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THE ECONOMIC OUTLOOK FOR WASHTENAW COUNTY IN 2019–2021

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Introduction: the Current State of Washtenaw County's Economy

Based on data through the second quarter of 2018, we currently estimate that payroll employment in Washtenaw County grew by 2,300 jobs, or 1.1 percent, for the year. That pace would be below the average annual growth rate of 1.8 percent the county has enjoyed during its current expansion. The slowdown was concentrated in the government sector, which in Washtenaw is dominated by the University of Michigan and Eastern Michigan University. Private sector employment growth held steady with the pace from 2017. We expect the trend from 2018 to continue over the next few years, with growth continuing at a slower pace than in the earlier part of the expansion period.

Figure 1
Job Growth in Washtenaw County, 1991–2018

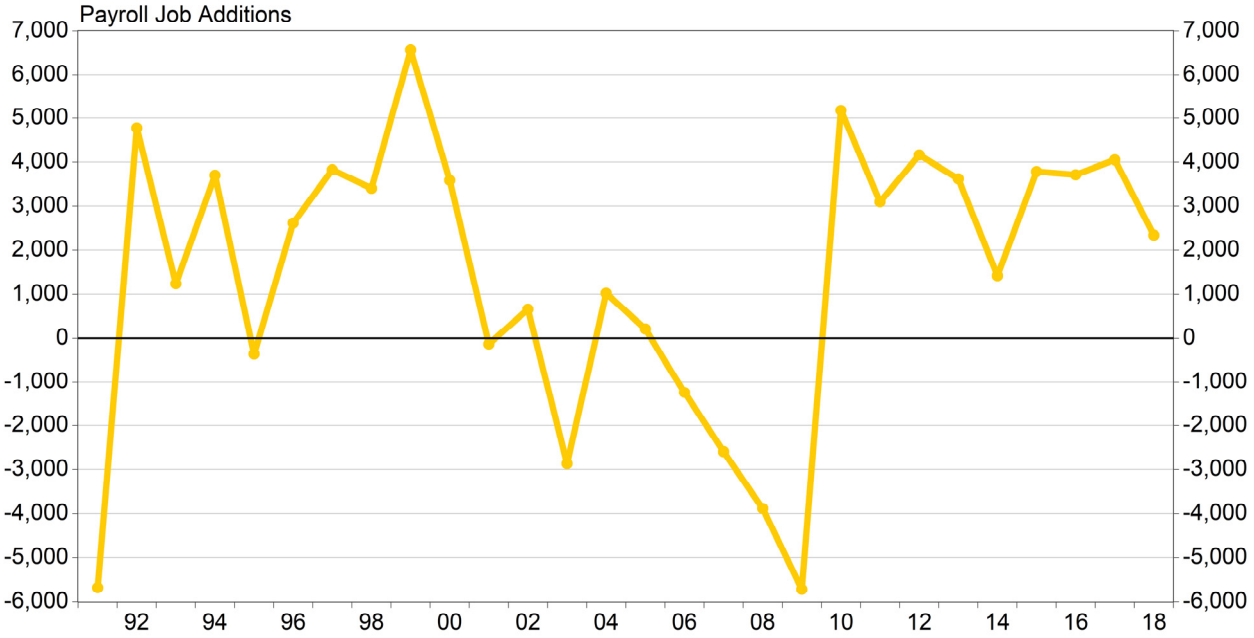
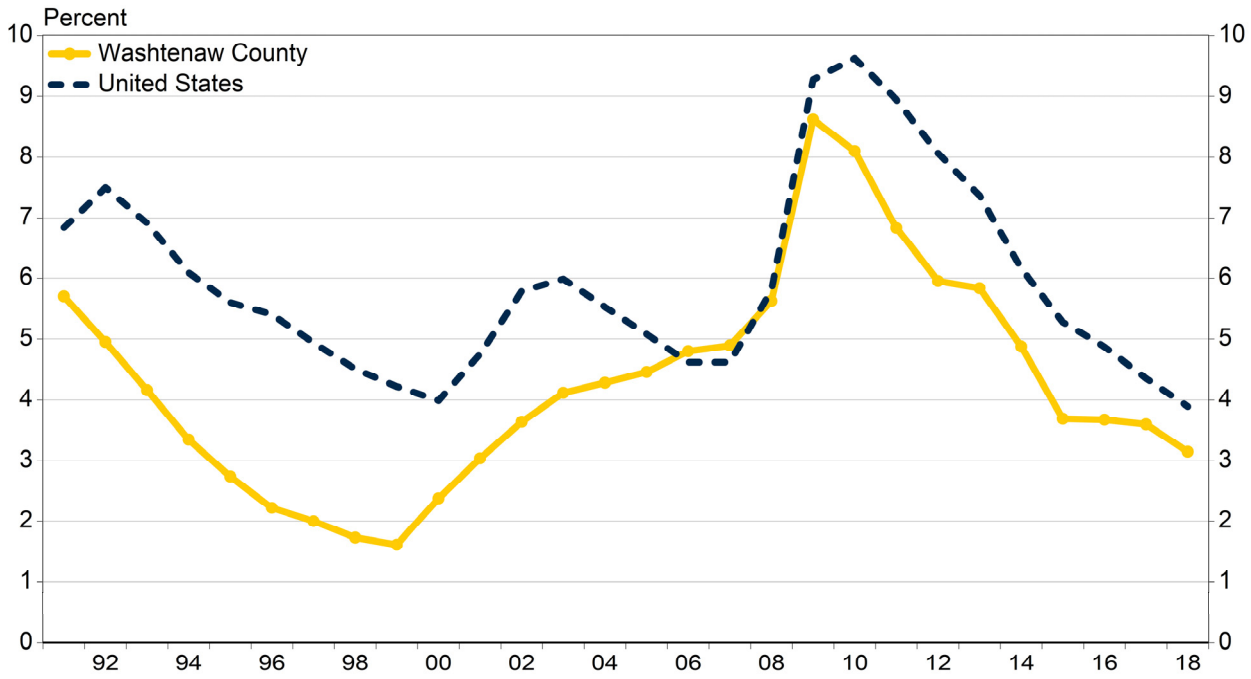


Figure 1 displays payroll employment growth in Washtenaw County over the years 1991–2018. Based on our estimate for 2018, Washtenaw has added an average of 3,500 payroll jobs per

year since 2009, or 31,400 in total. Washtenaw's payroll job count reached a new all-time high of 212,600 jobs in 2018, surpassing the previous year's record of 210,200 jobs.

Figure 2 shows Washtenaw's unemployment rate from 1991–2018 alongside the U.S. rate. The unemployment rate for Washtenaw ticked down to 3.2 percent in 2018 after holding roughly flat in the 3.6–3.7 percent range in the preceding three years. Washtenaw's unemployment rate in 2018 was 5.4 percentage points below the prior peak of 8.6 percent in 2009. Washtenaw has seen even lower rates in the past, however, with an all-time low of 1.6 percent averaged in 1999. That experience provides hope that the unemployment rate can continue to fall.

Figure 2
Unemployment Rates for Washtenaw County and for the United States, 1991–2018



Real wage growth has been the missing piece of the labor market recovery nationally, and Washtenaw is no exception. Average real wages for payroll employees have increased by an average of just 0.4 percent per year since 2009. Wage growth has been even grimmer for blue collar workers, whose real wages have fallen by an average of 1.5 percent per year in that time.

Although we foresee real wage growth remaining mostly sluggish over the next few years, we are optimistic that it will extend more broadly through Washtenaw's economy, with blue-collar workers, highly-educated service workers, and less educated service workers all seeing raises.

The focus of this report is whether or not Washtenaw County can continue its economic growth over the next three years. Before turning to our current forecast, however, we look back on our prior estimates from one year ago and assess how well we have performed.

Review of the Forecast for 2018: A Report Card

A year ago, we presented our thirty-third annual economic outlook for Washtenaw County. We can now compare last year's forecast of employment, unemployment, and inflation for 2018 to the currently estimated outcomes.

In our forecast last March, we expected that Washtenaw would add 3,721 payroll jobs in 2018, for a growth rate of 1.8 percent. We now estimate that the county added only 2,346 jobs, for a growth rate of 1.1 percent. Our forecast of job growth was therefore 0.7 percentage points too high, an overestimate of 1,375 jobs. As shown in Table 1, that miss is similar to our average absolute forecast error over the past 33 years of 0.6 percentage points, or 60 workers per every thousand.[1]

We always examine where among the major industry divisions our forecast error came from to get a better sense of current trends in the economy. It turns out that almost all of last year's error can be traced to a much weaker performance by state government. Last year we forecast that employment in state government would grow by 1,973 jobs; instead employment increased by

[1] Our forecast and estimates for 2018 are based on data through the second quarter of 2018. As of the writing of this report, some preliminary statistics for the third quarter of 2018 have been released, but not yet the industry detail necessary to update the full forecast. Based on the preliminary data for the third quarter, we expect growth for 2018 to be a bit higher than we have estimated here, which would lead to a smaller forecast error for 2018.

only 637. Therefore, all of our last year's forecast error was caused by an overestimate of growth in state government employment.

Table 1
Report Card: Track Record over the Years

Year of forecast	Percentage forecast error for total jobs[1]	Year of forecast	Percentage forecast error for total jobs[1]
1986	-1.4	2003	+1.0
1987	-0.8	2004	+0.2
1988	-1.2	2005	+0.4[2]
1989	-0.6	2006	+0.7
1990	+0.8	2007	0
1991	+1.4	2008	+0.6
1992	+0.5	2009	+1.0
1993	+1.3	2010	-2.3
1994	n.a.	2011	-0.6
1995	+0.2	2012	-0.4
1996	+0.3	2013	0
1997	+0.4	2014	+1.1
1998	-0.5	2015	+0.2
1999	0	2016	-0.4
2000	0	2017	-0.3
2001	+0.3	2018	+0.7
2002	+0.3		

[1] Positive numbers indicate that the forecast was too high; negative, too low.
[2] Estimate.

Average absolute forecast error 1986–2018: 0.6%

	Forecast 2018	Actual 2018
Unemployment rate	3.3%	3.2%
Consumer inflation rate	2.6%	2.4%

We were virtually spot-on in forecasting job growth in the private sector. We forecast the private sector would grow by 1,665 jobs, and we now estimate that the number of private sector jobs grew by 1,646. Within the private sector, we underestimated employment growth in the goods-producing sector, especially the motor vehicle manufacturing sector, which added 618 jobs instead of losing 91 jobs as we expected. We are not certain where those motor vehicle manufacturing job gains occurred. It is possible that some temporary employees were converted to permanent employees in one of our auto parts manufacturing plants.[2] Within the private service-providing sector, our largest error was in retail trade. Rather than holding essentially flat, as we had expected, employment in this sector fell by 600. Despite the closures of some iconic stores, our forecast for department stores and other general merchandise stores was actually too strong: the industry shed only 16 jobs versus the 75 we expected. Instead, the large and unanticipated job losses in the retail sector were in food, drug, and clothing stores.

The bottom of Table 1 shows the forecast and actual values for the unemployment rate and the local consumer price inflation rate in 2018. We had forecast an average unemployment rate of 3.3 percent for the year, one-tenth of a percentage point higher than the actual rate of 3.2 percent. We did similarly well in our forecast of the local consumer inflation rate for 2018. We had forecast a rate of 2.6 percent for the year, two-tenth of a percentage point higher than the realized rate of 2.4 percent. The realized rate of local inflation represents a significant pickup from the rates of negative 1.4 percent in 2015 and positive 1.6 percent in 2016. It reflects a smaller pickup in national inflation over the same period, along with a tighter local labor market.

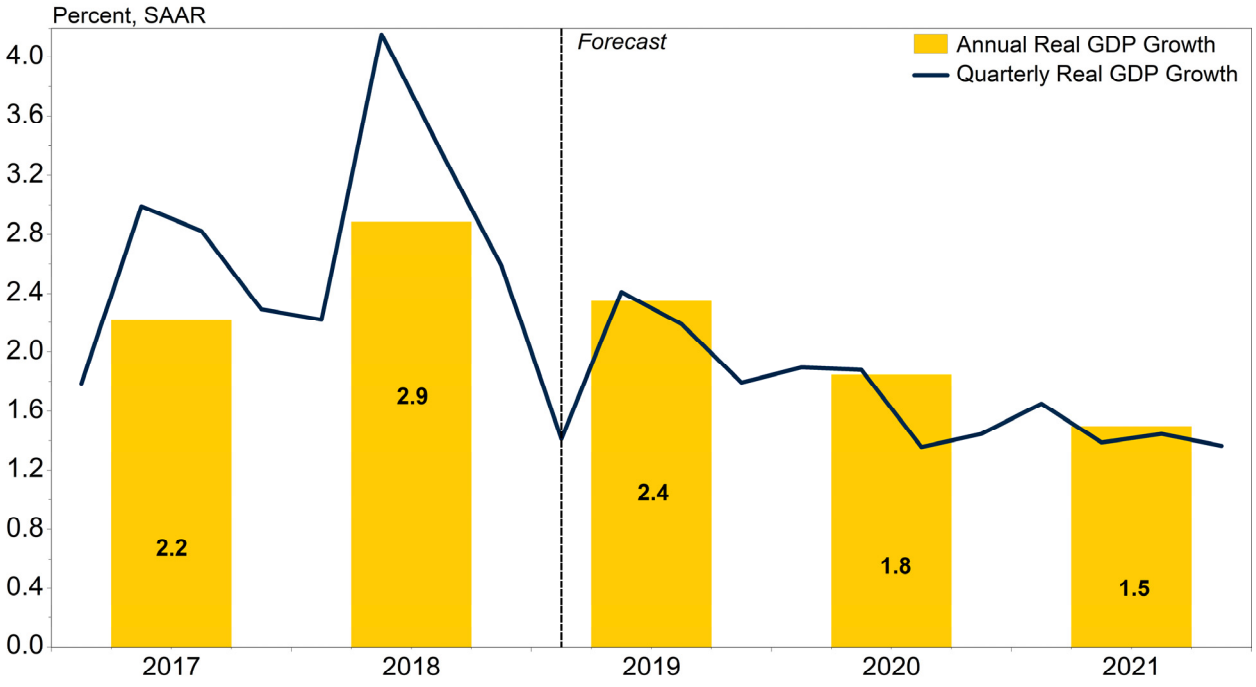
[2] Temporary employees are counted in the employment services industry, which is part of the service sector of the economy. Consistent with this potential explanation, employment in the employment services industry declined unexpectedly in 2018.

National Outlook: 2019–2021

Figure 3 displays our forecast of real GDP growth through 2021.[3] The yellow bars display annual average growth rates, while the blue line displays quarterly rates. Real GDP grew by 2.9 percent in 2018, the strongest reading in thirteen years. GDP growth slowed during the course of 2018, however, from an annual rate of 4.2 percent in the second quarter to 2.6 percent in the fourth quarter.

We expect GDP growth to decelerate over the next few years as the temporary boost from the tax cuts in the Tax Cuts and Jobs Act of 2017 and the extra spending from the fiscal 2018 and 2019 federal budgets fades. Our forecast assumes no further tariffs imposed by the United States or retaliatory tariffs by other nations and very gradual further monetary tightening from the Federal Reserve.

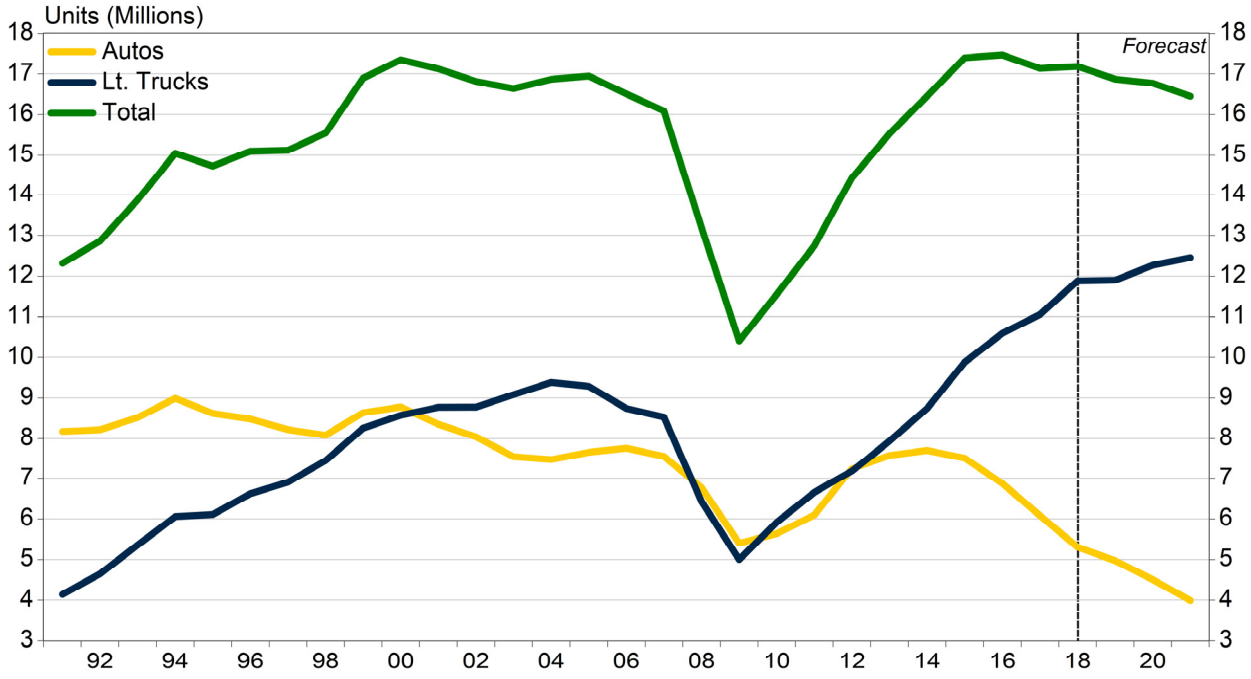
Figure 3
Growth of Real U.S. GDP, 2017–2021



[3] Gross Domestic Product (GDP) comprises all of the goods, services, and structures produced in the economy. Real GDP is adjusted for price inflation to be expressed in chained 2012 dollars.

Figure 4 shows that as the economy slows over our forecast horizon, so do U.S. light vehicle sales. Total light vehicle sales set an all-time high of 17.5 million units in 2016, but that pace now feels like a distant memory. Sales fell to 17.2 million units in 2018, and we are projecting them to total 16.9 million this year before sliding to 16.8 million in 2020 and 16.5 million in 2021. The decline is driven by automobiles, as light truck sales, which include minivans, SUVs, and CUVs, continue to eke out gains. We see the light truck share of vehicle sales edging up to 76 percent of the market by the end of 2021.

Figure 4
U.S. Light Vehicle Sales, 1991–2021



The decline in light vehicle sales over our forecast period obscures a more heartening trend, which is that real U.S. light vehicle output continues to inch up. The difference between the trends for sales and output arises from the diverging fortunes of automobiles and light trucks seen in Figure 4. Because light trucks contain much more value added than automobiles, the continued growth of light truck sales outweighs the decline in auto sales when it comes to vehicle output.

Figure 5 shows our forecast for real U.S. light vehicle output, which grows from 546 billion chained 2012 dollars in 2018 to 565 billion dollars in 2021, for a modest average growth rate of 1.2 percent per year.

Figure 5
Real U.S. Light Vehicle Output, 1991–2021

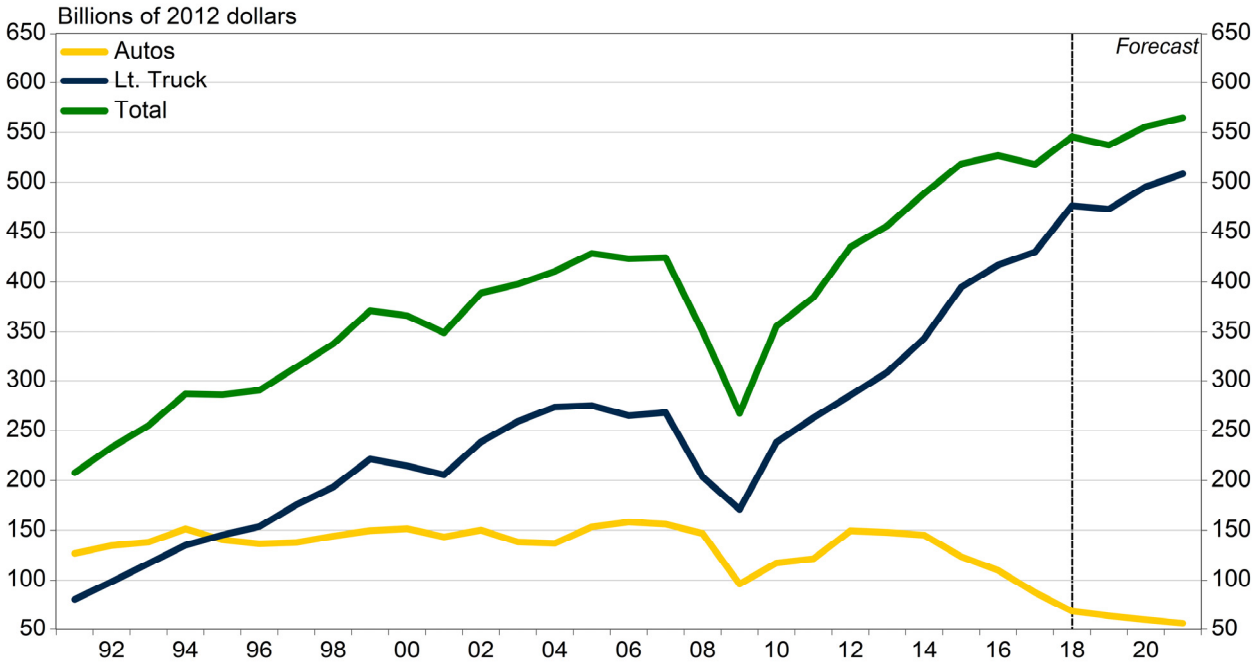
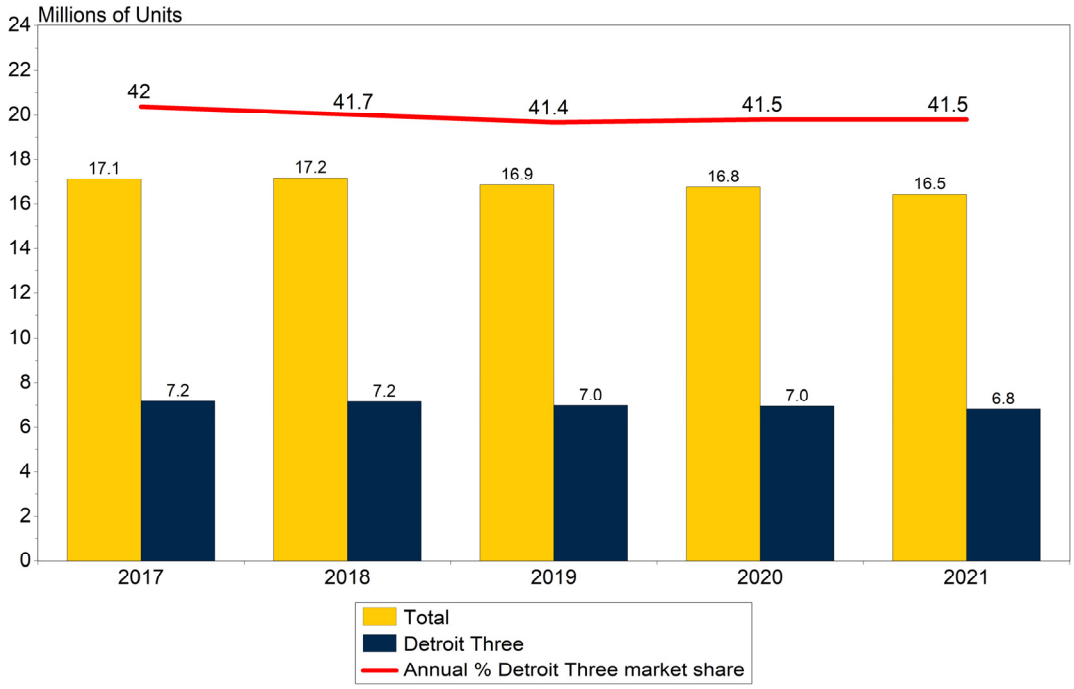


Figure 6 displays our forecast for Detroit Three light vehicle sales. The Detroit Three share of the light vehicle market fell from 42 percent in 2017 to 41.7 percent last year, and we see it falling further to 41.4 percent in 2019. It then edges back up to 41.5 percent over the next two years. When combined with the falling size of the overall market, our forecast implies that Detroit Three light vehicle sales decline from 7.2 million units in each of 2017 and 2018 to 7.0 million units per year in 2019 and 2020 and 6.8 million units in 2021. Our forecast makes several relatively optimistic assumptions: that the contract negotiations between the United Autoworkers and the Detroit Three automakers are completed without a prolonged work stoppage; the United States-Mexico-Canada Agreement is ratified successfully in all three nations; the Trump administration

does not impose new tariffs on automotive imports from the European Union; and the trade tensions with China do not result in any substantial new tariffs.

Figure 6
Total vs. Detroit Three U.S. Light Vehicle Sales, 2017–2021



Washtenaw County Outlook: 2019–2021

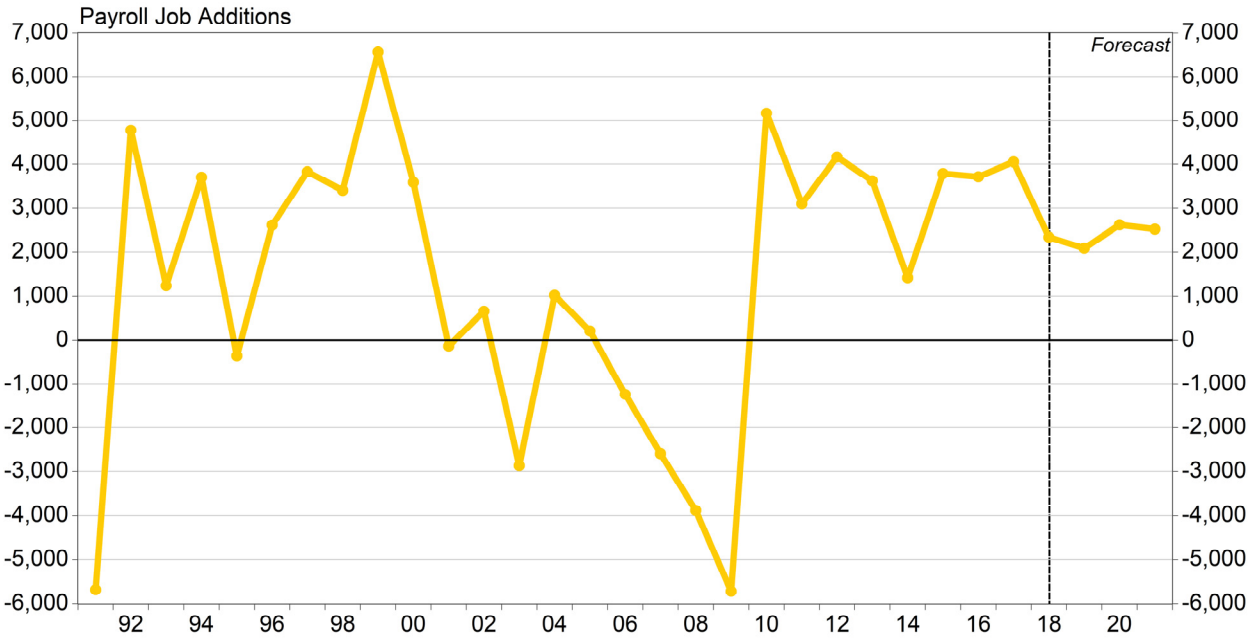
Our economic outlook for Washtenaw County through 2021 encompasses employment, unemployment, inflation, and real wages. First, we evaluate the county's prospects for job growth in total, putting that in context with recent job market developments.

Employment

The Washtenaw County economy is now well into its tenth year of expansion since the previous recession's low point in the summer of 2009. The expansion to date has been brisk, with 31,391 job additions from calendar year 2009 to 2018, a growth rate of 1.8 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 1.5 percent per year.

The county economy added 2,346 jobs in 2018, for an increase of 1.1 percent, the second smallest annual job gain since the end of the recession. As noted, though, we see job growth in the county continuing through 2021, bringing the span of the expansion to twelve years. That would be the longest sustained employment expansion in the county's history since at least 1969, when annual employment data was first collected at the county level.

Figure 7
Job Growth in Washtenaw County, 1991–2021

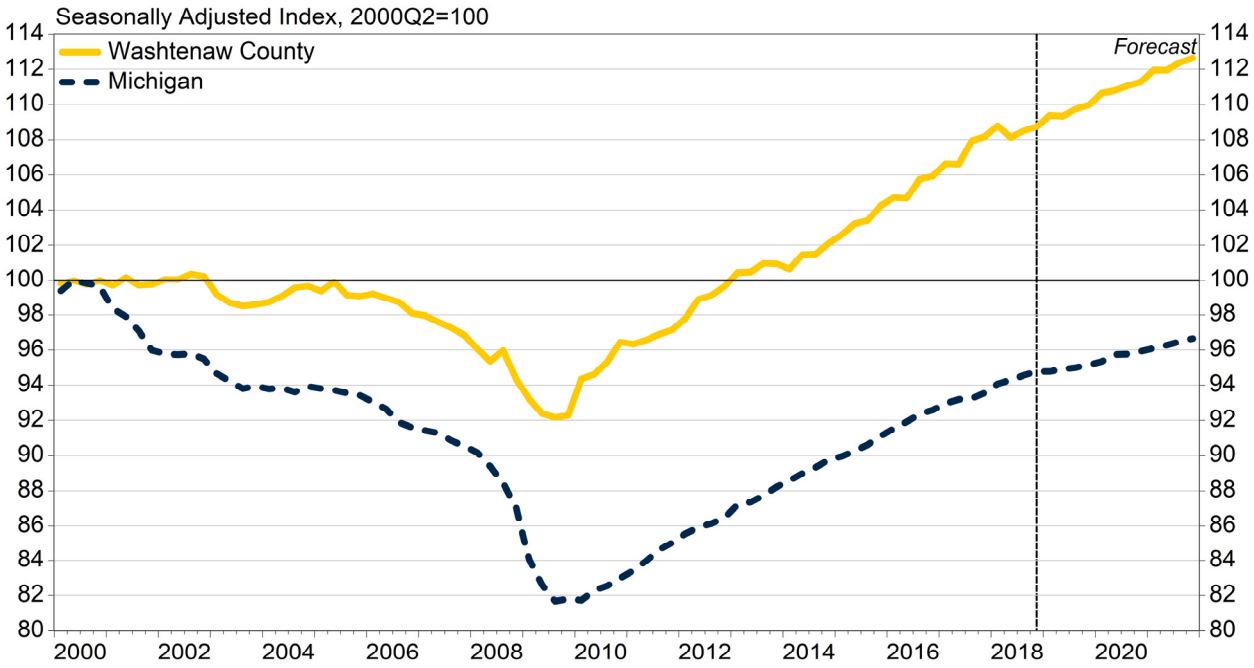


As the labor market approaches full employment, we see job growth continuing at around the pace seen in 2018. Figure 7 shows that we are forecasting that the county will add a total of 7,244 jobs over the next three calendar years: 2,090 jobs in 2019; 2,628 in 2020; and 2,626 in 2021. Those additions translate to an average rate of 1.1 percent per year, the same as the county experienced in 2018.

To provide additional context for recent history and our forecast, Figure 8 shows the historical and forecast quarterly path of total jobs from the start of 2000 to the end of 2021 for both

Washtenaw County and the state of Michigan. For comparison purposes, both paths are indexed to equal 100 in the second quarter of 2000, which represents Michigan's previous peak employment level.[4]

Figure 8
Total Jobs in Washtenaw County, 2000Q1–2021Q4



From its peak employment quarter in the spring of 2001 (index value of 100) to its trough in the summer of 2009, the county lost 15,705 jobs, with 64 percent of the losses occurring in the two-year period from summer 2007 to summer 2009. Washtenaw recovered to its previous peak employment level in the first quarter of 2013. It has added 32,247 jobs from the employment trough in summer 2009 to the end of the currently published data in the second quarter of 2018. From then to the end of 2021, we are forecasting that the county will create an additional 8,841 jobs,

[4] An index value of 90 indicates that employment in a given period is 90 percent of its level in the base period, or 10 percent lower 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.

thus cumulating to 40,088 job additions from the quarterly bottom of the downturn through the end of 2021.

In contrast, Michigan as a whole is not forecast to regain its previous peak employment level even by the end of our forecast period in 2021. Statewide employment fell more sharply during the downturn on a proportional basis than employment in Washtenaw, and it has also been slower to recover. Michigan's employment index reached a low point of 81.7 in the summer of 2009. Washtenaw County's employment index also reached its low point in that quarter, but at a higher index value of 92.2. From then through the end of 2018, Michigan's employment index recovered to a value of 94.8, indicating that the state remained 5.2 percent below its peak employment level. In contrast, we estimate that Washtenaw's employment level exceeded its previous peak by 8.7 percent at the end of last year. We expect the gap between the two indices to continue growing through the end of 2021, when Washtenaw's employment level will be 12.6 percent higher than in spring 2001, while the state's employment level will remain 3.3 percent lower.

Real Wage

Figure 9 shows the average real wage for all workers in Washtenaw County from 1990 to 2021 (all wages reported in this section have been adjusted for inflation using the national Consumer Price Index and are expressed in 2017 dollars).[5] Real wage growth for all workers in

[5] The wage series are averages per worker. The nominal series is from the Bureau of Labor Statistics Quarterly Census of Employment and Wages and does not include variations in hours worked, a measure that is not available to us in the necessary detail. This is likely less of a consideration over the longer term than at the business cycle frequency. 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. Wages are adjusted for inflation using the U.S. Consumer Price Index for all urban consumers.

the county averaged 1.3 percent per year between 1990 and 2000, before slowing to only 0.3 percent growth per year between 2000 and 2007. Average real wages in the county reached a peak of $58,437 in that year. They then began to fall during and after the Great Recession, reaching a low of $54,203 in 2011 (a decline of 7.2 percent over that four-year period). Real wages grew slowly, by 0.5 percent per year, over the next three years, to an average of $55,102 in 2014. Between 2014 and 2018, real wages accelerated to an average of 1.2 percent per year, helped by very modest price inflation. The average real wage in the county reached $57,845 in 2018, slightly below the peak in 2007. We estimate that the real wage will increase by 1.6 percent in 2019, to $58,758, slightly above 2007 levels. We are forecasting that accelerating consumer price inflation will constrain real wage growth to only 0.4 percent in both 2020 and 2021, so that the average real wage will reach $59,264 in 2021.

Figure 9
Average Real Wage in Washtenaw County, 1990–2021

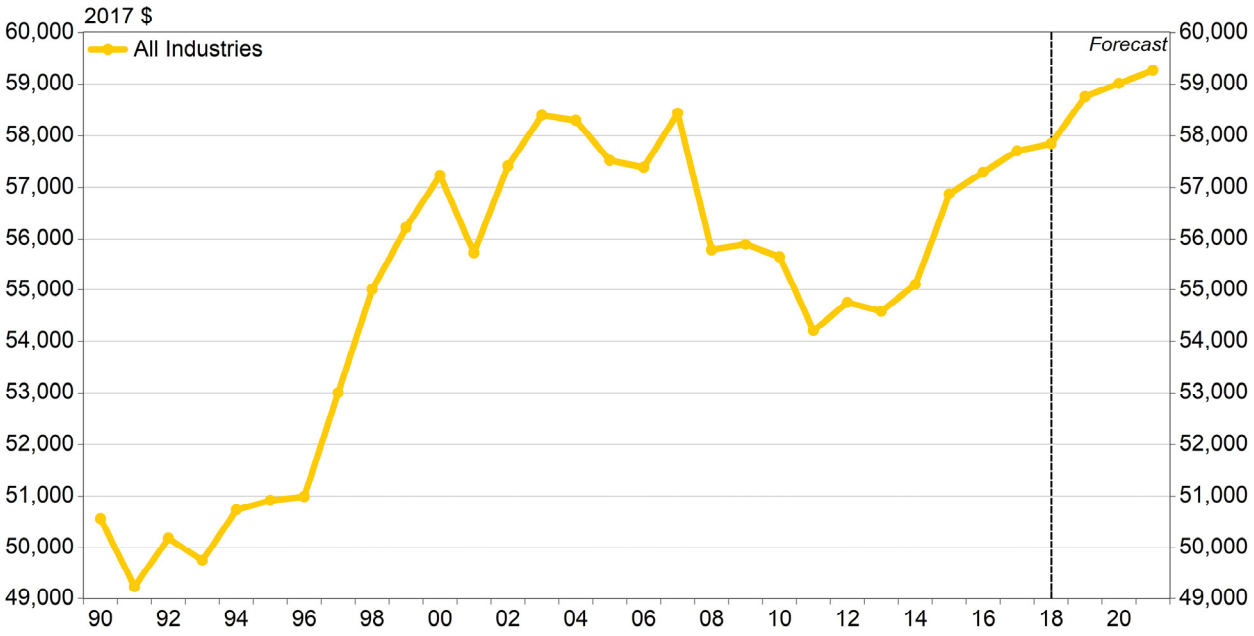
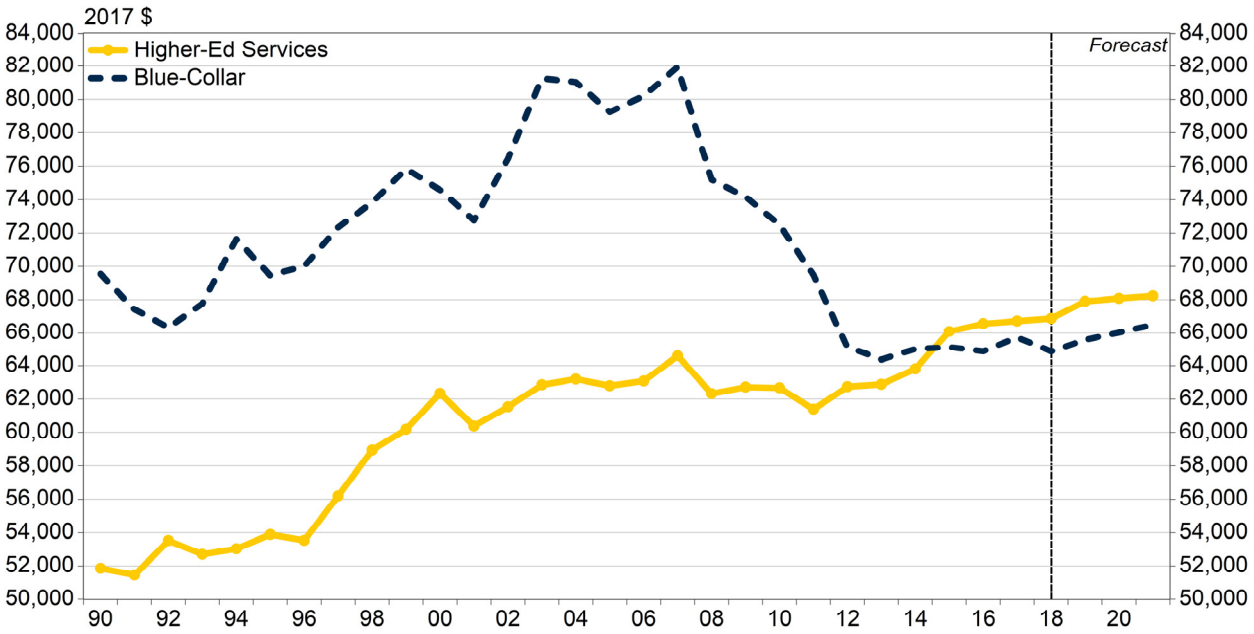


Figure 10 shows the average real wage from 1990 to 2021 for two industry group combinations. The first is traditionally blue-collar industries, and the second is service-providing industries that tend to employ highly-educated workers. We will call the latter group higher-education service industries.[6] In 1990, the average real wage in the blue-collar industries ($69,545) was about one-third higher than the average real wage in the higher-education service industries ($51,858). The average real wage in the blue-collar industries increased by 1.0 percent per year on average from 1990 through 2007, reaching a peak of $81,935 in 2007. 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 $64,354 in 2013, 7.5 percent below 1990 levels. Since 2013, the average blue-collar wage has increased slowly, by 0.2 percent per year on average. In 2018 average wages in these industries ($64,857) remained below 1990 levels. We expect that over the next three years the average blue-collar wage will grow at a faster clip (0.8 percent per year), but that by 2021 real wages will still remain 4.4 percent below 1990 levels and 18.8 percent below the 2007 peak levels.[7]

[6] 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.

[7] 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. 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.

Figure 10
Average Real Wage in Washtenaw County, 1990–2021,
Blue Collar and Higher-Education Service Industries

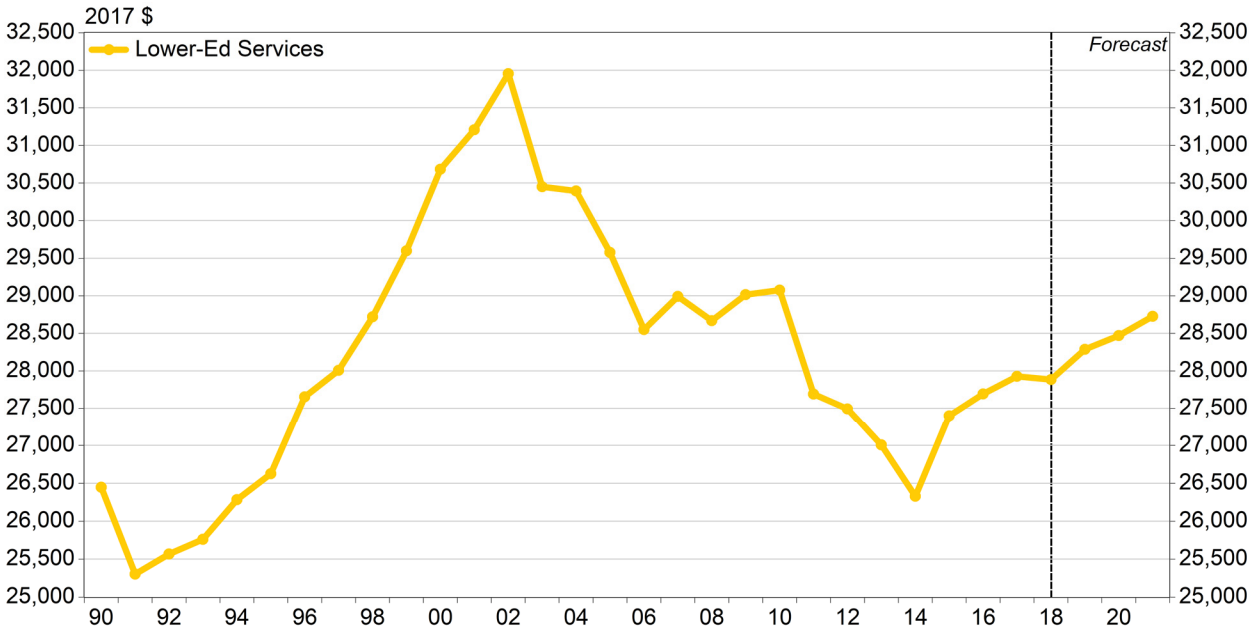


In contrast, the average wage in the higher-education service industries grew relatively steadily during the historical period. The average wage in those industries overtook the average wage in the blue-collar industries for the first time in 2015, reaching $66,093. We forecast average wages in the higher-education service industries to grow by an average of 0.7 percent per year between 2018 and 2021. We expect the average wage in these industries to reach an all-time high of $68,231 in 2021.

Figure 11 shows the average real wage for service-providing industries that tend to employ workers with less education, which we will call lower-education service industries.[8] We show wages for this industry group on a separate graph because they are substantially lower than wages in the other two industry groups.

[8] 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.

Figure 11
Average Real Wage in Washtenaw County, 1991–2021,
Lower-Education Service Industries



The average real wage in the lower-education service industries grew steadily from 1992 through 2002, when it reached a peak of $31,955. Wages in these industries then generally declined through 2014, to an average of only $26,328. Between 2014 and 2018, real wages grew at an average rate of 1.4 percent per year, helped by low price inflation and increases in Michigan's minimum wage. We anticipate that wage gains in these industries will continue over the next three years, with real wage growth averaging 1.0 percent per year. Nonetheless, we forecast that by 2021, average real wages ($28,726) in the low-education service industries will remain 10 percent below their peak level in 2002.

In summary, the 2000s have been a mixed bag for real wages in Washtenaw County. We estimate that the average real wage across all industries increased by a total of 1.1 percent from 2000 to 2018, an average rate of less than 0.1 percent per year. This weak growth reflects the fact that the average real wage actually fell during that time interval in two broad industry groups, blue-

collar industries (–0.8 percent per year) and lower-education service industries (–0.5 percent per year). Higher-education service industries (the largest of the three industry groups), on the other hand, experienced sustained real wage growth of 0.4 percent per year. The good news is that we are forecasting real wage growth in all three industry groups over the forecast period, with the most rapid growth expected in the lower-education service industries.

Employment by Industry

Table 2 divides the total job movements we project over our forecast period among twenty-three major industry divisions.[9] The table includes, for each industry, our preliminary estimates of the level of employment in 2018; the forecast change for each of 2019, 2020, and 2021; and the cumulative change over the three-year period 2018–21. The table also includes the average annual wage for each industry category in 2017, as does the appendix.[10] Total employment is forecast to grow by 2,090 jobs, or 1.0 percent, in 2019. Job growth then accelerates to about 1.2 percent per year in each of 2020 and 2021, generating job gains of 2,628 and 2,526, respectively.

Over one-third (36 percent) of all job gains in Washtenaw County over the next three years are expected to occur in the government sector. We expect that federal government employment will decline by 117 jobs over the next three years, albeit with a temporary spike in 2020 because of the employment of census workers in the county. Employment in local government, which includes public K-12 education and Washtenaw Community College, lost jobs every year between 2010 and 2016, even as the economy overall was adding jobs. This period of job losses finally came to an end in 2017, when local government added 285 jobs, followed by a gain of 156 jobs in

[9] The appendix divides the job movements into 145 finer divisions.

[10] 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.

2018. We anticipate that local government will continue to grow over the next three years, contributing a total of 245 job additions, for an average growth rate of 0.7 percent per year.

Table 2

Forecast of Employment in Washtenaw County by Major Industry Division
2018–2021

	Estimate	Employment Change Forecast				Average Annual Wage
	2018	'18–'19	'19–'20	'20–'21	'18–'21	2017
TOTAL JOBS (Number of persons)	212,561	2,090	2,628	2,526	7,244	$57,706
(Annual percentage change)	(1.1)	(1.0)	(1.2)	(1.2)		
TOTAL PRIVATE	132,436	1,352	1,596	1,670	4,618	55,554
GOODS-PRODUCING	19,537	158	84	41	283	64,279
Natural resources, mining, construction	4,482	133	134	123	391	60,351
Manufacturing	15,055	26	-50	-82	-107	65,453
Motor vehicles	4,756	-41	-57	-72	-170	63,245
Other manufacturing	10,299	67	6	-11	62	66,342
PRIVATE SERVICE-PROVIDING	112,898	1,194	1,512	1,629	4,335	54,097
Trade, transportation, and utilities	24,645	120	205	219	544	45,970
Wholesale trade	5,466	148	152	151	450	75,940
Retail trade	15,663	-90	-35	-19	-145	30,266
Transportation, warehousing, and utilities	3,516	62	89	87	238	73,385
Information	4,568	33	41	49	123	94,939
Financial activities	6,462	13	58	63	134	72,763
Professional and business services	27,495	459	502	500	1,461	78,591
Professional, scientific, and technical	16,949	470	445	436	1,352	96,179
Management of companies and enterprises	1,224	40	11	-1	50	173,252
Administrative support and waste management	9,323	-51	46	65	60	36,405
Private education and health services	26,683	300	393	462	1,156	52,250
Leisure and hospitality	17,772	252	275	283	810	19,766
Other services	5,078	20	37	54	111	31,744
Unallocated private services	195	-5	0	0	-5	60,659
GOVERNMENT	80,125	738	1,033	855	2,626	61,249
State government	64,497	679	898	921	2,499	61,976

Employment growth in state government, which includes the University of Michigan, Michigan Medicine, and Eastern Michigan University, slowed in 2018 to 1.0 percent from 3.4 percent in 2017. The industry's average annual growth rate between 2000 and 2017 was 2.4 percent, also substantially higher than 2018's rate. We are forecasting that employment gains will remain subdued over the next three years, cumulating to 2,499 jobs, for an average growth rate of 1.3 percent per year.

The private goods-producing sector is forecast to add only 283 jobs over the next three years, as job losses in transportation equipment manufacturing (–170) partially offset modest job gains in other manufacturing (62) and relatively strong job gains in natural resources and construction (391).

The manufacturing industries that we anticipate will gain the most jobs over the next three years are fabricated metals manufacturing (81), plastic products manufacturing (59), machinery manufacturing (55) and food processing (53). In addition to transportation equipment, manufacturing industries that we expect to lose jobs include printing (–146) and computer and electronic products manufacturing (–82).

Job growth in the private service-providing sector in 2019 is forecast to register 1,194 (1.1 percent), an acceleration from the gain of 830 (0.7 percent) in 2018. Job growth in the sector continues to accelerate to 1,512 in 2020 and 1,629 in 2021.

Retail trade is forecast to lose 145 jobs over the next three years (–0.3 percent per year). The largest job losses are expected at department and other general merchandise stores (–118), sporting goods, hobby and book stores (–70), and gasoline stations (–22). We are forecasting very modest job gains over the next three years at motor vehicle dealers (18), building materials stores (18) and non-store retailers (15). Multiple factors contribute to the weak job growth we foresee in

the retail sector. Online retailers and big box stores employ fewer workers than traditional retailers, while labor costs in the sector are rising, driven by a tighter labor market and an increasing minimum wage.

Elsewhere in the trade, transportation, and utilities super-sector, wholesale trade is forecast to see above-average growth, with 450 job gains over the next three years (an average pace of 2.7 percent per year), as is transportation services (251 jobs over the period, an average pace of 2.6 percent per year). On the other hand, employment at utilities is forecast to decrease by 12 jobs over the next three years.

Information services is forecast to see relatively weak job growth over the next three years, cumulating to 123 jobs (0.9 percent per year). Financial activities is forecast to have even weaker job growth, cumulating to 134 jobs (0.7 percent per year). The weakness in the financial sector is caused by a substantial decline in employment in the credit intermediation industry. This industry, which includes both depository (banking) and non-depository credit granting establishments, is forecast to lose 132 jobs over the next three years. The rest of the financial activities sector, including insurance and real estate, should see moderate job growth over the next three years.[11]

The professional and technical services industry is forecast to add 459 jobs this year, followed by job gains of 502 in 2020 and 500 in 2021. Over the three-year forecast period, professional services is forecast to add 1,461 jobs (2.6 percent growth per year). With this gain, professional services accounts for about one in every five jobs created in the county over the next three years, more than double its share of the county's employment base in 2018.

[11] 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.

Within the professional and technical services industry category, the largest job gains over the next three years are in computer systems design (305), testing laboratories (304), other professional services (291), and physical, engineering, and biological research (277). The professional and technical services industry category pays very well, an average of $96,179 per year in 2017. It also tends to employ relatively well-educated workers, those with at least a bachelor's degree. Washtenaw County's success in creating jobs in this industry category has been an important driver, along with the significant growth of state government, of the county's economic prosperity over the past several decades.

The management and corporate headquarters industry (average pay in 2017 of $173,252) is quite small in Washtenaw County, but it is forecast to add 50 jobs over the next three years. The administrative support and waste management industry adds only 60 jobs over the next three years (0.2 percent per year). This weak performance reflects job losses in 2019 and small job gains in 2020 and 2021. Most of the net job gains over the next three years will be in waste management, as employment in employment services, which mostly consists of temporary help agencies, is forecast to decline slightly.

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 300 in 2019, 393 in 2020, and 462 in 2021, cumulating to a total job gain of 1,156 over the next three years. Private education services account for only 11 of these new jobs; virtually all of the job gains are in private health care and social assistance (1,145).

Nearly one-half of the employment gains in private health care over the next three years are in physicians' offices (561 jobs or 3.8 percent per year). Over this period, employment in

private hospitals is forecast to increase by 233 (1.1 percent per year), while employment in home health care services is forecast to decline by 34.

Employment in the leisure and hospitality sector is forecast to grow by 810 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 192 jobs over the forecast horizon, includes businesses such as golf courses, fitness facilities, and the performing arts.[12]

Employment at local hotels and other lodging places jumped by 104 jobs in 2016 and 143 jobs in 2017 as some new hotels opened, but declined by 21 jobs in 2018. We expect employment at local lodging places to decline slowly over the next three years for a total loss of 22 jobs. Full-service restaurants add 305 jobs over the next three years (1.6 percent per year). Employment in limited-service restaurants (better known as fast-food restaurants) also grows 1.6 percent per year, cumulating to a total gain of 237 jobs.

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 111 jobs (an increase of 0.7 percent per year) over the forecast period.

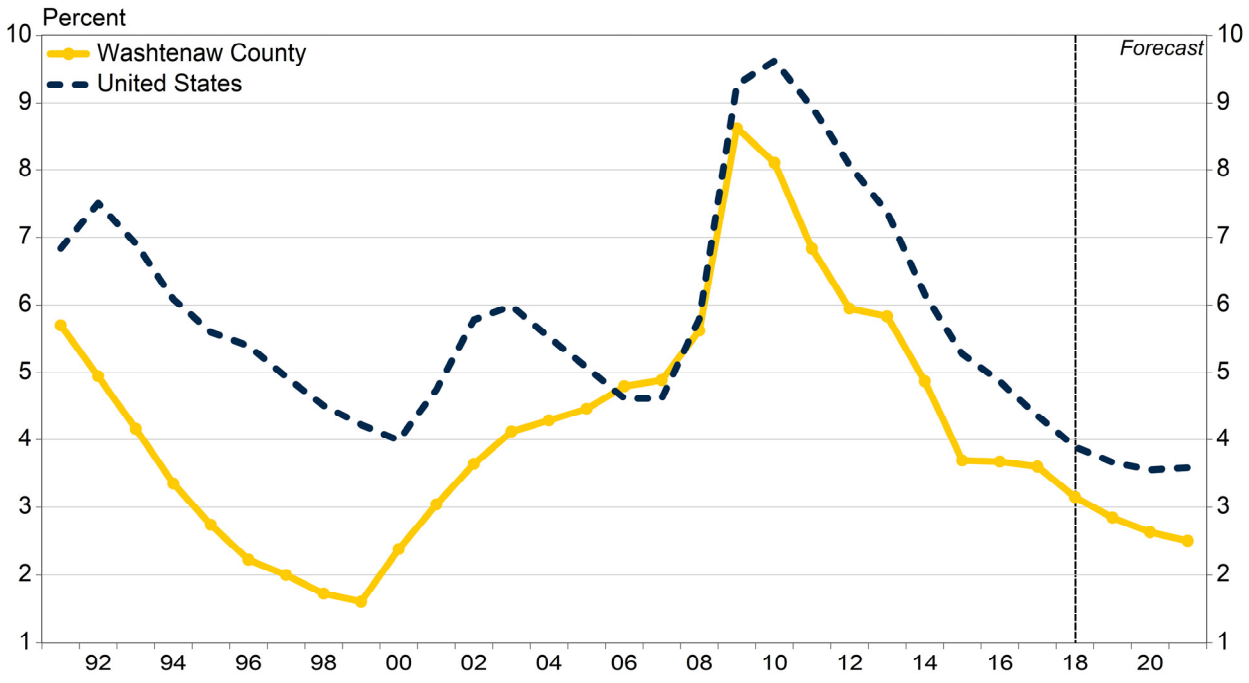
Unemployment

Figure 12 displays our forecast for the unemployment rate in Washtenaw County and the United States through 2021. The local unemployment rate declined from 3.6 percent in 2017 to 3.2 percent last year, after staying stuck in the 3.6–3.7 percent range since 2015. The national

[12] Much of the last category resides in public universities in Washtenaw County, and thus is not counted in the private sector.

unemployment rate also fell rapidly from 2017 to 2018, from 4.4 percent to 3.9 percent. Going forward, we expect the unemployment rate in Washtenaw to continue falling, to 2.8 percent in 2019, 2.6 percent in 2020, and 2.5 percent in 2021. That would be the county's lowest unemployment rate since the year 2000, but would still be nearly a percentage point higher than the county's all-time low unemployment rate of 1.6 percent recorded in 1999. In contrast to our forecast for Washtenaw County, we expect the national unemployment rate to settle just a bit below its 2018 level over the next few years, at 3.7 percent in 2019 and 3.6 percent in 2020 and 2021.

Figure 12
Unemployment Rates for Washtenaw County and the United States, 1991–2021



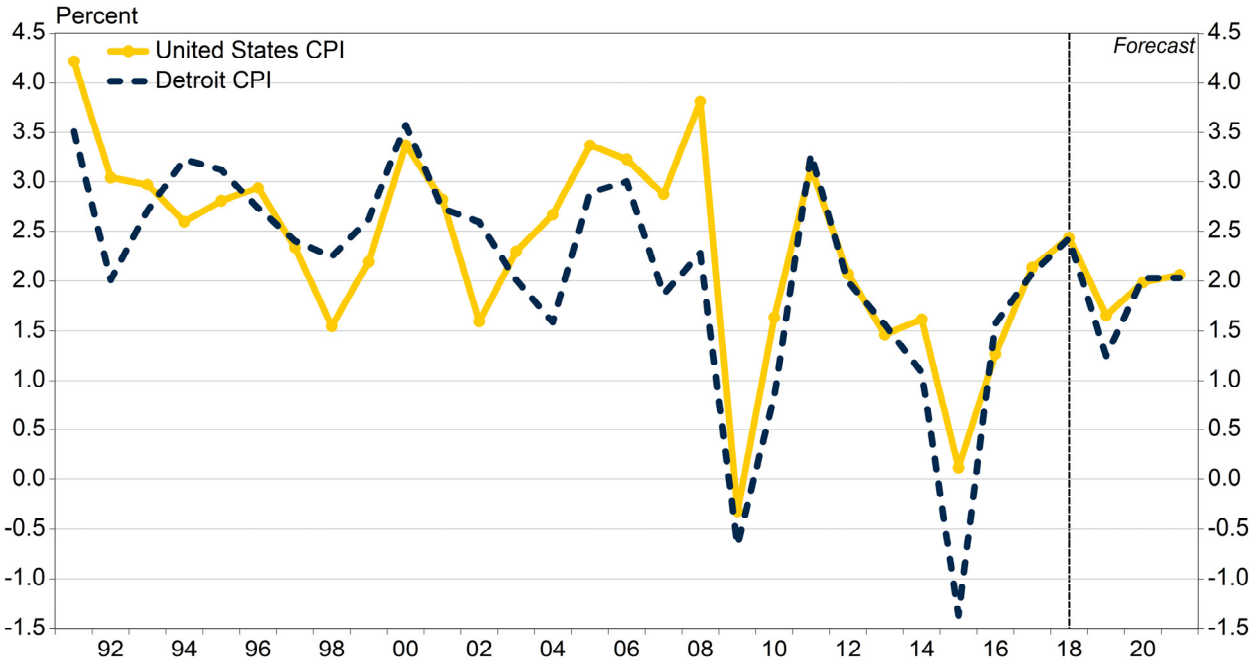
Inflation

Figure 13 displays our forecast of local inflation, measured by the growth rate of the Detroit Consumer Price Index (CPI).[13] Local and national inflation registered 2.4 percent in 2018, pushed upward by a large increase in energy prices that persisted through most of the year. Energy prices

[13] Consumer price data are compiled at the regional level; they are not available for the county in isolation.

tumbled toward the end of the year and the start of 2019, which should cause inflation to dip this year. We are forecasting national inflation of 1.7 percent and local inflation of only 1.3 percent for the year. Inflation then inches back up toward the Federal Reserve's target of 2.0 percent as energy prices stabilize; we are forecasting local inflation of 2.0 percent per year in 2020 and 2021, while national inflation registers 2.0 percent in 2020 and 2.1 percent in 2021.[14]

Figure 13
Inflation Rate, National and Detroit CPIs, 1991–2021



Washtenaw County Gross Domestic Product (GDP)

In December 2018, the Bureau of Economic Analysis released prototype statistics for Gross Domestic Product (GDP) by county.[15] The estimates currently cover only the years 2012 to 2015, and the next release is not due until December of 2019. Therefore, as of now the historical time

[14] The Federal Reserve targets an alternative measure of price inflation, the Personal Consumption Expenditures (PCE) Chain-Type Price Index published by the Bureau of Economic Analysis. It has historically tended to run about 0.4 percentage points below the Consumer Price Index, so the Federal Reserve's 2 percent target for PCE inflation translates to roughly 2.4 percent for CPI inflation. That means we are forecasting inflation to run slightly below the Federal Reserve's target in 2020 and 2021.

[15] The statistics are available at https://www.bea.gov/data/gdp/gdp-county.

series is not long enough, and the data releases are not timely enough, to include county-level GDP in our forecast. Nonetheless, the data contain valuable insights regarding Washtenaw County's economy. With that in mind, in this section we explore the new county-level GDP data and what they tell us about Washtenaw County's economy.

Gross domestic product measures the value of all of the goods and services produced in a particular location over a specific time period; real GDP adjusts that measure for inflation. The BEA adjusts all of the real GDP statistics reported in this section to be expressed in 2012 chained dollars using a different methodology and price index than we used to adjust wages earlier in the report. Therefore, the two sets of numbers are not exactly comparable.

The left panel of Figure 14 displays a map of county-level real GDP in 2015 for all of the counties in Michigan. Over three-fifths (62 percent) of the state's GDP was produced in the five largest counties: Kent, Macomb, Oakland, Washtenaw, and Wayne. Oakland's real GDP was $101 billion in 2015, making it the only county in Michigan with a GDP of over $100 billion. Wayne was second among Michigan counties, with GDP of $81 billion, followed by Kent and Macomb, with GDPs of $37 billion and $32 billion, respectively. As of 2015, Washtenaw County's real GDP was just over $20 billion, fifth highest out of the 83 counties in Michigan.

The right panel of Figure 14 displays a map of county-level real GDP growth rates over the period 2012–2015. Washtenaw's average growth rate was 1.3 percent per year in that period, just above Michigan's statewide rate of 1.2 percent. Washtenaw ranked 29th in the state over that period, roughly in line with Oakland (27th), Wayne (33rd), and Macomb (37th), but a bit behind Kent (18th). Washtenaw is one of 25 counties in Michigan that experienced real GDP growth in each year from 2013–2015.

Figure 15 depicts 2015 payroll employment by county in the left panel and real 2015 GDP per payroll worker in the right panel. Similarly to the distribution of real GDP, nearly three-fifths (57 percent) of Michigan's payroll employment can be found within its five largest counties. Washtenaw's count of 202,000 payroll employees as of 2015 was also the fifth-highest in the state, behind the same counties.

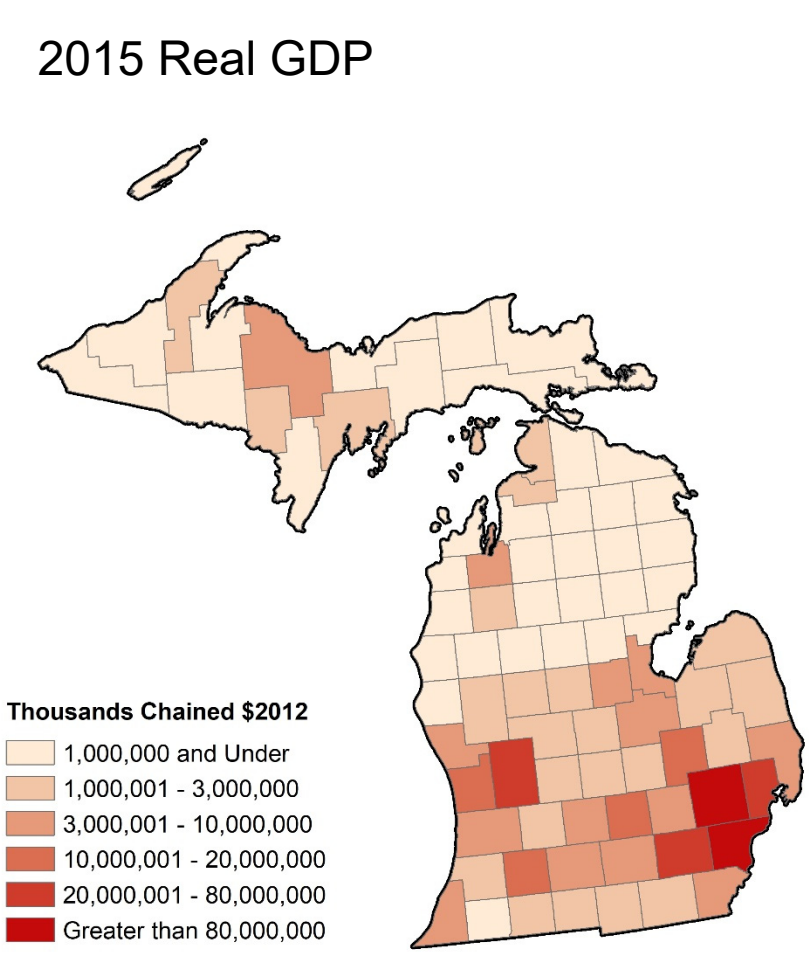
Dividing Washtenaw's real GDP by its payroll employee count implies that Washtenaw had a real GDP of $98,936 per payroll employee in 2015. That ranked 27th out of the Michigan counties. (Luce County, in the Upper Peninsula, ranked highest on that measure, with a real GDP per worker of over $150,000, but the small size of the Luce and many of the other highly ranked counties and the disproportionately large presence of mining and utility activity in those counties means their relatively high rankings should be taken with a grain of salt.[16]) Washtenaw also lagged its larger county peers in Michigan on this measure, however: Oakland registered real GDP per worker of $143,085, and Wayne registered $115,369. Macomb's real GDP per worker of $102,844 and Kent's level of $100,244 were closer to, but still higher than, Washtenaw's.

Although the data in the prototype statistics is limited, we speculate that a relatively large number of part-time student employees may explain why otherwise prosperous Washtenaw County lags its peers in real GDP per worker. Consistent with that hypothesis, Washtenaw's real GDP per government employee was only $75,500 in 2015, ranking 46th out of Michigan's 83 counties. Kent ($92,000), Macomb ($110,300), Oakland ($95,200), and Wayne ($99,200) all comfortably exceeded Washtenaw on this measure. Washtenaw's private sector real GDP per worker was $112,800 in 2015, ranking 14th among all counties in Michigan. That level was higher

[16] Detailed Industry data are not available by county, but statewide in 2015 real GDP per mining worker ($342,900) was three times the overall average ($110,200), and real GDP per utility worker ($446,400) was four times the overall value.

than in Kent ($100,900) and Macomb ($102,000), although it was a bit lower than in Wayne ($117,600) and substantially lower than in Oakland ($146,400).

Figure 14: Real Gross Domestic Product by Michigan County



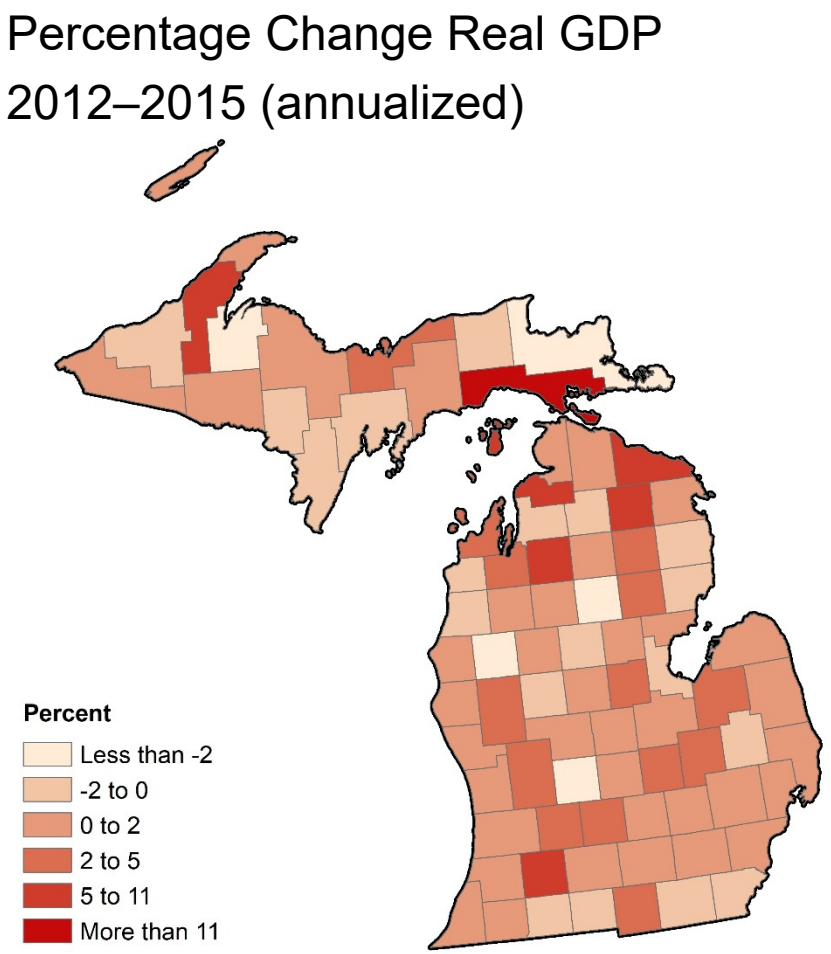
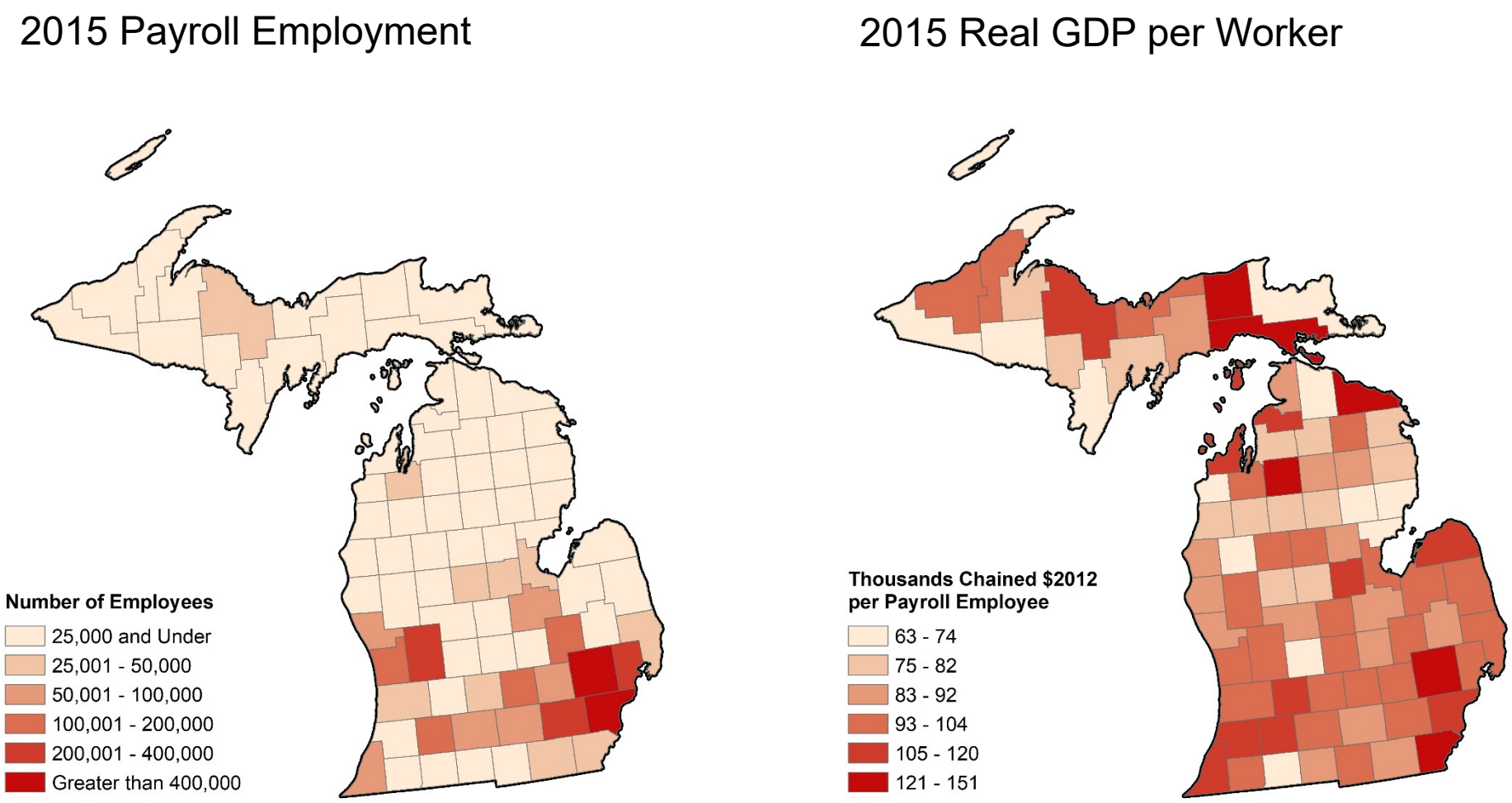


Figure 15: Payroll Employment and Real GDP per Worker by Michigan County



Conclusion

Although Washtenaw County grew more slowly in 2018 than it had over the preceding few years, a slowdown was bound to come sometime in the face of an increasingly tight labor market. We do not believe that last year's moderation in job growth portends a contraction after nine consecutive years of growth. Instead, we are calling for three more years of growth at roughly the pace seen in 2018, along with falling unemployment and real wage growth, that while moderate, spreads to a large proportion of the economy.

Our relatively upbeat outlook for the Washtenaw economy assumes a national economy that also continues to deliver moderate growth. A national recession, which is not in our baseline forecast, would present a considerable headwind to Washtenaw's growth prospects. Likewise, a major disruption to international trade or a major slowdown in the state's manufacturing sector are potential risks to our forecast. That being said, our baseline forecast is that Washtenaw County will enjoy at least three more years of positive economic news, extending its current growth streak to twelve calendar years.

As Washtenaw's expansion matures, growth slows to a moderate average rate of 1.1 percent per year over our three-year forecast period. That translates to a total of 7,244 job additions. The tight labor market supports real wage growth of 0.8 percent per year over the forecast period, higher than the historical average of 0.5 percent from 1991–2018. Those are the key components needed for continuing economic success.

Appendix
Forecast of Jobs in Washtenaw County by Detailed Industry Division

	Estimated	Forecast			Average Wage
	2018	2019	2020	2021	2017
Total wage and salary employment	212,561	214,652	217,280	219,806	$57,706
Total government	80,125	80,864	81,896	82,752	61,249
Federal government	3,942	3,901	3,968	3,824	82,083
Post office	571	566	562	559	59,793
Hospital	2,526	2,498	2,468	2,437	82,136
Other federal government	845	837	939	829	96,453
State government	64,497	65,177	66,075	66,996	61,976
Local government	11,686	11,785	11,853	11,931	49,927
Education and health services	7,271	7,335	7,385	7,435	48,303
Other local government	4,416	4,451	4,468	4,496	52,556
Total private	132,436	133,788	135,384	137,054	55,554
Goods-producing	19,537	19,696	19,780	19,821	64,279
Natural resources and mining	245	247	250	251	31,794
Construction	4,238	4,368	4,500	4,621	62,194
Buildings	1,269	1,309	1,355	1,395	58,091
Residential	724	750	791	828	46,473
Nonresidential	545	559	563	568	75,855
Heavy and civil engineering construction	381	384	394	405	71,410
Specialty trade contractors	2,588	2,675	2,751	2,821	62,510
Building foundation and exterior	448	473	496	517	53,164
Building equipment	1,290	1,332	1,364	1,396	70,178
Building finishing	538	548	562	576	53,857
Other specialty trade	311	323	328	331	56,738
Manufacturing	15,055	15,081	15,030	14,948	65,453
Food	882	901	919	935	45,603
Printing and related support activities	1,696	1,641	1,595	1,550	40,492
Chemicals	698	711	722	731	72,193
Plastics and rubber products	1,499	1,523	1,542	1,558	82,152
Fabricated metal products	1,272	1,308	1,333	1,354	57,511
Machinery	1,029	1,063	1,077	1,084	72,737
Computer and electronic products	1,142	1,118	1,089	1,060	95,533
Transportation equipment	4,756	4,715	4,658	4,586	63,245
Miscellaneous manufacturing	1,395	1,412	1,424	1,436	77,553
Medical equipment and supplies	804	799	790	781	89,478
Other miscellaneous manufacturing	590	613	634	655	60,380
Other manufacturing	686	689	672	654	55,225
Private service-providing	112,898	114,092	115,604	117,233	$54,097
Trade, transportation, and utilities	24,645	24,765	24,970	25,189	45,970
Wholesale trade	5,466	5,613	5,765	5,916	75,940
Merchant wholesalers, durable goods	3,042	3,141	3,234	3,324	82,026
Merchant wholesalers, nondurable goods	1,822	1,848	1,883	1,919	62,962
Electronic markets and agents and brokers	602	625	649	672	84,176
Retail trade	15,663	15,573	15,537	15,518	30,266
Motor vehicles	1,693	1,690	1,699	1,711	55,756
Furniture and home furnishings	573	568	573	578	38,766
Electronics and appliances	712	718	719	720	43,238
Building materials and garden supplies	1,417	1,418	1,426	1,435	39,868
Food and beverages	3,102	3,090	3,095	3,102	23,438
Health and personal care stores	1,032	1,027	1,025	1,028	35,889
Gasoline stations	522	515	507	500	20,184

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

	Estimated 2018	2019	Forecast 2020	2021	Average Wage 2017
Retail trade (continued)					
Clothing and accessories	1,308	1,303	1,305	1,308	18,867
Sporting goods, hobby, book, music stores	646	619	597	576	18,483
General merchandise	3,220	3,180	3,140	3,101	23,741
Miscellaneous store retailers	903	906	907	909	21,507
Nonstore retailers	535	539	544	550	35,736
Transportation and warehousing	3,097	3,164	3,257	3,348	62,639
Truck transportation	615	594	597	601	63,443
Other transportation and warehousing	2,482	2,570	2,660	2,747	62,414
Utilities	419	414	410	407	147,824
Information	4,568	4,601	4,642	4,691	94,939
Publishing industries, except Internet	1,803	1,797	1,794	1,794	83,913
Newspaper, book, and directory publishers	301	289	277	266	63,438
Software publishers	1,502	1,508	1,517	1,528	88,664
Telecommunications	348	336	332	328	64,379
Data processing, hosting, and related services	1,035	1,055	1,067	1,078	88,076
Other information	1,381	1,413	1,449	1,491	122,190
Financial activities	6,462	6,475	6,533	6,596	72,763
Finance and insurance	3,959	3,923	3,928	3,936	83,684
Credit intermediation and related activities	2,150	2,078	2,047	2,018	72,065
Depository credit intermediation	1,173	1,177	1,182	1,189	64,814
Other credit intermediation and related	977	901	864	829	80,150
Insurance carriers and related activities	980	988	997	1,006	70,788
Other finance	829	857	884	912	133,003
Real estate and rental and leasing	2,504	2,552	2,605	2,660	$54,892
Real estate	2,214	2,268	2,321	2,376	51,395
Lessors of real estate	979	993	1,002	1,011	46,123
Offices of real estate agents and brokers	221	225	232	238	65,453
Activities related to real estate	1,015	1,049	1,087	1,126	53,601
Rental and leasing services	210	209	211	212	45,590
Lessors of nonfinancial intangible assets	79	76	74	72	178,060
Professional and business services	27,495	27,955	28,457	28,957	78,591
Professional and technical services	16,949	17,419	17,864	18,300	96,179
Legal services	1,029	1,047	1,066	1,084	83,730
Accounting and bookkeeping	585	587	583	580	63,444
Architectural and engineering	4,758	4,859	4,976	5,101	112,071
Engineering	1,234	1,237	1,235	1,230	97,935
Testing laboratories	3,106	3,188	3,294	3,410	122,496
Other architectural and engineering	418	434	447	461	73,622
Specialized design	267	280	292	305	70,782
Computer systems design and related services	3,189	3,324	3,419	3,493	103,331
Management and technical consulting	2,385	2,402	2,426	2,452	96,251
Scientific research and development	2,952	3,049	3,136	3,219	102,672
Physical, engineering, and bio. research	2,745	2,845	2,935	3,022	105,772
Social science and humanities research	207	204	201	197	64,425
Advertising, PR, and related services	228	226	223	220	66,970
Other professional and technical services	1,556	1,644	1,743	1,846	48,834
Management of companies and enterprises	1,224	1,264	1,275	1,274	173,252
Administrative and waste services	9,323	9,272	9,318	9,383	36,405
Administrative and support services	8,673	8,604	8,634	8,684	33,515

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

	Estimated 2018	Forecast 2019	2020	2021	Average Wage 2017
Administrative and support services (continued)					
Office administrative services	585	581	581	582	107,474
Employment services	5,177	5,101	5,116	5,144	24,853
Business support	357	354	353	352	44,588
Services to buildings and dwellings	1,682	1,684	1,694	1,707	30,828
Other administrative and support services	872	885	891	899	38,472
Waste management and remediation services	650	668	684	698	79,676
Private education and health services	26,683	26,984	27,377	27,839	52,250
Private educational services	3,170	3,157	3,168	3,181	36,503
Private elementary and secondary schools	1,045	1,041	1,041	1,043	38,842
Other private educational services	2,126	2,116	2,127	2,138	35,381
Private health care and social assistance	23,513	23,826	24,209	24,658	54,406
Ambulatory health care services	9,747	9,959	10,199	10,469	73,255
Offices of physicians	4,692	4,867	5,053	5,254	106,136
Offices of dentists	1,295	1,306	1,320	1,338	55,054
Offices of other health practitioners	743	771	796	823	42,470
Home health care services	1,444	1,423	1,414	1,410	29,995
Other ambulatory health care services	1,573	1,593	1,616	1,644	59,587
Nursing and residential care facilities	4,357	4,357	4,382	4,419	29,980
Community care facilities for the elderly	2,123	2,138	2,160	2,187	32,672
Other nursing and residential care facilities	2,233	2,219	2,222	2,232	27,762
Individual and family services	1,068	1,097	1,108	1,142	23,768
Child day care services	1,166	1,183	1,200	1,219	21,303
Hospitals, emergency relief, and vocational rehabilitation services	7,176	7,230	7,319	7,408	$53,112
Leisure and hospitality	17,772	18,025	18,300	18,582	19,766
Arts, entertainment, and recreation	2,434	2,483	2,550	2,626	23,260
Amusements, gambling, and recreation	1,949	1,989	2,042	2,098	18,919
Golf courses and country clubs	537	551	566	579	21,412
Fitness and recreational sports centers	1,064	1,091	1,127	1,168	17,455
Other amusements, gambling, recreation	349	347	348	351	19,049
Performing arts, spectator sports, museums, and parks	485	493	509	528	40,495
Accommodation and food services	15,338	15,542	15,750	15,957	19,242
Accommodation	1,313	1,306	1,297	1,291	25,151
Food services and drinking places	14,025	14,236	14,453	14,666	18,674
Special food services	1,108	1,119	1,138	1,155	22,684
Drinking places, alcoholic beverages	809	813	824	841	20,182
Restaurants and other eating places	12,108	12,304	12,491	12,670	18,202
Full-service restaurants	6,401	6,513	6,612	6,707	20,527
Limited-service restaurants	4,890	4,969	5,050	5,127	15,848
Cafeterias and nonalcoholic beverage bars	817	822	829	836	13,348
Other services	5,078	5,098	5,135	5,189	31,744
Repair and maintenance	1,045	1,054	1,067	1,079	40,702
Personal and laundry services	1,353	1,359	1,366	1,375	28,381
Membership associations and organizations	1,789	1,793	1,799	1,808	36,673
Private households	890	892	903	926	15,974
Unallocated private services	195	191	191	191	60,659
Addendum					
Unemployment rate	3.2	2.8	2.6	2.5	