

**THE ECONOMIC OUTLOOK FOR
WASHTENAW COUNTY
IN 2017–19**

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The Economic Outlook for Washtenaw County in 2017–19

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Introduction

Ann Arbor typically sits near the top of the annual list of happiest cities in America, and the well-being of the metro area economy undoubtedly has an influence on that ranking. Washtenaw County continues on a roll into its eighth year of economic recovery. Job growth averaged a healthy rate of 1.9 percent per year over the first six years of the current recovery period, to 2015—outpacing both the nation and the state—and that performance was repeated in 2016. The unemployment rate has plummeted from 8.6 percent in 2009 to 3.2 percent in 2016, and the local inflation rate currently sits at a tame 1.6 percent. Recently the final player in the labor market recovery, inflation-adjusted wages, has arrived on stage to complete the roster, with real wage growth picking up in the past few years.

Anemic wage growth well into the recovery period and underutilized labor were the lingering clouds in what otherwise had been a stout job upturn in the county since exiting the Great Recession, significantly outpacing the prior growth era of the 1990s. Now, in addition to the recent pickup in wage growth, the county economy is currently on approach to full employment, as expanding job opportunities are drawing greater numbers of residents into the labor force. There remain a number of residents who want to work but are still not working, or are working part-time and would prefer to work full-time—but locally there are increasingly fewer of them.

So, the good news is not only that Washtenaw's recovery has kept going, but also that its labor market performance is now more complete. But celebration over where we are now often begets concern over where we're heading next. An eight-year span for a recovery sounds like a long time, even though there is no time limit on the duration of economic recoveries. The question still lingers, though, on whether the good times will soon run their course, and if not, what the architecture of the extended recovery will be, particularly in terms of the leading growth sectors, the potential for a full-employment economy, and the prospects for continuing wage growth with manageable price inflation.

Our view of where the Washtenaw economy is now and where it's headed over the next three years is, of course, the central focus of this report, which offers our take on the path of employment by industry, unemployment, wages, and inflation through 2019. As a special addition to this year's report, we assess the demographic outlook for the county over the next 30 years, to 2045. As always, we also summarize the national outlook underlying our forecast of Washtenaw.

The local economic forecast is generated from a regional model constructed specifically for this study at the University of Michigan's Research Seminar in Quantitative Economics (RSQE) in the Department of Economics. The regional model uses as inputs national economic indicators from RSQE.

Before considering our perspective on how the Washtenaw County economy will evolve through 2019, we first take a look at 2016, to learn more about what kind of year it was and to gauge how well we anticipated developments as that year began.

Review of the Forecast for 2016: A Report Card

A year ago (March 22, 2016), we presented our thirty-first annual economic outlook for Washtenaw County (coterminous with the Ann Arbor metropolitan area). Last year's forecast of

employment, unemployment, and inflation for 2016 can now be compared with estimates of the outcome for that year, to see how accurate our forecast was.

From the previous recession's low point in 2009 to 2015 the Washtenaw County economy averaged a growth rate of 1.9 percent per year, duplicating that rate for 2015. In our forecast last March, we anticipated solid job growth would continue, but that the tempo would slow a bit to 1.5 percent for 2016, as the county economy moved deeper into the recovery period. Indeed, relatively strong job growth was sustained in 2016, but so was the pace, which by our estimate again came in at 1.9 percent. As a consequence, our forecast made early last year of job growth for 2016 was a little low, off by 0.4 percentage points, as recorded in table 1. This miss still compares favorably with our average error over the past thirty-one years of 0.6 percent, or six workers per 1,000.

Where was the undershoot in the forecast of job growth among the major industry divisions? It turns out that much of the deficit was in three industry categories: professional, scientific, and technical services; leisure and hospitality; and state government, which in Washtenaw is dominated by the University of Michigan and Eastern Michigan University. Within the high-wage, high-educational-attainment professional services category, our major forecast shortfall was in architectural and engineering services, which performed much more robustly than we anticipated last year. Within the leisure and hospitality category, most of the additional strength in excess of our expectations occurred in the accommodation and food services industry subcomponent, which includes restaurants. On the other hand, a few industries did not perform as well as we had projected, particularly financial activities and private health care. Overall, though, we view the forecast record for employment as being quite favorable, especially in view of how difficult it is to forecast at this level of detail for a small, open economy such as Washtenaw's.

Table 1
Report Card: Track Record over the Years

| <u>Year of forecast</u> | <u>Percentage forecast error for total jobs¹</u> | <u>Year of forecast</u> | <u>Percentage forecast error for total jobs¹</u> |
|-------------------------|---|-------------------------|---|
| 1986 | -1.4 | 2002 | +0.3 |
| 1987 | -0.8 | 2003 | +1.0 |
| 1988 | -1.2 | 2004 | +0.2 |
| 1989 | -0.6 | 2005 | +0.4 ² |
| 1990 | +0.8 | 2006 | +0.7 |
| 1991 | +1.4 | 2007 | 0 |
| 1992 | +0.5 | 2008 | +0.6 |
| 1993 | +1.3 | 2009 | +1.0 |
| 1994 | n.a. | 2010 | -2.3 |
| 1995 | +0.2 | 2011 | -0.6 |
| 1996 | +0.3 | 2012 | -0.4 |
| 1997 | +0.4 | 2013 | 0 |
| 1998 | -0.5 | 2014 | +1.1 |
| 1999 | 0 | 2015 | +0.2 |
| 2000 | 0 | 2016 | -0.4 |
| 2001 | +0.3 | | |

¹ Positive numbers indicate that the forecast was too high; negative, too low.

² Estimate.

| |
|---|
| Average absolute forecast error 1986–2016: 0.6% |
|---|

| | <u>Forecast</u> | <u>Actual</u> |
|-------------------------|-----------------|---------------|
| | <u>2016</u> | <u>2016</u> |
| Unemployment rate | 3.2% | 3.2% |
| Consumer inflation rate | 1.1% | 1.6% |

The observed and forecast numbers for the unemployment rate and the local consumer price inflation rate in 2016 are reported at the bottom of table 1. We hit the bull's eye in our forecast of the county unemployment rate, with our projection a year ago of a rate of 3.2 percent for 2016 matching the recently posted official rate for that year.

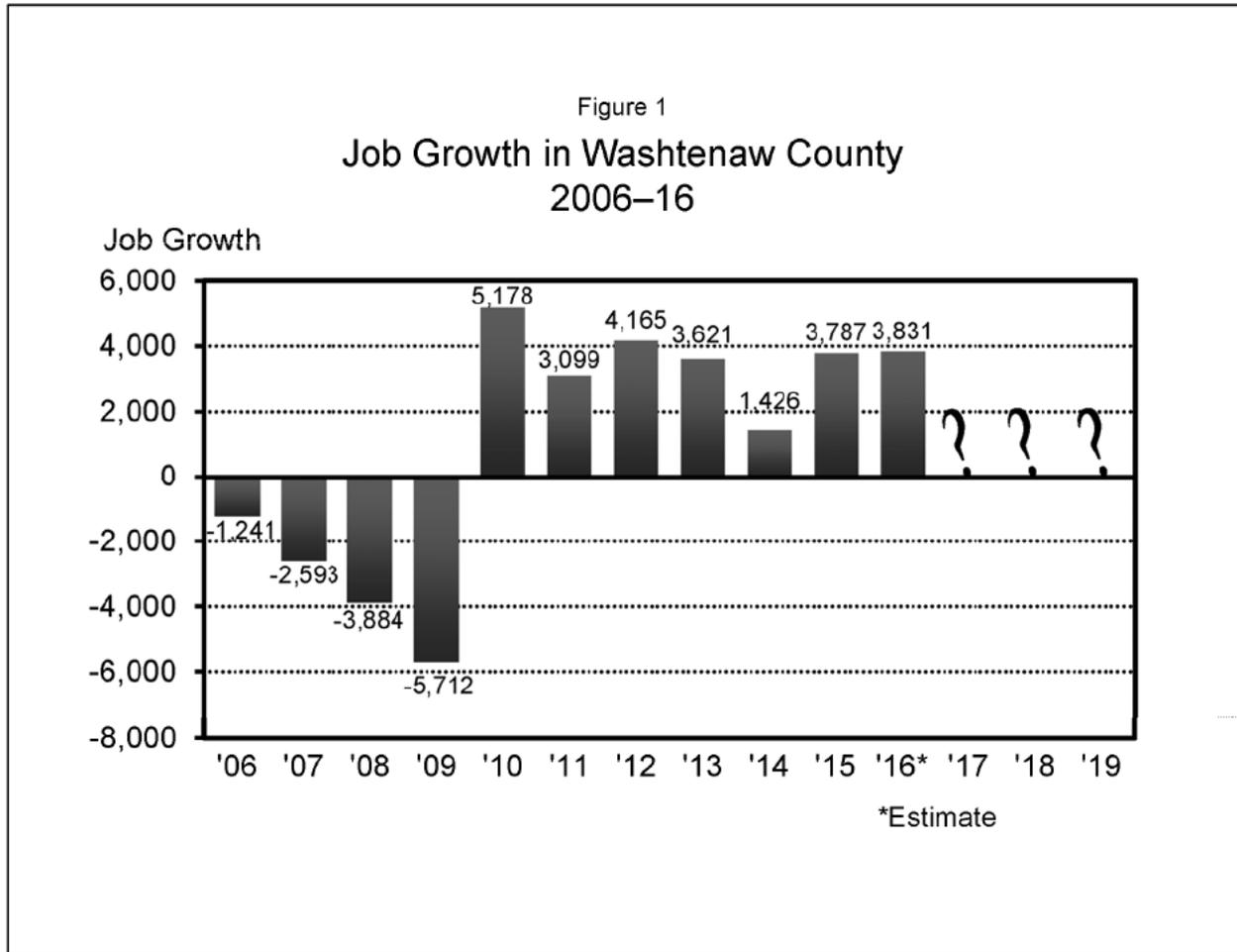
We did not do quite as well in forecasting the local consumer inflation rate for 2016. We did capture the rebound from the negative rate of 1.4 percent posted in 2015, but were short on the magnitude of the rebound, projecting a rate of 1.1 percent for 2016 rather than the stronger bounce-back to 1.6 percent that we now estimate.

This review gives us a glimpse of an economy still on a roll, with job growth in 2016 matching the average annual rate of 1.9 percent recorded over the current seven-year recovery period, an unemployment rate descending closer to historical lows, and tame inflation. We need to take a more detailed look at the current state of the economy, however, before we anticipate developments beyond 2016.

The Current State of Washtenaw County's Economy

Employment Path of the Washtenaw County Economy

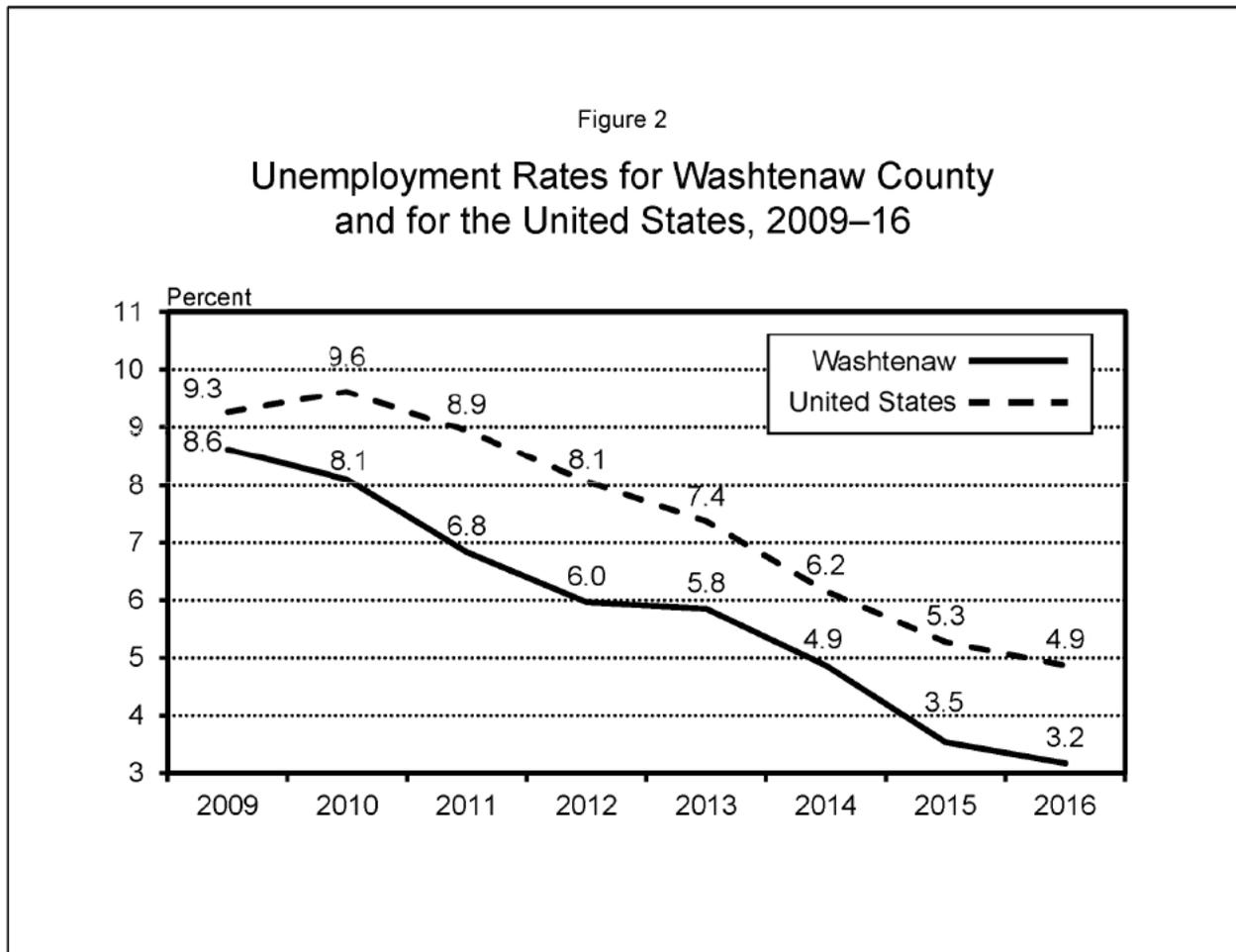
What we have learned from the report card for 2016 is that the Washtenaw County economy continued to expand in 2016, recording its seventh consecutive calendar year of employment growth. As shown in figure 1, the county suffered progressively worse job losses from 2006 to 2009, bottoming out with a loss of 5,712 jobs in 2009. That year's performance reflected the national Great Recession, bankruptcy proceedings for both General Motors and Chrysler, and the repercussions locally of Pfizer's departure.



By 2010, Washtenaw turned the corner to return to positive growth, creating 21,277 jobs in the six years from 2010 to 2015, a vigorous pace of 1.9 percent per year. In 2016, employment also grew by 1.9 percent, or 3,831 jobs. The gains over the seven-year recovery period from 2009 to 2016 averaged 3,537 jobs per year, exceeding substantially the average yearly additions of 2,720 jobs in the prior growth era from 1991 to 2002. Approximately one out of three of those job additions has occurred in the government sector, which includes Eastern Michigan University, the University of Michigan, and Michigan Medicine, the latter's health system.

Unemployment Path of the Washtenaw County Economy

The unemployment rate is another summary measure of the performance of Washtenaw's economy. The path of the county's yearly unemployment rate from 2009 to 2016 is shown in figure 2. (Note that the rate is for the county, and should not be confused with the rate for the city of Ann Arbor.) The rate for the United States is included for comparison.



The recovery in the local labor market has led to a dramatic decline in Washtenaw County's unemployment rate, which has fallen by more than half, from 8.6 percent in 2009 to 3.2 percent in 2016. The declines observed early in the recovery, through 2011, were due in part to discouraged workers leaving the labor force, which officially removes them from the count of the unemployed.

Movements in the local labor force turned positive beginning in 2012, however, as a greater number of residents sought out expanding job opportunities.

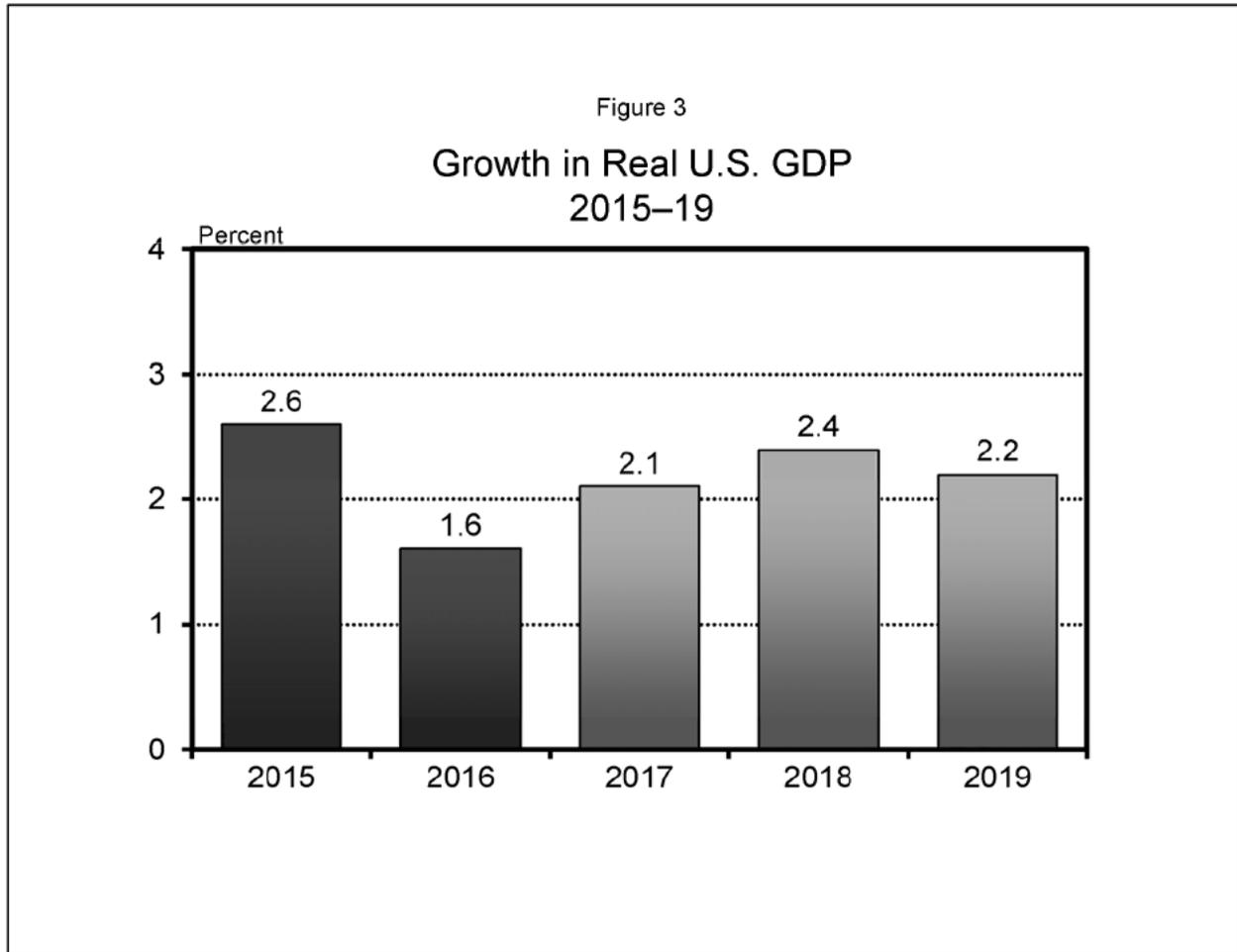
These county unemployment numbers can be put into context in two ways. First, if we compare the outcomes over time for the county, we find that the rate of 3.2 percent for 2016 matches the rate averaged in the growth era of the 1990s. Second, if we compare rates geographically, we find that Washtenaw compares favorably with the United States. The gap between the two rates has ranged from 0.7 percentage points to 2.1 percentage points in Washtenaw's favor from 2009 to 2016, with Washtenaw's rate in 2016 of 3.2 percent falling 1.7 percentage points below the U.S. rate of 4.9 percent.

Even though the county's unemployment rate is dropping, a number of Washtenaw's residents who want to work are still not working, or are working part-time and would prefer to work full-time. Fortunately, there are progressively fewer of them as the county economy continues to improve.

Washtenaw operates within a broader economic environment that has ramifications for our outlook for the county. As we extend our analysis into the future, we start with a summary of the national outlook.

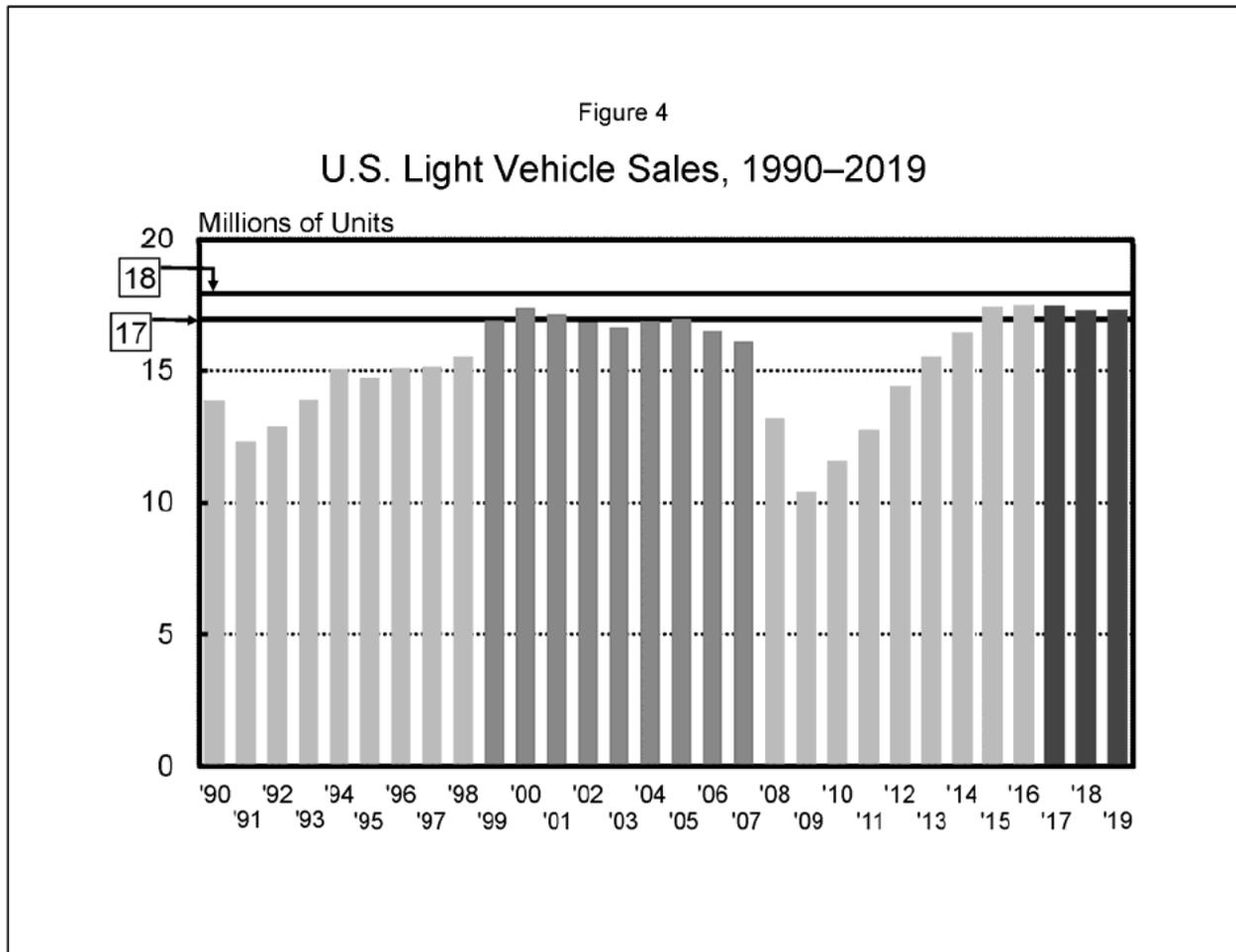
National Outlook: 2017–19

The future course of the Washtenaw County economy depends in part on the overall health of the national economy. Forecasts of economic indicators for the U.S. economy in 2017–18 are from RSQE's forecast dated March 17, 2017, along with internally generated extensions of the forecast to 2019. The national outlook is summarized in figures 3, 4, and 5 by two economic indicators key to the Washtenaw economy.



The best single measure of the U.S. economy is inflation-adjusted, or real, Gross Domestic Product (GDP), which comprises all of the goods, services, and structures produced in the economy. As shown in figure 3, real GDP growth downshifted from a 2.6 percent average growth rate in 2015 to 1.6 percent in 2016. Real GDP growth in 2016 was held down by negative contributions from inventory investment and net exports, both of which can be volatile. A measure that strips out those components, real final sales to domestic purchasers, grew a more respectable, if still disappointing, 2.1 percent in 2016. We project net exports to continue subtracting from growth over the forecast period, due in part to the very strong dollar. On the other hand, we expect inventory investment to make small positive contributions to growth on average over the next few years. An acceleration in nonresidential fixed investment, led by pickups in investment in

equipment and structures, also leads to stronger growth of final sales to domestic purchasers, which we foresee expanding between 2.3–2.4 percent per year during the forecast period. Overall, we foresee real GDP growth accelerating to 2.1 percent in 2017 and 2.4 percent the next year, before moderating slightly to 2.2 percent in 2019.



The national vehicle sales forecast is another key input to the economic outlook for Washtenaw County. Figure 4 shows the history of annual U.S. light vehicle sales beginning in 1990, as well as the three forecast years 2017–2019. Light vehicle sales exceeded 16 million units in every year 1999 through 2007 before plunging to 13.2 million in 2008, with the onset of the Great Recession. Sales then bottomed at 10.4 million units in 2009, and have grown every year since then, climbing back above the 16-million-unit line 2014. Sales set a new all-time record of

17.4 million units in 2015, which was surpassed the next year with sales of 17.5 million units. We are forecasting that sales reached a cyclical peak in 2016, and will retreat a bit from here, to 17.4 million units in 2017 and 17.3 million in each of the following two years. Some caution signs for light vehicle sales include high average incentives and high inventory levels for many models, especially for smaller vehicles.

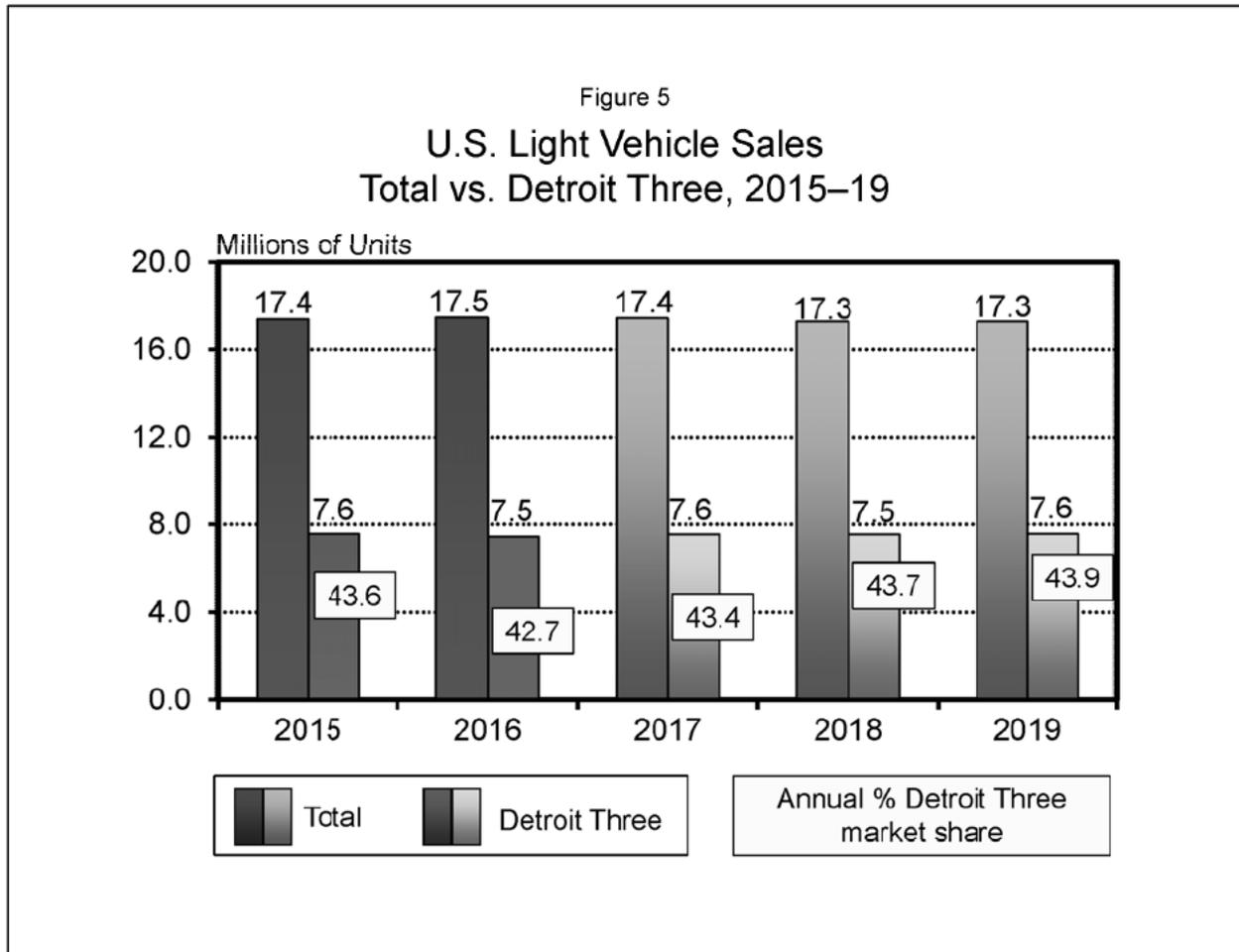


Figure 5 displays a shorter-term perspective on light vehicle sales, along with the prospects for the Detroit Three share of the light vehicle market. The Detroit Three's share of the light vehicle market fell from 43.6 percent in 2015 to 42.7 percent in 2016. That decline was due to a combination of a slight decline in Detroit Three sales and a slightly larger increase in non-Detroit Three sales. We see the Detroit Three share rebounding to 43.4 percent in 2017, and climbing

slowly from there, to 43.7 percent in 2018 and 43.9 percent in 2019. This pattern is consistent with our projection of a slowly declining share of foreign-made light trucks, combined with a roughly steady share of auto imports.

The projections for total sales and the Detroit Three's share of that market, taken together, yield our outlook for Detroit Three sales, which stay in the 7.5–7.6-million-unit range throughout the forecast period, in line with the past couple of years. The flattening out of Detroit Three sales follows a period of vigorous growth from 2009 to 2015, and is consistent with a maturing economic expansion.

We now turn to our view of the prospects for the county economy through 2019.

Washtenaw County Outlook: 2017–19

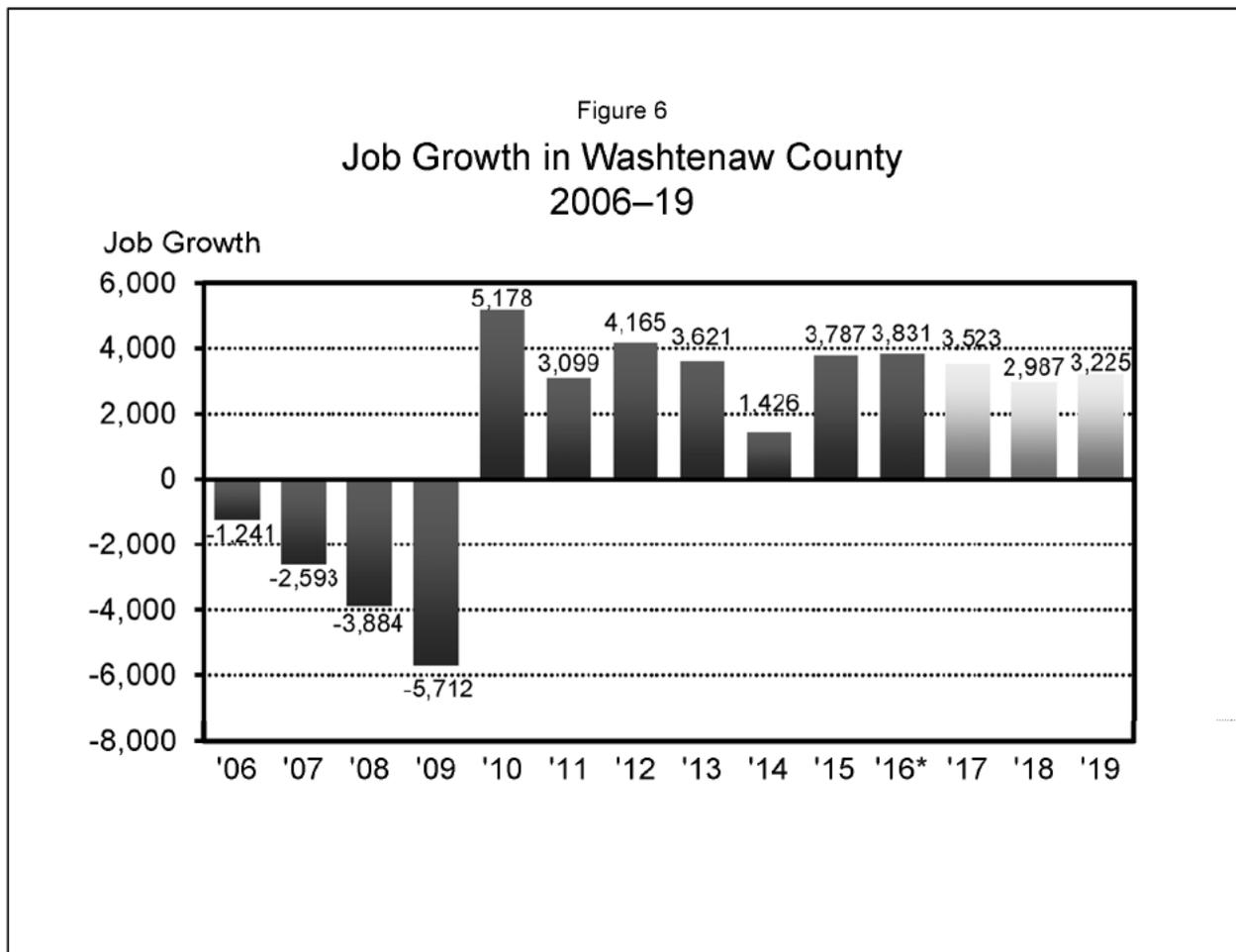
The economic outlook for Washtenaw County through 2019 is measured using information on employment, unemployment, inflation, and the real wage. First, we evaluate the county's prospects for job growth in total, putting that in context with recent job market developments.

Employment

The Washtenaw County economy is now well into its eighth year of recovery since the previous recession's low point in the summer of 2009. To date, the recovery has been brisk, adding 25,107 jobs from calendar year 2009 to 2016, a growth rate of 1.9 percent per year. Over that same period, the county's job growth outpaced both the nation's average rate of 1.4 percent per year and Michigan's 1.6 percent per year.

The county economy added another 3,831 jobs in 2016, for an increase of 1.9 percent. We see the local economic fundamentals in place, in combination with a continuing expansion of the U.S. economy, to support the extension of solid growth in the county through 2019, bringing the span of the expansion to ten years. As the labor market approaches full employment, job growth

slows a bit from its previous pace, to an average of 1.5 percent per year over the next three years. As shown in figure 6, we are forecasting that the county will add a total of 9,735 jobs over the next three calendar years. Job growth slips from 3,831 in 2016 to 3,523 in 2017 and to 2,987 in 2018, before rebounding to 3,225 in 2019.

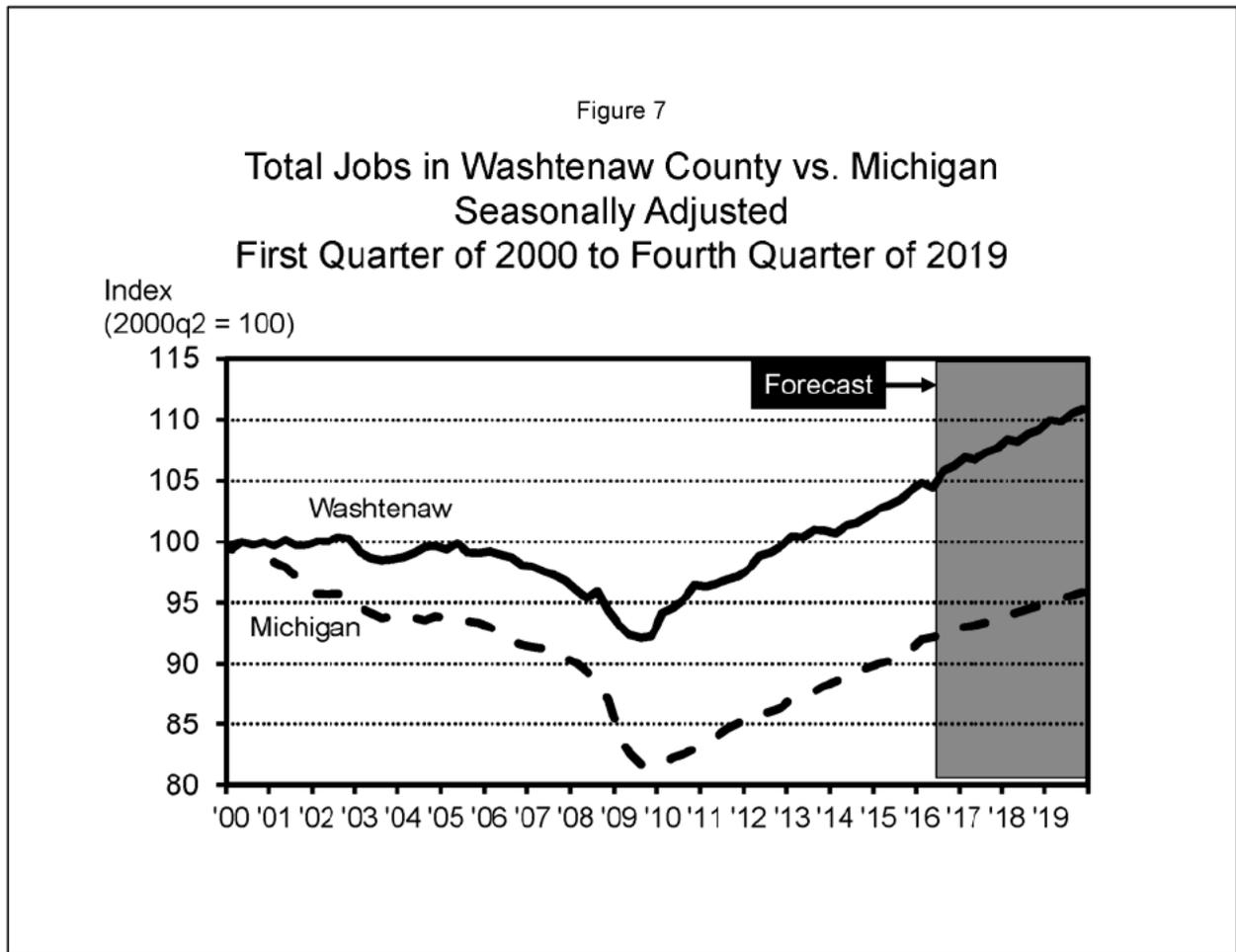


The job additions in each of the next three years will exceed the 2,720 jobs per year gained on average during the prior growth period between 1991 and 2002. Indeed, if our forecast proves correct, the 34,843 job additions in the period 2009–19 will outpace all other ten-year intervals on record.

To put the current expansion, including the forecast period, in broader historical context, we now consider how much ground the Washtenaw economy is gaining from 2009 through 2019

relative to what it lost in the preceding decline. We assess Washtenaw’s progress measured from its previous economic peak in the summer of 2002, a more challenging benchmark than measuring from the trough in 2009.

Figure 7 shows the historical and forecast quarterly path of total jobs from the start of 2000 to the end of 2019, adjusted for seasonal variations. For comparison purposes, we include the same profile for Michigan, with both the county and state employment paths indexed to equal 100 in the second quarter of 2000, which represents Michigan’s previous peak employment level.¹



¹ Using index values permits us to compare on the same figure two regions with widely different employment scales. An index value of 90 indicates that employment in a given period is 90 percent of its level in the base period (in this case, the second quarter of 2000), that is, 10 percent less than the base-period value. An index value of 110 indicates a level of employment that is 10 percent higher than its level in the base period.

From its peak employment quarter in the summer of 2002 (index value of 100.4) to its trough in the summer of 2009, the county lost 16,101 jobs, with 62 percent of the losses occurring in the two-year period summer 2007 to summer 2009. In the ensuing recovery from the third quarter of 2009 to the first quarter of 2013, Washtenaw gained 16,259 jobs—thus replenishing the number of jobs lost between the summers of 2002 and 2009. From then to the end of 2019, we are forecasting that the county will create an additional 20,366 jobs, thus cumulating to 36,625 job additions from the quarterly bottom of the downturn through the end of 2019 (16,259 + 20,366).

The state as a whole, on the other hand, is forecast to remain below the employment level it enjoyed at its peak in the spring of 2000 (index value of 100) through the end of our forecast period in 2019. Employment in the state fell by much more on a proportional basis than employment in Washtenaw, with the state index reaching a low point of 81.7 in the summer of 2009 relative to Washtenaw's 92.2. The state has also experienced a less vigorous employment recovery to date than has Washtenaw. As of the end of 2016, the state's employment level was still 7 percent below its peak; in contrast, Washtenaw's employment level well exceeded its previous peak by 6.2 percent. We expect the gap to continue to widen over the forecast period through the end of 2019, as employment grows more quickly in Washtenaw than in the state as a whole. Nonetheless, we are forecasting that by the end of 2019, the state will recover 77 percent, or just over three in four, of the jobs lost from the spring of 2000 to the summer of 2009. That would return the state to the job level it posted at the beginning of 2002, nearly two years into its employment decline.

Real Wage

Figure 8 shows the average real wage for all workers in in Washtenaw County between 1990 and 2019. All wages reported in this section have been adjusted for inflation and are

expressed in 2015 dollars.² Real wage growth for all workers in the county averaged 1.2 percent per year between 1990 and 2000, before slowing to 0.6 percent per year between 2000 and 2007. The average real wage reached \$54,013 in 2007. Average real wages then began to fall during the Great Recession, reaching a low of \$51,367 in 2011 (a decline of 4.9 percent over that four-year period). Real wages grew very slowly over the next few years, to an average of \$52,480 in 2014. Real wages then recorded an impressive jump of 4.8 percent in 2015, as a 1.4 percent decline in local prices augmented a 3.4 percent nominal wage gain, bringing the average real wage for the year to \$54,985, above the previous peak in 2007. With the return of price inflation in 2016, we estimate that the real wage increased a more modest 1.4 percent. We are forecasting that average real wages will continue to grow by an average rate of 1.5 percent annually over the next three years, reaching \$58,250 in 2019.

² The wage series are averages per worker, and do not include variations in hours worked, a measure that is not available to us in the detail we would require. This is likely less of a consideration over the longer term. On the other hand these data include all payroll income, including profit sharing bonuses, overtime and holiday pay, and other irregular income which is not included in the more commonly cited Bureau of Labor Statistics Current Employment Statistics hourly and weekly wage data.

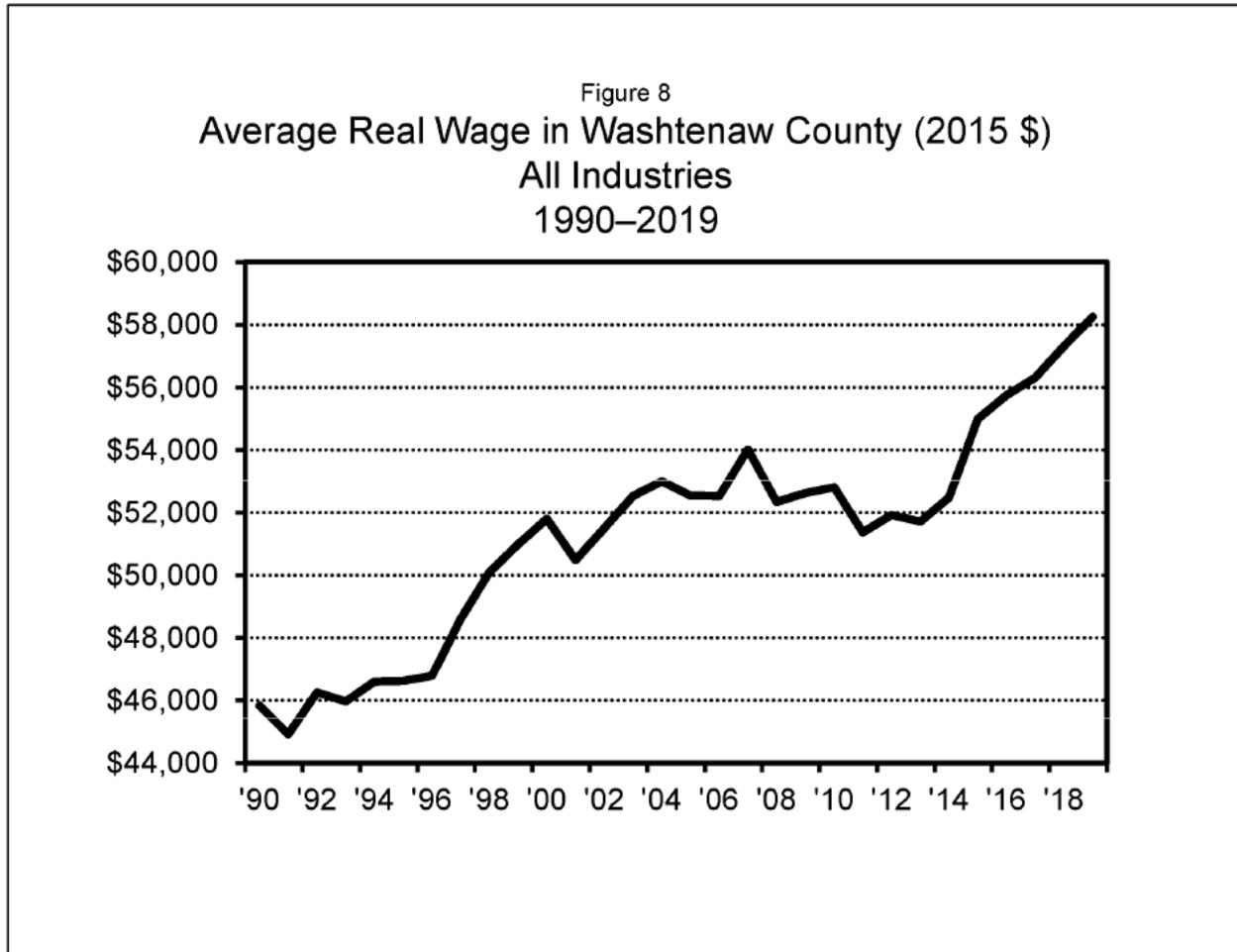
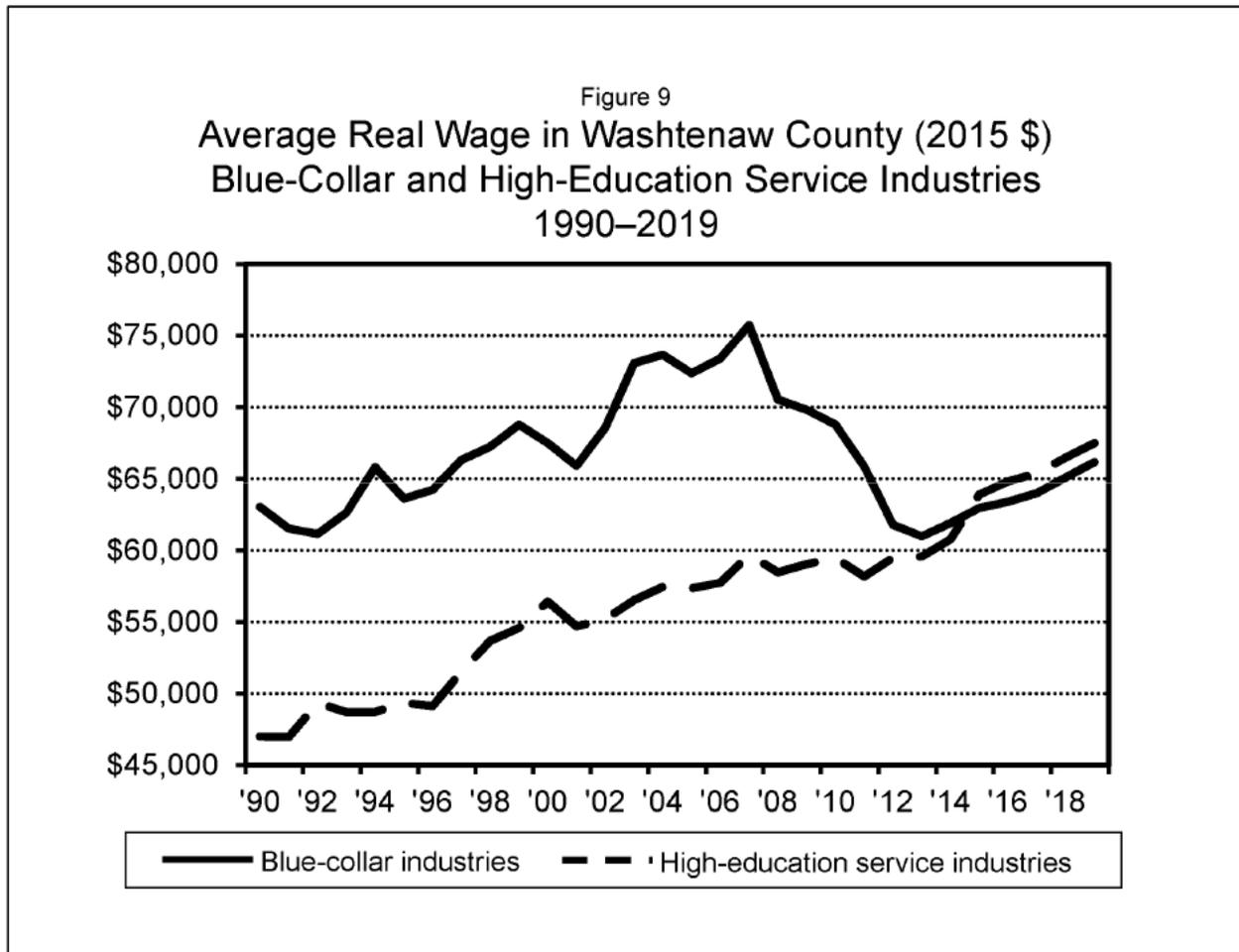


Figure 9 shows the average real wage for two industry group combinations: blue-collar industries and service-providing industries that tend to employ highly-educated workers, which we will call high-education service industries.³ In 1990, the average real wage in the blue-collar industries (\$63,030) was about one-third higher than the average real wage in the high-education service industries (\$46,999). The average wage in the blue-collar industries increased by 1.1 percent per year through 2007, reaching a peak of \$75,732. With the onset of the Great Recession, the average blue-collar wage began to fall sharply, partly because of job losses in high-paying industries such as motor vehicle manufacturing. Average real wages reached a low of \$60,972 in

³ Blue-collar industries include natural resources and mining, construction, manufacturing, and transportation. High-education service industries include government, education and health services, professional services and corporate headquarters, wholesale trade, financial activities, and information services.

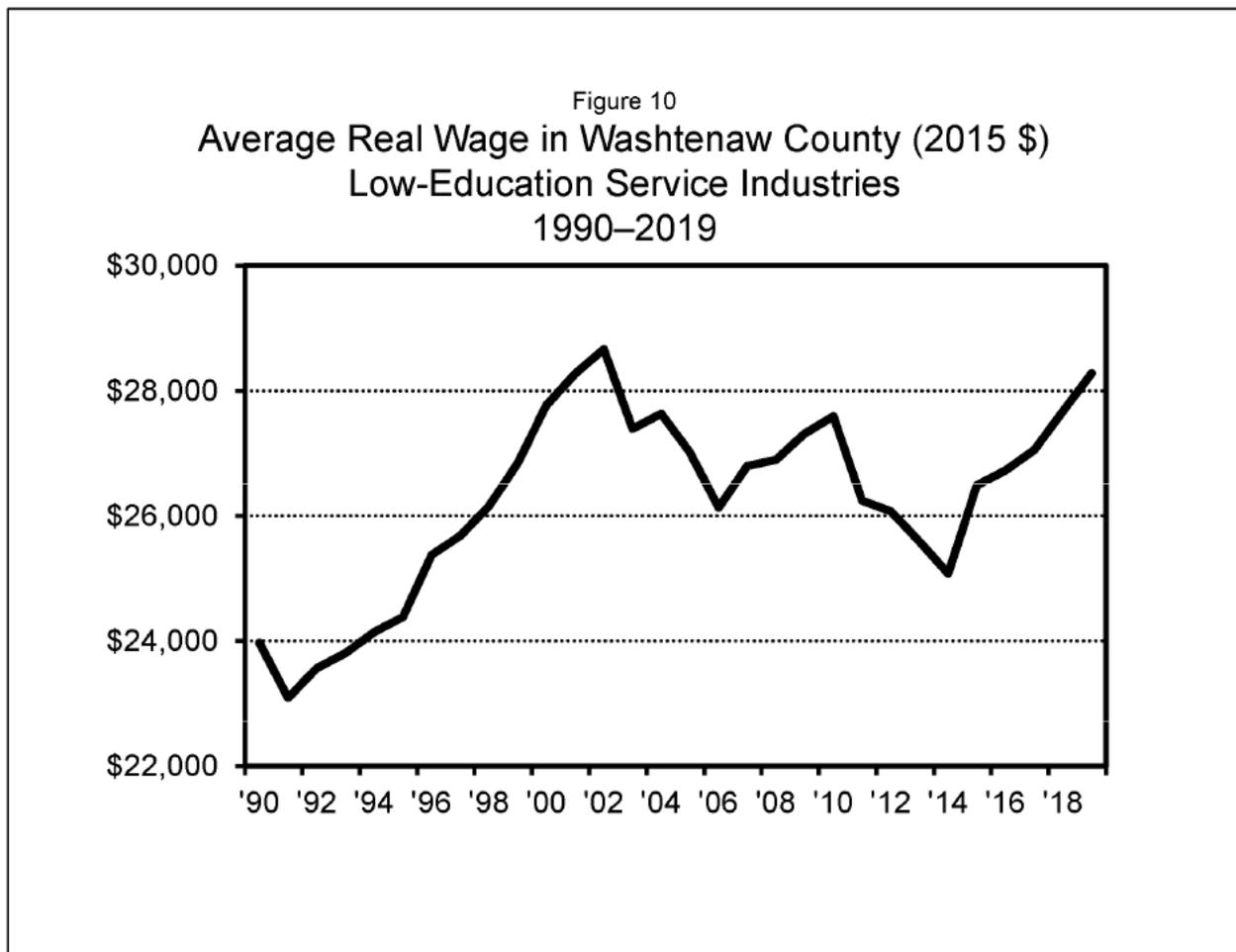
2013, about 3 percent below 1990 levels. Since 2013, the average blue-collar wage has increased, and is estimated to have exceeded 1990 levels in 2016. Over the next three years we are forecasting that real wages in these industries will grow by 1.4 percent per year, although even by 2019 the average wage in the blue-collar industries will remain almost 13 percent below 2007 levels.⁴



⁴ The average wage in any industry group reflects both the wages in a detailed industry and the share of the group accounted for by the detailed industry. Thus, a change in the mix of industries over time can cause a change in the average wage, apart from any change in actual wage levels. For example, suppose that an aggregate industry is composed of two detailed industries, A and B. In time period 1, industry A accounts for 60 percent of the aggregate category and pays an average wage of \$70,000 a year. Industry B accounts for 40 percent of the aggregate and pays an average wage of \$30,000 a year. Then the aggregate industry category has an average wage of \$54,000 ($0.6 \times \$70,000 + 0.4 \times \$30,000$). In the second time period, wages in the individual industries remain the same, but industry A loses jobs and industry B gains jobs, so that both industries now account for 50 percent of the aggregate category. Then the average wage in the aggregate category falls to \$50,000 ($0.5 \times \$70,000 + 0.5 \times \$30,000$). As in this example, part of the reason for the large decline in the average wage in the blue-collar industries after 2007 was the disproportionate loss of jobs in relatively high-wage industries such as motor vehicle manufacturing. Another reason for the decline in blue-collar wages is that the wages in the auto industry itself also fell sharply.

In contrast, the average wage in the high-education service industries grew relatively steadily during the historical period. In fact, the average wage in those industries overtook the average wage in the blue-collar industries for the first time in 2015. The average wage in the high-education service industries grows by an average of 1.4 percent per year from 2017 to 2019.

Figure 10 shows the average real wage for service-providing industries that employ workers with less education, which we will call low-education service industries. Such industries include retail trade, leisure and hospitality services, business support services such as temporary help services, and the miscellaneous other services category, which includes repair and personal services. Wages for this industry group are shown on a separate graph because they are substantially lower than wages in the other two industry groups.



The average wage in the low-education service industries grew steadily from 1992 through 2002, reaching a peak of \$28,664. Wages in these industries then tended to decline through 2014, when the average real wage reached \$25,075. We estimate that wages in this group of industries increased by an impressive 5.6 percent in 2015, and by a more modest 0.9 percent in 2016. We are forecasting that inflation-adjusted wages in these low-education service industries will continue to increase over the next three years, at an average rate of 1.9 percent per year. Even by 2019, however, the average real wage in these industries will remain 1.3 percent below their peak levels in 2002.

In summary, the 2000s have been a mixed bag for real wages in Washtenaw County. We estimate that average real wages in all industries increased by 7.6 percent from 2000 to 2016, an average of 0.5 percent per year. Average real wages actually fell during that time interval in two broad industry groups, blue-collar industries and low-education service industries. High-education service industries, on the other hand, experienced sustained real wage growth. The good news is that we are forecasting real wage growth in all three industry groups over the forecast period. Average real wage growth for all industries is forecast to average 1.5 percent from 2016 to 2019, three times higher than the average from 2000 to 2016.

Employment by Industry

The projected job movements shown in total in figure 6 are distributed among twenty-three major industry divisions in table 2, and into 174 finer divisions in the appendix. The detail for the forecast presented in table 2 includes, for each industry, the level of employment in 2016 (including two quarters of preliminary data); the forecast change for 2017, 2018, and 2019; and

Table 2
Forecast of Employment in Washtenaw County by Major Industry Division
2017–19

| | Estimate 2016 | Employment Change | | | | Average Annual Wage 2015 |
|---|------------------|-------------------|----------|-------|---------|-----------------------------------|
| | | '16-'17 | Forecast | | '16-'19 | |
| | | '17-'18 | '18-'19 | | | |
| TOTAL JOBS (Number of persons) | 206,278 | 3,523 | 2,987 | 3,225 | 9,735 | \$54,985 |
| (Annual percentage change) | (1.9) | (1.7) | (1.4) | (1.5) | | |
| TOTAL PRIVATE | 129,172 | 1,904 | 2,273 | 2,390 | 6,568 | 52,666 |
| GOODS-PRODUCING | 18,429 | 48 | 118 | 113 | 279 | 61,847 |
| Natural resources, mining, construction | 4,109 | 134 | 150 | 135 | 420 | 56,927 |
| Manufacturing | 14,320 | -86 | -33 | -22 | -141 | 63,187 |
| Motor vehicles | 4,142 | -138 | -80 | -75 | -293 | 63,611 |
| Other manufacturing | 10,178 | 52 | 47 | 53 | 152 | 63,013 |
| PRIVATE SERVICE-PROVIDING | 110,743 | 1,856 | 2,156 | 2,277 | 6,288 | 51,139 |
| Trade, transportation, and utilities | 24,964 | 337 | 368 | 381 | 1,086 | 43,409 |
| Wholesale trade | 5,009 | 113 | 122 | 123 | 358 | 72,901 |
| Retail trade | 16,513 | 102 | 128 | 141 | 371 | 29,098 |
| Transportation, warehousing, and utilities | 3,441 | 122 | 118 | 117 | 357 | 68,668 |
| Information | 4,503 | 23 | 66 | 75 | 163 | 88,615 |
| Financial activities | 6,388 | -19 | 123 | 109 | 213 | 72,410 |
| Professional and business services | 27,057 | 842 | 702 | 742 | 2,285 | 70,991 |
| Professional, scientific, and technical | 16,168 | 635 | 555 | 581 | 1,771 | 90,607 |
| Management of companies and enterprises | 1,155 | 41 | 15 | 13 | 68 | 148,204 |
| Administrative support and waste management | 9,734 | 166 | 132 | 148 | 446 | 33,364 |
| Private education and health services | 25,800 | 398 | 531 | 586 | 1,514 | 50,945 |
| Leisure and hospitality | 16,953 | 223 | 284 | 289 | 797 | 18,018 |
| Other services | 4,886 | 49 | 82 | 96 | 227 | 30,971 |
| Unallocated private services | 191 | 3 | 0 | 0 | 3 | 49,356 |
| GOVERNMENT | 77,107 | 1,619 | 713 | 835 | 3,168 | 58,915 |
| State government | 61,736 | 1,462 | 681 | 695 | 2,838 | 59,572 |

the cumulative change over the three-year period 2016–19. The table also includes the average annual wage for each industry category in 2015, as does the appendix.⁵

Total employment is forecast to grow by 3,523 jobs, or 1.7 percent, in 2017. Job gains then slip a bit to 2,987 in 2018, and 3,225 in 2019.

The private goods-producing sector is forecast to add only 279 jobs over the next three years, as job losses in transportation equipment manufacturing (–293) partially offset modest job gains in natural resources and mining (25), construction (395), and other manufacturing (152).

The manufacturing industries that we anticipate will gain the most jobs over the next three years are food (84), machine shops (70), and other miscellaneous manufacturing (57). In addition to transportation equipment, manufacturing industries that we expect to lose jobs include book printing (–91) and medical equipment and supplies (–72).

Job growth in the private service-providing sector in 2017 is forecast to tick up to 1,856 (1.7 percent) compared with a gain of 1,579 in 2016. Job gains then increase to 2,156 in 2018 and 2,277 in 2019.

The job growth is widespread, with almost all of the private service-providing industries growing employment. Retail trade sees the weakest job growth among the major industry groups, adding only 358 jobs over the next three years (0.7 percent per year). Job losses are expected at department stores (–61), gasoline stations (–18), sporting goods stores (–10), liquor stores (–7), and book stores (–5). We are forecasting job growth over the next three years at clothing stores (83), specialty food stores (81), pharmacies and drug stores (80), motor vehicle dealers (55),

⁵ The historical employment data are from the Bureau of Labor Statistics Quarterly Census of Employment and Wages. The average annual wage includes both full- and part-time workers, weighted equally. Consequently, the average wages for industries that employ a disproportionately large number of part-time workers, such as retail trade and leisure and hospitality, are much lower than they would be if the wages were calculated only for full-time workers.

miscellaneous store retailers (51), non-store retailers (28), and grocery stores (28). Job growth in the retail sector is limited by technological change, the Internet replacing brick-and-mortar stores, and rising labor costs driven by growing labor shortages and an increasing minimum wage.

Wholesale trade is forecast to see above-average growth, with job gains over the next three years of 358 (an average gain of 2.5 percent per year), as is transportation services (346 jobs over the period, an average of 3.8 percent per year). Employment at utilities increases by only 11 jobs over the next three years. Information services also see relatively weak job growth over the next three years, cumulating to 163 jobs (1.2 percent per year).

Financial activities lose 19 jobs in 2017, before adding 123 jobs in 2018 (1.9 percent) and 109 jobs in 2019. The job loss in 2017 results from a decline of 110 jobs in non-depository credit intermediation firms. Outside of this industry, the financial activities sector sees moderate job growth in 2017.⁶

The professional and technical services industry adds 635 jobs this year, followed by job gains of 555 in 2018 and 581 in 2019. Over the three-year forecast period, professional services is forecast to add 1,771 jobs (3.5 percent growth per year). With this gain, professional services accounts for about one in every six jobs created in the county, more than double its share of the county's employment base in 2015.

Within the professional and technical services industry category, the largest job gains over the next three years are in computer systems design (480), testing laboratories (471), and physical, engineering, and biological research (312). These are all very well-compensated industries, with an average salary in 2015 of over \$85,000 a year. They also tend to employ relatively well-

⁶ Note that these job gains do not show all of the improvement in the local residential real estate industry, because real estate agents are predominantly self-employed, and thus are not counted in the data on establishment employment shown here.

educated workers, those with at least a bachelor's degree. The success of Washtenaw County in creating jobs in these industries has been a major contributing factor to the county's economic prosperity over the past several decades.

The management and corporate headquarters industry added 105 jobs in 2016. Over the next three years, this extremely well-compensated industry (average pay in 2015 of \$148,204) adds a more modest 68 jobs.

The administrative support and waste management industry adds 446 jobs over the next three years (1.5 percent per year). Within this industry category, over half of the job growth is in employment services, which mostly consists of the temporary help services industry.

The private education and health services industry is forecast to add jobs at an accelerating pace over the next three years, with job gains of 398 in 2017, 531 in 2018, and 586 in 2019, cumulating to a total job gain of 1,514 over the next three years. Private education services account for 206 of these new jobs while most of the job gains are in private health care and social assistance (1,308).

The greatest employment gains in private health care over the next three years are in physicians' offices (596 jobs or 4.5 percent per year); nursing and other residential care facilities (334 or 2.4 percent per year); and outpatient care centers, diagnostic laboratories, and ambulance services (239 or 5.1 percent per year). Employment in private hospitals, by contrast, declines by 154 jobs in 2017 and then remains flat in 2018 and 2019.

Employment in the leisure and hospitality sector is forecast to grow by 797 jobs over the next three years (1.5 percent per year). This sector includes arts and recreation, food services and drinking places, and hotels. The arts and recreation industry, which is projected to gain 150 jobs

over the forecast horizon, includes businesses such as golf courses, fitness facilities, and the performing arts. (Much of the last category resides in the universities in Washtenaw County, and thus is not counted here.)

Employment at local hotels and other lodging places jumped by 107 jobs in 2016 as some new hotels opened. Over the next three years, however, we expect employment at local lodging places to remain virtually unchanged, with a decline of 5 jobs. Full-service restaurants add 382 jobs over the next three years (2.0 percent per year), but limited-service restaurants, better known as fast-food restaurants, grow at only half that rate (1.0 percent per year), cumulating to a total job gain of 143.

The miscellaneous other services sector includes a grab bag of individual industries such as repair services, including motor vehicle repair shops; personal services, such as hair salons and dry cleaners; membership organizations; and private household services. Collectively these industries add 227 jobs (an increase of 1.5 percent per year) over the forecast period. The largest job gains occur in religious, business, and grant-making organizations (115); and private households (46).

Employment in the government sector jumped by 1,981 jobs (2.6 percent) in 2016, with state government accounting for almost all of that gain (1,852 jobs). Because most of these job gains occurred in the summer and fall of 2016, the job additions in late 2016 help propel state government to an annual gain of 1,462 in 2017 and the government sector overall to a gain of 1,619 in 2017 (2.1 percent). Job growth in the government sector then falls to 1.0 percent in 2018 and 1.1 percent in 2019. Job growth in state government follows suit with gains of 1.1 percent in both 2018 and 2019.

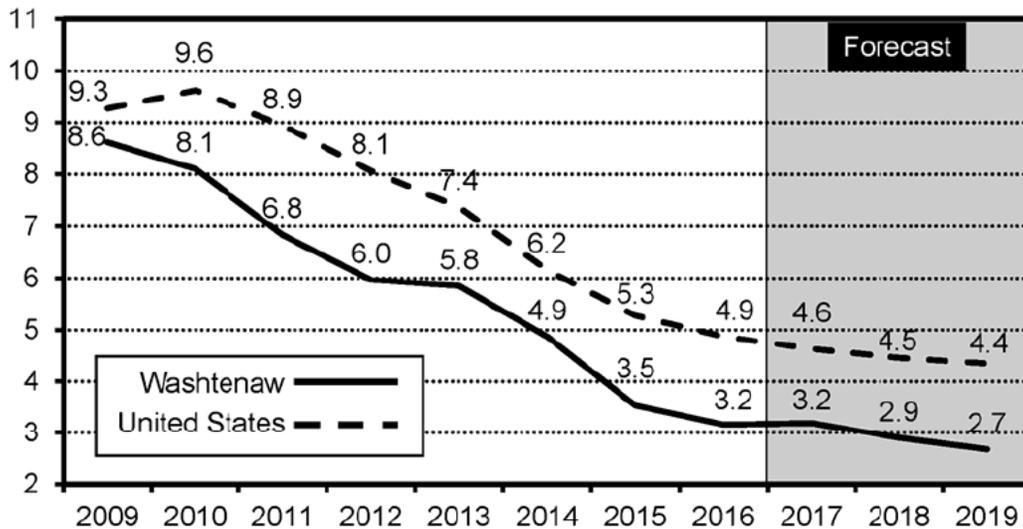
We expect that federal government employment will increase by 202 over the next three years, led by job additions at the Veterans Hospital in Ann Arbor. Employment in local government, which includes public K-12 education and Washtenaw Community College, lost jobs every year between 2010 and 2015, even as the economy overall was adding jobs. This period of job loss finally came to an end in 2016, when local government posted a modest gain of 50 jobs. We anticipate that local government will continue to add jobs slowly over the next three years, cumulating to 128 jobs (0.4 percent per year).

Unemployment

As shown in figure 11, the unemployment rate declined from 3.5 percent in 2015 to 3.2 percent in 2016. We expect that the unemployment rate will remain at 3.2 percent in 2017 as growth in the labor force provides sufficient new workers to fill newly created jobs. We then forecast that the unemployment rate will fall to 2.9 percent in 2018 and 2.7 in 2019. Those unemployment rates would be in the neighborhood of Washtenaw's levels in the mid-1990s, but still above the county unemployment rate's historical low of 1.6 percent in 1999. Nonetheless, if our forecast of the unemployment rate proves correct, the county labor market could be approaching full employment over the next three years.

Figure 11

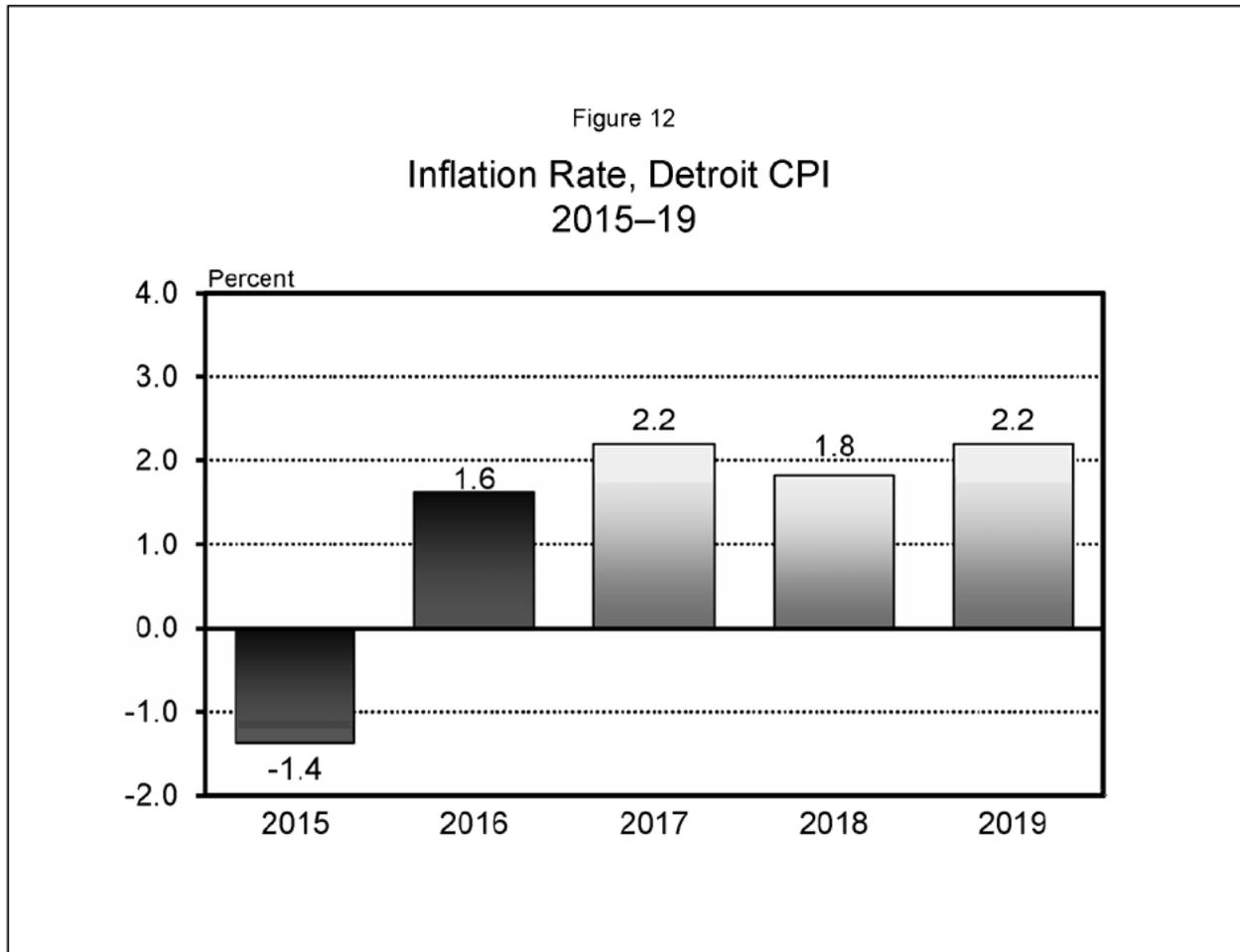
Unemployment Rates for Washtenaw County and for the United States, 2009–19



Inflation

Figure 12 shows our forecast of local inflation, measured by the growth rate of the Detroit Consumer Price Index (CPI). (Consumer price data are compiled at the regional level; they are not available for the county in isolation.) Local prices fell by an alarming 1.4 percent in 2015, the largest decline on record. As we had projected in last year's forecast, this puzzling decline reversed itself in 2016, when local prices rose by 1.6 percent, led in part by the pickup in U.S. inflation. We project a further acceleration in local inflation to 2.2 percent in 2017, as energy prices rebound from their 2016 levels. As energy prices stabilize in 2018, local inflation recedes to 1.8 percent,

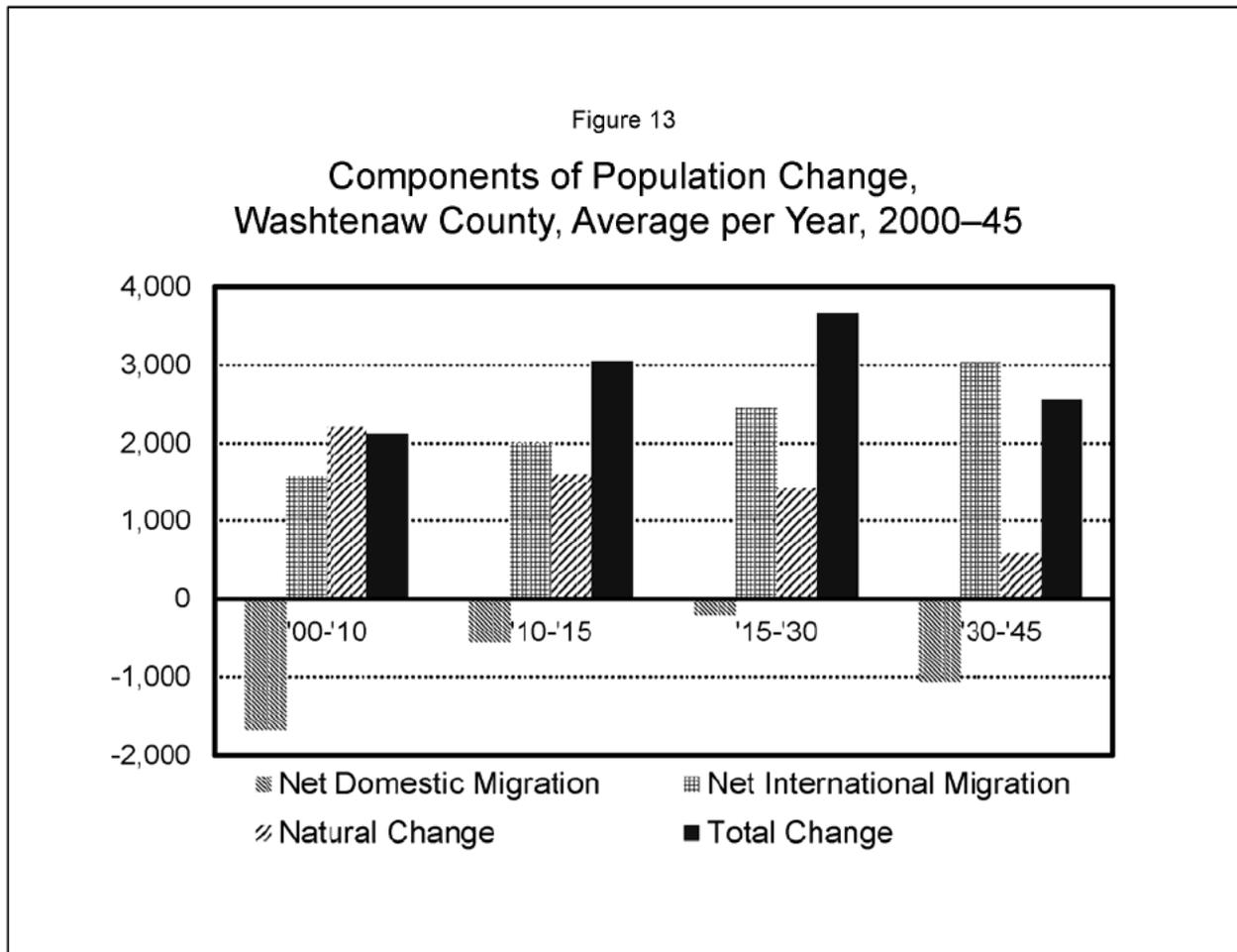
before picking up again to 2.2 percent in 2019, as a tight labor market finally puts pressure on trend inflation.



Washtenaw County Demographic Outlook: 2015 to 2045

Unlike in most of Michigan, Washtenaw’s population continued to grow throughout the 2000s. The only year the county’s population declined was 2008, during the onset of the Great Recession. Between 2000 and 2010 the county’s population increased by 21,196. Figure 13 presents a mathematical decomposition of the county’s population growth into its component sources. There are three potential sources of population growth: natural population change (the difference between births and deaths); net international migration (the difference between moves

to Washtenaw from abroad and moves from Washtenaw to abroad); and net domestic migration (the difference between moves to Washtenaw from elsewhere in the United States and moves from Washtenaw to elsewhere in the United States). Together, these sources of growth sum to the total change in population over any time period.



Between 2000 and 2010, the county's population increased by 2,120 people per year. The natural population increase of 2,205 per year was larger than the total increase, because net domestic *outmigration* (negative net domestic migration) of 1,671 per year was higher than net international migration of 1,586 per year. We believe that the net domestic outmigration was partly due to international students returning to their native countries after completing their

educations, who may be misclassified as domestic rather international departures in the data. Much of the outmigration, however, reflected the relatively poor economic conditions in the county during that period, including a sharp decline in the motor vehicle manufacturing industry.

Net domestic outmigration from Washtenaw slowed as the economy improved, to an average of 555 per year between 2010 and 2015. Conversely, net international migration increased to 2,005 per year. Together, these trends more than compensated for a slowdown in natural population growth to 1,606 per year. In sum, total population growth increased to 3,056 per year over the 2010–15 period.

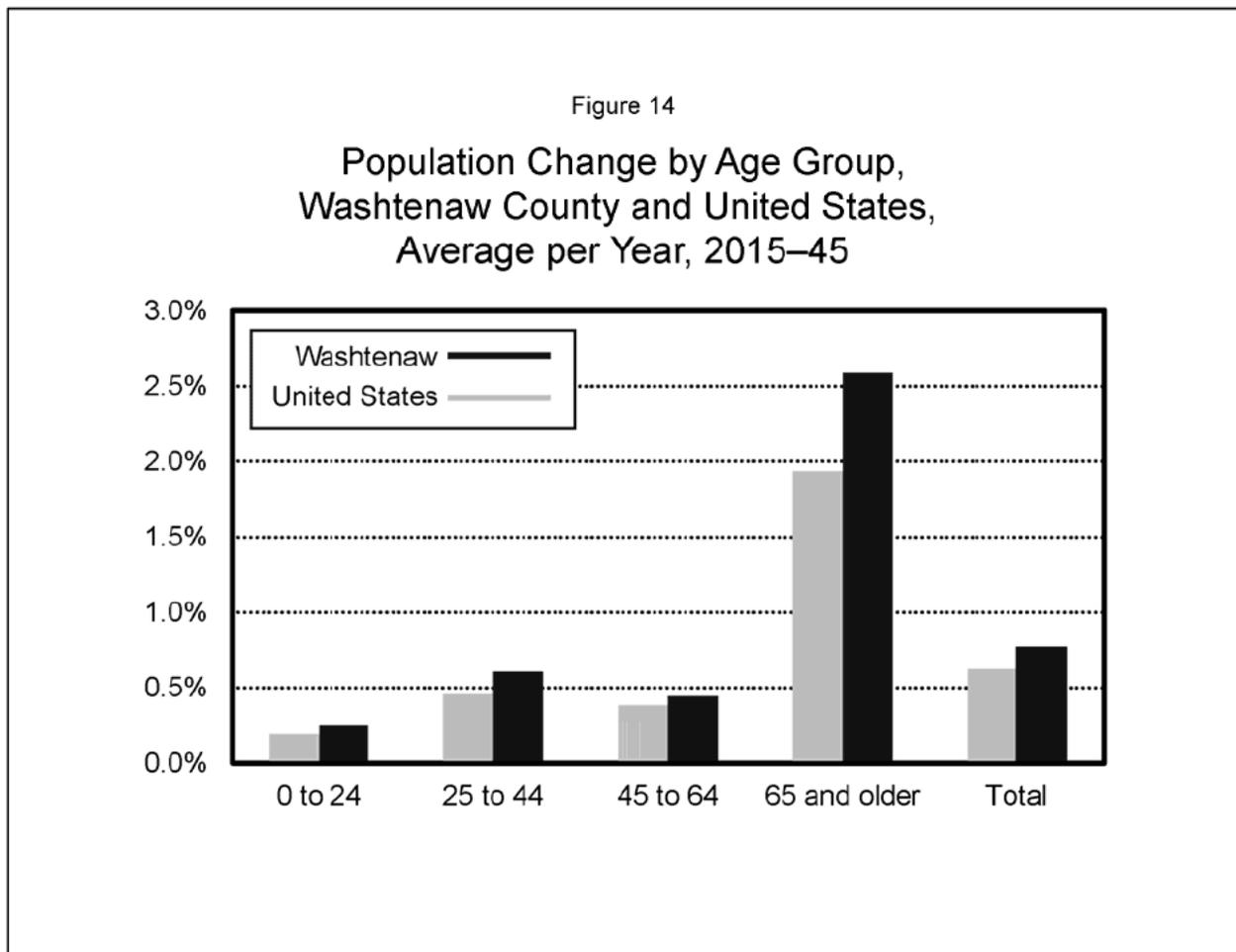
Net domestic outmigration slows to a trickle (208 per year on average) during the first fifteen years of our forecast period, while net international migration accelerates to 2,455 per year. The boost to population growth from these two factors is again more than enough to compensate for the slowdown in natural population growth to 1,412 per year. Total population growth increases to 3,659 per year on average from 2015 to 2030.

In the final fifteen years of our forecast, 2030 to 2045, net domestic outmigration is expected to pick up to 1,062 per year, while natural population growth falls to only 581 per year. Consequently, the population of Washtenaw County would be declining during this period were it not for net international migration of 3,038 per year.⁷ Accounting for all three components, total population growth from 2030 to 2045 slows to an average rate of 2,557 per year.

The most prominent feature of the county's population over the next 30 years, however, will be its dramatic aging. The percentage change per year in the population between 2015 and 2045 for different age groups in the United States and Washtenaw County is shown in figure 14.

⁷ 2035 is the year when the county's population would begin to decline without international migration.

The total population in Washtenaw County is forecast to grow 0.77 percent per year between 2015 and 2045, faster than the United States overall (0.63 percent per year). Moreover, Washtenaw County grows faster than the United States overall in each of the age categories we consider: 0 to 24 years, 25 to 44 years, 45 to 64 years, and 65 years and over. The under-65 age groups, however, increase at a slower rate than the total population in both the United States and Washtenaw County. The population aged 65 and older is forecast to surge in the United States overall (1.93 percent per year), and moreso in Washtenaw County (2.59 percent per year).



To put the effect of this rapid growth in the 65 and over cohort in perspective, we note that in 2015, 12.5 percent of Washtenaw’s population was 65 or older; by 2045, 21.6 percent of the

county's population will be 65 or older. For comparison, in Florida today, well-known for its large retirement community, 19.4 percent of the population is 65 or older.

Conclusion

Washtenaw County's job growth has averaged a rate of 1.9 percent per year over the first seven calendar years of the current recovery, its most rapid pace for any seven-year period since the 1980s. Our outlook for the county economy is buoyant over the next three years as we see the recovery continuing, supported by sustained expansion of the U.S. economy and by the county's strong economic fundamentals—a highly educated populace combined with enterprises associated with the New Economy. That would lengthen the span of the current expansion to ten straight calendar years, longer than the eight-year stretch the county enjoyed from 1993 to 2001.

With the maturing recovery and as the labor market approaches full employment, we do see a little slowing in job growth from its tempo in the recovery to date, averaging a slightly more modest pace of 1.5 percent annually over the next three years. That pace translates to a total of 9,735 jobs over the next three calendar years: 3,523 in 2017, 2,987 in 2018, and 3,225 in 2019. According to our forecast, by the end of 2019 the county economy would boast 20,524 more jobs than it achieved at its previous peak level of employment in the summer of 2002.

The largest job gains over the forecast period are expected in higher education; professional, scientific, and technical services; health care services; and leisure and hospitality, consistent with the traditional strength and image of the Ann Arbor area. Most of these industries pay well above average wages in the county. On the other hand, we anticipate job losses in motor vehicle manufacturing and relatively small job gains in corporate management, information (telecommunications, data processing, publishing), and financial activities.

In concert with the employment gains, we are forecasting that the unemployment rate will fall by half of a percentage point over the next three years, from 3.2 percent in 2016 to 2.7 percent in 2019, the lowest rate in the county since a reading of 2.4 percent in 2000 and a mere 1.1 percentage point above Washtenaw's all-time record low achieved in 1999. The declining rate occurs with an expanding labor force rather than with an exodus of discouraged workers from the labor force. If our forecast of the unemployment rate proves correct, the county labor market would appear to be approaching full employment over the next three years.

Average real wage growth in Washtenaw had been sluggish throughout the current recovery period until it began to pick up in 2014. After increasing by 1.4 percent in 2016, growth in real wages averages 1.5 percent per year over the three-year forecast period, three times the average annual rate of 0.5 percent realized from 2000 to 2016.

The demographic outlook for the county to 2045 highlights the significant impact the dramatic aging of the population will have on the local economy, particularly on the supply of labor. In 2015, 12.5 percent of Washtenaw's population was 65 or older; by 2045, 21.6 percent of the county's population is projected to be in that age cohort, representing the typical retirement years. The longer-term outlook also highlights the importance of attracting and retaining labor from outside the county, and outside the nation, to fill out the impending work force needs of the local economy.

The primary risks to the forecast outside of the county include several salient risks stemming from the yet-unclear policy directions to be pursued by the Trump administration, not the least of which are: (1) new health care legislation; (2) corporate tax reform; and (3) the path of trade policy. Additional risks at the national level are the potentially uncertain path of monetary policy and the clearly uncertain path of oil prices.

Locally, there are three overriding risks to the forecast, all of them major in stature: (1) with higher education, scientific research, and health care as the bedrock of the local economy, the Trump administration's proposal to cut back severely on funding for scientific and medical research could be a major hit, including all of the negative implications for spinoff activity; (2) growing shortages of labor are a significant and increasing risk over time with the tightening labor market and aging population, which would be compounded by any federal legislation that significantly limits the number of documents to be issued for immigration into the United States; and (3) how the technological evolution of the auto industry impacts the local economy remains an important unknown.

In short, for the Washtenaw County economy over the next three years we see sustained, yet a tad slower, job growth and an economy approaching full employment, combined with growing real wages and moderate inflation. That is a recipe for continuing economic success, with all of the key ingredients finally in the mix.

Appendix
Forecast of Jobs in Washtenaw County by Detailed Industry Division

| | Estimated | | Forecast | | Average Wage |
|--|-----------|---------|----------|---------|--------------|
| | 2016 | 2017 | 2018 | 2019 | 2015 |
| Total wage and salary employment | 206,278 | 209,801 | 212,788 | 216,014 | \$54,985 |
| Total government | 77,107 | 78,725 | 79,439 | 80,274 | 58,915 |
| Federal government | 4,064 | 4,129 | 4,196 | 4,266 | 78,373 |
| Post office | 527 | 529 | 529 | 530 | 67,166 |
| Hospital | 2,670 | 2,731 | 2,796 | 2,862 | 75,814 |
| Other federal government | 868 | 869 | 871 | 874 | 92,570 |
| State government | 61,736 | 63,198 | 63,879 | 64,573 | 59,572 |
| Local government | 11,307 | 11,399 | 11,364 | 11,435 | 48,529 |
| Education and health services | 6,923 | 6,925 | 6,859 | 6,895 | 46,311 |
| Other local government | 4,383 | 4,474 | 4,505 | 4,540 | 52,151 |
| Total private | 129,172 | 131,076 | 133,349 | 135,739 | 52,666 |
| Goods-producing | 18,429 | 18,477 | 18,595 | 18,708 | 61,847 |
| Natural resources and mining | 229 | 253 | 253 | 254 | 32,535 |
| Construction | 3,880 | 3,991 | 4,141 | 4,275 | 58,467 |
| Buildings | 1,080 | 1,109 | 1,149 | 1,177 | 55,550 |
| Residential | 635 | 666 | 699 | 720 | 42,922 |
| Nonresidential | 444 | 443 | 450 | 456 | 73,124 |
| Heavy and civil engineering construction | 380 | 403 | 432 | 460 | 67,456 |
| Specialty trade contractors | 2,421 | 2,479 | 2,561 | 2,638 | 58,335 |
| Building foundation and exterior | 399 | 396 | 410 | 425 | 47,975 |
| Building equipment | 1,239 | 1,289 | 1,333 | 1,376 | 65,751 |
| Building finishing | 518 | 513 | 528 | 542 | 51,079 |
| Other specialty trade | 264 | 282 | 289 | 295 | 51,363 |
| Manufacturing | 14,320 | 14,234 | 14,201 | 14,179 | 63,187 |
| Food | 881 | 908 | 937 | 965 | 47,043 |
| Printing and related support activities | 1,828 | 1,803 | 1,781 | 1,764 | 40,526 |
| Books | 1,107 | 1,072 | 1,042 | 1,016 | 43,101 |
| Other printing and related | 721 | 731 | 740 | 748 | 36,520 |
| Chemicals | 667 | 673 | 676 | 680 | 77,102 |
| Plastics and rubber products | 1,440 | 1,433 | 1,428 | 1,425 | 78,101 |
| Fabricated metal products | 1,248 | 1,272 | 1,289 | 1,306 | 55,565 |
| Machine shops and threaded products | 700 | 728 | 748 | 770 | 59,631 |
| Other fabricated metal products | 549 | 544 | 540 | 536 | 50,272 |
| Machinery | 946 | 960 | 968 | 976 | 73,642 |
| Commercial and service industry | 237 | 247 | 255 | 263 | 82,828 |
| Metalworking | 341 | 351 | 358 | 364 | 66,022 |
| Other machinery | 368 | 363 | 355 | 348 | 75,796 |
| Computer and electronic products | 1,083 | 1,096 | 1,102 | 1,111 | 71,986 |
| Computer and peripheral products | 44 | 41 | 39 | 37 | 82,330 |
| Semiconductor and electronic components | 450 | 460 | 471 | 484 | 67,662 |
| Electronic instruments | 574 | 584 | 584 | 584 | 73,983 |
| Other computer and electronic products | 16 | 11 | 8 | 6 | 114,060 |
| Transportation equipment | 4,142 | 4,004 | 3,924 | 3,849 | 63,611 |
| Miscellaneous manufacturing | 1,318 | 1,296 | 1,287 | 1,278 | 76,933 |
| Medical equipment and supplies | 829 | 795 | 776 | 756 | 89,755 |
| Other miscellaneous manufacturing | 489 | 501 | 512 | 522 | 54,107 |
| Other manufacturing | 768 | 789 | 808 | 824 | 56,953 |

Appendix (continued)
Forecast of Jobs in Washtenaw County by Detailed Industry Division

| | Estimated | | Forecast | | Average Wage |
|--|-----------|---------|----------|---------|--------------|
| | 2016 | 2017 | 2018 | 2019 | 2015 |
| Private service-providing | 110,743 | 112,599 | 114,754 | 117,031 | \$51,139 |
| Trade, transportation, and utilities | 24,964 | 25,301 | 25,669 | 26,050 | 43,409 |
| Wholesale trade | 5,009 | 5,122 | 5,244 | 5,368 | 72,901 |
| Merchant wholesalers, durable goods | 2,570 | 2,636 | 2,702 | 2,766 | 80,083 |
| Merchant wholesalers, nondurable goods | 1,736 | 1,773 | 1,817 | 1,866 | 60,479 |
| Electronic markets and agents and brokers | 704 | 713 | 725 | 736 | 79,445 |
| Retail trade | 16,513 | 16,616 | 16,744 | 16,884 | 29,098 |
| Motor vehicles | 1,692 | 1,710 | 1,728 | 1,746 | 53,220 |
| Automobiles | 1,358 | 1,374 | 1,390 | 1,405 | 56,889 |
| Other motor vehicles | 334 | 336 | 338 | 341 | 41,037 |
| Furniture and home furnishings | 514 | 515 | 517 | 518 | 37,385 |
| Electronics and appliances | 704 | 709 | 706 | 702 | 43,625 |
| Building materials and garden supplies | 1,421 | 1,413 | 1,426 | 1,441 | 38,950 |
| Food and beverages | 3,470 | 3,478 | 3,522 | 3,572 | 22,517 |
| Grocery stores | 2,877 | 2,874 | 2,888 | 2,904 | 22,967 |
| Specialty food stores | 460 | 471 | 505 | 541 | 20,169 |
| Beer, wine, and liquor stores | 133 | 133 | 130 | 127 | 19,622 |
| Health and personal care stores | 1,211 | 1,241 | 1,269 | 1,299 | 35,918 |
| Pharmacies and drug stores | 911 | 938 | 964 | 991 | 37,737 |
| Other health and personal care stores | 299 | 303 | 305 | 308 | 30,684 |
| Gasoline stations | 489 | 481 | 476 | 471 | 18,545 |
| Clothing and accessories | 1,441 | 1,467 | 1,496 | 1,524 | 18,086 |
| Sporting goods, hobby, book, music stores | 746 | 738 | 734 | 730 | 17,839 |
| Sporting goods and musical instruments | 531 | 526 | 523 | 521 | 17,735 |
| Books, periodicals, and music | 214 | 212 | 211 | 209 | 18,153 |
| General merchandise | 3,305 | 3,308 | 3,292 | 3,279 | 22,582 |
| Department stores | 1,521 | 1,508 | 1,482 | 1,460 | 20,699 |
| Other general merchandise stores | 1,784 | 1,800 | 1,809 | 1,819 | 24,336 |
| Miscellaneous store retailers | 942 | 960 | 976 | 993 | 19,673 |
| Nonstore retailers | 580 | 596 | 602 | 608 | 36,303 |
| Transportation and warehousing | 2,956 | 3,073 | 3,188 | 3,302 | 57,284 |
| Truck transportation | 756 | 759 | 783 | 808 | 66,214 |
| Other transportation and warehousing | 2,200 | 2,314 | 2,405 | 2,494 | 53,649 |
| Utilities | 486 | 490 | 493 | 497 | 140,051 |
| Information | 4,503 | 4,526 | 4,591 | 4,666 | 88,615 |
| Publishing industries, except Internet | 1,863 | 1,861 | 1,876 | 1,893 | 83,382 |
| Newspaper, book, and directory publishers | 343 | 332 | 323 | 315 | 56,684 |
| Software publishers | 1,520 | 1,529 | 1,553 | 1,578 | 89,533 |
| Telecommunications | 420 | 416 | 417 | 418 | 57,365 |
| Data processing, hosting, and related services | 929 | 919 | 922 | 924 | 86,403 |
| Other information | 1,291 | 1,330 | 1,376 | 1,430 | 108,397 |
| Financial activities | 6,388 | 6,369 | 6,492 | 6,601 | 72,410 |
| Finance and insurance | 4,124 | 4,083 | 4,176 | 4,254 | 80,346 |
| Credit intermediation and related activities | 2,431 | 2,334 | 2,365 | 2,371 | 70,871 |
| Depository credit intermediation | 1,232 | 1,246 | 1,256 | 1,267 | 59,891 |
| Other credit intermediation and related | 1,198 | 1,088 | 1,109 | 1,104 | 81,126 |
| Insurance carriers and related activities | 950 | 984 | 1,026 | 1,077 | 74,829 |
| Insurance carriers | 518 | 547 | 583 | 628 | 72,152 |
| Insurance agencies and brokerages | 432 | 437 | 443 | 448 | 76,890 |
| Other finance | 744 | 765 | 786 | 807 | 120,490 |

Appendix (continued)
Forecast of Jobs in Washtenaw County by Detailed Industry Division

| | Estimated 2016 | 2017 | Forecast 2018 | 2019 | Average Wage 2015 |
|---|-------------------|--------|------------------|--------|----------------------|
| Financial activities (continued) | | | | | |
| Real estate and rental and leasing | 2,264 | 2,286 | 2,316 | 2,347 | \$57,079 |
| Real estate | 1,954 | 1,969 | 1,997 | 2,025 | 47,407 |
| Lessors of real estate | 908 | 896 | 894 | 893 | 46,215 |
| Offices of real estate agents and brokers | 222 | 236 | 253 | 270 | 51,269 |
| Activities related to real estate | 824 | 838 | 850 | 862 | 47,285 |
| Rental and leasing services | 219 | 224 | 225 | 225 | 37,129 |
| Lessors of nonfinancial intangible assets | 91 | 92 | 94 | 96 | 269,749 |
| Professional and business services | 27,057 | 27,899 | 28,601 | 29,342 | 70,991 |
| Professional and technical services | 16,168 | 16,803 | 17,358 | 17,939 | 90,607 |
| Legal services | 939 | 946 | 957 | 968 | 84,523 |
| Accounting and bookkeeping | 625 | 630 | 637 | 644 | 57,167 |
| Architectural and engineering | 4,583 | 4,783 | 4,962 | 5,148 | 105,921 |
| Engineering | 1,223 | 1,243 | 1,250 | 1,256 | 94,655 |
| Testing laboratories | 2,960 | 3,118 | 3,270 | 3,431 | 117,665 |
| Other architectural and engineering | 400 | 422 | 442 | 461 | 69,731 |
| Specialized design | 264 | 272 | 281 | 291 | 56,873 |
| Computer systems design and related services | 2,975 | 3,159 | 3,309 | 3,455 | 89,291 |
| Management and technical consulting | 2,110 | 2,144 | 2,185 | 2,235 | 95,583 |
| Scientific research and development | 3,109 | 3,240 | 3,337 | 3,433 | 99,222 |
| Physical, engineering, and bio. research | 2,889 | 3,011 | 3,107 | 3,201 | 101,804 |
| Social science and humanities research | 219 | 228 | 230 | 232 | 64,846 |
| Advertising, PR, and related services | 256 | 261 | 267 | 274 | 62,707 |
| Other professional and technical services | 1,308 | 1,368 | 1,425 | 1,492 | 51,221 |
| Management of companies and enterprises | 1,155 | 1,196 | 1,211 | 1,224 | 148,204 |
| Administrative and waste services | 9,734 | 9,900 | 10,032 | 10,180 | 33,364 |
| Administrative and support services | 9,156 | 9,321 | 9,447 | 9,590 | 31,452 |
| Office administrative services | 595 | 599 | 607 | 616 | 106,392 |
| Employment services | 5,364 | 5,530 | 5,553 | 5,594 | 22,873 |
| Business support | 390 | 385 | 431 | 479 | 40,842 |
| Services to buildings and dwellings | 1,970 | 1,952 | 1,983 | 2,014 | 27,182 |
| Other administrative and support services | 837 | 855 | 872 | 887 | 38,166 |
| Waste management and remediation services | 578 | 580 | 585 | 590 | 68,106 |
| Private education and health services | 25,800 | 26,198 | 26,729 | 27,315 | 50,945 |
| Private educational services | 3,151 | 3,235 | 3,300 | 3,357 | 33,765 |
| Private elementary and secondary schools | 1,027 | 1,058 | 1,072 | 1,086 | 36,694 |
| Other private educational services | 2,124 | 2,177 | 2,228 | 2,271 | 32,300 |
| Private health care and social assistance | 22,649 | 22,963 | 23,428 | 23,957 | 53,319 |
| Ambulatory health care services | 9,691 | 10,035 | 10,348 | 10,697 | 70,196 |
| Offices of physicians | 4,270 | 4,485 | 4,668 | 4,866 | 106,769 |
| Offices of dentists | 1,251 | 1,250 | 1,247 | 1,253 | 53,103 |
| Offices of other health practitioners | 682 | 702 | 740 | 781 | 40,865 |
| Home health care services | 1,996 | 2,025 | 2,044 | 2,065 | 26,823 |
| Other ambulatory health care services | 1,493 | 1,573 | 1,649 | 1,732 | 56,412 |
| Nursing and residential care facilities | 4,516 | 4,597 | 4,712 | 4,850 | 27,793 |
| Community care facilities for the elderly | 2,077 | 2,122 | 2,183 | 2,249 | 31,170 |
| Other nursing and residential care facilities | 2,439 | 2,475 | 2,529 | 2,601 | 25,020 |
| Individual and family services | 933 | 947 | 959 | 971 | 22,462 |
| Child day care services | 1,151 | 1,179 | 1,207 | 1,233 | 19,819 |

Appendix (continued)
Forecast of Jobs in Washtenaw County by Detailed Industry Division

| | Estimated 2016 | 2017 | Forecast 2018 | 2019 | Average Wage 2015 |
|--|-------------------|--------|------------------|--------|----------------------|
| Private health care and social assistance (cont.) | | | | | |
| Hospitals, emergency relief, and vocational rehabilitation services | 6,358 | 6,204 | 6,202 | 6,207 | \$56,183 |
| Leisure and hospitality | 16,953 | 17,176 | 17,460 | 17,750 | 18,018 |
| Arts, entertainment, and recreation | 2,296 | 2,320 | 2,379 | 2,447 | 22,675 |
| Amusements, gambling, and recreation | 1,823 | 1,851 | 1,898 | 1,946 | 18,367 |
| Golf courses and country clubs | 537 | 536 | 534 | 535 | 21,810 |
| Fitness and recreational sports centers | 994 | 1,024 | 1,072 | 1,118 | 16,958 |
| Other amusements, gambling, recreation | 291 | 291 | 292 | 294 | 16,583 |
| Performing arts, spectator sports, museums, and parks | 474 | 469 | 482 | 500 | 39,731 |
| Accommodation and food services | 14,657 | 14,856 | 15,081 | 15,303 | 17,286 |
| Accommodation | 1,193 | 1,199 | 1,192 | 1,188 | 22,736 |
| Food services and drinking places | 13,463 | 13,658 | 13,889 | 14,115 | 16,831 |
| Special food services | 1,091 | 1,118 | 1,146 | 1,173 | 21,056 |
| Drinking places, alcoholic beverages | 737 | 754 | 768 | 786 | 18,088 |
| Restaurants and other eating places | 11,635 | 11,786 | 11,975 | 12,156 | 16,402 |
| Full-service restaurants | 6,306 | 6,453 | 6,574 | 6,689 | 18,640 |
| Limited-service restaurants | 4,557 | 4,572 | 4,637 | 4,700 | 13,951 |
| Cafeterias and nonalcoholic beverage bars | 771 | 761 | 764 | 767 | 13,654 |
| Other services | 4,886 | 4,936 | 5,018 | 5,114 | 30,971 |
| Repair and maintenance | 896 | 901 | 912 | 923 | 37,652 |
| Automotive repair and maintenance | 764 | 770 | 781 | 793 | 37,684 |
| Other repair and maintenance | 132 | 131 | 131 | 130 | 37,465 |
| Personal and laundry services | 1,482 | 1,480 | 1,494 | 1,512 | 21,088 |
| Personal care services | 907 | 899 | 911 | 926 | 17,425 |
| Other personal and laundry services | 575 | 581 | 583 | 586 | 27,472 |
| Membership associations and organizations | 1,840 | 1,885 | 1,923 | 1,964 | 34,338 |
| Civic and social organizations | 522 | 522 | 523 | 524 | 20,311 |
| Labor unions and similar labor organizations | 151 | 154 | 156 | 158 | 26,932 |
| Other membership associations and org. | 1,166 | 1,209 | 1,244 | 1,282 | 42,268 |
| Private households | 668 | 670 | 689 | 715 | 16,459 |
| Unallocated private services | 191 | 194 | 194 | 194 | 49,356 |
| <u>Addendum</u> | | | | | |
| Unemployment rate | 3.2 | 3.2 | 2.9 | 2.7 | |