

THE ECONOMIC OUTLOOK FOR WASHTENAW COUNTY IN 2021–2023

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Introduction: the Current State of Washtenaw County's Economy

Washtenaw County's economy has recovered substantial ground from the losses it suffered at the beginning of the COVID-19 recession, but there is more work to be done. The county's economy held up better than the state of Michigan's at the start of the recession: the number of jobs in Washtenaw County declined by 16 percent from February to April 2020, whereas the number of jobs in Michigan fell 23 percent in that time.¹ The state, however, rebounded more quickly than Washtenaw in the early stages of the recovery. By the fourth quarter of 2020 the decline in jobs in the state from the first quarter was only slightly worse than in Washtenaw (9.8 percent compared to 8.3 percent).² The dominant role that higher education plays in Washtenaw's economy tempered the impact of the recession on the way down, but the pandemic's disruptions to in-person education have slowed the county's rebound on the way back up. Looking forward our forecast attempts to answer two questions: First, how long will it take for Washtenaw County's economy to recover from the COVID-19 recession? Second, what will Washtenaw's economy look like in the post-COVID era?

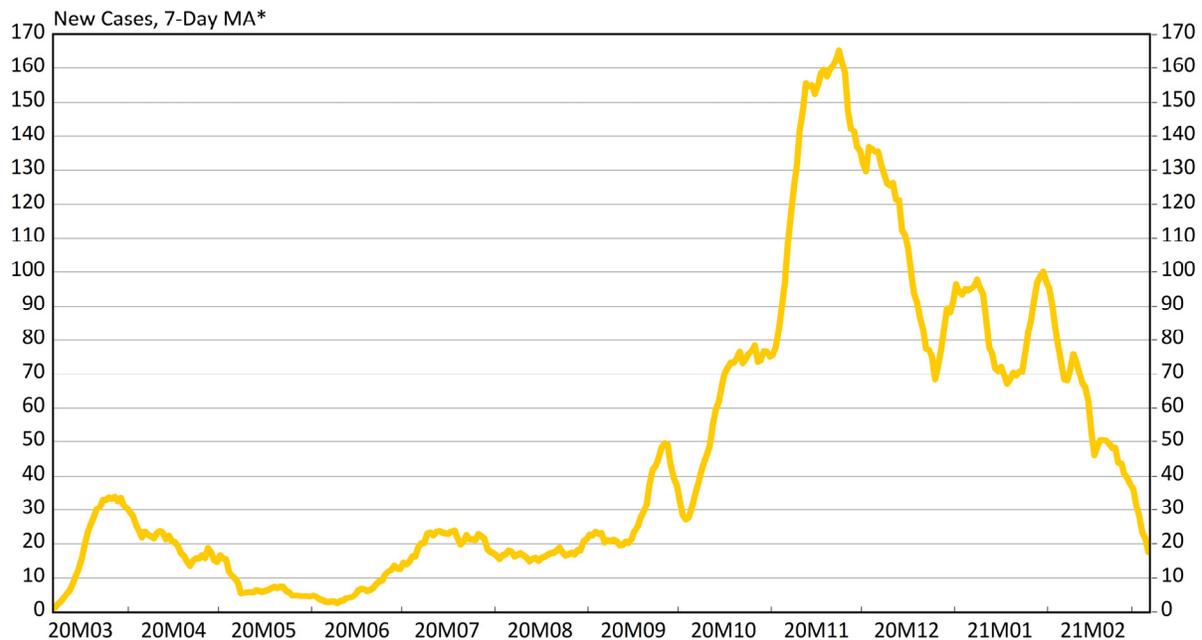
The future path of the pandemic will play the most important role in determining how quickly the economy recovers. Figure 1 shows that the seven-day moving average of new confirmed cases of COVID-19 in Washtenaw has plummeted from 165 new cases on November 23rd to 18 new cases as of March 6th. Although the pandemic's second local wave started to recede before vaccinations began to be administered, we believe that vaccinations will reinforce and expedite the decline in new cases and prevent future waves. Unfortunately, the county's pace of

¹ Unless otherwise noted, all monthly and quarterly data in this report is reported on a seasonally adjusted basis. When the data is not published in a seasonally adjusted format, we have seasonally adjusted it ourselves to facilitate comparisons over time and across series.

² The December 2020 household employment count in Washtenaw County remained 7.4 percent below its February level, relative to a gap of 6.8 percent for the state overall.

vaccinations decelerated throughout February, with only 11,868 doses administered in the final week of February after 15,752 doses were administered in the last full week of January. We believe this slowdown is only temporary, and that the pace of vaccinations will increase in the near future with the authorization of Johnson & Johnson's single-shot vaccine. The new vaccine should help alleviate some of the supply constraints that the state of Michigan and Washtenaw County have been facing.

Figure 1
New Cases of COVID-19 in Washtenaw County



Source: MDHHS as of 03/08/2021

*Data is subject to revisions

Figure 2 shows the seasonally adjusted monthly unemployment rates in Michigan and Washtenaw County. The unemployment rate in the county peaked at 14.7 percent in April 2020 as private precautions and statewide restrictions forced the economy into a deep recession amid the first wave of COVID-19. As the first wave began to recede and the public health situation improved, employment among Washtenaw residents recovered briskly in the late spring and

summer. Although the recovery slowed down last fall, by December 2020 the county's unemployment rate had fallen to 5 percent.

Figure 2
Monthly Unemployment Rates in Michigan and Washtenaw County

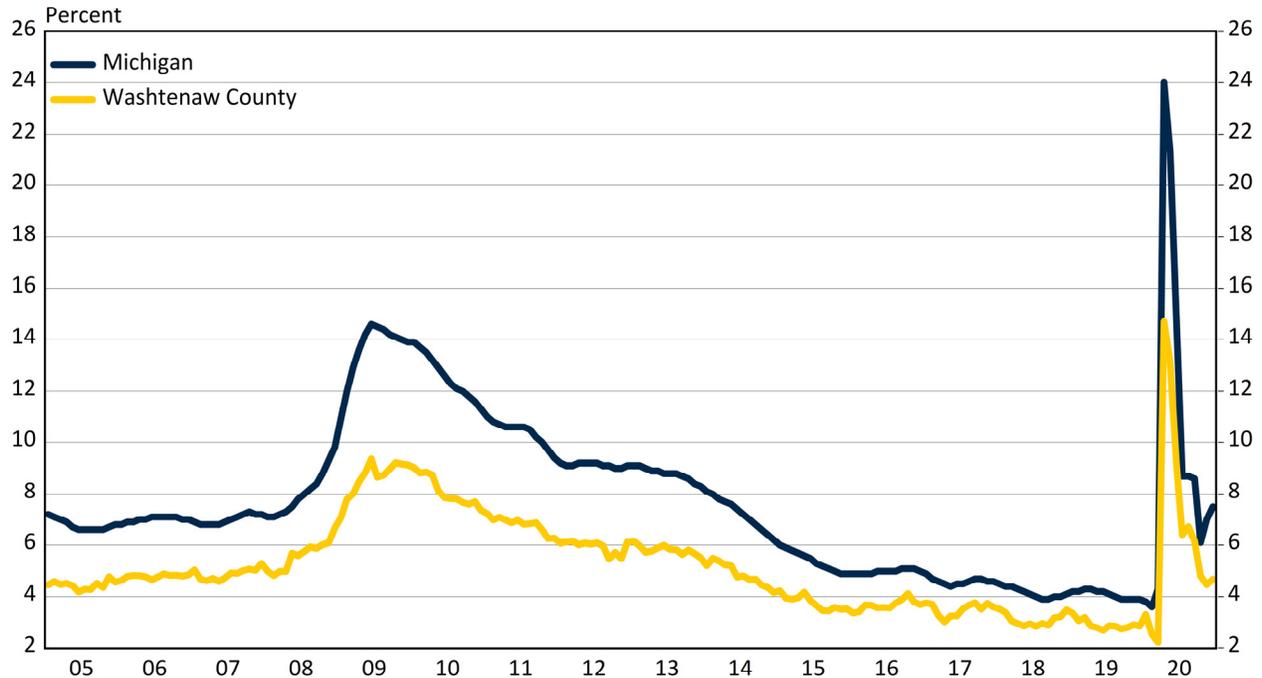
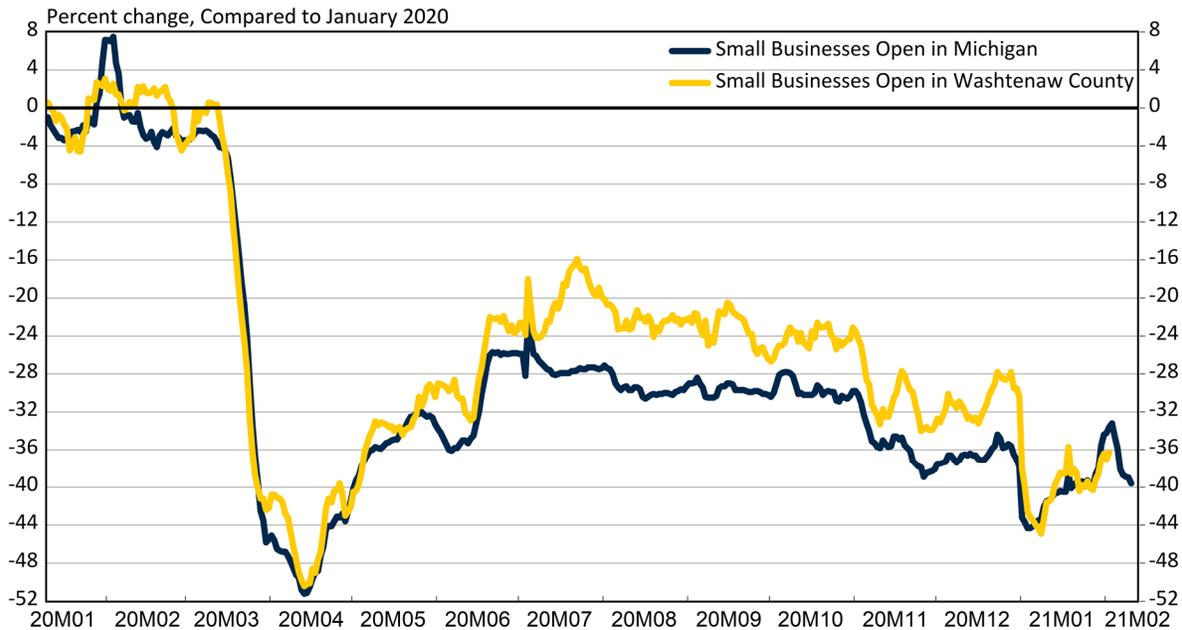


Figure 3 compares the proportion of small business locations in Michigan and Washtenaw County that were closed on any given day, relative to the January 2020 average. The small business closure rate in the county stabilized around 24 percent in September and October 2020, but as the severity of the second wave increased in November, the small business closure rate rose by 6 percentage points. It is important to note that the closure rate began to rise prior to the Pause to Save Lives that took effect November 18th. As of early February, Washtenaw's small business closure rate was in the 36–37 percent range. However, we anticipate the strong economic recovery from last summer to resume this spring as the public health situation continues to improve, vaccinations accelerate, and the warmer weather lures people outdoors.

Figure 3
Small Business Closures in Michigan and Washtenaw County



Source: Womply via Opportunity Insights

We expect progress against the COVID-19 pandemic to allow economic activity to return largely to normal by this summer and fall, leading to a vigorous economic recovery. We forecast that Washtenaw County's unemployment rate will decline to an average of 2.7 percent in 2023, which would be 0.2 percentage points lower than its level in 2019. There are several reasons for our relatively optimistic forecast. Our first, and most important, reason is the rapid improvement in the public health situation. Our second reason is the aggressive economic policy response to the recession. The \$900 billion fiscal relief package that Congress passed in December 2020, together with the \$1.9 trillion American Rescue Plan passed this month should also jumpstart the recovery. We suspect many people will be surprised by the strength of the economic recovery after the COVID-19 pandemic subsides.

Before examining our forecast for Washtenaw County's economy over the next three years, we first turn our focus to how Washtenaw County's pre-COVID-19 prosperity was distributed geographically and demographically throughout the county.³

Shared Prosperity in Washtenaw County

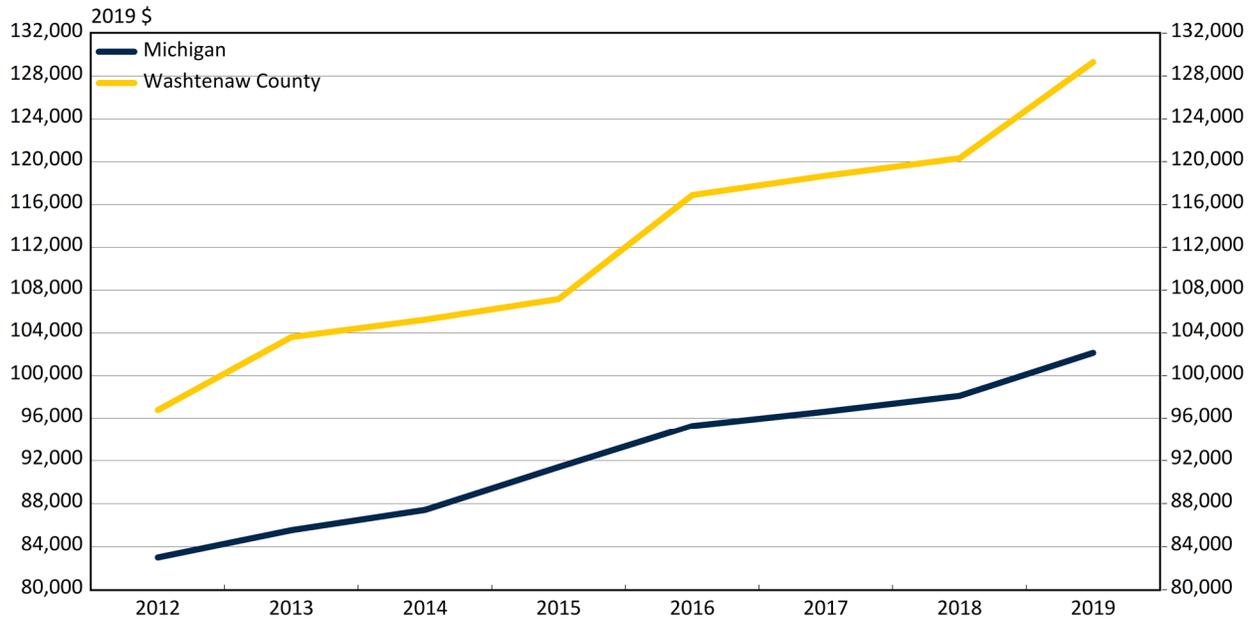
Figure 4 shows average household income for residents of Washtenaw County compared to residents in Michigan for the years 2012 to 2019. The average income measure shown is adjusted for household size and differences in cost of living in different parts of the state as described in our report for the Southeast Michigan Council of Governments, [Evaluating Shared Prosperity in Southeast Michigan, 2012–2018](#).⁴ All income figures have also been adjusted to be expressed in 2019 inflation-adjusted dollars.

Washtenaw County's affluence relative to Michigan overall is readily apparent. Despite Washtenaw's high cost of living, the average adjusted income in Washtenaw County is significantly higher than in the rest of the state. Furthermore, between 2012 and 2019, the real income of Washtenaw County residents grew at a faster rate than the real income of Michigan residents overall. Between 2012 and 2019, the average annual, inflation adjusted, three-person equivalent household income grew from \$97,000 to \$129,000, an increase of one-third. Over the same time, the average annual, inflation adjusted, three-person equivalent household income of Michigan residents increased by nearly one-quarter, from \$83,000 to \$102,000.

³ We have included our longstanding review of how our forecast from last year fared as Appendix A to this report.

⁴ We made two modifications to our methodology from the methodology used in the Evaluating Shared Prosperity report. First, to adjust for cost of living, we use the BEA's Regional Price Parity index but do not adjust for differences in PUMA-level housing costs within the same Metropolitan Statistical Area (MSA). Second, we classify lower-, middle-, and upper- income households based on the national median cost-of-living and household-size adjusted income rather than the national median income of three person households.

Figure 4
Average Three-Person Household Income in Washtenaw County and Michigan

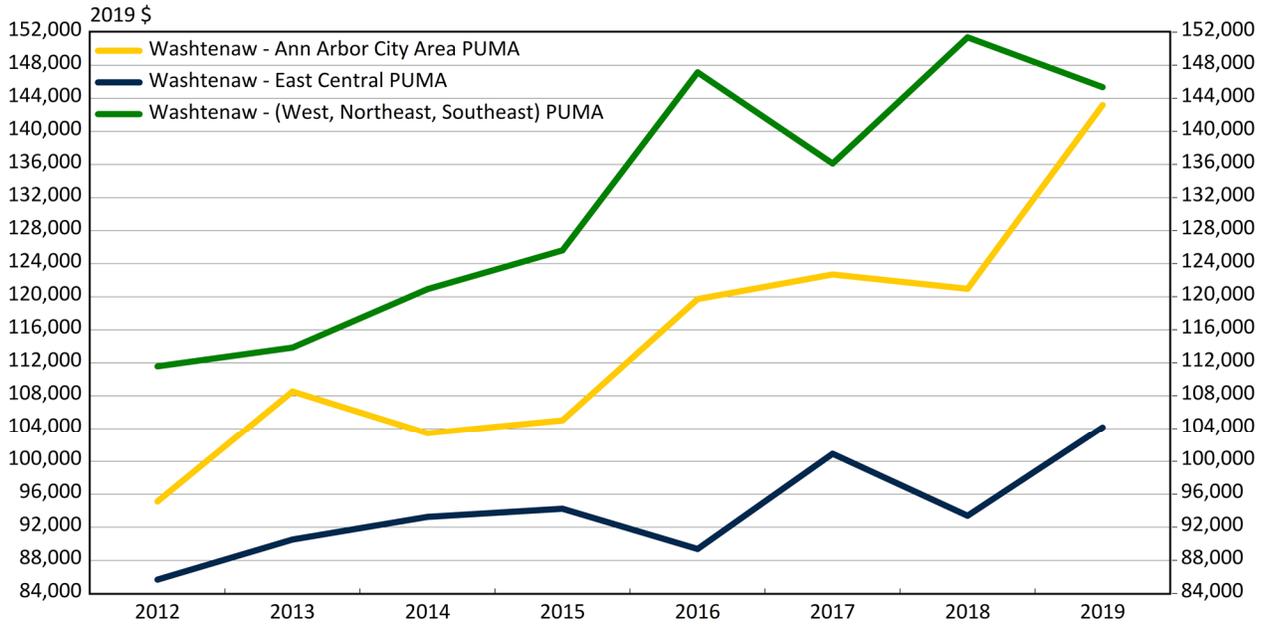


Despite the relative prosperity of Washtenaw County, large disparities exist across the county's geographical regions. Figure 5 shows household income for residents of the three geographic regions of Washtenaw County designated by the Census Bureau (Public Use Microdata Areas, or PUMAs).⁵ Those areas are the East Central (Ann Arbor City Area) PUMA, which we will call the Ann Arbor PUMA; the West, Northeast, and Southeast PUMA, which we will call the Western PUMA; and the East Central (Outside Ann Arbor City) PUMA, which we will call the East Central PUMA. Three-person household incomes are much higher in the Ann Arbor PUMA and the Western PUMA as compared to the East Central PUMA. In addition, Figure 5 shows that the disparities in incomes between the different parts of the county have been increasing since 2012. While real incomes in the relatively more affluent parts of the county have been growing rapidly, 50 percent in Ann Arbor City Area and 30 percent in the Western PUMA, real three-

⁵ Appendix B displays a map of these three PUMA areas within the county.

person equivalent household income in the eastern part of the county outside of Ann Arbor have grown only 22 percent over this time period.

Figure 5
Average Three-Person Equivalent Household Income in Washtenaw County PUMAs



The economic disparities in Washtenaw County are also visible across demographic groups. Table 1 shows the proportions of Washtenaw County residents living in lower-, middle-, and upper-income households broken down by race and ethnicity.⁶ Although only 20 percent of non-Hispanic White and 25 percent of non-Hispanic Asian county residents live in lower-income households, that proportion was 35 percent for non-Hispanic Black and Hispanic residents. By comparison, 39 percent of non-Hispanic Asian and 35 percent non-Hispanic White residents live in higher-income households, versus 18 percent of non-Hispanic Black and 21 percent of Hispanic residents. Although the disparity in the income distribution between White and Asian households

⁶ We define the threshold between lower- and middle- income households to be two-thirds the median three-person equivalent household income in the United States, adjusted for local cost of living and household-size. We define the threshold between middle- and upper- income households to be twice the adjusted national median income. Those thresholds were \$51,000 and \$153,000 for a three-person household in 2019. The thresholds were \$41,600 and \$124,900 for a two-person household and \$29,400 and \$88,300 for a single-person household.

and Black and Hispanic households is wide in Washtenaw County, the gap is much wider in the state and nation overall. For instance, in 2019, 23.1 percent of non-Hispanic White residents of Michigan lived in lower-income households and 20.4 percent lived in higher-income households; those proportions were 47.2 percent and 10.6 percent, respectively, for non-Hispanic Black residents.

Thus, although real household income grew rapidly in Washtenaw County in the years prior to the pandemic and was high relative to Michigan overall, there were large economic disparities within the county, along both geographic as well as racial and ethnic lines even prior to COVID-19.

Table 1
Population in Lower-, Middle-, and Upper- Income Households by Race and Ethnicity, Washtenaw County, 2019

	Lower Income Population	Middle Income Population	Upper Income Population
All Race/Ethnicity	24%	45%	32%
Hispanic	35%	44%	21%
Non-Hispanic Asian	25%	37%	39%
Non-Hispanic Black	35%	47%	18%
Non-Hispanic White	20%	46%	35%

National Outlook 2021–2023

Figure 6 displays our baseline forecast for the level of U.S. real GDP through 2023.⁷ Perhaps surprisingly, the pandemic-related turmoil led to an annual real GDP decline of only 3.5 percent in 2020, as unprecedented federal fiscal support insulated the economy from a more severe contraction. We expect real GDP to return to its pre-pandemic level by mid-2021 as the pandemic continues to subside and the \$1.9 trillion spending package in the recently passed American Rescue

⁷ 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.

Plan helps to support the economy. Our forecast translates to annual real GDP growth of 4.8 percent in 2021. Real GDP growth moderates to 3.9 percent in 2022 and 2.6 percent in 2023 as the effects of the federal spending and stimulus wear off.

Figure 6
Real Gross Domestic Product

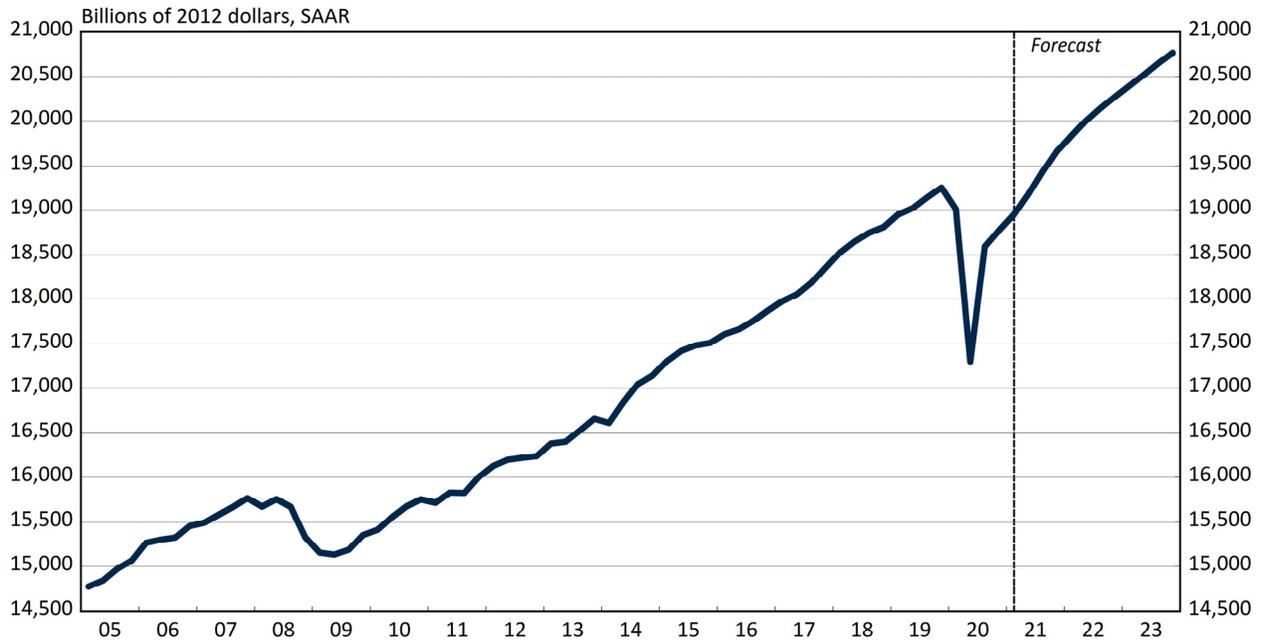
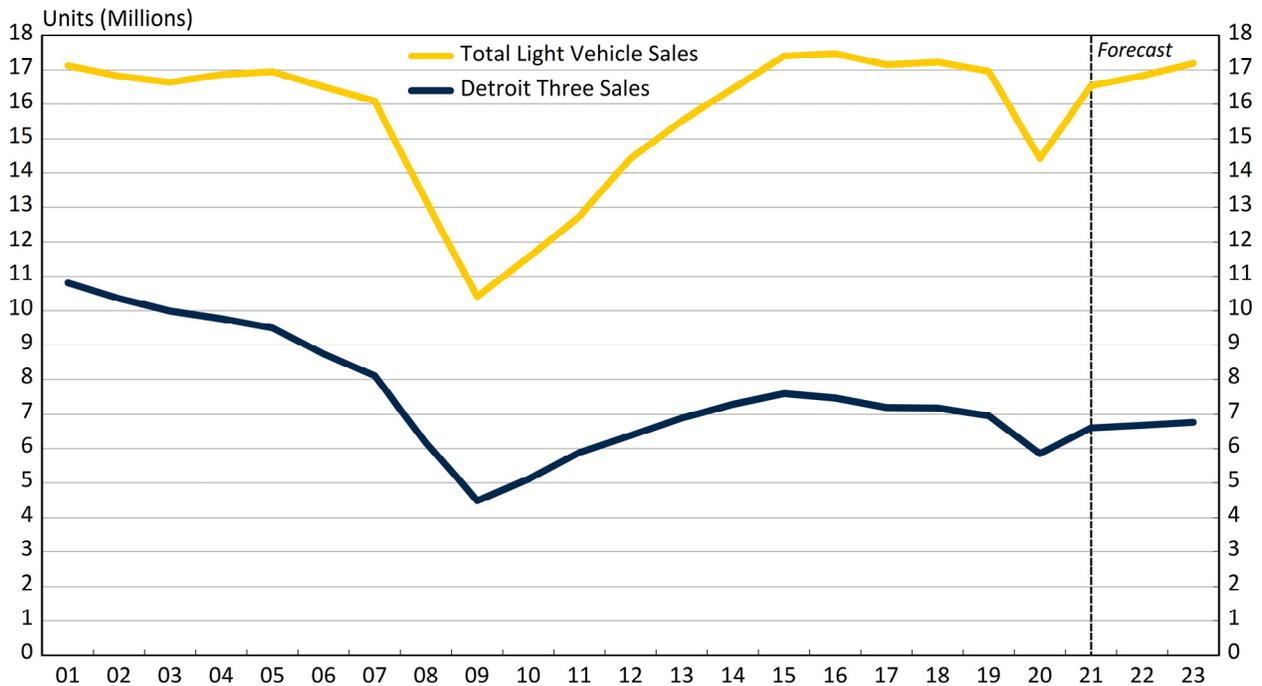


Figure 7 shows our forecast for national and Detroit Three light vehicle annual sales. Total vehicle sales fell from 17 million in 2019 to 14.4 million in 2020, with the bulk of that loss occurring in the second quarter of last year. We are forecasting light vehicle sales to rebound to 16.5 million units this year, 16.8 million units in 2022, and 17.2 million units in 2023. Although our projected sales pace for 2021 remains 2.5 percent below pre-pandemic levels, we consider our forecast to lean a bit toward the optimistic side in light of the many uncertainties surrounding the automotive industry such as the ongoing semiconductor shortage.

Our baseline forecast assumes that the shortage of semiconductors will have a limited effect on Michigan's recovery, but the shortage does pose a serious downside risk to the state's auto

industry. The shortage has already caused slowdowns at the Detroit Three automakers, but we expect production in Michigan to be less affected than elsewhere. We believe the Detroit Three automakers will prioritize truck and large SUV production at the expense of smaller vehicles, both because the larger vehicles are more profitable and because it will be more difficult to make up production for those models in the future. That logic should favor production in Michigan, although if the shortages intensify, there is a risk that the state’s auto industry could suffer more than we are forecasting.

Figure 7
Total U.S. vs. Detroit Three Light Vehicle Sales



Detroit Three sales fell from just under 7 million units in 2019 to 5.9 million units in 2020, and we do not expect a full recovery during our forecast period. As the pandemic subsides and consumers regain their confidence, we are predicting sales to nudge up to 6.6 million units this year, to 6.7 million units in 2022, and to 6.8 million units in 2023. Despite those gains, we expect

the Detroit Three's share of total national sales to continue its downward trend from the past decade, falling from 40.5 percent in 2020 to 39.4 percent by 2023.

Washtenaw County Outlook: 2021–2023

Our economic outlook for Washtenaw County through 2023 encompasses unemployment, employment, inflation, and real wages. As described above, 2019 was, in aggregate, a great year for household income in Washtenaw County and in the state of Michigan. It was also a great year in the labor market. From the bottom of the Great Recession in the summer of 2009, Washtenaw County had enjoyed over ten years of economic growth, cumulating to 37,300 job additions from calendar year 2009 to 2019. The county's employment growth rate of 1.9 percent per year substantially exceeded the U.S. and Michigan average rates of 1.4 percent per year over the same period.

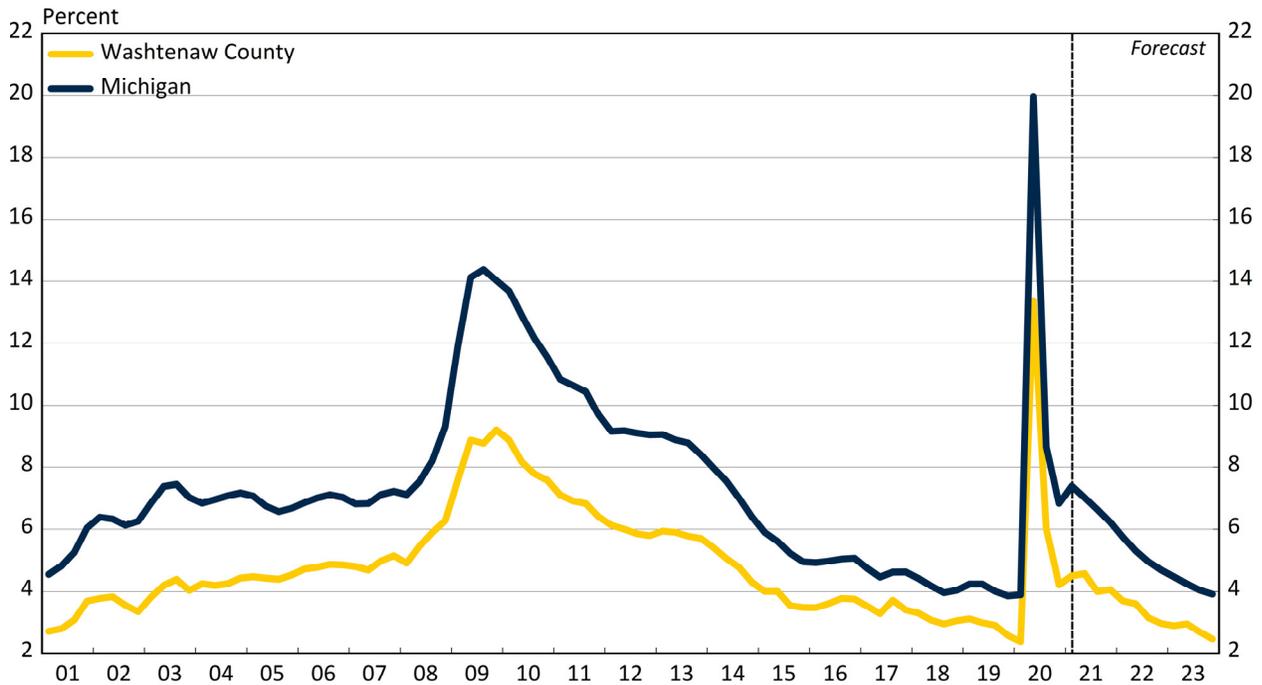
Unemployment Rate

Perhaps the best way to visualize the benefits from Washtenaw's pre-pandemic economic expansion is to look at the unemployment rate in Washtenaw County and Michigan since 2001 as shown in Figure 8. Michigan's unemployment rate fell from 14.4 percent in the summer of 2009 to 3.9 percent in the fall of 2019, while the unemployment rate in Washtenaw County declined from a peak of 9.2 percent in the fall of 2009 to a low of 2.4 percent in the first quarter of 2020.

Then came the COVID-19 recession, which caused an unprecedented jump in the unemployment rate in the second quarter of 2020, to 20.0 percent statewide and 13.4 percent in the county. The recovery from the recession started vigorously in the summer of 2020, before retrenching in the fall in response to a resurgence of COVID-19 cases. By the fourth quarter of 2020, the unemployment rate had fallen to 4.8 percent in Washtenaw County and 8.2 percent

statewide.⁸ We are forecasting that the unemployment rate in both the state and county will flatten out in the first quarter of 2021.

Figure 8
Seasonally Adjusted Unemployment Rate in Michigan and Washtenaw County



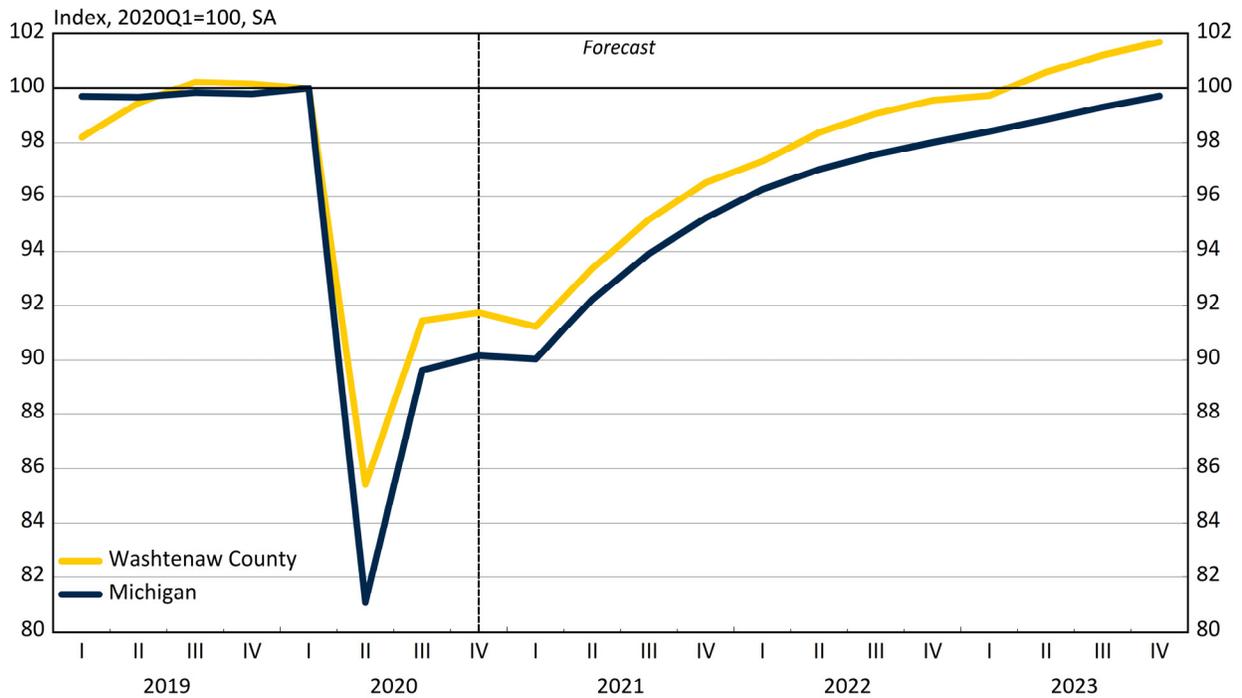
The economic recovery is forecast to resume in the second quarter of 2021, driving the unemployment rate down to 4.1 percent in Washtenaw County and 6.2 percent in Michigan by the end of 2021. By the end of our forecast, in the fourth quarter of 2023, the unemployment rate in the state of Michigan is forecast to be 3.9 percent, exactly equal to the rate in the fourth quarter of 2019. We are forecasting that Washtenaw County's unemployment rate in the fourth quarter of 2023 will be 2.5 percent, 0.1 percentage points below the level reached in the fourth quarter of 2019. Thus, measured by the unemployment rate, both Washtenaw County and the state of Michigan are expected to recover to their pre-pandemic levels by the end of 2023.

⁸ This report was prepared prior to the March 2021 benchmark revisions to the state and county unemployment data. Figure 8 presents the historical data as it informed our forecast.

Employment in Washtenaw compared to Michigan

Figure 9 shows the impact of the COVID-19 recession and subsequent recovery on employment in the county and state. In this figure, seasonally adjusted total wage and salary employment in both Washtenaw County and the state of Michigan are indexed to be equal to 100 in the first quarter of 2020. This technique allows us to compare the movements of employment over time between two geographic areas of vastly different scale.

Figure 9
Seasonally Adjusted Employment in Michigan and Washtenaw County



Payroll employment declined by 19 percent in Michigan and 15 percent in Washtenaw County in the second quarter of 2020 amid the first wave of the COVID-19 pandemic. The county recovered 41 percent of its job losses in the third quarter of 2020 and the state recovered 45 percent of the losses, but the jobs recovery largely stalled in the fourth quarter amid the pandemic’s second wave.

We expect the jobs recovery to resume vigorously in the spring of 2021. By the second quarter of 2023, Washtenaw County will have recovered all the jobs lost during the recession and then some. Employment in the county ends our forecast period at a record high level, 1.7 percent higher than in the first quarter of 2020. The jobs recovery in the state overall lags slightly behind Washtenaw County; by the end of 2023 we expect that total employment in the state will remain about 0.3 percent below the first quarter of 2020 level.

Employment by Industry

Table 2 divides the total job movements we project over our forecast period among twenty-four major industries.⁹ The table includes, for each industry, our preliminary estimates of the level of employment in 2020; the estimated change from 2019 to 2020; the forecast change for each of 2021, 2022, and 2023; and the cumulative change over the three-year period 2020–23. The table also includes the average annual wage for each industry category in 2019.¹⁰ Total employment is forecast to grow by 4,270 jobs, or 2.1 percent, in 2021. Job growth will then accelerate to 4.8 percent in 2022 (9,880 jobs) and 2.3 percent in 2023 (4,910). Cumulative job growth over the next three years is almost 3,000 jobs greater than the number of jobs the county lost in 2020.

The government sector is expected to lose 170 jobs this year; it is the only major industry that we expect to see a job decline this year. Government then rebounds strongly, surpassing its 2019 employment level in 2022. Government adds an additional 1,560 jobs in 2023, so that government employment is 1,690 jobs higher in 2023 than it was in 2019. Almost all of those job gains are in state government, reflecting the resilience of the University of Michigan and Michigan Medicine.

⁹ The appendix divides the job movements into 111 industries including 82 detailed industries.

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.

The private sector industries shown in Table 2 have been organized into two categories: 12 “full-recovery industries” in which employment in 2023 exceeds employment in 2019 and 7 “incomplete-recovery industries”, in which 2023 employment continues to run behind 2019 levels.

Four of the full-recovery industries (information, corporate headquarters, transportation and warehousing, and utilities) actually gained jobs in 2020. Three of these industries paid the highest average wages in the county in 2019, and the other (transportation and warehousing) paid an average wage that was 10 percent above the county average. Transportation and warehousing is expected to see the fourth-fastest job growth of all major industries between 2020 and 2023 (710 jobs or 19.2 percent), with most of these job gains occurring in warehousing. Employment at corporate headquarters is forecast to grow by 169 jobs or 12.1 percent over the forecast period. Job gains in the relatively small utility industry are minor, while gains in information are also modest because continued job losses at newspapers and telecommunications offset gains in software publishing, data processing, and internet-based companies.

Of the eight full-recovery industries that lost jobs in 2020, six had relatively small employment losses in 2020, and two suffered job losses that exceeded the county’s average proportional loss in 2020. Four of these eight industries paid wages that exceeded the countywide average while four paid relatively low wages.

Professional and technical services is the industry that is probably most closely identified with the knowledge economy, and it is the fourth-highest paying major industry in the county. The industry lost relatively few jobs in 2020 (-410), and we expect it to enjoy some of the largest job gains between 2020 and 2023 (1,800 or 10.4 percent). Within this aggregate industry, the largest job gains between 2020 and 2023 are in computer systems design (750 or 23.1 percent) and

engineering and architectural services (350 or 7.4 percent). Accounting services are forecast to lose 4 jobs while legal services are forecast to gain a relatively modest 58 jobs over this period.

The finance and insurance industry is forecast to see relatively small job gains between 2020 and 2023 (79), following relatively small job losses in 2020 (-62). Wholesale trade is forecast to grow by 499 jobs over the next three years.

In contrast to its behavior during prior recessions, the construction industry lost 290 jobs in 2020, or 6.7 percent. We expect construction to add 340 jobs in 2021 and maintain roughly that pace over the following two years. In fact, over the three-year period 2020 to 2023, the construction industry is forecast to grow by 1,030 jobs or 23.4 percent. This would be the fastest growth seen by any major industry in the county. The need for additional trained skilled trade workers will be acute over the next three years.

Employment in private health and social services is forecast to grow by 2,250 jobs, or 9.5 percent, between 2020 and 2023. Most of the job gains will be in physician's offices (740), private hospitals and some other small health care industries (350), and individual and family social services (320). Home health care services is forecast to lose 25 jobs over the next three years.

Employment in real estate and rental services is forecast to grow by 270 jobs, or 11.7 percent, over the next three years, following the loss of 185 jobs in 2020.¹¹ Natural resources and mining, a very small industry locally, is forecast to gain 32 jobs over the next three years, following the loss of 29 jobs in 2020.

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.

Table 2
Forecast of Employment in Washtenaw County by Major Industry Division
 Employment Change

	Estimate 2020	Forecast					Average Annual Wage 2019
		19-'20	20-'21	21-'22	22-'23	20-'23	
Total Jobs (Number of jobs)	202,269	-16,207	4,266	9,882	4,907	19,056	\$61,276
(Annual percent change)		(-7.4%)	(2.1%)	(4.8%)	(2.3%)		
Private Sector	122,409	-13,694	4,434	7,100	3,320	14,853	\$58,795
Total Government	79,861	-2,512	-168	2,783	1,588	4,203	\$65,375
State Government	64,574	-1,960	-10	2,279	1,362	3,631	\$66,408
Full-Recovery Industries							
Management of Companies and Enterprises	1,397	67	22	101	46	169	\$166,914
Utilities	428	5	5	3	2	9	\$155,132
Information	5,033	247	35	77	49	162	\$105,829
Transportation & Warehousing	3,683	159	297	211	200	709	\$67,704
Professional & Technical services	17,226	-415	595	694	510	1,799	\$99,532
Finance & Insurance	3,632	-62	24	31	24	79	\$92,911
Wholesale Trade	5,685	-191	220	158	121	499	\$79,257
Construction	4,382	-294	345	491	191	1,026	\$65,965
Private Health & Social services	23,593	-1,251	664	1,118	467	2,248	\$56,997
Real Estate & Rental	2,327	-185	65	133	75	272	\$52,246
Natural Resources & Mining	255	-29	12	14	6	32	\$32,078
Arts & Recreation	1,682	-833	312	595	296	1,203	\$23,021
Incomplete-Recovery Industries							
Accommodation & Food Services	11,124	-4,461	476	2,099	735	3,309	\$21,008
Retail Trade	14,129	-1,657	335	225	80	639	\$32,476
Other Services	4,346	-783	242	156	69	467	\$33,846
Private Education	2,808	-458	148	223	48	419	\$36,761
Administrative Support & Waste Management	8,327	-946	245	347	112	703	\$38,039
Transportation Equipment Manufacturing	3,604	-1,080	193	206	142	541	\$66,126
Other Manufacturing	8,395	-1,530	201	219	148	568	\$67,216
Unallocated	355	3	0	0	0	0	\$53,279

Employment in arts and recreation fell by 33.1 percent in 2020 (-830 jobs), one of the largest percentage declines in all industries in the county. Employment in this relatively low-wage industry is expected to rebound sharply over the next three years (1,200 jobs), so that employment in 2023 is comfortably above 2019 levels.

We will now turn to the incomplete-recovery industries. The first five industries listed in this group near the bottom of Table 2 all pay relatively low wages. The lowest-paying major industry group is accommodations and food services. The average pay in this industry, which includes a high-proportion of part-time workers, was only \$21,000 in 2019. Employment in accommodations and food services fell by 4,460 or 28.6 percent, in 2020. The greatest percentage of job losses were in accommodations (39.3 percent or 520 jobs), and full-service restaurants (37.5 percent or 2,340 jobs). Limited-service (more commonly known as fast food) restaurants fared better, with a decline of 830 jobs, or 15.7 percent. All of these industries are expected to see relatively large employment gains over the next three years, but none of them will return to 2019 levels.

Retail trade lost 1,660 jobs in 2020, and we are forecasting that this sector will recover only 38.6 percent of these jobs (640) over the next three years. There is a wide variance in performance among individual retail trade industries. Electronic and appliance stores, clothing stores, sporting goods and book stores, and department stores are all forecast to continue to lose jobs over the next three years, following large job losses in 2020. On the other hand, food stores, pharmacies and personal care stores, non-store retailers, and miscellaneous retail stores are all expected to enjoy employment gains sufficient to send employment in 2023 above 2019 levels.

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 lost 780 jobs in 2020 and regain 470 jobs over the next three years. Private education, which includes private colleges as well as private K-12 education, lost 460 jobs in 2020. This industry is forecast to regain almost all of those job losses by 2023.

The manufacturing sector lost 2,610 jobs in 2020, or a decline of 17.9 percent. That was a much bigger fall than in Michigan overall, where the decline was 10.7 percent. The decline in local motor vehicle and parts manufacturing was especially acute in Washtenaw County, with a loss of 1,080 jobs (-23.1 percent). Over the next three years, we expect the local motor vehicle manufacturing industry to recover about one-half of those job losses (541). While last year's employment decline in the other local manufacturing industries was less severe (-15.4 percent), the recovery over the next three years will also be weaker, coming to only one out of every three jobs lost in 2020 (570 out of 1,530). Machinery manufacturing and computer and electronic parts manufacturing add more jobs between 2020 and 2023 than they lost in 2020, while printing is forecast to lose 14 jobs from 2020 to 2023 in addition to its loss of 240 jobs in 2020.

Detailed industries with the largest employment gains

In this section, we briefly discuss our forecast for 75 unique private sector industries. The 15 detailed private sector industries with the greatest job gains between 2015 and 2019 or between 2020 and 2023 are shown in Table 3. The table shows the change in jobs between 2015 and 2019 and our expected gain between 2020 and 2023, as well as the average annual pay in the industry in 2019. We also rank these 75 industries in terms of their job gains in these two periods. Of the 15 private sector industries with the greatest job gains between 2015 and 2019, 11 also rank in the top 15 industries in employment growth between 2020 and 2023. Of the four industries that rank in the top 15 between 2020 and 2023, but are not in the top 15 between 2015 and 2019 (shown at the bottom of the table), three are still among the top half of all industries in terms of job gains.

The exception is employment services, which predominately consists of the temporary help industry. This industry lost 630 jobs between 2015 and 2019, ranking 74th out of 75 industries. We expect it will add 395 jobs between 2020 and 2023, which will rank it 12th among detailed industries.

The most striking pattern in Table 3 is that the industries that gained the most jobs between 2015 and 2019 are also expected to be among the largest job gaining industries during our forecast period. We expect Washtenaw County's pattern of job creation over the next three years to look a lot like it did in the pre-pandemic recent past.

Table 3
Detailed Private-Sector Industries with the Greatest Job Gains in Washtenaw County

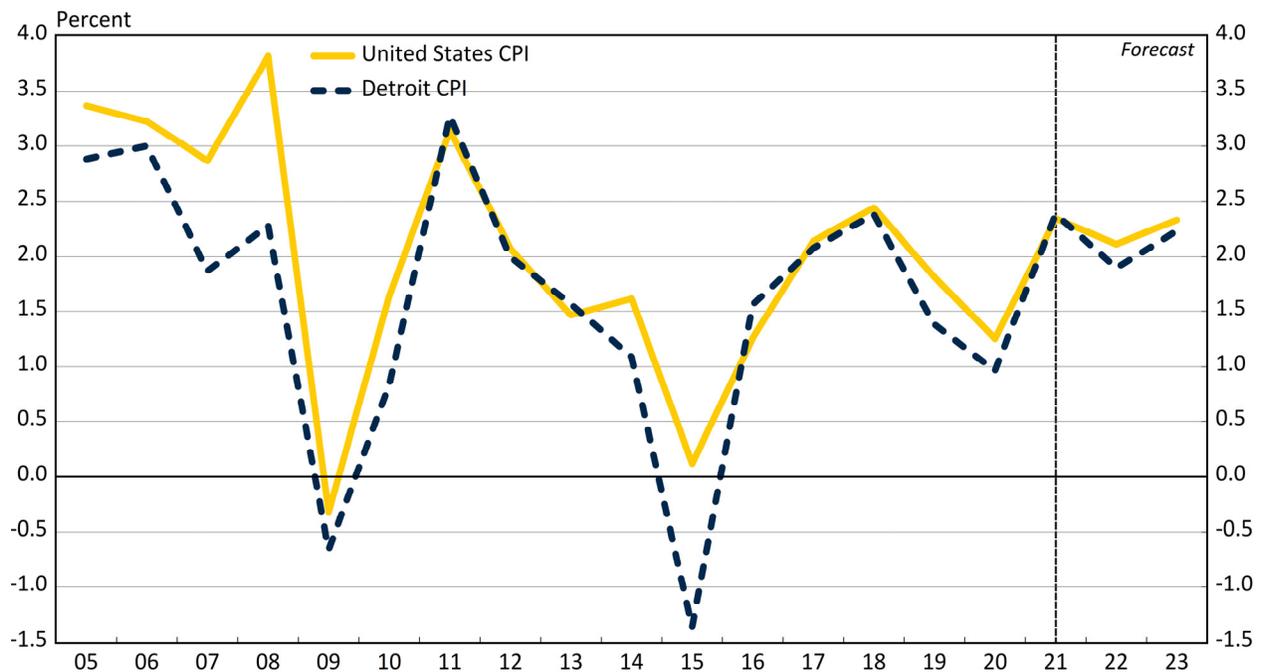
	Historical Job Growth from 2015–2019	Projected Job Growth from 2020–2023	Historical Rank	Projected Rank	Average Annual Wage 2019
Total Payroll Jobs	16,028	19,056			\$61,276
Government	7,247	4,203			\$65,375
Private Sector	8,781	14,853			\$58,795
Detailed Private Sector Industries*					
Wholesale Trade Durable Goods	997	362	1	13	\$84,645
Architectural & Engineering Services	850	354	2	14	\$122,105
Offices of Physicians	829	745	3	5	\$108,529
Air, Ground passenger, Support for Transportation Services, & Warehousing	711	550	4	7	\$75,073
Limited-Service Restaurants	651	810	5	3	\$17,243
Outpatient Care Clinics, Medical Laboratories, Offices except Physicans & Dentists	607	308	6	17	\$55,408
Computer Systems Design & Related Services	590	750	7	4	\$101,382
Private Hospitals, Emergency & Vocational Rehabilitation Social Assistance	581	348	8	15	\$52,777
Transportation Equipment Manufacturing	522	541	9	8	\$66,126
Residenital & Nonresidential Building Construction	514	406	10	10	\$58,866
Management & Technical Consulting Services	489	215	11	21	\$103,805
Specialty Trade Contractors	407	606	12	6	\$66,519
Individual & Family Social Assistance	365	165	13	30	\$25,251
Arts, Entertainment & Recreation Services	302	1,203	14	2	\$23,021
Specialized Design, Advertising, and Other Professional & Technical Services	297	209	15	22	\$54,484
Full-Service Restaurants	255	1,567	20	1	\$22,831
Private Education Services	144	419	28	9	\$36,761
Accomodations	248	399	21	11	\$27,182
Employment Services	(626)	395	74	12	\$26,044

*A ranking of 1 is the highest job growth observed in a given period, while a ranking of 75 is the lowest job growth observed over that period. The historical rank is based on job gains from 2015–2019, while the projected rank is based on our forecast of job growth from 2020–2023.

Inflation

Figure 10 shows that we expect price inflation to rebound in 2021 to 2.3 percent in the U.S. and 2.4 percent in the Detroit region following a period of very low inflation in 2020 (1.3 percent in the U.S. and 1.0 percent locally).¹² We think inflation will fall back to about 2.0 percent in 2022 before returning to a rate just north of 2.0 percent in 2023. Our forecast translates into the highest three-year rate of local price inflation since the 2010 to 2013 period, but despite some supply chain bottlenecks and a historical fiscal stimulus, we do not expect high inflation to be a major problem over the next three years, although one of risk to our forecast is that inflation could turn out higher than we are forecasting.

Figure 10
Inflation Rate, National and Detroit CPI



¹² We measure local price inflation using the Consumer Price Index for Detroit region because the Bureau of Labor Statistics does not publish a local inflation measure for Washtenaw County.

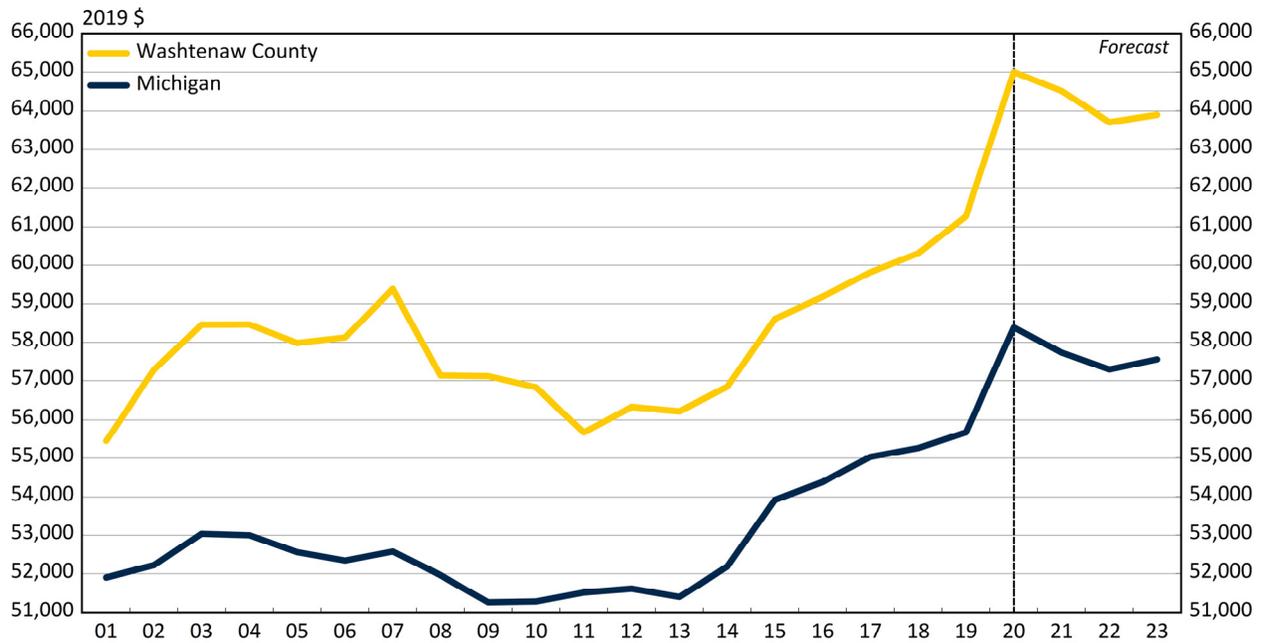
Real Wage

Figure 11 shows the average real wages for all workers in Washtenaw County and Michigan from 2001 to 2023, expressed in 2019 dollars.¹³ The first thing to notice in this figure is that the average wage is consistently about 10 percent higher in the county than in the state of Michigan overall. Real wage growth for all workers in the county averaged 1.2 percent per year between 2001 and 2007, with average real wages in the county reaching a peak of \$59,400 in that year. They then began to fall during and after the Great Recession, reaching a low of \$55,700 in 2011 (a decline of 6.2 percent over that four-year period). The average real wage in Michigan peaked in 2003, and then slowly declined to a low of \$51,300 in 2009. The average real wage in the state then remained fairly constant until 2013.

The average real wage started growing in Washtenaw County in 2012 and in the state of Michigan in 2014. Between 2011 and 2019, the average real wage in Washtenaw County increased by 1.2 percent per year, reaching a record high of \$61,300. The average real wage in Michigan increased by 1.3 percent per year between 2013 and 2019, also reaching a record high of \$55,700. Thus, the 2010s were a period of relatively rapid average real wage growth both in Washtenaw County and in the state of Michigan.

¹³ 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 consideration is likely less problematic over the longer term than at the business cycle frequency. That said, 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. Personal Consumption Expenditure Price Index.

Figure 11
Average Real Wage for Michigan and Washtenaw



The COVID-19 recession generated what many people will see as a very surprising change in the average wage between calendar years 2019 and 2020. The average real wage jumped by 6.1 percent in Washtenaw County and 4.9 percent in the state of Michigan. Part of that growth came from the unexpected slowdown in inflation, but the biggest reason that real wages skyrocketed during 2020 was the changing mix of employment. The country, state, and county all saw a disproportionate loss of lower-paying jobs relative to higher-paying jobs. Indeed, as we discussed above, some high-paying industries actually saw employment levels increase. This change in the mix of jobs is one of the most unique characteristics of the COVID-19 recession from a macroeconomic perspective.

Figure 12 shows the average real wage from 2001 to 2023 for three industry group combinations. The first group comprises traditional blue-collar industries; the second is service-providing industries that tend to employ highly-educated workers, which we call higher-education

service industries; and the third are service-providing industries that tend to employ less well-educated workers, which we call lower-education service industries.¹⁴

Figure 12
Average Real Wage for Washtenaw by Industry Groupings

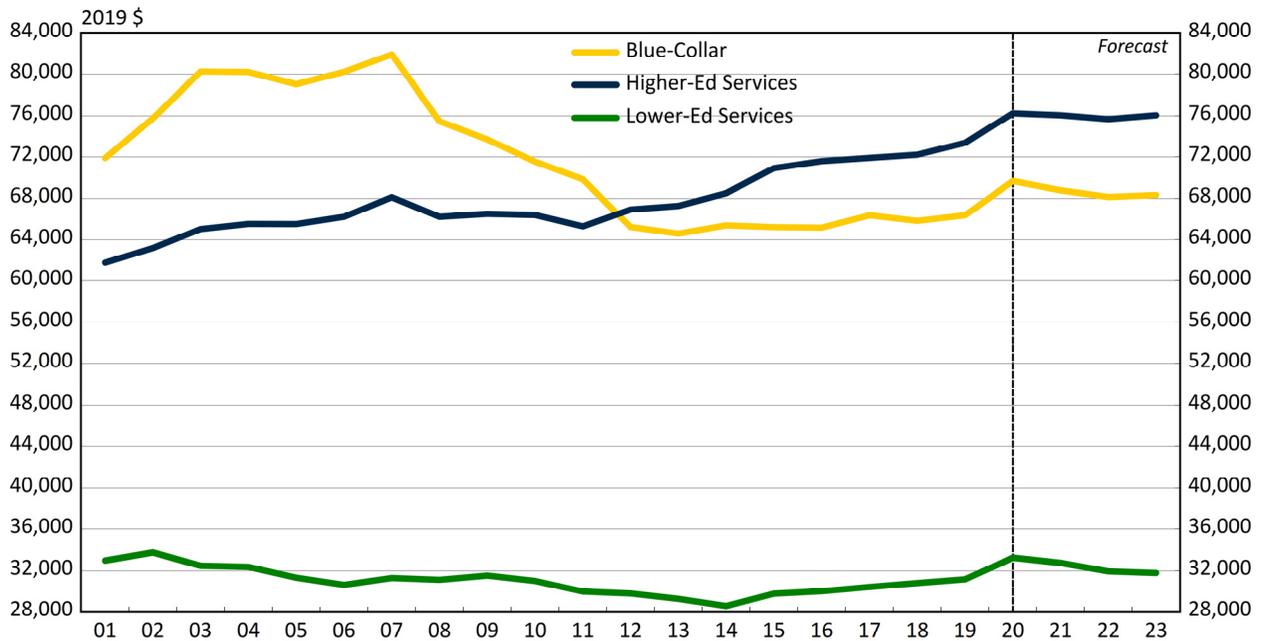


Figure 12 shows several historical trends, which appear to have remained intact during and following the COVID-19 recession. First, prior to the Great Recession and the turmoil it caused in the motor vehicle manufacturing industry, average wages in the blue-collar industries substantially exceeded average wages in the higher-education services industries. Since the Great Recession, average wages in the blue-collar industries have fallen, while average wages in the higher-education service industries have risen. By 2019, the average pay in the higher-education industries

¹⁴ Blue-collar industries include natural resources and mining, construction, manufacturing, and transportation and warehousing. Higher-education service industries include government except for the post office, education, ambulatory health care services except for home health care services, hospitals, professional services, corporate headquarters, wholesale trade, utilities, finance and insurance, and information services except for telecommunications. Lower-education service industries include retail trade, leisure and hospitality services, real estate and rental services, business support services such as temporary help services, telecommunication services, home health care services, residential care services, day care services, and the miscellaneous other services category, which includes repair and personal services.

was 10.5 percent above average pay in blue-collar industries. Second, both the blue-collar and higher-education services industries pay at least twice as much as the lower-education services industries, which we note again feature a higher proportion of part-time jobs than the other two categories.

The 2020 recession caused a spike in average wages in all three industry groups: 4.9 percent in blue-collar; 3.9 percent in higher-education services; and 6.6 percent in lower-education services. The relatively big jump in lower-education services reflects the fact that even in this generally lower paying industry group it was the lowest-paid industries (arts and recreation and accommodations and food services) that lost the greatest share of jobs in 2020.

The real average wage in all three of these industry groups declines in 2021 and 2022 as inflation picks up and lower-wage workers return to the job. By 2023, real wages are expected to be 2.9 percent higher than their 2019 levels in blue-collar industries; 3.7 percent higher in higher-education service industries; and 2.0 percent higher in lower-education service industries.

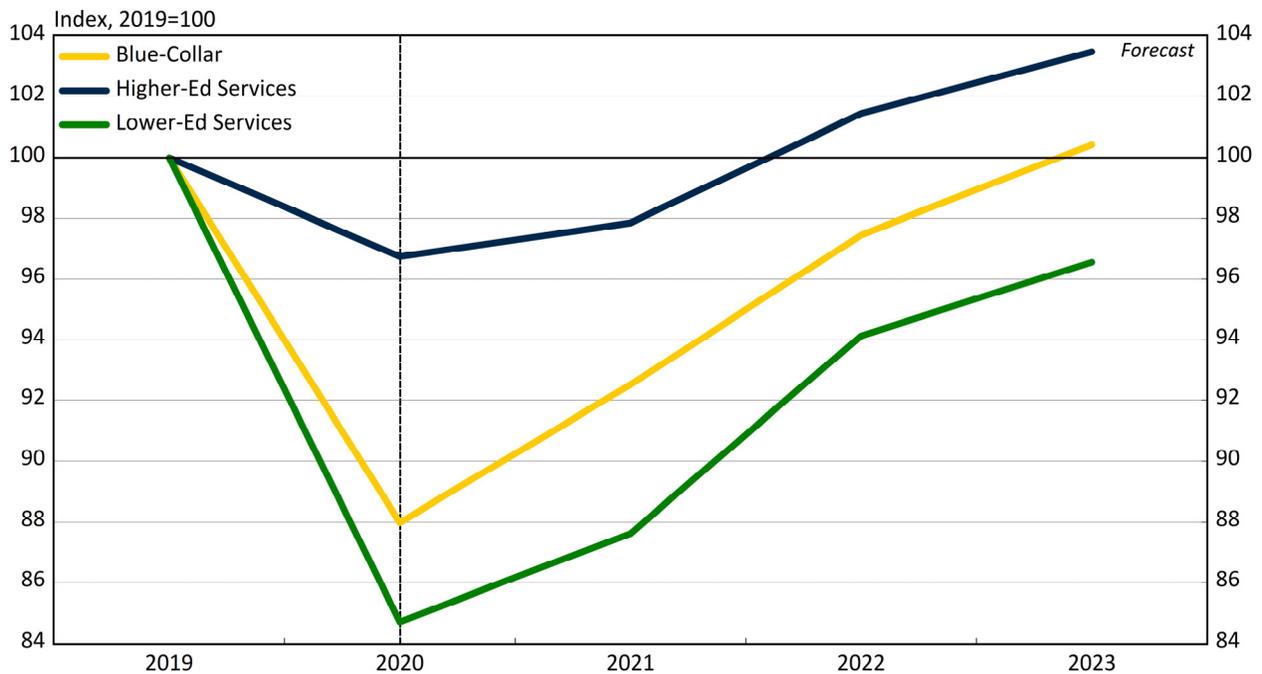
Employment by type of industry

Figure 13 shows how we expect employment in the above-mentioned three industry groups to evolve between 2019 and 2023. Employment in higher-education services industries declined by 3.3 percent in 2020, less than one-half the overall rate of job loss in the county. Employment in blue-collar industries declined by 12 percent in 2020, with manufacturing accounting for almost all of that loss. Finally, employment in lower-education services industries declined by 15.3 percent in 2020.

All three industry groups are expected to regain some of the lost jobs in 2021 but to remain below their 2019 employment levels. The number of jobs in the higher-education attainment services industries recovers to above 2019 levels in 2022, while employment in the other two groups takes longer to recover. By 2023, the number of jobs in higher-education services industries

is forecast to average 3.5 percent above its 2019 levels, while the number of jobs in the blue-collar industries is expected to average 0.5 percent higher than its 2019 levels, driven by strong growth in construction and transportation and warehousing. We expect that the number of jobs in lower-educational attainment industries during 2023 will remain 3.4 percent lower than the 2019 level owing to the large job losses these industries experienced during the pandemic.

Figure 13
Washtenaw County Employment by Industry Groupings



Conclusion

Our expectations for the Washtenaw economy rely on a national economic forecast that delivers solid growth throughout 2023. While we do not expect a national or statewide shutdown from another wave of COVID-19, the pandemic remains in the driver seat of Washtenaw's economic outlook, and it remains our largest risk. As the public health situation improves, we expect another risk to the Washtenaw economy to emerge: labor shortages are bound to return as

the labor market tightens. We believe labor shortages will turn into a growing problem as Washtenaw County moves into the post-COVID era. As the populace ages, the county will need to continue to draw workers in from elsewhere to maintain its historical growth pace. That being said, we always like to emphasize that a labor shortage is a much better problem for a local economy to face than a jobs shortage.

Our view continues to be that the economy of 2019 was fundamentally a healthy one, and we expect those fundamentals to return once the pandemic subsides. Despite the downside risks, our baseline forecast for Washtenaw County is that it will enjoy three years of economic growth as it recovers from the pandemic. We forecast that the county will recover all the jobs it has lost due to the COVID-19 recession, and that by 2023, the county's payroll job count will stand 2,800 jobs higher than its 2019 level. While we expect average real wages to decline over the next two years, we believe that they will decline for an encouraging good reason, the return of lower-paid workers to the job.

Although we remain optimistic about Washtenaw's future, the path moving forward will not be an easy one. The COVID-19 pandemic has caused a sharp contraction in economic activity throughout the nation, and Washtenaw County has not been exempt. The pandemic took an especially heavy toll on job opportunities for less-educated workers. We predict that Washtenaw County will restore many of those jobs in the recovery, but we anticipate a challenging few years for those seeking lower-education service jobs.

Appendix A: Review of the Forecast for 2020

Last May, we forecast that the COVID-19 pandemic would cause payroll employment in Washtenaw County to decline by 14,300 payroll jobs in 2020, for a decline of 6.5 percent. The preliminary data indicates that the county lost 16,200 jobs, for a decline of 7.4 percent. Our forecast of job growth was therefore 0.9 percentage points too high, an underestimate of about 1,900 jobs lost due to the pandemic. As shown in Table 4, that miss is about 0.2 percentage points larger than our absolute forecast error over the past 33 years of 0.7 percentage points.

Last year, Washtenaw County's job count contracted the most in a single year in recorded history—an unfortunate distinction that also applied statewide. We are satisfied with last year's forecast error in light of the difficult forecasting environment caused by the pandemic.

The bottom of Table 4 shows the forecast and actual values for the unemployment rate and the local consumer price inflation rate in 2020. We had forecast an average unemployment rate of 8.4 percent for the year, 1.9 percentage points higher than the actual rate of 6.5 percent. In our forecast of the local consumer inflation rate for 2020, we estimated a rate of 0.5 percent for the year, one-half of a percentage point lower than the realized rate of 1 percent.

Table 4
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	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	-0.3
2000	0	2017	-0.3
2001	+0.3	2018	+0.4
2002	+0.3	2019	-1.8
2003	+1.0	2020	+0.9
2004	+0.2		

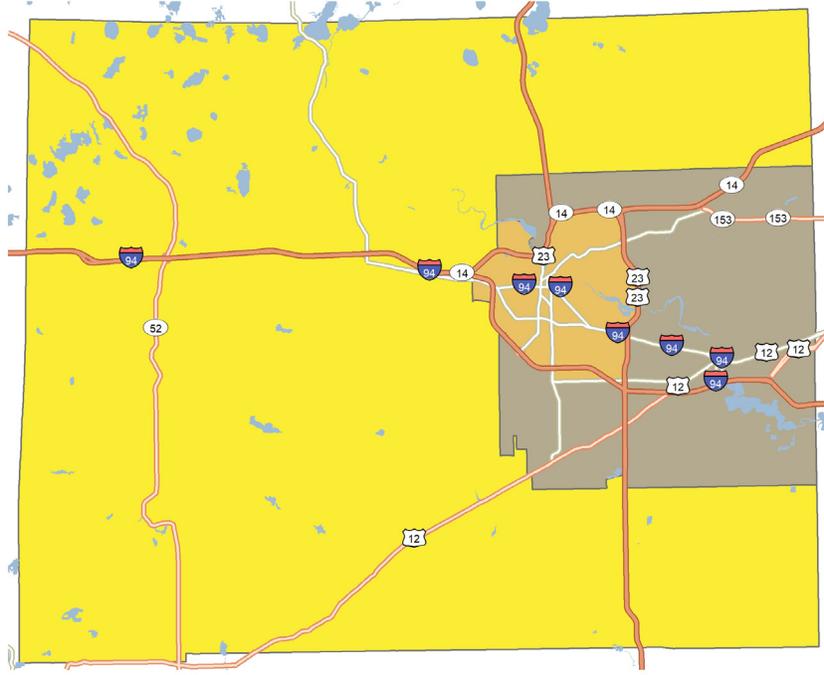
¹ Positive numbers indicate that the forecast was too high; negative, too low.

² Estimate.

Average absolute forecast error 1986–2020: 0.7%

	<u>Forecast</u>	<u>Actual</u>
	<u>2020</u>	<u>2020</u>
Unemployment rate	8.4%	6.5%
Consumer inflation rate	0.5%	1.0%

Appendix B: Washtenaw County PUMA Regions



- East Central, Ann Arbor City
- East Central, Outside Ann Arbor City
- West, Northeast, & Southeast

Appendix C: Forecast of Jobs in Washtenaw County by Detailed Industry

	Estimated	Forecast			Average Wage
	2020	2021	2022	2023	2019
Total wage and salary employment	202,269	206,535	216,417	221,325	\$61,276
Total government	79,861	79,693	82,475	84,063	65,375
Federal government	4,028	4,015	4,040	4,055	87,367
Post office	521	502	489	472	61,119
Hospital	2,640	2,669	2,703	2,733	87,561
Other federal government	868	844	848	850	103,671
State government	64,574	64,563	66,842	68,204	66,408
Local government	11,258	11,115	11,593	11,804	52,267
Education and health services	7,087	6,993	7,328	7,498	50,544
Public administration	3,459	3,410	3,524	3,551	55,845
Other local government	712	711	741	754	51,194
Total private	122,409	126,842	133,942	137,262	58,795
Goods-producing	16,636	17,386	18,315	18,802	66,146
Farming, forestry, fishing and mining	255	267	281	287	32,078
Construction	4,382	4,727	5,218	5,408	65,965
Buildings	1,348	1,471	1,669	1,754	58,866
Heavy and civil engineering construction	454	470	481	467	86,201
Specialty trade contractors	2,580	2,786	3,068	3,186	66,519
Manufacturing	11,998	12,392	12,816	13,107	66,867
Food	830	843	859	872	49,178
Printing and related support activities	1,063	1,033	1,053	1,049	44,841
Chemicals	604	617	634	647	75,986
Plastics and rubber products	662	695	720	739	76,800
Fabricated metal products	1,049	1,082	1,106	1,118	59,812
Machinery	919	965	1,007	1,041	71,443
Computer and electronic products	1,193	1,243	1,277	1,305	80,851
Transportation equipment	3,604	3,796	4,002	4,144	66,126
Miscellaneous manufacturing	1,246	1,255	1,268	1,276	81,402
Other manufacturing	828	862	891	915	61,243
Private service-providing	105,773	109,456	115,627	118,460	57,561
Trade, transportation, and utilities	23,925	24,782	25,379	25,781	50,083
Wholesale trade	5,685	5,905	6,063	6,184	79,257
Merchant wholesalers, durable goods	3,395	3,552	3,667	3,757	84,645
Merchant wholesalers, nondurable goods	1,751	1,805	1,846	1,876	68,409
Electronic markets and agents and brokers	539	548	550	550	81,702

Appendix C (Continued): Forecast of Jobs in Washtenaw County by Detailed Industry

	Estimated	Forecast			Average Wage
	2020	2021	2022	2023	2019
Retail trade	14,129	14,464	14,689	14,769	32,476
Motor vehicles	1,497	1,537	1,579	1,586	60,005
Furniture and home furnishings	450	484	505	514	40,200
Electronics and appliances	699	689	689	682	46,621
Building materials and garden supplies	1,256	1,269	1,264	1,256	40,372
Food and beverages	3,121	3,213	3,259	3,300	25,292
Health and personal care stores	988	1,043	1,062	1,078	34,945
Gasoline stations	515	529	536	540	21,305
Clothing and accessories	704	651	685	686	20,088
Sporting goods, hobby, book, music stores	468	442	434	415	20,916
General merchandise	2,848	2,915	2,884	2,847	26,326
Miscellaneous store retailers	1,017	1,092	1,165	1,213	24,781
Nonstore retailers	568	601	625	650	40,177
Transportation and warehousing	3,683	3,980	4,191	4,392	67,704
Truck transportation	725	796	827	850	61,878
Couriers and messengers	561	575	585	594	44,048
Other transportation and warehousing	2,397	2,609	2,780	2,947	75,073
Utilities	428	433	436	437	155,132
Information	5,033	5,068	5,146	5,195	\$105,829
Publishing industries, except Internet	1,735	1,735	1,740	1,738	94,710
Newspaper, book, and directory publishers	257	248	241	232	75,075
Software publishers	1,479	1,487	1,499	1,506	98,869
Telecommunications	549	500	462	425	74,500
Data processing, hosting, and related services	1,257	1,291	1,343	1,377	95,575
Other information	1,492	1,541	1,600	1,654	134,831
Financial activities	5,959	6,048	6,212	6,310	76,453
Finance and insurance	3,632	3,656	3,687	3,711	92,911
Credit intermediation and related activities	1,890	1,842	1,800	1,750	79,851
Insurance carriers and related activities	900	903	909	911	75,444
Other finance	842	911	977	1,051	137,548
Real estate and rental and leasing	2,327	2,392	2,525	2,599	52,246

Appendix C (Continued): Forecast of Jobs in Washtenaw County by Detailed Industry

	Estimated	Forecast		Average Wage	
	2020	2021	2022	2023	2019
Professional and business services	26,949	27,810	28,952	29,620	82,516
Professional and technical services	17,226	17,820	18,514	19,025	99,532
Legal services	966	983	1,011	1,024	87,782
Accounting and bookkeeping	554	554	552	550	68,240
Architectural and engineering	4,751	4,854	5,010	5,105	122,105
Computer systems design and related services	3,243	3,504	3,756	3,993	101,382
Management and technical consulting	2,532	2,605	2,689	2,748	103,805
Scientific research and development	3,272	3,359	3,432	3,489	99,660
Other professional and technical services	1,907	1,961	2,064	2,116	54,484
Management of companies and enterprises	1,397	1,418	1,519	1,565	166,914
Administrative and waste services	8,327	8,571	8,918	9,030	38,039
Administrative and support services	7,631	7,859	8,179	8,275	35,402
Employment services	4,016	4,144	4,348	4,411	26,044
Services to buildings and dwellings	1,980	2,050	2,126	2,149	33,349
Other administrative and support services	1,635	1,665	1,705	1,715	63,252
Waste management and remediation services	696	712	739	756	68,757
Private education and health services	26,401	27,212	28,553	29,068	54,646
Private educational services	2,808	2,955	3,178	3,226	36,761
Private health care and social assistance	23,593	24,257	25,375	25,842	56,997
Ambulatory health care services	10,061	10,426	11,020	11,272	77,663
Offices of physicians	4,996	5,232	5,555	5,740	108,529
Offices of dentists	906	943	1,068	1,090	55,625
Home health care services	1,673	1,668	1,673	1,648	43,137
Other ambulatory health care services	2,486	2,583	2,724	2,793	55,408
Nursing and residential care facilities	4,266	4,313	4,406	4,431	32,430
Individual and family services	1,397	1,485	1,627	1,718	25,251
Child day care services	1,029	1,071	1,192	1,230	22,443
Hospitals, emergency relief, and vocational rehabilitation	6,841	6,961	7,131	7,190	52,777

Appendix C (Continued): Forecast of Jobs in Washtenaw County by Detailed Industry

	Estimated	Forecast		Average Wage	
	2020	2021	2022	2023	2019
Leisure and hospitality	12,806	13,593	16,287	17,318	21,288
Arts, entertainment, and recreation	1,682	1,993	2,589	2,885	23,021
Accommodation and food services	11,124	11,600	13,699	14,433	21,008
Accommodation	810	865	1,114	1,209	27,182
Food services and drinking places	10,314	10,734	12,585	13,225	20,430
Special food services	787	836	976	1,017	24,632
Drinking places, alcoholic beverages	528	520	656	692	22,633
Restaurants and other eating places	8,999	9,378	10,953	11,516	19,894
Full-service restaurants	3,897	4,079	5,114	5,464	22,831
Limited-service restaurants	4,452	4,623	5,089	5,262	17,243
Cafeterias and nonalcoholic beverage bars	650	676	750	789	13,993
Other services	4,346	4,588	4,744	4,812	33,846
Repair and maintenance	816	851	873	877	43,364
Personal laundry services	1,022	1,117	1,152	1,155	27,677
Membership associations and organizations	1,888	1,962	1,993	2,010	40,880
Private households	620	658	726	770	18,357
Unallocated private services	355	355	355	355	53,279
<i>Addendum</i>					
Unemployment rate	6.5	4.3	3.4	2.7	