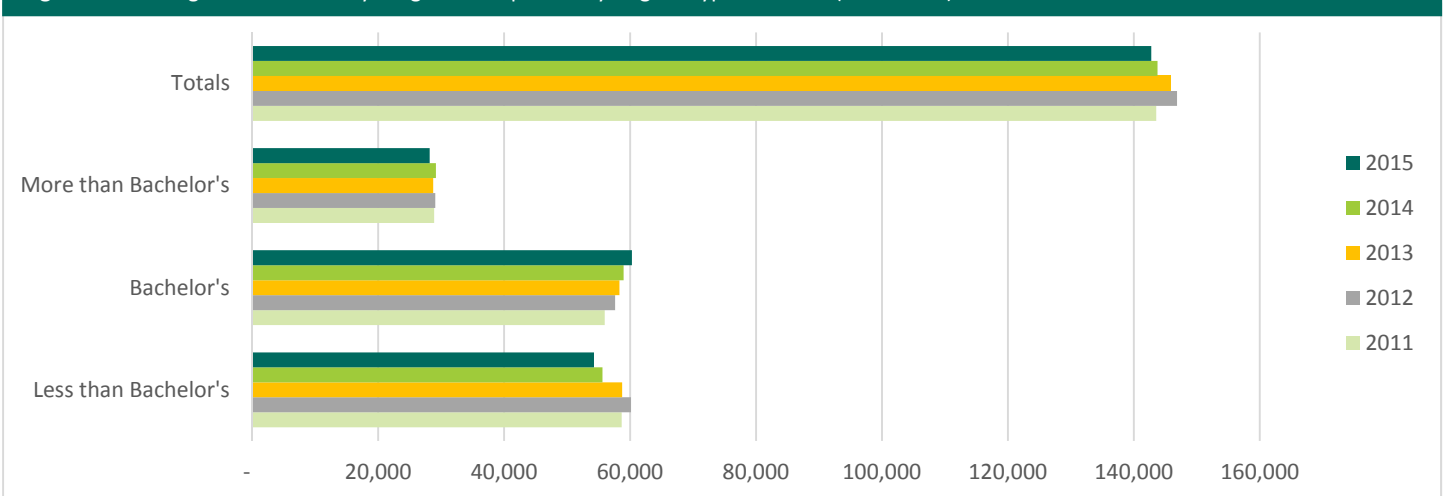
Trends in postsecondary educational attainment provide vital information about the skills of incoming labor supply participants. The National Center for Educational Statistics delivers detailed state-level information regarding postsecondary program completers through their Integrated Postsecondary Education Data System (IPEDS). A breakdown of the postsecondary completers in Michigan by degree type for the past five years, as well as degree type definitions, is below.

More than Bachelor's: Students completing any type of post Baccalaureate degree or certificate, including MA and PhD degrees.

Bachelor's degree: Students receiving an award (Baccalaureate or equivalent) that normally requires at least 4 but not more than 5 years of full-time equivalent college-level work.

Less than Bachelor's: Students completing an Associate's degree or any type of certificate below the Baccalaureate level.

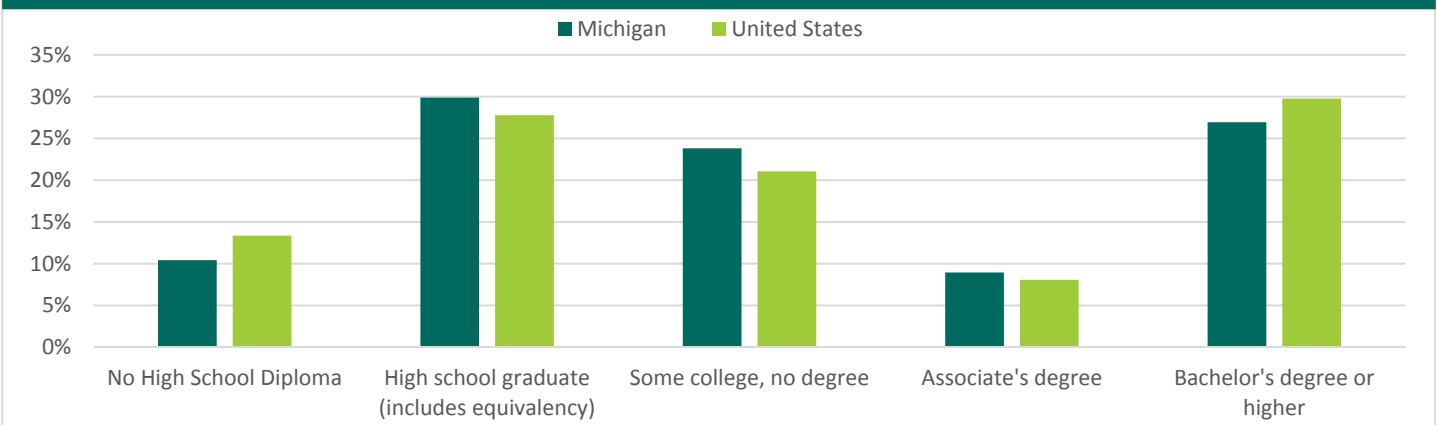
Figure 5-6. Michigan Postsecondary Program Completers by Degree Type Awarded (2011-2015)



Source: Integrated Postsecondary Education Data System

¹ The information in this report only pertains to registered apprenticeships. It does not represent all apprenticeships in Michigan.

Figure 5-7. Educational Attainment, Michigan vs United States (25+)



Source: U.S. Census Bureau, American Community Survey

Following overall trends in Michigan’s labor market, the total number of post-secondary credentials awarded has been decreasing for the last three years. The largest number of students graduating from any postsecondary program occurred in 2012, with 146,846 total credentials awarded. This is also when the highest number of credentials below a Bachelor’s degree was awarded. One possible explanation for this trend is that the increase in postsecondary completions during this period is due to workers who returned to school during the height of the recession in 2009, completing their degrees in preparation for re-entry into the labor market with new skills.

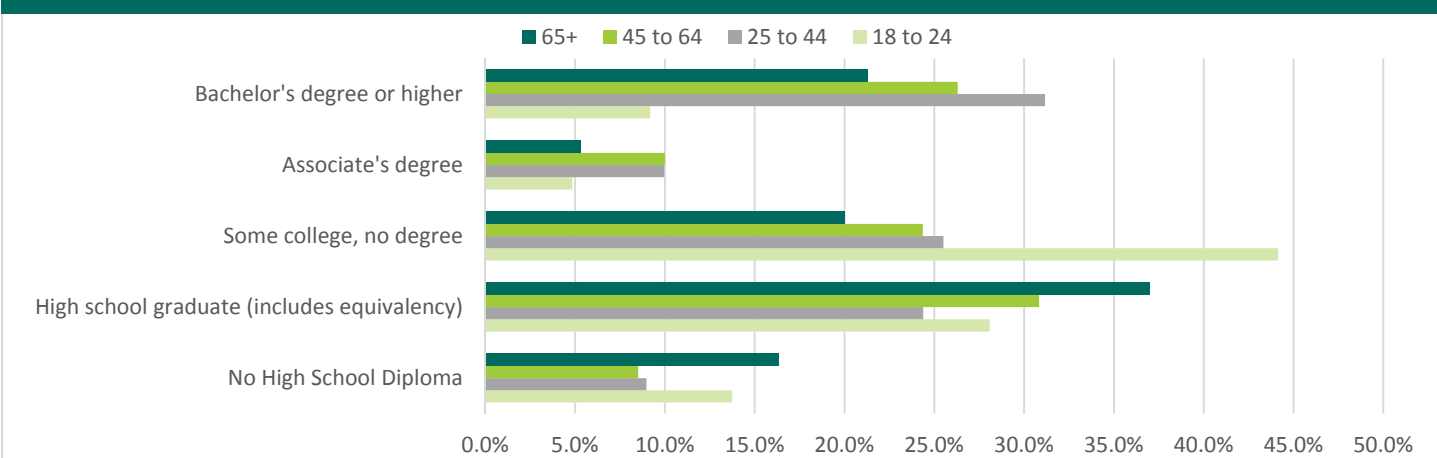
The number of students earning a Bachelor’s degree has been slightly increasing the past five years, culminating in a five-year high of 60,286 completers in 2015. Approximately 40 percent of all postsecondary graduates earned a Bachelor’s degree in 2015. Students earning a postsecondary certificate or degree below a Bachelor’s, such as an Associate’s degree or certificate

requiring less than one year of study, have been in decline the past three years. The total number of students earning such degrees is almost 10 percent lower than its high of 60,150 students in 2012. In contrast, the number of students earning credentials above a Bachelor’s degree has stayed relatively constant the past five years.

EDUCATIONAL ATTAINMENT OF MICHIGAN RESIDENTS

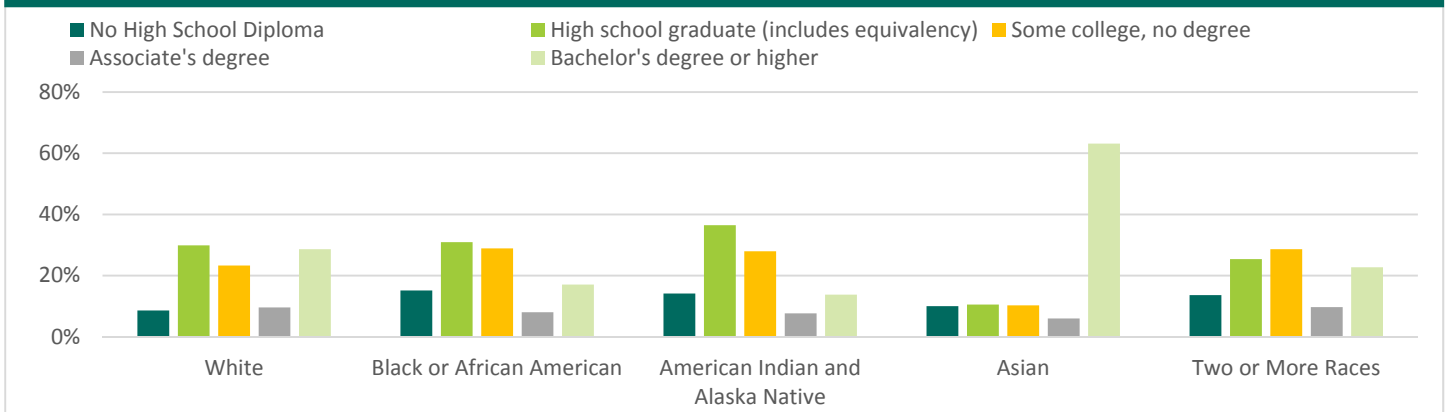
Educational attainment of Michigan residents is another useful indicator of skills in the state’s current workforce. It shows the available supply for high-end positions that require an advanced degree, and by looking at breakdowns by age, can track the trends of degree obtaining individuals. However, the portion of the supply pool that does not have a degree is not necessarily unskilled, and should not be viewed that way. As seen in the incoming supply section, many of those workers are still being

Figure 5-8. Educational Attainment by Age in Michigan



Source: U.S. Census Bureau, American Community Survey

Figure 5-9. Educational Attainment by Race in Michigan



Source: U.S. Census Bureau, American Community Survey

trained with apprenticeships, career technical training, or other programs that do not grant a degree.

The largest educational attainment group of residents in Michigan over 25 are those who have attained a high school diploma or equivalent reward, with the second largest group being those who have received a Bachelor's degree or higher. These two groups are reversed when looking at the United States, with those receiving a Bachelor's or higher degree at three percentage points higher than in Michigan. Michigan does, however, have a higher percentage of residents with some college but no degree relative to the United States, as well as a higher percentage of those with an Associate's degree.

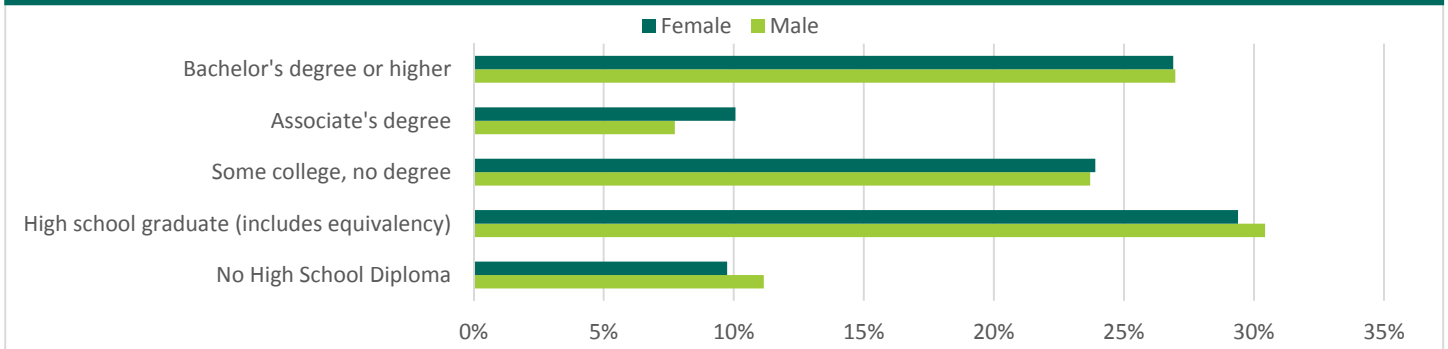
Michigan as a whole has been getting more educated over time. The oldest age cohort, 65 and older, has the smallest percentage in every educational category above high school, except for the 18-24 age cohort, many of whom are too young to have obtained an Associate's or Bachelor's degree. Bachelor's degrees or higher have been increasing in every age cohort in Michigan, but continue to lag behind the overall numbers for the United States in every age group. But, the gap has been shrinking, with the 65 and older age group three percentage points behind the United States, and the 18-24 age group only one percentage point behind the United States. One reason that Michigan would have a lower percentage with at least a Bachelor's degree, especially in the older age cohorts, is that Michigan has traditionally had a very strong manufacturing sector, which provided numerous jobs that did not require a four year degree. Now that the manufacturing sector has weakened, Michigan residents have begun looking to get a higher education to compete in the job market. Another factor pointing to this reasoning is that Michigan does have a lower percentage of residents with no high school diploma at every age level than the

United States as a whole, showing that Michigan is better than average at getting its children to finish secondary school. With more high school graduates, one would expect a higher number of people going on to college to get degrees, but many residents viewed that as unnecessary, since there were plenty of good jobs that did not require one.

There is a large divide in educational attainment by race (Figure 5-9). Asians lead the way with over 60 percent of those over 25 having a Bachelor's degree or higher in Michigan, far outpacing every other racial category. This is consistent with what is happening at the national level, although not quite as pronounced, with over 50 percent of this group having a Bachelor's degree or higher. Whites are the next highest, with American Indians and Alaskan Natives being the lowest with only 14 percent having a Bachelor's degree or higher, which is also consistent with the United States levels. Blacks or African Americans are the most likely in Michigan to have no high school diploma, at 15 percent, which is the same rate nationally. In Michigan, Asians are the only race to have a higher percentage of people with a Bachelor's degree or higher than have a high school diploma. They are also the only race that has a higher percentage of Bachelor's degrees or higher in Michigan than the United States average.

While there are more women at every educational attainment level above high school, this is a bit misleading, because there are also more women in the state overall. When looking at the percentages, women were about equal with men at acquiring a Bachelor's or higher degree, but they do outpace men in acquiring Associate's degrees, having some college with no degree, and in at least finishing high school. It is important to note that despite equaling or exceeding men in educational attainment, women lag well behind in labor force participation.

Figure 5-10. Educational Attainment by Sex (25+)



Source: U.S. Census Bureau, American Community Survey

Men aged 16 to 64 are ahead overall in the labor force with 76 percent reporting having worked in the past year, compared to only 70 percent of women. Men also greatly outpace women in working full-time, with 61 percent reporting having worked 35 or more hours per week, compared to only 45 percent of women reporting the same.

STEM AND PROFESSIONAL TRADES

Occupations can be grouped together to create several key occupational clusters that help to better understand the current labor supply in Michigan. One such category is professional trades occupations, which are mostly middle-skill jobs that require training after high school, but typically require less than a Bachelor's degree. Some of the most common jobs in this category in Michigan are: *Electricians; Maintenance and repair workers; Machinists; Automotive service technicians and mechanics; and Computer user support specialists*. Michigan has 462,750 jobs in professional trade occupations, which is 11 percent of all jobs in Michigan.

Another important group is Science, Technology, Engineering, and Mathematics (STEM) jobs. This group is made up of occupations that typically require a Bachelor's degree or higher. The top five jobs in this category in Michigan are: *Mechanical engineers; Industrial engineers; Software developers, applications; Computer user support specialists; and Computer systems analysts*. All of these positions, except for *Computer user support specialists*, require at least a Bachelor's degree. In Michigan there were 304,430 STEM jobs in 2016, which is 7.2 percent of all jobs in Michigan, compared to only 6.3 percent nationwide, and ranks 8th overall in STEM job concentration in

the United States. The two Metropolitan Statistical Area's (MSA) in Michigan with the highest concentration of STEM occupations are Ann Arbor and Detroit, both of which rank highly nationally. Ann Arbor has the 10th highest concentration in the United States at 12.5 percent of all jobs in that area, likely due to the largest university and employer in the state being in this area. The Detroit MSA ranks 29th nationally with 9.3 percent of all jobs in STEM, led by the high concentration of *Mechanical and Industrial engineers* in the region.

Looking at the number of jobs that require a Bachelor's degree or higher, based on a Bureau of Labor Statistics list, can give an indication of the number of high-level jobs in the Michigan labor market. Michigan had 1,063,530 jobs that require a Bachelor's or higher degree, which is 25.2 percent of all jobs statewide, and ranked 20th nationally. One interesting thing to note is that according to the American Community Survey, 1,791,892 residents of Michigan over 25 have Bachelor's degrees or higher, many more than are in jobs that require a degree. Of those, 265,911 are not currently working at all, leaving 1,525,981 workers with a degree, meaning only 69.7 percent of all people in Michigan with degrees that are working, are in jobs that require a Bachelor's degree or higher. However, this is higher than the amount nationally, where only 66.5 percent of workers with a Bachelor's degree or higher are working in a job that requires a degree.

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EMPLOYMENT PROJECTIONS

CHAPTER HIGHLIGHTS

- Michigan is expected to add over 327,000 new jobs between 2014 and 2024, registering modest job growth at an average rate of 0.7 percent per year and similar to the expected national average employment growth rate of 0.6 percent for the same period.
- *Health care and social assistance* is expected to lead Michigan's industry job growth through 2024. Nearly one in four new jobs statewide is expected to come from expansion in this sector, and the 12.4 percent total projected job gain in this sector (1.2 percent annually) should significantly outpace the overall average in Michigan.
- Occupations requiring higher levels of education and training, such as those found in *Computer and mathematical*, *Healthcare support*, and *Architecture and engineering*, are expected to drive much of the new job growth in Michigan through 2024. However, many of the state's occupations that require less education are projected to provide numerous job opportunities due to the need to fill openings that are expected to arise out of replacement needs.
- *Michigan's Hot 50*, the *Going Pro* campaign, and STEM analysis provide examples of specific occupations projected to provide significant job opportunities between 2014 and 2024. These occupations cover a variety of skill levels and occupational groups and each provide above-average wages to Michigan workers.

INTRODUCTION

According to long-term projections released in 2016, Michigan is expected to add over 327,000 new jobs between 2014 and 2024, registering modest job growth at an average rate of 0.7 percent per year and similar to the expected national average employment growth rate of 0.6 percent for the same period. Businesses expected to drive most of Michigan's job gains through 2024 range from healthcare and professional service providers to goods-producers in manufacturing and construction-related industries. On the occupational side, *Computer and mathematical*, *Healthcare support*, and *Architecture and engineering* are projected to be among the fastest-growing occupational groups, while jobs in *Office and administrative*, *Sales and related*, and *Production* are expected to be among the top contributors of overall job demand, which includes not only growth but also replacement needs. Jobs requiring more than a high school diploma or GED are expected to expand by 8.7 percent, while those requiring high school or less are projected to move up by 6.6 percent through 2024. The average rate of increase across all jobs in Michigan for the 10-year forecast period is 7.4 percent.

Using the most recent statewide long-term data, the state has published analyses on growing and high demand jobs and also jobs with unique skills. *Michigan's Hot 50* and the *Going Pro* campaign provide specific examples of this work and are briefly discussed later in this chapter. Additionally, a special analysis of STEM-related occupational projections are discussed.

LONG-TERM INDUSTRY JOB OUTLOOK

Michigan employment is projected to grow by a relatively moderate 7.4 percent over the 10-year period ending in 2024. While seemingly lower than previous long-term projections, it is important to note that this current set of future estimates assumes at least some economic slowing nationally and that Michigan will follow suit. The current national employment projections for this same period place overall job growth at a slightly lower 6.8 percent.

It should be cautioned that any projected job growth could potentially be limited by an inability of employers to acquire workers who are qualified to fill vacancies. If the skillset of the available labor pool is inadequate to meet the increasing needs of employers, actual employment growth over the long term could fall short of the projected amount. Accordingly, however, an influx of talented workers into the labor force that are readily available and able to match themselves with businesses who need them could expand long-term growth beyond the projected amount.

In the early years of Michigan's recovery from the Great Recession, a number of industry sectors drove job growth statewide, from auto-related job gains in *Manufacturing* to advances in *Construction* and *Professional and business services*. However, over the longer term, Michigan's ever-present workforce and population aging concerns continue to fuel demand for both inpatient and outpatient healthcare and related services. Consequently, the *Health care and social assistance* sector is projected to lead Michigan's industry job growth. Nearly one in four new jobs statewide is expected to

come from expansion in this sector, despite a recent slowdown of new job creation in some sub-sectors of this industry, such as hospitals. The 12.4 percent total projected job gain in this sector (1.2 percent annually) should significantly outpace the overall average in Michigan, yet will fall short of the United States projected growth rate of 21 percent in this sector over the forecast period (Figure 6-1).

Professional and business services is another important sector expected to drive long-term employment growth in Michigan. This field, which includes a wide variety of industries such as accounting, engineering, and technology services, ranks second in terms of the most new expected jobs in Michigan, with a 43,700 increase during the projection period (13 percent of the statewide total). It is also expected to be the fastest-growing two-digit industry sector at 15.9 percent through 2024, over twice the projected average growth rate for all jobs. Jobs in this field, like *Health care*, generally require skills, education, knowledge and expertise well beyond a high school diploma, and illustrate previously-mentioned concerns regarding labor availability and its impact on long-term economic growth.

Despite a slightly below-average anticipated job growth rate of 6.2 percent compared to 7.4 percent overall, *Manufacturing* remains a key industry in Michigan's employment outlook. The sector's expected gain of 35,000 jobs through 2024 will account for over one in ten new jobs statewide. Additionally, this industry is a key source of income to the Michigan economy, as *Manufacturing* workers earn wages that are 31 percent above the private sector average.

Not represented in Figure 6-1 are industries expected to decrease in employment size by 2024. Three sectors, *Mining, Utilities, and Government (Public Administration)* are expected to lose jobs during the projection period. The *Government* sector, which in the data provided excludes educational and health services, is estimated to lose nearly 2,600 jobs or roughly one percent of its 2014 base level. Most of the job losses will be seen at the state and federal levels, with local government showing only a minor uptick in employment through 2024.

LONG-TERM OCCUPATIONAL JOB OUTLOOK

A look at the projected growth of Michigan's employment by industry is useful from a business and economic development perspective, but fails to tell the whole story of future employment opportunities, especially for educational, workforce development, and job-seeking data users. Occupational data provides users with another way to examine Michigan's projected job outlook by focusing on the specific roles that workers play in the labor market rather than the industries in which they work. In addition to the 327,000 new jobs estimated statewide through the projection period, job demand will also arise out of vacancies created due to a need to replace workers permanently leaving a position (e.g. retirement, change in career). When factoring in openings due to replacement, it is estimated that there will be over 1.4 million employment opportunities in Michigan between 2014 and 2024.

The occupational projections also provide insight on average education and training requirements for job titles. Occupations requiring higher levels of education and training are expected to drive much of the new job growth through 2024. For example, nearly 80 percent of occupations found within the projected top

Figure 6-1. Michigan Industry Sectors Projected to Add the Most New Jobs through 2024

| Industry | 2014 Employment (Estimated) | 2024 Employment (Projected) | 10-Year Numeric Change | 10-Year Percent Change |
|---|-----------------------------|-----------------------------|------------------------|------------------------|
| Total, All Industries | 4,438,820 | 4,765,850 | 327,030 | 7.4% |
| Health Care and Social Assistance | 606,530 | 681,940 | 75,410 | 12.4% |
| Professional and Business Services | 275,240 | 318,970 | 43,730 | 15.9% |
| Manufacturing | 566,520 | 601,610 | 35,090 | 6.2% |
| Administrative/Support and Waste Management | 288,890 | 318,550 | 29,660 | 10.3% |
| Accommodation and Food Services | 356,270 | 383,060 | 26,790 | 7.5% |
| Retail Trade | 459,850 | 479,400 | 19,550 | 4.3% |
| Construction | 141,330 | 157,650 | 16,320 | 11.5% |
| Other Services (Except Government) | 179,740 | 193,230 | 13,490 | 7.5% |
| Financy and Insurance | 153,630 | 166,910 | 13,280 | 8.6% |
| Wholesale Trade | 167,230 | 179,810 | 12,580 | 7.5% |

Source: Industry Long-Term Employment Projections (2014-2024)

five fastest-growing occupational groups will require a Bachelor's degree or higher, while only half that share of all occupations statewide (41 percent) require this level of education (Figure 6-2).

That is not to say, however, that demand for jobs requiring less education will be necessarily low. For a complete picture of employment demand, it is necessary to look at occupations with high projected rates of expansion as well as those generating the most job openings (Figure 6-2). Only one occupational group, *Healthcare practitioners and technical* occupations, is found on both the list of top five fastest-growing groups and the top five in terms of total job openings. This latter group measures occupational employment demand due to replacement needs in addition to the number of new jobs. For example, the five occupational groups in the bottom category of Figure 6-2 are expected to account for half of the total job openings statewide (71,000 annually out of 141,300 statewide) through 2024.

STEM OUTLOOK AND SPECIAL PUBLICATIONS

STEM Occupational Outlook

STEM occupations in Michigan are projected to grow significantly faster than overall jobs between 2014 and 2024. While total statewide employment is expected to grow by only 7.4 percent, STEM jobs are expected to almost double that rate, increasing by 13.3 percent. Roughly one out of every eight new Michigan jobs during this period will be a STEM occupation, with these occupations expected to expand from an estimated 6.9 percent share of total jobs in 2014 to about 7.3 percent by 2024.

Much of the anticipated STEM job growth will be driven by the *Professional and business services* sector, which is projected to outpace employment growth for all other sectors in Michigan over the ten-year forecast period. While STEM occupations are concentrated throughout much of this broad sector, some related industries contained therein are particularly notable, including *Architectural, engineering, and related services*, which is expected to add 13,320 new jobs (+16.3 percent) and *Computer systems design and related services* (10,390 new jobs, 22.3 percent growth). But STEM occupations are not limited to the *Professional and business services* sector. In fact, they are found across a wide range of industries in Michigan, including most manufacturing industries – especially *Transportation equipment manufacturing* which employs many of the state's engineers – as well as healthcare-related industries, financial and insurance-related, *Information*, and *Administrative and support services*, to name a few.

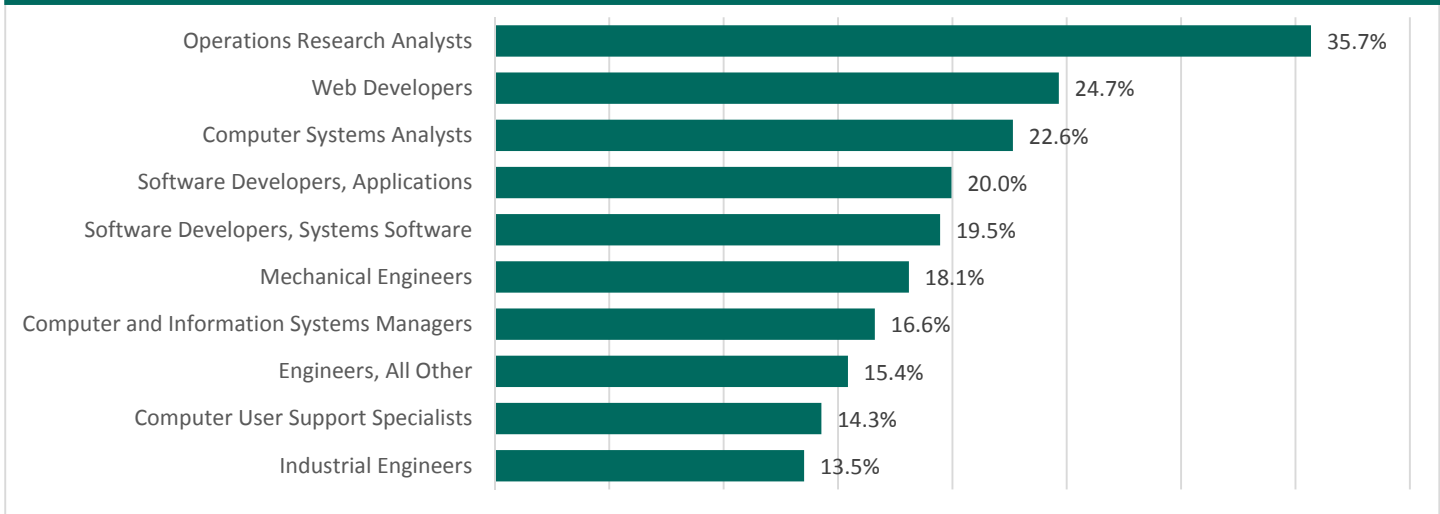
Though STEM occupations are broadly defined, the bulk of these jobs are contained within the *Computer and mathematical* and *Architecture and engineering* occupational groups. As seen in Figure 6-2, these two groups are expected to grow by 15.2 percent and 12.9 percent, respectively, between 2014 and 2024, and combined should add over 33,000 new jobs during this period. Total STEM occupations overall are forecast to increase by nearly 41,000 jobs and, after factoring replacement opportunities into the mix, provide almost 11,000 average openings annually during this time. Figure 6-3 provides information on projected growth rates for the top 10 STEM occupations based on a favorable mix of projected numeric change, growth rates, and total annual openings.

Figure 6-2. Occupational Groups Ranked by Job Growth Rates and Total Annual Openings – (2014-2024)

| Ranking Category | Occupational Group | Projected Job Growth | | Total Annual Openings | Share of Occupations Bachelor's + |
|---|--|------------------------|------------------------|-----------------------|-----------------------------------|
| | | 10-Year Numeric Change | 10-Year Percent Change | | |
| Top Occupational Groups by Growth Rate | Computer and Mathematical | 16,420 | 15.2% | 3,254 | 94% |
| | Healthcare Support | 21,200 | 14.4% | 5,407 | 12% |
| | Architecture and Engineering | 16,890 | 12.9% | 5,153 | 97% |
| | Healthcare Practitioners and Technical | 28,440 | 10.5% | 8,785 | 79% |
| | Business and Financial Operations | 21,110 | 10.3% | 6,241 | 93% |
| Top Occupational Groups by Total Job Openings | Food Preparation and Serving Related | 27,200 | 7.4% | 16,574 | 0% |
| | Office and Administrative Support | 17,730 | 2.7% | 16,464 | 6% |
| | Sales and Related | 25,020 | 5.7% | 15,824 | 16% |
| | Production Occupations | 27,660 | 6.3% | 13,401 | 1% |
| | Healthcare Practitioners and Technical | 28,440 | 10.5% | 8,785 | 79% |

Source: Occupational Long-Term Employment Projections (2014-2024)

Figure 6-3. Fastest-Growing STEM Occupations, Percent Employment Change in Michigan (2014-2024)



Source: Occupational Long-Term Employment Projections (2014-2024)

Michigan's Hot 50 Jobs

Michigan's Hot 50 Jobs, produced biennially, is a popular publication among workforce developers, educators and state and local decision-makers. This product uses the Michigan Long-Term Occupational Employment Projections in conjunction with Occupational Employment Statistics wage data to rank and lists occupations that show favorable long-term job growth, expected annual openings, and above-average wages statewide. While valued amongst a variety of data users, the publication is intended as a guide for students and jobseekers who are seeking training or postsecondary education paths towards promising careers.

Occupations on this list can generally require anything from on-the-job training or an apprenticeship up to a doctoral degree. Together, these 50 occupations account for 17.4 percent of the state's employment in 2014, but are expected to contribute 31.5 percent of the state's job growth in the period from 2014 through 2024. These occupations earn a median wage of about \$63,700 annually and have an average projected growth rate of 13.4 percent—nearly double the average occupational growth rate of 7.4 percent.

One notable feature of *Michigan's Hot 50* is that these occupations offer a variety of opportunities for those seeking career information. For example, jobseekers looking for more immediate placement might choose to pursue one of the fourteen middle-skill occupations found within this list, such as *Electricians, Machinists, Physical therapist assistants, or Web developers*. These jobs require a somewhat shorter time frame

for skill investment, yet provide relatively high wages and are in demand; the middle-skill jobs found in the Hot 50 pay a median wage of about \$46,500, and will create 33,430 new jobs by 2024.

Those taking a different approach to career opportunities find value in the *Hot 50* as well. Students and those making a longer-term investment in a career change will find 36 jobs on this list that require at least a Bachelor's degree and pay a median annual wage of \$85,400. These well-paid occupations include STEM occupations such as *Civil engineers, Network and computer systems administrators, and Physical therapists* as well as several non-STEM careers such as *Management analysts, Lawyers, and Personal financial advisors*, and will account for nearly 70,000 of Michigan's 327,000 new jobs through 2024. This is just over 20 percent of all new jobs by 2024.

Going Pro Hot Jobs

Michigan's *Going Pro Hot Jobs* were created to serve a very similar purpose to the *Michigan Hot 50*, but is instead wholly focused on middle-skill occupations. Occupations included here are still fairly diverse across several occupational categories, such as *Computer and mathematical, Healthcare, and Architecture and engineering* as well as professional trades occupations found in *Construction & extraction, Installation, maintenance & repair, and Production*. Occupations on this list are expected to grow at combined rate of 14.8 percent through 2024, double the Michigan average of 7.4 percent. These occupations require at least long-term on-the-job training and at

Figure 6-4. Top Hot 50 Jobs by Projected Percent Growth and Annual Openings

| Occupation | Percent Growth, (2014-2024) | Occupation | Projected Annual Openings, (2014-2024) |
|--------------------------------|-----------------------------|--|--|
| Operations Research Analysts | 35.7% | Registered Nurses | 3,372 |
| Physical Therapist Assistants | 28.6% | General and Operations Managers | 2,169 |
| Industrial Machinery Mechanics | 27.1% | Mechanical Engineers | 1,994 |
| Personal Financial Advisors | 26.8% | Heavy and Tractor-Trailer Truck Drivers | 1,566 |
| Web Developers | 24.7% | Sales Representatives, Wholesale/Manufacturing | 1,555 |

Figure 6-5. Top Going Pro Jobs by Projected Percent Growth and Annual Openings

| Occupation | Percent Growth, (2014-2024) | Occupation | Projected Annual Openings, (2014-2024) |
|---|-----------------------------|--|--|
| CNC Machine Tool Programmers, Metal/Plastic | 28.7% | Machinists | 1,279 |
| Physical Therapist Assistants | 28.6% | Industrial Machinery Mechanics | 752 |
| Industrial Machinery Mechanics | 27.1% | Computer User Support Specialists | 601 |
| Web Developers | 24.7% | Electricians | 562 |
| Massage Therapists | 20.6% | Welders, Cutters, Solderers, and Brazers | 489 |

Source: Occupational Long-Term Employment Projections (2014-2024)

most an Associate’s degree, but they earn a median annual wage of \$45,800.


Of the 25 Going Pro Hot Jobs, 23 pay a median wage of more than \$20 per hour, 22 are projected to have double-digit percent growth through 2024, and 16 require less than an Associate’s degree.

Leading these occupations in terms of percentage growth is *CNC machine tool programmers, metal and plastic*, an in-demand occupation that is expected to expand 28.7 percent through 2024. Although they require only a high school diploma and long-term on-the-job training to enter the occupation, these positions offer a median wage of \$49,275. Additionally, the two largest occupations in the Going Pro Hot Jobs, *Machinists* and *Computer user support specialists*, are each expected to experience double-digit percent growth from 2014 through 2024, providing many new openings for potential jobseekers.



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A close-up photograph of a worker in a blue uniform and brown leather gloves using an angle grinder. The worker is holding the tool with both hands, and a large, dense spray of bright orange sparks is being emitted from the point of contact. The background is blurred, showing an industrial setting with metal structures and a bright light source.

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