



Washtenaw County Economic Outlook

2022–2024

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The Washtenaw County Economic Outlook for 2022–2024 Executive Summary

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Washtenaw County's economy continued to recover from the COVID-19 pandemic and recession during 2021, and we expect the improvement to continue over the next three years. As of December 2021, the county's unemployment rate had fallen to 3.8 percent from its high of 15.3 percent in April 2020.¹ During that time, Washtenaw County recovered just over three-fifths of the 38,800 payroll jobs that it lost between February and April 2020. We forecast Washtenaw County to surpass its pre-pandemic level of payroll employment by the second quarter of 2023, one quarter before Michigan reaches full recovery. By the end of 2024, we project total employment in Washtenaw County to exceed its pre-pandemic level by 3.4 percent. At the same time, we expect the county's unemployment rate to decline to 2.7 percent.

That bright overall jobs picture masks differing outlooks for Washtenaw's industry groups. Compared with pre-pandemic levels, we expect total employment at the end of 2024 to be strongest for the county's traditional blue-collar industries, which have been among the quickest to recover so far. The blue-collar job count finishes 7.9 percent higher at the end of 2024 than the pre-pandemic level. Higher-education services jobs lost comparatively fewer jobs during the pandemic, but their recovery has been

¹ This forecast was produced using data released through early March 2022. Some revised data has been published since we produced the forecast.

tepid until now. Nevertheless, we forecast steady gains over the next three years, leaving higher-education services jobs 4.7 percent above the pre-pandemic level at the end of 2024. The lower-education services sector fared the worst during the pandemic, and their recovery has also been the slowest. Despite our projection for continuous growth, the lower-education services sector remains 3 percent below the pre-pandemic level at the end of 2024 due to the scale of jobs still to be recovered. As an example, we forecast over 2,700 job gains in the county for the accommodation and food services sector between 2021 and 2024, the most gains for any of the major private industries that we forecast. Despite that strong growth, the sector remains nearly 800 jobs shy of its 2019 level in 2024.

One striking pattern in our forecast is that industries with higher average wages are more likely to make a full employment recovery by 2024 than industries with lower average wages. Full-recovery industries include management of companies and enterprises; information; professional, scientific, and technical services; and finance and insurance. Those four industries in Washtenaw County all had average annual wages in 2020 above \$100,000. In fact, 7 out of 10 of the full-recovery industries had an average wage in 2020 that was above the county's overall average for the year. Meanwhile, 6 out of 9 of the incomplete-recovery industries had an average wage that was below the county's overall average. In addition to accommodation and food services, the incomplete-recovery industries include arts, entertainment, and recreation; retail trade; natural resources and mining; and other services, among others.²

Inflation continues to be a risk for the local and national economy and is currently running at its fastest pace in 40 years. The all-items inflation rate for the Detroit Consumer Price Index (CPI) in February 2022 was 7.5 percent year-over-year, the highest reading since September 1981. We expect inflation to remain high in the near term as the spike in gas prices reinforces the pre-existing trend, but we are optimistic that the Federal Reserve can engineer a “soft landing”, in which it brings down inflation without undermining the recovery in the labor market. Improvement in supply chains and contractionary fiscal policy will also help price increases cool off later this year. We project local inflation to register 6.1

² See Table 1 for a complete listing of full- and incomplete-recovery industries.

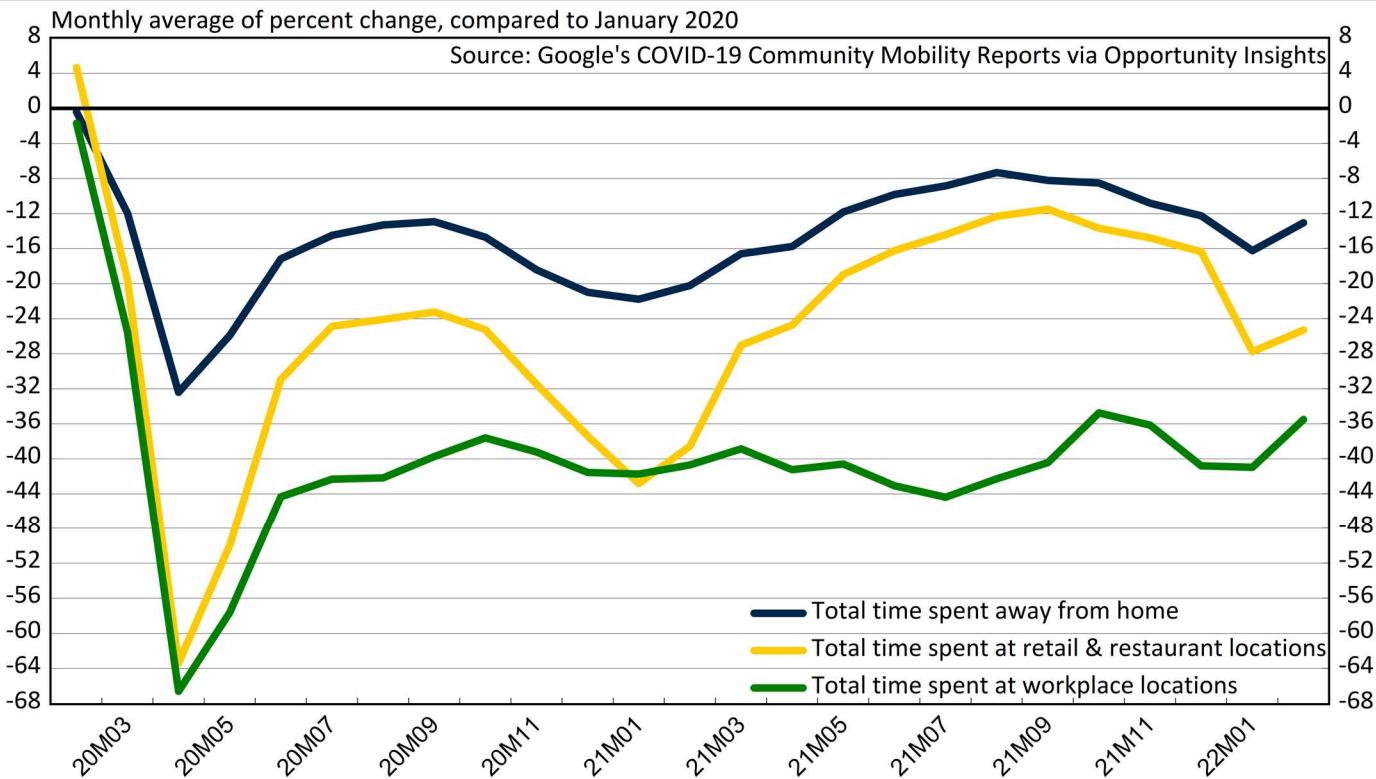
percent in 2022, the fastest calendar-year rate since 1981, before dropping to 3.1 percent next year. Local inflation then dips further, to 2.6 percent, in 2024.

Despite the recent inflationary headwinds, average real wages in both the state and county have increased substantially since 2019. Average real wages jumped in 2020 due to the disproportionate loss of lower-paying jobs. As many of those workers returned to work in 2021, average real wages declined in the county, but they remained well above 2019's level. We forecast Washtenaw's average real wage to resume growth over 2022–2024, finishing the forecast period with an average real wage of \$70,400, or 9.3% above the pre-pandemic level from 2019.

This year, we also examined how Washtenaw's employment and wages in computer and math occupations stack up against its peers. Currently, Washtenaw County is having mixed results with these occupations. On one hand, the county enjoys a higher share of computer and math jobs than the nation as a whole, but on the other hand, local wages in these occupations are lower than the national average after adjusting for the cost of living. In order to remain a technology-driven community, Washtenaw will need to find ways to pay more competitively in these occupations.

Figure 1

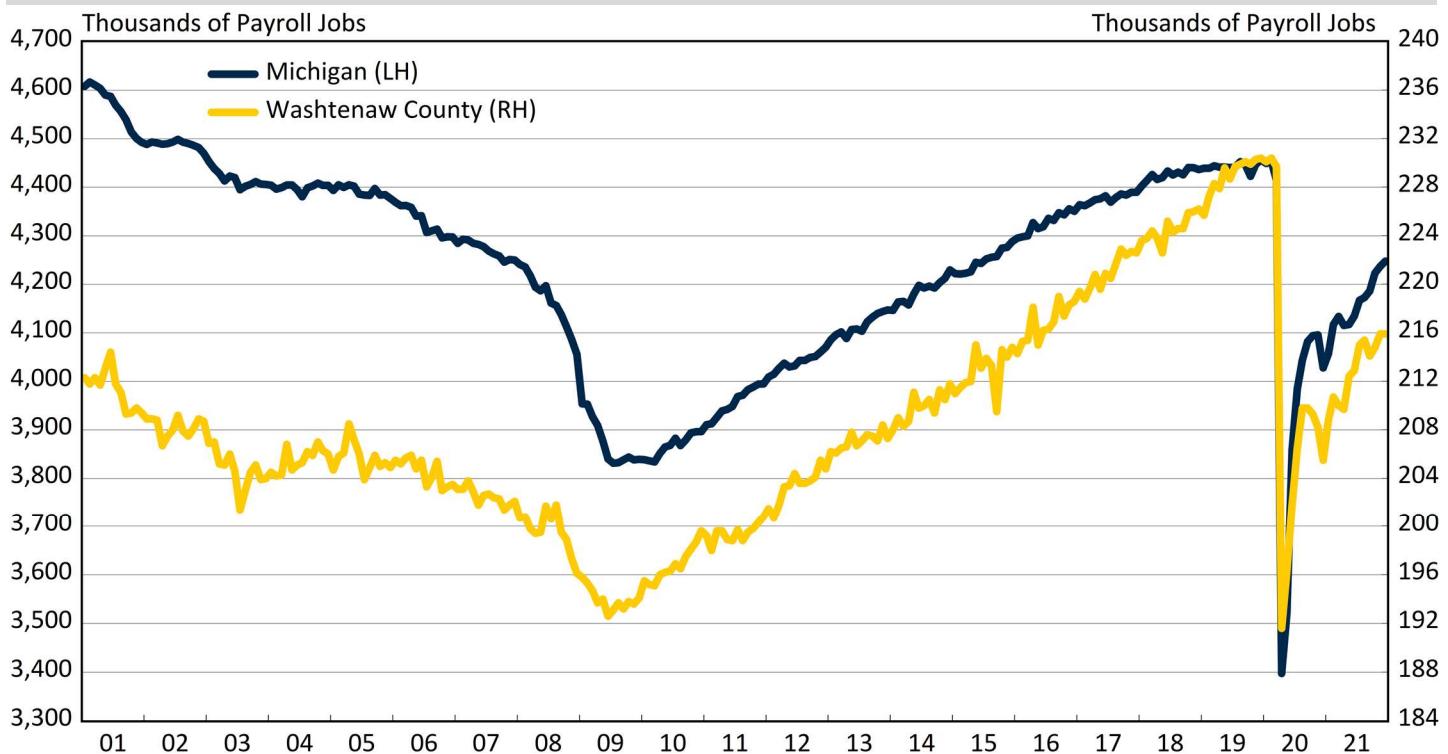
Time Use Patterns in Washtenaw County



- Figure 1 gives a sense of how Washtenaw County is and is not returning to pre-pandemic patterns through the lens of Google's COVID-19 Community Mobility Report. The report estimates the amount of time spent at various locations outside the home as measured by cell phone GPS data and is provided by the Opportunity Insights project.
- Total time spent away from the home in Washtenaw County decreased by 32 percent from January to April 2020. Trips to retail and restaurant locations and to workplaces fell even more sharply, by 63 percent and 67 percent respectively.
- Time spent at stores and restaurants over the past two years has waned and waxed with the weather and the prevalence of COVID-19. (These data are not seasonally adjusted.) The shortfall in time spent at stores and restaurants relative to the pre-pandemic level averaged 13 percent in the third quarter of 2021 and 15 percent in the fourth quarter. The shortfall spiked to 25–28 percent this January and February.
- Judging from the previous cycles, we are optimistic that, with the decline in the Omicron wave of the COVID-19 pandemic, time spent at Washtenaw County's stores and restaurants will rebound sharply in the months ahead.
- Time spent at workplace locations in Washtenaw County has not fluctuated as noticeably with changing pandemic caseloads. After a partial recovery in mid-2020, time spent at Washtenaw County workplaces has held roughly flat. It averaged 40 percent lower than the pre-pandemic level in 2021 before showing modest improvement in early 2022.
- We expect some pick-up in time spent at workplaces over the next few months as return-to-office plans begin to materialize. Still, we expect the shortfall in time spent at workplaces to be very persistent, if not permanent. Some surveys indicate that more than 20 percent of all work hours nationally may be performed remotely even after the pandemic is well behind us. That proportion may be even higher in Washtenaw County, with its large share of professional jobs.
- Total time spent outside the home in Washtenaw County averaged 13 percent below its pre-pandemic level in 2021. It fell to 16 percent below the pre-pandemic level in January before returning to a 13 percent shortfall in February.
- We will be monitoring this series closely to get a better sense of how Washtenaw County's economy is evolving in the months ahead. We suspect that people are enthusiastic to return to many of the activities they paused during the pandemic.

Figure 2

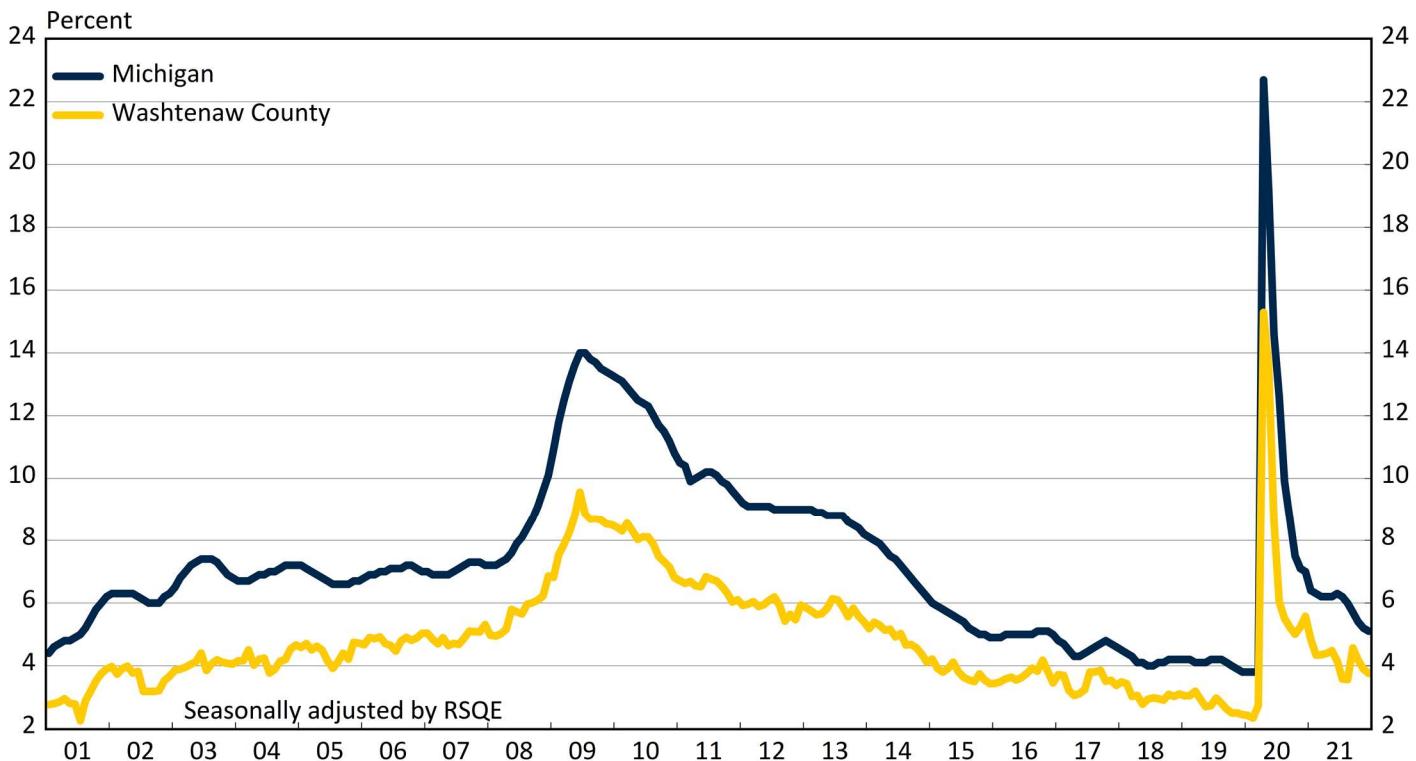
Monthly Payroll Employment, Michigan and Washtenaw County



- Figure 2 shows seasonally adjusted total payroll employment in both Washtenaw County and the state of Michigan through December 2021. Payroll employment is the number of jobs at business and government establishments physically located in the county or state. The jobs may be either full- or part-time.
- The state and county data presented in this figure come from the Bureau of Labor Statistics' Current Employment Statistics program. The data for Washtenaw County is represented by the Ann Arbor Metropolitan Area, which comprises the entire county.
- Payroll employment in Washtenaw County fell by 38,800 jobs, or 16.8 percent, from February to April 2020 at the start of the pandemic. Payroll employment in the state fell by 1,055,300 jobs, or 23.7 percent, in that time.
- Although Washtenaw County fared better than Michigan during the first two months of the pandemic, the county's jobs recovery since then has been slower than the state's recovery.
- By August 2020, Washtenaw County recovered 18,200 jobs, or 46.9 percent of its peak loss from February to April 2020, whereas the state recovered 645,900 jobs, or 61.2 percent of its loss.
- Washtenaw County's recovery stalled as COVID's second wave began to take shape. The county experienced a loss of 4,300 jobs between August and December 2020. Michigan continued to add jobs between August and November 2020, but the state lost 67,800 jobs from November to December with rising cases leading to the state's "economic pause."
- The recovery resumed in January 2021, and by February both the county and state had surpassed their August–November 2020 job levels.
- Although Washtenaw and Michigan experienced hiccoughs to growth during 2021, both the county and state generally continued to add jobs.
- By December 2021, Washtenaw County had regained a total of 24,300 jobs since April 2020, or 62.6 percent of its initial pandemic job loss. The state, meanwhile, had recovered 850,100 jobs, or 80.6 percent of its original pandemic loss.
- One note of strength for Washtenaw is that it now exceeds its June 2001 business cycle peak of 214,400 payroll jobs, which it had also surpassed in late 2015 before the pandemic. The state, on the other hand, remains well below its all-time peak of 4,693,200 jobs from June 2000.

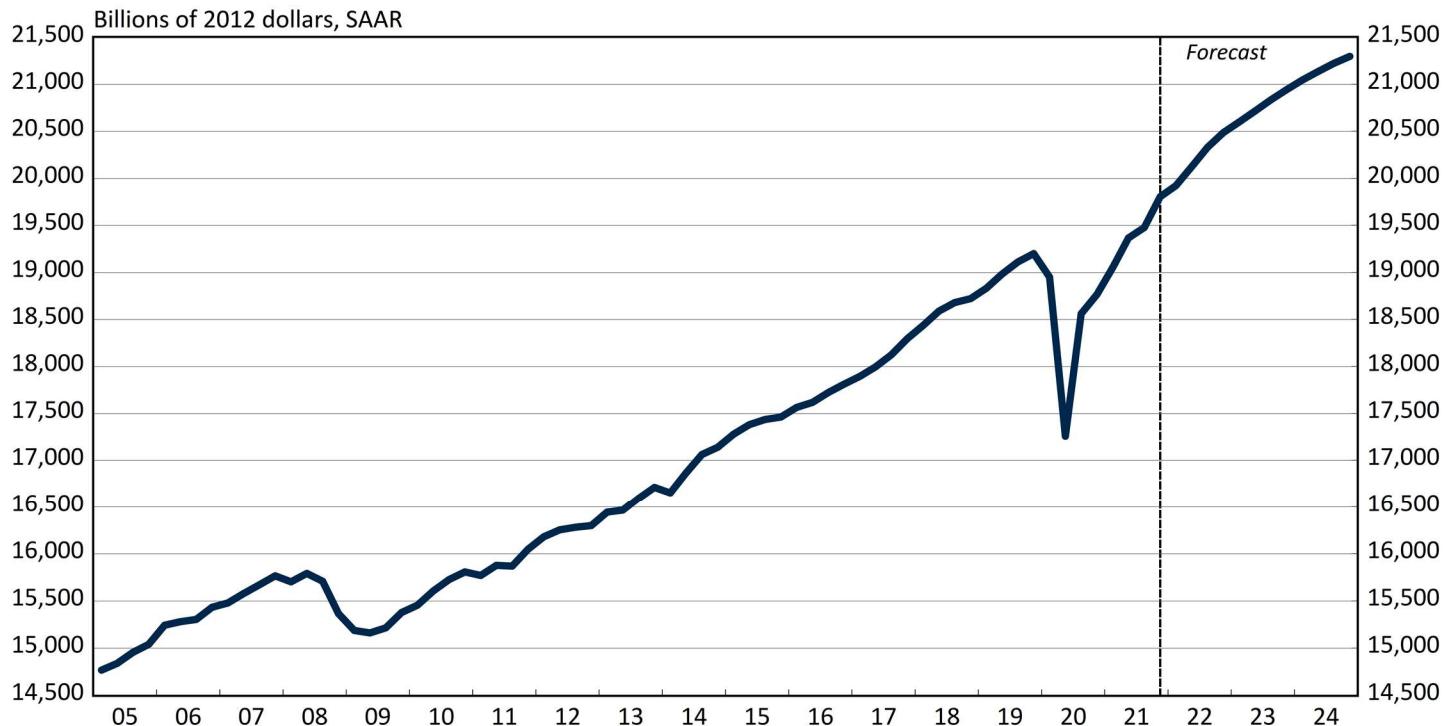
Figure 3

Monthly Unemployment Rate, Michigan and Washtenaw County



- Figure 3 shows unemployment rates for Michigan and Washtenaw County. Both series are seasonally adjusted; we have seasonally adjusted the Washtenaw unemployment series ourselves.
- Over the past two decades, the unemployment rate in Washtenaw County has been consistently below the unemployment rate for the state, with an average monthly difference of 2.5 percentage points from 2000–2021.
- Washtenaw's unemployment rate rose from 2.3 percent in February 2020 to 15.3 percent in April during the initial wave of the pandemic. Michigan's unemployment rate jumped from 3.8 percent to 22.7 percent during that time.
- Both the state and county unemployment rates dropped sharply over the spring and early summer of 2020 as the economy began to reopen. By July 2020, Washtenaw's unemployment rate had fallen to 6 percent, while the state's unemployment rate had dropped to 12.6 percent.
- Washtenaw's unemployment rate dropped to 5 percent in October 2020 before nudging up to 5.6 percent in December as the state's second wave of COVID-19 picked up. Meanwhile, the state's unemployment rate continued its decline, to 7 percent by the end of 2020.
- The unemployment rates in both the state and county improved dramatically in 2021. Washtenaw's unemployment rate dropped to 4.8 percent in January 2021, and it has trended downward since then, albeit with some bumps along the way.
- The state's jobless rate dropped to 6.4 percent in January 2021 and then hovered around 6.2 percent through July 2021. It then resumed its decline for the remainder of the year, reaching 5.1 percent in December.
- The unemployment rate in Washtenaw stood at 3.8 percent in December 2021, the most recent month for which data was available when we produced this forecast.

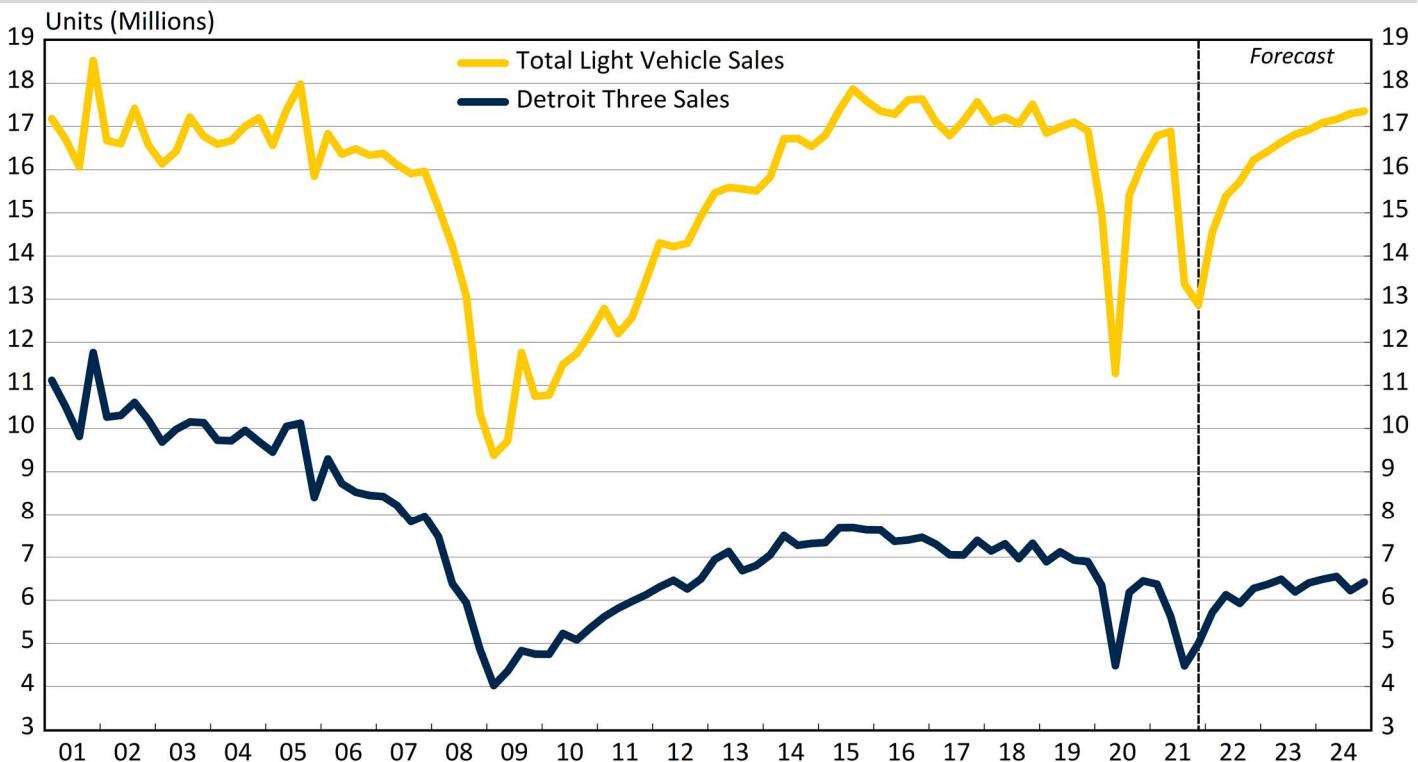
Figure 4
U.S. Real GDP



- Washtenaw County's economic future is closely tied to the overall health of the national economy. Figure 4 shows our February 2022 forecast for quarterly U.S. real GDP. Note that our U.S. forecast was completed prior to Russia's invasion of Ukraine.
- Real GDP grew at a 6.9 percent annualized pace in the fourth quarter of 2021, but that brisk pace was bolstered by a strong contribution from inventory restocking, which we do not expect to persist.
- We project the pace of growth to step down to 2.4 percent in the first quarter of 2022 amid the Omicron wave of the COVID-19 pandemic, a decline in net exports, and a dip in inventory investment.
- Real GDP then grows at a healthier average pace of 3.8 percent over the remainder of 2022, as net exports and inventory investment stabilize.
- On a calendar year average basis, we forecast real GDP to grow by 4.1 percent in 2022, a deceleration from the 5.7 percent growth pace in 2021 but still a strong performance.
- Real GDP growth decelerates further after this year. We forecast growth of 2.8 percent in 2023 and 1.9 percent in 2024.
- We believe that the extremely strong fiscal and monetary policy responses to the pandemic have been crucial in producing the V-shaped recovery in real GDP that we are forecasting. Both monetary and fiscal policy turn sharply tighter in our forecast, consistent with an economy that is returning to full employment.
- We project the federal budget deficit to shrink from an average of 13.4 percent of GDP in fiscal years 2020 and 2021 to 4.8 percent in fiscal 2022 and 3.3 percent in each of 2023 and 2024. The basic picture of a rapidly shrinking deficit does not depend on the particulars of any potential revival of the Biden Administration's Build Back Better agenda.
- The Federal Reserve recently raised short-term interest rates for the first time since cutting them to near zero at the start of the pandemic. We project the target range for the federal funds rate to reach 1.5–1.75 percent by the end of this year and to increase more slowly over the following two years. The target range for the fed funds rate reaches 2.5–2.75 percent by the end of 2024.

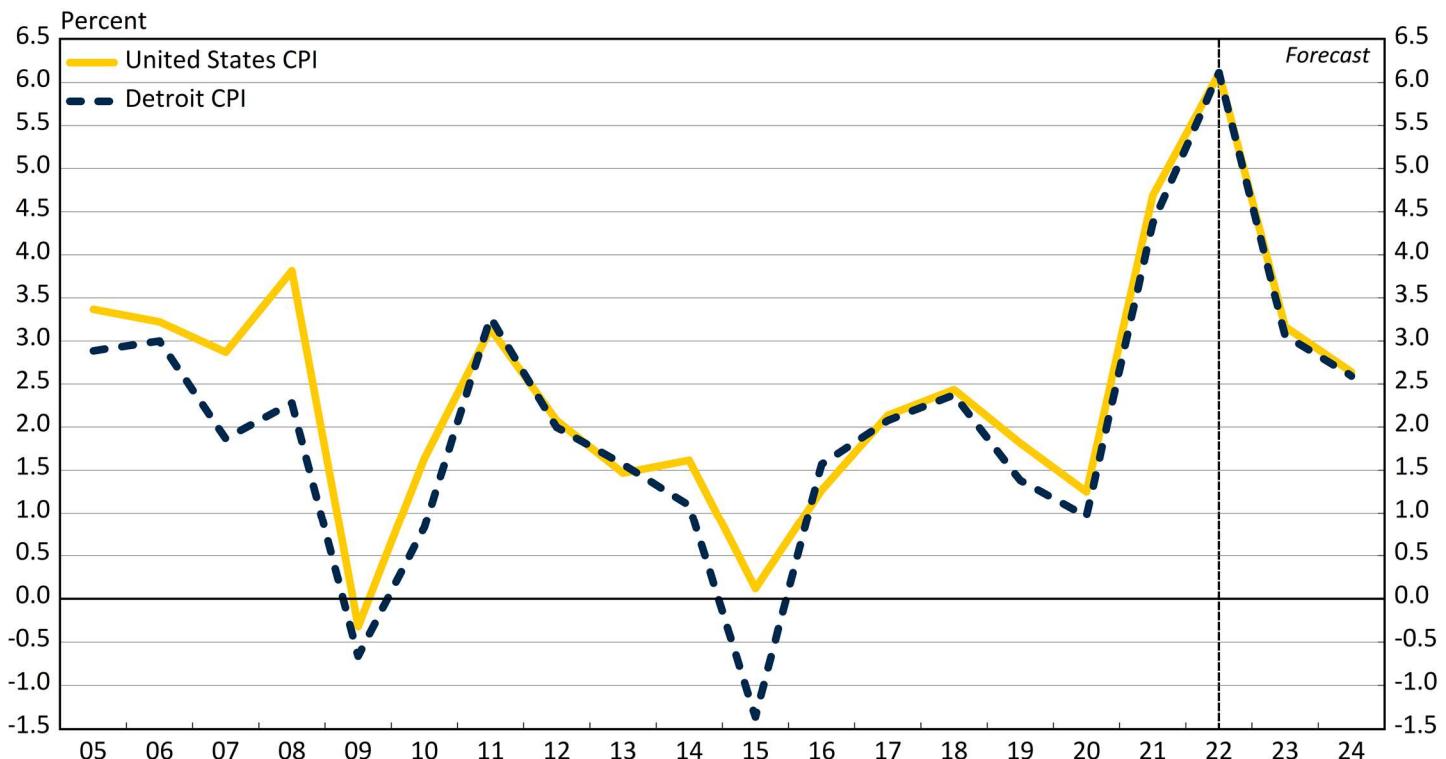
Figure 5

U.S. and Detroit Three Light Vehicle Sales



- Figure 5 shows our quarterly forecast for total U.S. and Detroit Three light vehicle sales. Light vehicle sales rebounded temporarily from the pandemic in late 2020 and early 2021. Sales averaged a 16.8-million-unit pace in the first half of last year, not far off the 17.0-million-unit pace in 2019.
- Vehicle sales plunged again in the second half of 2021, to an average pace of just 13.1 million units. The global microchip shortage coming out of the pandemic drastically curtailed light vehicle production last year, leading to barebones inventories on dealer lots and lower sales volumes.
- The microchip shortage is not yet finished, but it has eased substantially since its peak. Production volumes have begun to pick up, and sales have started to follow suit. The light vehicle sales pace jumped to 15.0 million units in January.
- Production disruptions due to the Omicron wave of the pandemic and the recent Ambassador Bridge shutdown will likely reduce output this quarter, delaying dealer lot restocking. A bigger obstacle to normalization in the auto industry could come from the war in Ukraine, which has already led to spiking gas prices and may also lead to new supply chain disruptions. Much will depend on the duration and path of the war.
- We project total light vehicle sales to climb to 15 million units this year, 16.7 million next year, and 17.2 million in 2024. The sales pace we are projecting for 2024 would be on par with the pace seen in 2018–19.
- The Detroit Three automakers' share of light vehicle sales fell from 40.5 percent in 2020 to 35.9 percent in 2021, as the Detroit Three were disproportionately affected by the microchip shortage last year.
- The Detroit Three's share of the market recovered sharply in the fourth quarter of 2021, though, and we expect some further recovery in the first half of this year. We are projecting the Detroit Three's share of light vehicle sales to average 38.9 percent this year, before dipping to 38.1 percent next year and 37.3 percent in 2024.
- Our forecast thus calls for Detroit Three light vehicle sales to total 6.0 million units this year and 6.4 million units in each of the next two years. That performance would not get the Detroit Three quite back to the 7.0 million unit sales they achieved in 2019, but it would still be a substantial recovery from the 5.4 million units they sold in 2021.

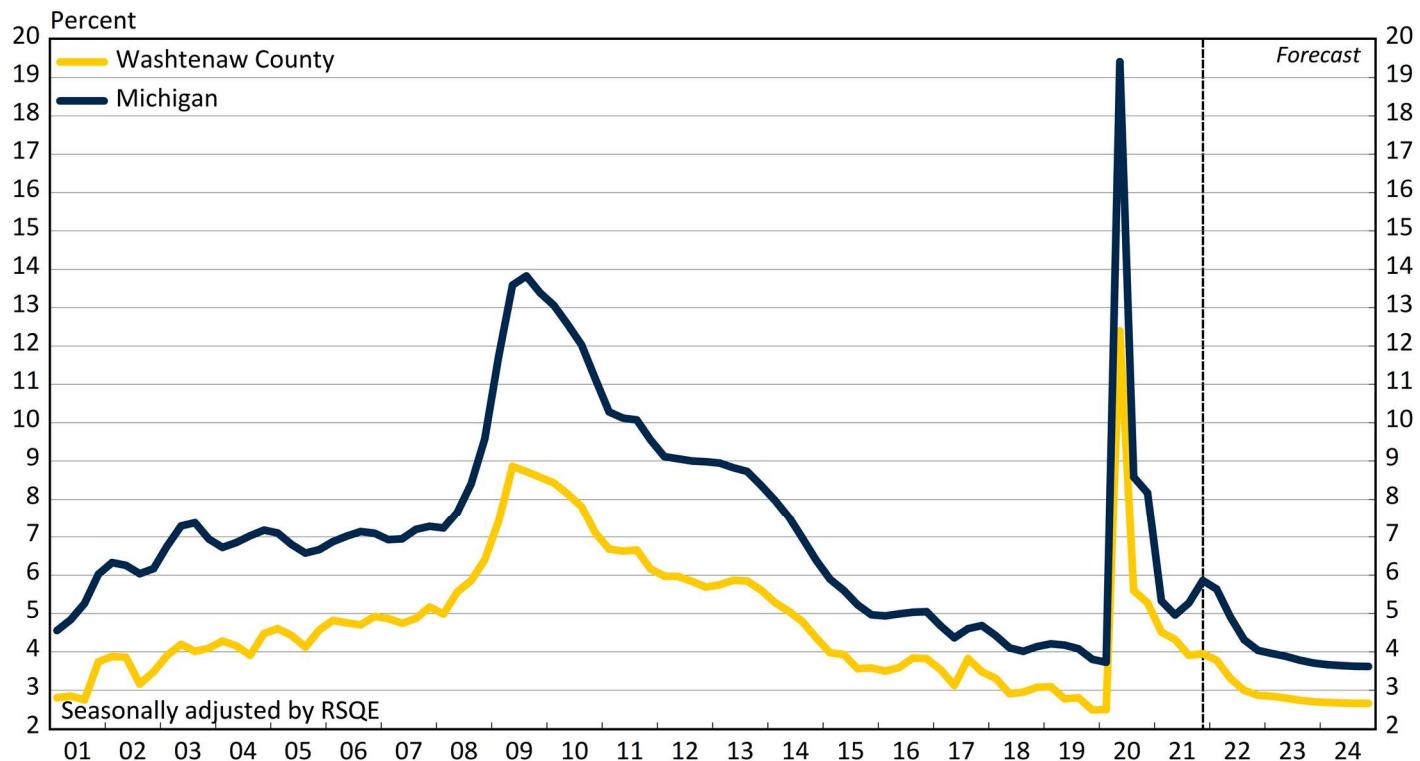
Figure 6
Inflation Rate, National and Detroit CPI



- Figure 6 shows history and our forecast of annual national and local inflation from 2005 to 2024. We measure local inflation by the growth rate of the Detroit Consumer Price Index (CPI), as county-level consumer price data are not available.
- Calendar year average local inflation registered 4.4 percent in 2021, but inflation was running even higher at the end of the year. Local prices increased by 7.0 percent from December 2020 to December 2021.
- We expect inflation to remain very high in the near-term, as the recent spike in gas prices reinforces the pre-existing trend. Local inflation picked up to 7.5 percent year-over-year in February.
- Prior to Russia's invasion of Ukraine, we saw several reasons to expect price increases to cool off in 2022. First, supply chains were already showing tangible signs of improvement in some high-frequency indicators. Second, fiscal policy has turned highly contractionary. Third, monetary policy will turn sharply tighter this year.
- In the long run, these trends ought to bring inflation back to a more tolerable pace. It is unclear how long that process will take and what toll it will take on economic growth in the meantime, though.
- We project local inflation to register 6.1 percent in 2022, the fastest calendar-year rate since 1981. We are currently forecasting local inflation to drop to 3.1 percent next year, in light of the improvement in supply chains and tighter macroeconomic policy. Local inflation then dips further, to 2.6 percent, in 2024.
- The inflation rates we are forecasting for 2023 and 2024 would still be higher than the Federal Reserve would prefer, but they would represent substantial progress toward the Fed's inflation target.
- The war in Ukraine represents a major risk to our forecast of inflation. The war's effects on prices will depend in large part on its duration. Its largest short-run effects on U.S. inflation will be through higher energy and food prices. Longer-term, it may present important disruptions to automotive and other supply chains. Despite these risks, it is important to remember that the human toll of the war dwarfs its macroeconomic impact.
- Unfortunately, there is additional alarming news for the inflation outlook. Authorities recently imposed a lockdown in Shenzhen, China, amid a resurgence in COVID-19 there. A large new wave of the pandemic could further disrupt U.S. supply chains, putting upward pressure on prices, even if the pandemic remains muted in the United States.

Figure 7

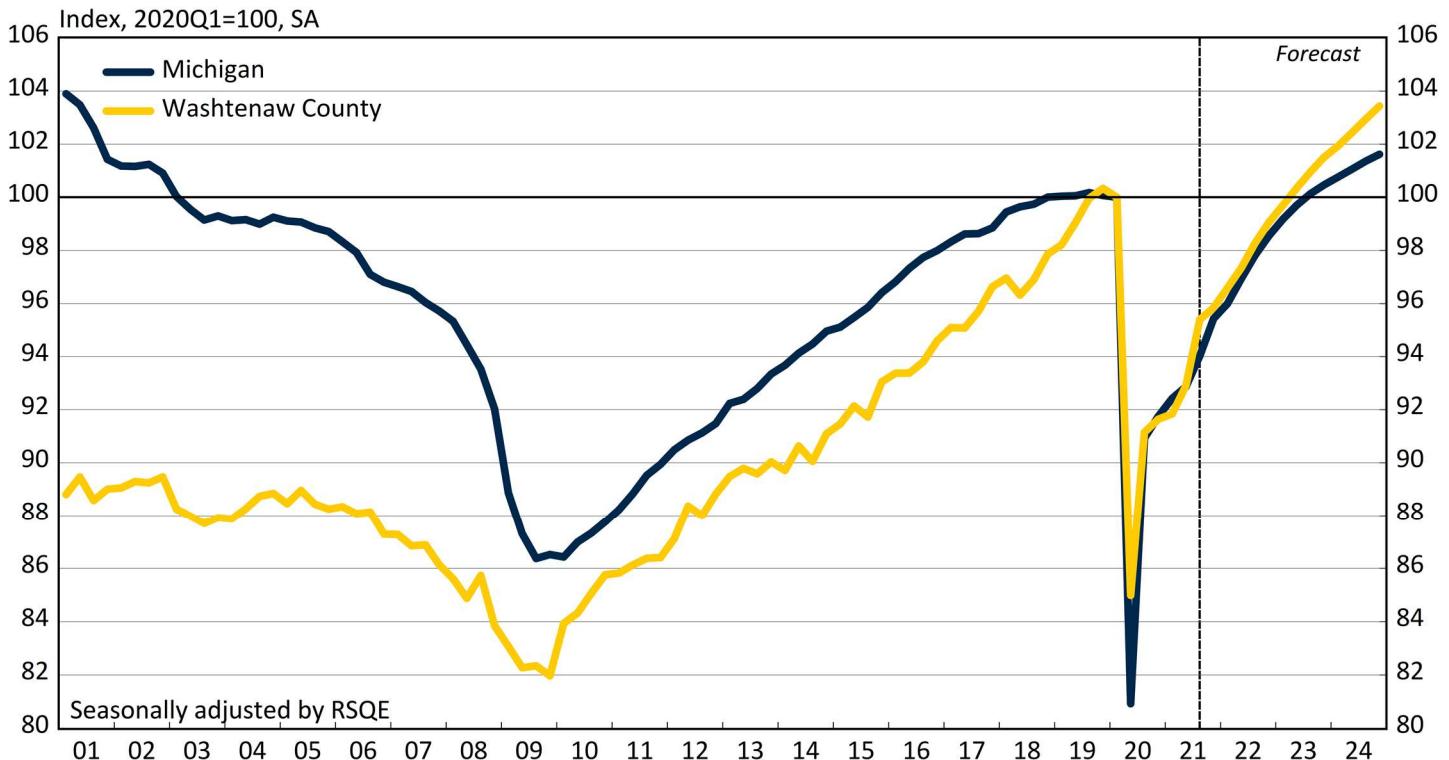
Quarterly Unemployment Rate, Michigan and Washtenaw County



- In March 2022, the BLS revised the history of Michigan's unemployment rate. The revision substantially affected the unemployment rate's path during the first three quarters of 2021. Unfortunately, that revision was released after we completed our forecast for the county. Therefore, the path of the state unemployment rate in 2020 and 2021 in Figure 7 looks slightly different than it does in Figure 3.
- As also shown in Figure 3, joblessness rose less at the start of the COVID-19 pandemic in Washtenaw County than statewide. We attribute that difference to the county's larger share of higher-education jobs, which allowed residents to remain employed while working from home.
- By the end of 2021, Washtenaw's unemployment rate had come down to 4.0 percent, or 1.5 percentage points above its pre-pandemic level. Meanwhile, the statewide rate had only decreased to 5.9 percent (2.1 percentage points above its pre-pandemic level).
- We forecast that the unemployment rate in the state and Washtenaw County will continue to decline through the end of 2024, with the statewide rate falling a bit more quickly.
- We therefore anticipate that the gap between Washtenaw's and Michigan's unemployment rates will decrease to roughly 1 percentage point by the end of our forecast. For comparison, the gap averaged 1.3 percentage points in 2019, shortly before the pandemic.
- We expect the unemployment rate to fall to 3.6 percent in Michigan and to 2.7 percent in Washtenaw County by the end of 2024. Our projected unemployment rate in Washtenaw County at the end of 2024 would be slightly higher than pre-pandemic levels.

Figure 8

Quarterly Payroll Employment Indices, Michigan and Washtenaw County

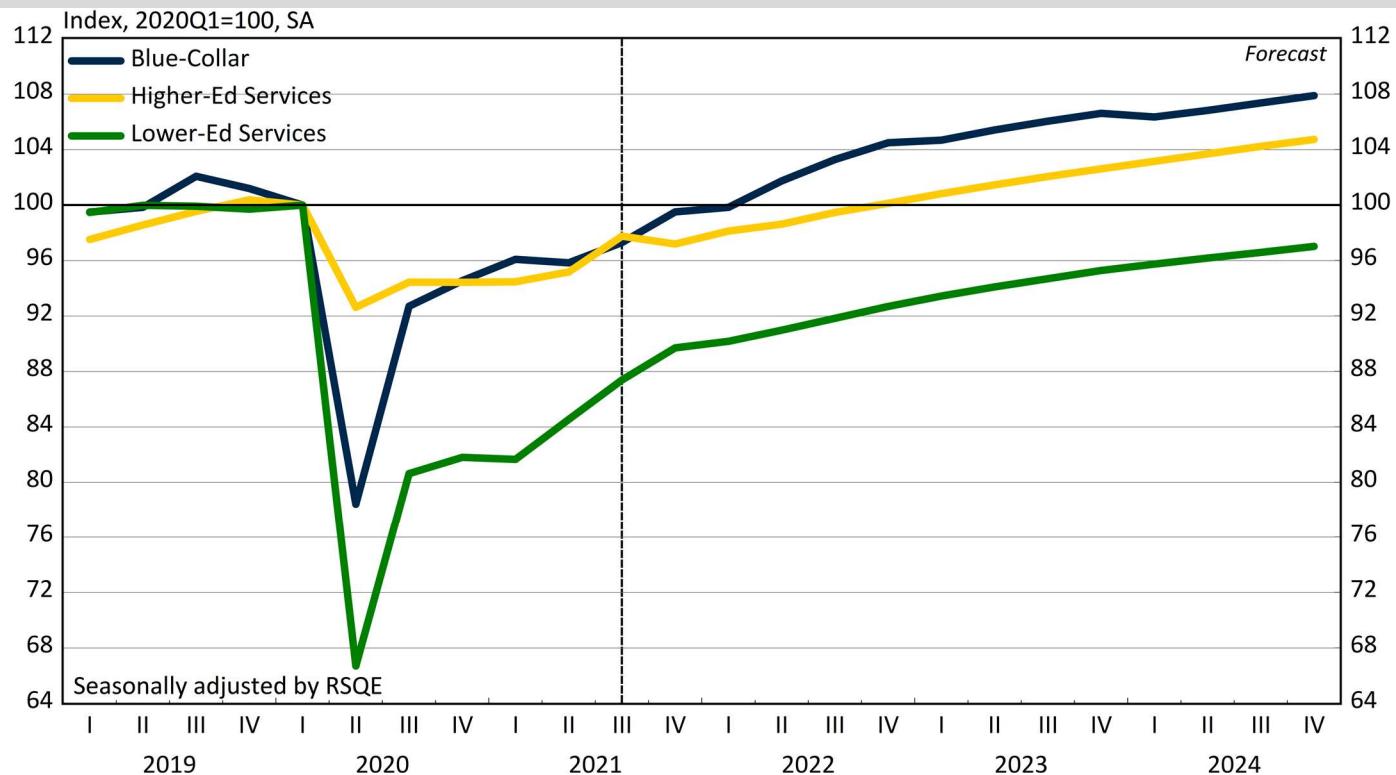


- Figure 8 displays our forecast for Michigan's and Washtenaw County's payroll employment levels, with values indexed to 100 in 2020q1.
- From the end of the Great Recession to the beginning of the pandemic, employment in Washtenaw County grew more quickly than in the state, averaging roughly 0.5 percent per quarter compared to the state's 0.3 percent per quarter.
- The COVID-19 recession led employment in the state of Michigan to decline by 846,700 (19.1 percent) in the second quarter of 2020, while Washtenaw County lost 33,000 jobs (15.0 percent).
- Although the county's economy was better shielded from the initial downturn of the COVID-19 pandemic, the state has outperformed the county in recuperating its job losses to date. By the end of 2021, Michigan had recovered 76 percent of its initial job losses, while we estimate that Washtenaw County had recovered only 72 percent.

- We are forecasting for that growth differential to reverse course, with the county's recovery slightly outpacing the state's over the next few years.
- One reason we expect Washtenaw's growth to pick up steam relative to the state's is that we project government employment to grow more quickly in Washtenaw than statewide each year of the forecast. The bulk of the county's government job growth comes from state government, reflecting the resilience of Washtenaw County's higher-education sector.
- We expect employment in Washtenaw County to return to its pre-pandemic level in the second quarter of 2023 and to exceed that level by 3.4 percent at the end of 2024.
- We forecast employment in Michigan to return to its 2020q1 employment level in the third quarter of 2023, and to exceed that value by a comparatively modest 1.6 percent at the end of 2024.

Figure 9

Job Indices in Washtenaw County by Selected Industries



- On the chart above, we categorize each of Washtenaw's industries into one of three groups. The graph displays our forecast for each group's total employment level, with values indexed to 100 in 2020q1.
- The **blue-collar** industries comprise mining; construction; manufacturing; and wholesale trade, transportation and warehousing, and utilities. These industries' job count declined by roughly one-fifth in the second quarter of 2020. We estimate that they recovered almost all of those losses by the first quarter of this year.
- We expect further growth ahead, leaving the blue-collar industries 7.9 percent higher than their pre-pandemic employment level, or 2,300 jobs, at the end of our forecast. Construction and transportation and warehousing account for over one-half of those job gains.
- The **higher-educational** services industries comprise information; finance; professional, scientific, and technical services; management of companies and enterprises; private education and health services; and government (which includes public education). These are industries that tend to employ highly-educated workers.
- The pandemic led to relatively few job losses in Washtenaw's higher-education services industries, but their recovery has been tepid so far. We are estimating that they recovered just three-fifths of their initial job losses by the end of 2021.
- We forecast a steady recovery for higher-educational attainment services going forward. This industry group averages 0.6 percent employment growth per quarter from 2022–24, leaving its employment 4.7 percent above the pre-pandemic level by the end of 2024.
- The **lower-education** services industries comprise retail trade; leisure and hospitality; administrative support services and waste management; and other services. These industries tend to employ less well-educated workers, and they suffered the worst of the pandemic's impact, shrinking by one-third in 2020q2. The rebound in employment so far has been muted as well, with employment remaining 10.3 percent below pre-pandemic levels in 2021q4. We are forecasting slow but continuous growth for these industries through 2024, but that performance is not enough to recuperate all their initial pandemic losses.

Table 1

Forecast of Jobs in Washtenaw County by Major Industry Division

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Average Annual Wage 2020 \$ |
|---|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------|
| Total Jobs (Number of jobs) | 218,476 | 202,114 | 206,631 | 215,018 | 221,207 | 225,736 | 66,385 |
| (Annual percentage change) | (2.4) | (-7.5) | (2.2) | (4.1) | (2.9) | (2.0) | |
| Total Government | 82,373 | 78,745 | 78,595 | 81,262 | 83,311 | 85,133 | 68,952 |
| Total Private | 136,103 | 123,369 | 128,035 | 133,756 | 137,896 | 140,603 | 64,746 |
| Full-Recovery Industries | | | | | | | |
| Management of companies and enterprises | 1,330 | 1,429 | 1,487 | 1,559 | 1,641 | 1,682 | 179,845 |
| Information | 4,786 | 5,042 | 4,655 | 4,666 | 4,730 | 4,794 | 114,843 |
| Professional, scientific, and technical services | 17,640 | 17,544 | 18,241 | 18,895 | 19,378 | 19,766 | 103,055 |
| Finance and insurance | 3,694 | 3,712 | 3,973 | 4,016 | 4,083 | 4,131 | 101,621 |
| Wholesale trade | 5,876 | 5,684 | 5,967 | 6,262 | 6,460 | 6,618 | 83,362 |
| Transportation and warehousing | 3,524 | 3,679 | 3,879 | 4,244 | 4,436 | 4,495 | 75,858 |
| Construction | 4,676 | 4,316 | 4,862 | 5,073 | 5,358 | 5,481 | 68,274 |
| Private health and social services | 24,844 | 23,804 | 24,411 | 24,962 | 25,690 | 26,289 | 58,815 |
| Administrative support and waste management | 9,273 | 8,272 | 8,003 | 8,520 | 9,012 | 9,341 | 41,575 |
| Private education | 3,265 | 2,735 | 2,833 | 2,979 | 3,245 | 3,401 | 41,133 |
| Incomplete-Recovery Industries | | | | | | | |
| Accommodation and food services | 15,585 | 11,342 | 12,078 | 13,479 | 14,254 | 14,815 | 21,255 |
| Arts, entertainment and recreation | 2,514 | 1,597 | 1,781 | 2,075 | 2,205 | 2,299 | 27,449 |
| Retail trade | 15,786 | 14,303 | 15,133 | 15,442 | 15,358 | 15,243 | 35,831 |
| Natural resources and mining | 284 | 268 | 282 | 283 | 279 | 277 | 38,084 |
| Other services | 5,128 | 4,259 | 4,479 | 4,671 | 4,794 | 4,893 | 38,198 |
| Real estate and rental and leasing | 2,512 | 2,291 | 2,219 | 2,226 | 2,255 | 2,276 | 55,251 |
| Transportation equipment (Motor Vehicles & Parts) manufacturing | 4,683 | 3,867 | 3,826 | 4,006 | 4,081 | 4,073 | 70,918 |
| Other manufacturing | 14,604 | 12,320 | 12,962 | 13,593 | 13,906 | 13,983 | 71,605 |
| Utilities | 423 | 425 | 422 | 425 | 421 | 419 | 154,679 |
| Unclassified | 352 | 344 | 364 | 380 | 388 | 396 | 58,224 |
| Addendum | | | | | | | |
| Unemployment Rate | 2.8 | 6.4 | 4.2 | 3.2 | 2.8 | 2.7 | |

- On an annual average basis, employment in Washtenaw County declined by 7.5 percent in 2020. We estimate that the number of jobs grew by only 2.2 percent in 2021 as the government sector continued to shed jobs last year. We are forecasting that job growth will accelerate this year, with employment growing by 4.1 percent on an annual average basis.
- We are forecasting that job growth in the county will then decelerate to a growth pace of 2.9 percent in 2023 and 2.0 percent in 2024. Washtenaw's payroll jobs count in 2024 exceeds the 2019 level by 7,260 jobs.
- Most of the net job gains in the county are forecast to occur in the private sector. Government, which includes public K-12 education as well as the University of Michigan, Michigan Medicine, Eastern Michigan University, and Washtenaw Community College, adds 2,760 jobs between 2019 and 2024. The private sector grows by 4,500 jobs over that period.

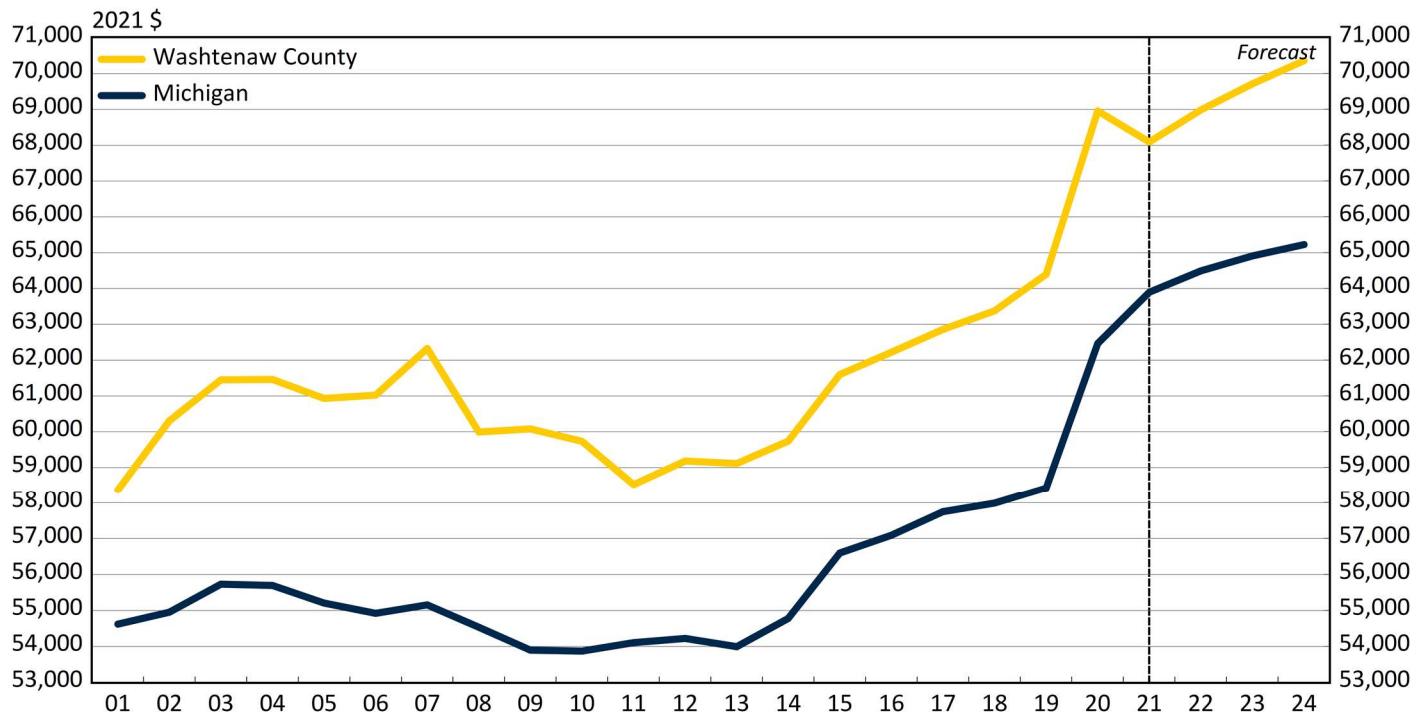
Table 1 Continued

Forecast of Jobs in Washtenaw County by Major Industry Division

- In Table 1, we divide Washtenaw's major private sector industry groups into two types of industries, those that fully return to 2019 employment levels by 2024, and those that only partly return to 2019 employment levels. We have listed the "full-recovery" industries in descending order by their average wages in 2020, and we have listed the "incomplete-recovery" industries in ascending order. Appendix B displays a full list of roughly 100 industries, organized by NAICS code.
- Table 1 shows that the full-recovery industries tend to be higher-paying (7 out of 10 have an average wage that is above the county's overall average in 2020), while the incomplete-recovery industries are generally lower-paying (6 out of 9 have an average wage that is below the county's average).
- Management of companies and enterprises added 100 jobs in 2020 as the industry successfully transitioned to working from home. Management employment is forecast to grow by 350 jobs (26.5 percent) from 2019 to 2024.
- The information industry is forecast to add only 10 jobs between 2019 and 2024, as job losses in newspapers and other traditional information industries offset gains in software publishing and data processing.
- Employment in professional and technical services declined by 100 jobs in 2020, but we are expecting it to recover all of those losses and more this year. Between 2019 and 2024, we expect professional services to grow by 2,130 jobs (12.1 percent).
- Within the professional services industry, we expect scientific research and development to enjoy the largest job gains between 2019 and 2024 (1,000 jobs, or 31.2 percent), followed by computer systems design (430 jobs or 12.7 percent).
- The finance and insurance industry grew by roughly 20 jobs in 2020 and is forecast to see a cumulative job gain of 440 (11.8 percent) between 2019 and 2024.
- Wholesale trade lost 190 jobs in 2020, but then grows by 930 jobs between 2020 and 2024.
- Transportation and warehousing added 150 jobs in 2020 and grows by an additional 820 jobs over the next three years, cumulating to an increase of 27.5 percent between 2019 and 2024.
- Employment in construction declined by 360 jobs in 2020, but it rebounded in 2021 with 550 job gains. Even though growth slows over the next three years, the number of construction jobs in 2024 is forecast to exceed 2019 levels by 800, or 17.2 percent.
- Private health and social services, administrative support and waste management, and private education all suffered substantial job losses in 2020, and they have recovered relatively slowly. By 2024, employment in these industries is expected to modestly exceed 2019 levels.
- Employment in accommodations and food services declined by 27.2 percent in 2020, with the greatest job losses in accommodations and full-service restaurants. This sector enjoys a strong rebound in our forecast, but it still falls 770 jobs (4.9 percent) short of 2019 employment levels in 2024.
- The arts and recreation industry lost 36.5 percent of its jobs in 2020. Despite a healthy jobs recovery, we forecast this industry will have 220, or 8.6 percent, fewer jobs in 2024 than in 2019.
- The retail trade industry lost 1,500 jobs (9.4 percent) in 2020. We estimate retail trade recovered over one-half of those losses in 2021 (830) and will add another 310 jobs in 2022, but that employment will then begin declining. We expect that employment in retail trade will remain well below 2019 levels for the foreseeable future.
- The other services industry enjoys a healthy jobs recovery over the next few years, but employment in 2024 remains slightly below 2019 levels.
- Employment in both automotive and non-automotive manufacturing took a major hit in 2020. Their recovery paths diverge, however. Non-automotive manufacturing has a strong rebound—employment in 2024 is only 10 jobs (0.1 percent) below 2019 levels. Motor vehicle manufacturing, on the other hand, is expected to regain only one-quarter of the jobs it lost in 2020 by 2024. Like retail trade, the local motor vehicle manufacturing industry may never return to its 2019 employment level.

Figure 10

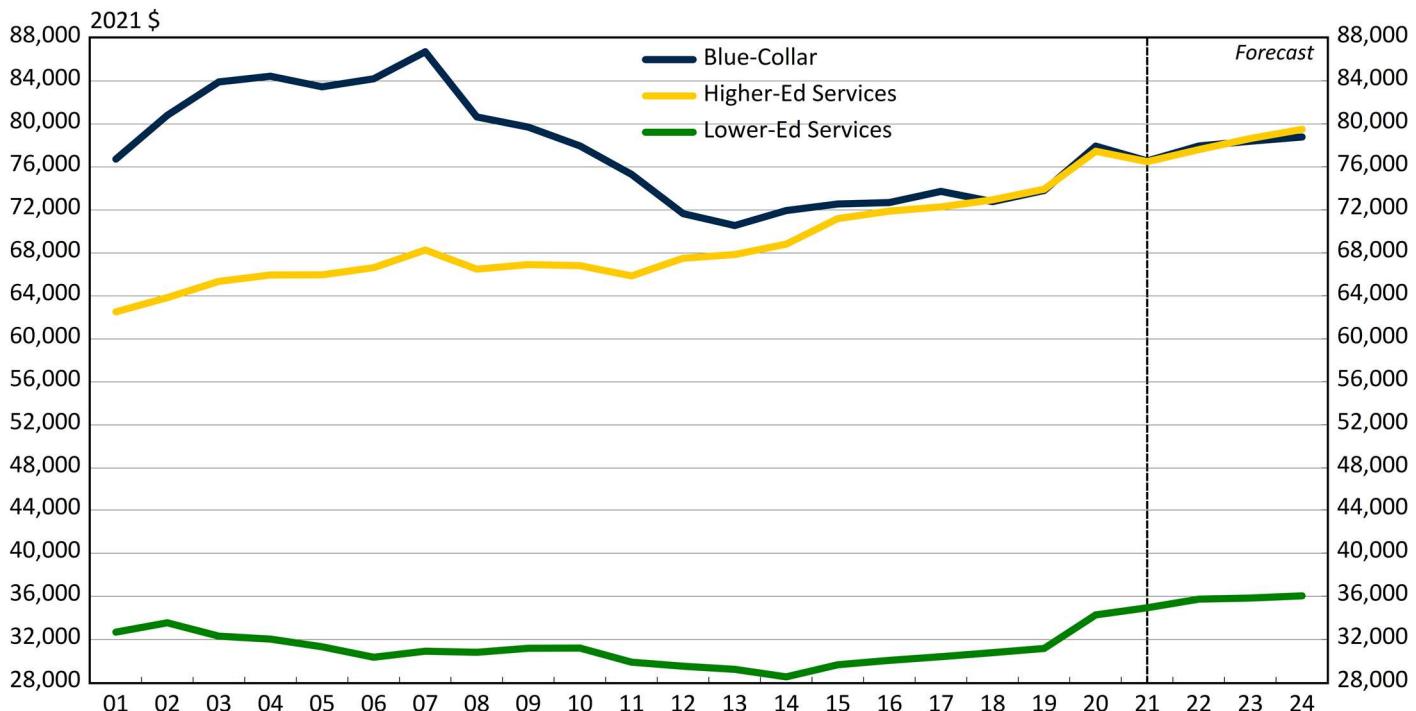
Average Real Wage, Michigan and Washtenaw County



- Figure 10 shows the average real wage for all workers in Washtenaw County and Michigan from 2001 to 2024, adjusted for inflation to be expressed in 2021 dollars.
- The average real wage in Washtenaw County has consistently run about 8 to 10 percent higher than in the state of Michigan.
- Both Washtenaw County and Michigan saw a large jump in average real wages during 2020. Real wages grew by 7.1 percent in Washtenaw County and by 6.9 percent statewide. Those were the largest single-year increases in real wages on record.
- The jump in average wages in 2020 was caused by the disproportionate loss of lower-paying jobs relative to higher-paying jobs during the COVID-19 pandemic. Few individual workers experienced wage increases of that magnitude.
- As the economy continues to recover from the pandemic, we expect employment for lower-income workers to increase more quickly than for higher-income workers. The mix between higher- and lower-income jobs thus returns closer to pre-pandemic levels.
- We estimate that the changing composition effect led average real wages to decline by 1.3 percent in Washtenaw County in 2021. We estimate that in Michigan, the average real wage increased by 2.3 percent.
- As the economy largely returns to normal in 2022 and 2023, the real average wage is forecast to grow a bit more quickly in Washtenaw County than in Michigan, with a differential of about 0.4 percentage points each year.
- Real wages are forecast to average \$70,400 in Washtenaw and \$65,200 in Michigan by 2024. Thus, Washtenaw County's average real wage in 2024 will stand 9.3 percent above 2019 levels. Average real wages statewide will stand 11.6 percent higher than their 2019 level.

Figure 11

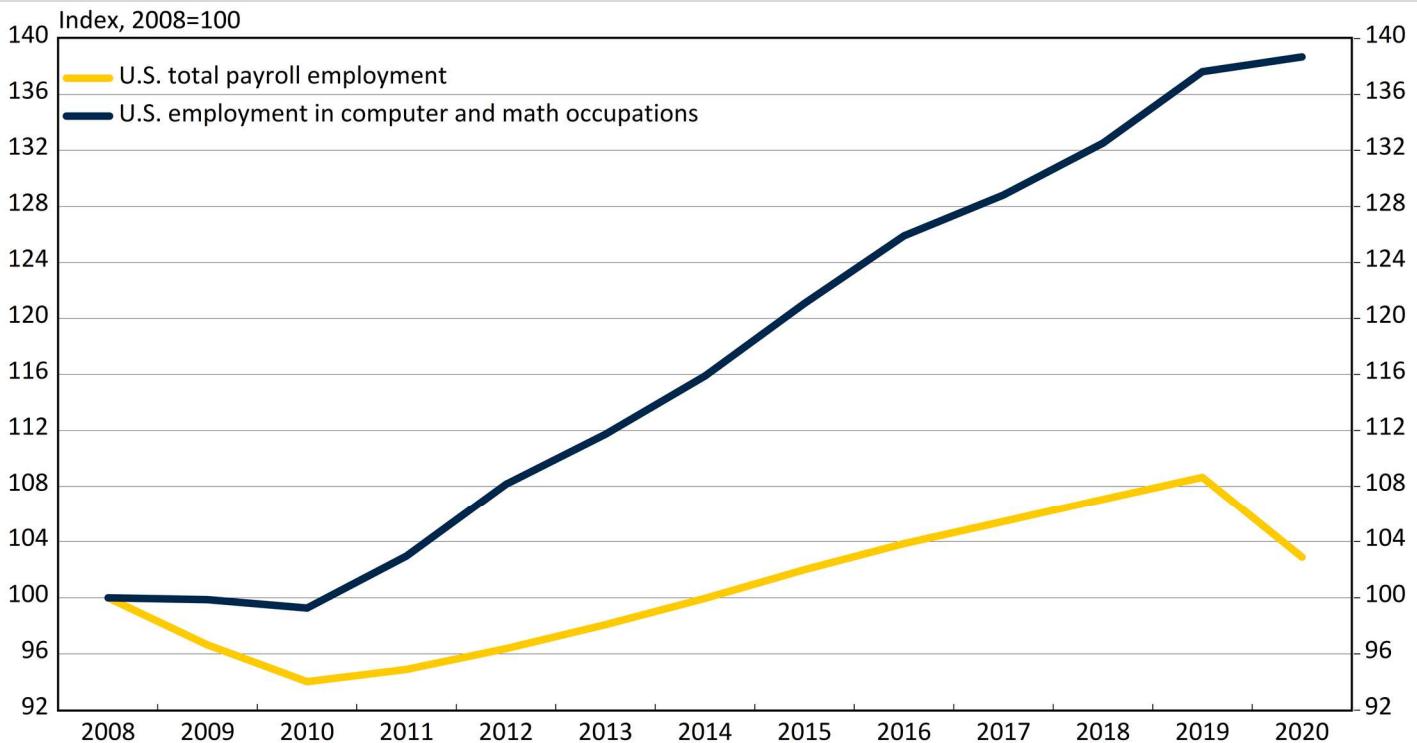
Average Real Wage in Washtenaw County by Selected Industry Group



- Figure 11 shows the average wage in Washtenaw County for the same three industry categories as in Figure 9: traditional blue-collar industries, higher-education service industries, and lower-education service industries.
- Average wages in the blue-collar and higher-education services industries are about twice as high as wages in the lower-education services industries.
- The 2020 pandemic recession caused a spike in average wages in all three-industry groups: 5.6 percent in the blue-collar industries, 4.8 percent in the higher-education services industries, and 10.0 percent in the lower-education services industries.
- The relatively large increase in wages in the lower-education services industries reflects the fact that, even within 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 declined in 2021 in the blue-collar industries and higher-education services industries, but it increased modestly in the lower-education services industries even as inflation picked up.
- Over the next three years the average real wage in the blue-collar industries and lower-education services industries is forecast to increase by 1.0 percent per year, while real wages increase slightly more in the higher-education services industries (1.3 percent per year).
- By 2024, real wages are expected to stand around 6.7 percent higher than their 2019 levels in the blue-collar industries, 7.5 percent higher in the higher-education services industries, and 15.6 percent higher in the lower-education services industries.

Figure 12

Growth in U.S. Employment: Total vs. Computer and Math Occupations



- Figure 12 shows the change in total employment and in computer and math occupation employment in the United States between May 2008 and May 2020. Both data series are indexed so that the value in May 2008 is equal to 100.
- The data come from the Occupational Employment and Wage Statistics (OEWS) program produced by the BLS.
- Between May 2008 and May 2019, total wage and salary employment in the United States increased by 11.7 million (8.6 percent). Jobs in computer and math occupations increased by 1.2 million (37.6 percent).
- Between May 2008 and May 2019 employment in computer and math occupations accounted for 10.6 percent of all net new jobs in the United States despite accounting for only 2.4 percent of all jobs as of May 2008.
- Between May 2019 and May 2020, total employment in the United States declined by 7.8 million due to the COVID-19 recession. Computer and math occupations, on the other hand, added 34,800 jobs over this period.
- Arguably, the future prosperity of the United States and its communities are going to be largely determined by how successful they are in attracting firms and industries that tend to employ large numbers of workers in computer and math occupations.

Table 2

Washtenaw vs. Its Peers: Computer and Math Occupations

| Metropolitan Area | Total Employment | Occupational Employment in Computer & Math | Share of Employment in Computer & Math | Computer & Math 2020 Median Wage (\$) | 2020 Median Wage (\$) |
|-------------------|------------------|--|--|---------------------------------------|-----------------------|
| Ann Arbor, MI | 208,320 | 9,090 | 4.4% | 75,919 | 47,695 |
| Austin, TX | 1,054,230 | 71,170 | 6.8% | 86,898 | 43,242 |
| Bloomington, IN | 68,060 | 2,360 | 3.5% | 71,376 | 41,657 |
| Boulder, CO | 181,420 | 15,400 | 8.5% | 96,979 | 53,393 |
| Greenville, SC | 390,860 | 8,530 | 2.2% | 77,541 | 40,286 |
| Madison, WI | 382,410 | 25,530 | 6.7% | 87,619 | 48,654 |
| Minneapolis, MN | 1,848,960 | 85,650 | 4.6% | 90,901 | 48,164 |
| Pittsburgh, PA | 1,068,070 | 36,070 | 3.4% | 83,054 | 45,148 |
| Portland, OR | 1,142,100 | 45,040 | 3.9% | 88,359 | 45,471 |
| Raleigh, NC | 621,270 | 37,150 | 6.0% | 98,219 | 45,472 |
| San Francisco, CA | 2,330,800 | 158,730 | 6.8% | 107,243 | 52,646 |
| <i>Addenda:</i> | | | | | |
| United States | 139,099,570 | 4,587,700 | 3.3% | 91,350 | 41,950 |

Wages are adjusted for local cost of living differences using BEA price parity index and are based on full-time equivalent without bonus or overtime pay.

- How is Washtenaw County doing in attracting computer and math occupation jobs? Table 2 shows the share of employment and the average wage in computer and math occupations in Washtenaw County and ten other “technology-driven communities” identified by Ann Arbor SPARK in its report, [“Benchmarking the Ann Arbor Region—2020.”](#)
- These data also come from the BLS’ OEWS program.
- In May 2020, computer and math occupations accounted for 4.4 percent of all jobs in Washtenaw County compared to 3.3 percent for the nation. Four of the comparison areas have a smaller share of jobs in computer and math occupations while six have a larger share of jobs in computer and math occupations.
- An important challenge for the local economy is that the wages paid in computer and math occupations in Washtenaw County are relatively low compared with the United States as a whole.
- Adjusted for the local cost of living, the median wage in computer and math occupations in Washtenaw County is \$75,919, which is 17 percent less than the median wage in computer and math occupations in the U.S. overall (\$91,350).
- Furthermore, nine out of the ten comparable technology-driven communities identified by Ann Arbor SPARK have higher wages in computer and math occupations than Washtenaw County.
- For example, even after adjusting for differences in the cost of living, the median wage in computer and math occupations in San Francisco is 41 percent higher than it is in Washtenaw County. These data do not include the value of stock options and bonuses, so the gap in total compensation may be even larger.
- Overall, jobs in Washtenaw County tend to pay relatively well, but not jobs in computer and math occupations. In order to remain a technology-driven community, Washtenaw will need to find ways to pay more competitively with national leaders in these occupations.

Appendix A:

Review of the Forecast

| Year of Forecast | % Forecast Error for Total Jobs | Year of Forecast | % Forecast Error for Total Jobs | Year of Forecast | % Forecast Error for Total Jobs |
|------------------|---------------------------------|------------------|---------------------------------|------------------|---------------------------------|
| 1986 | - 1.4 | 1998 | - 0.5 | 2010 | - 2.3 |
| 1987 | - 0.8 | 1999 | 0.0 | 2011 | - 0.6 |
| 1988 | - 1.2 | 2000 | 0.0 | 2012 | - 0.4 |
| 1989 | - 0.6 | 2001 | + 0.3 | 2013 | - 0.0 |
| 1990 | + 0.8 | 2002 | + 0.3 | 2014 | + 1.1 |
| 1991 | + 1.4 | 2003 | + 1.0 | 2015 | + 0.2 |
| 1992 | + 0.5 | 2004 | + 0.2 | 2016 | - 0.3 |
| 1993 | + 1.3 | 2005 | + 0.4 | 2017 | - 0.3 |
| 1994 | n.a. | 2006 | + 0.7 | 2018 | + 0.4 |
| 1995 | + 0.2 | 2007 | 0.0 | 2019 | - 1.8 |
| 1996 | + 0.3 | 2008 | + 0.6 | 2020 | + 1.0 |
| 1997 | + 0.4 | 2009 | + 1.0 | 2021 | - 0.0 |

(Positive numbers indicate that the forecast was too high; negative numbers indicate that it was too low.)

Average absolute forecast error 1986–2021: 0.6%

| | Forecast 2021 | Actual 2021 |
|-------------------------|---------------|-------------|
| Unemployment rate | 4.3% | 4.2% |
| Consumer inflation rate | 2.3% | 4.4% |

Forecast Date: March 2021

- In last year's report, we forecast that Washtenaw County would gain 4,270 jobs in 2021, for an increase of 2.1 percent. We now estimate that the county gained 4,520 jobs last year (an increase of 2.2 percent). Due to revisions to the calendar 2020 job count, our forecast error for the 2021 employment level comes to an under-prediction of just 96 jobs, or 0.0 percentage points after rounding.
- That forecast error was well below our average absolute error of 0.6 percent since 1986.
- We had forecast that Washtenaw's unemployment rate would decrease from 6.5 percent in 2020 to 4.3 percent in 2021. Washtenaw's unemployment rate decreased from 6.5 in 2020 to 4.2 percent in 2021.
- Considering the difficult data gathering environment, we are very satisfied with last year's forecast error. That said, we expect the unemployment rate to be revised shortly, leading to a marginally different forecast error.
- Last year, we forecast that local prices would increase by 2.3 percent from 2020 to 2021. Local prices ended up increasing by 4.4 percent last year amid supply shortages in a time of strong demand.
- Overall, we are quite impressed by Washtenaw County's recovery from the COVID-19 recession, and we are pleased with our forecast accuracy to date. We hope that we can beat our average forecast error again when the dust settles on 2022.
- Exiting a recession and a pandemic is an uncertain process. We hope that our forecasts help decision makers throughout Washtenaw County in their planning and decision making.

Appendix B:

Forecast of Jobs in Washtenaw County by Detailed Industry

| | Estimate 2021 | Forecast | | | Average Annual Wage |
|---|------------------|----------|---------|---------|---------------------|
| | | 2022 | 2023 | 2024 | 2020 \$ |
| Total Payroll Jobs (Number of jobs) | 206,631 | 215,018 | 221,207 | 225,736 | 66,385 |
| (Annual percentage change) | (2.2) | (4.1) | (2.9) | (2.0) | |
| Total Government | 78,595 | 81,262 | 83,311 | 85,133 | 68,952 |
| Federal government | 4,313 | 4,391 | 4,502 | 4,590 | 90,051 |
| State Government | 63,112 | 65,252 | 66,817 | 68,310 | 69,937 |
| Local Government | 11,171 | 11,619 | 11,992 | 12,233 | 55,414 |
| Total Private | 128,035 | 133,756 | 137,896 | 140,603 | 64,746 |
| Private Goods-Producing | 18,110 | 18,953 | 19,546 | 19,745 | 70,064 |
| Natural resources and mining | 282 | 283 | 279 | 277 | 38,084 |
| Construction | 4,862 | 5,073 | 5,358 | 5,481 | 68,274 |
| Construction of buildings | 1,544 | 1,693 | 1,795 | 1,850 | 62,434 |
| Heavy and civil engineering construction | 507 | 511 | 547 | 561 | 95,760 |
| Specialty trade contractors | 2,810 | 2,869 | 3,016 | 3,070 | 66,531 |
| Manufacturing | 12,966 | 13,597 | 13,910 | 13,987 | 71,387 |
| Printing and related support activities | 1,163 | 1,191 | 1,223 | 1,243 | 48,195 |
| Chemicals | 616 | 659 | 715 | 764 | 75,301 |
| Plastics and rubber products | 727 | 812 | 876 | 925 | 99,525 |
| Nonmetallic mineral products | 225 | 237 | 243 | 244 | 68,622 |
| Fabricated metals | 1,138 | 1,183 | 1,180 | 1,137 | 60,173 |
| Machinery | 1,069 | 1,146 | 1,194 | 1,203 | 70,769 |
| Computer and electronic products | 1,288 | 1,338 | 1,342 | 1,337 | 87,415 |
| Transportation equipment | 3,826 | 4,006 | 4,081 | 4,073 | 70,918 |
| Miscellaneous manufacturing | 1,292 | 1,318 | 1,304 | 1,281 | 87,214 |
| Manufacturing NEC | 1,623 | 1,707 | 1,752 | 1,779 | 59,505 |
| Private Service-Providing | 109,925 | 114,803 | 118,350 | 120,858 | 63,902 |
| Trade, transportation, and utilities | 25,423 | 26,374 | 26,675 | 26,775 | 55,255 |
| Wholesale trade | 5,967 | 6,262 | 6,460 | 6,618 | 83,362 |
| Merchant wholesalers, durable goods | 3,575 | 3,753 | 3,884 | 3,989 | 89,983 |
| Merchant wholesalers, nondurable goods | 1,738 | 1,806 | 1,855 | 1,894 | 69,641 |
| Wholesale electronic markets, agents, brokers | 654 | 703 | 720 | 735 | 85,987 |
| Retail trade | 15,133 | 15,442 | 15,358 | 15,243 | 35,831 |
| Motor vehicle and parts dealers | 1,557 | 1,586 | 1,595 | 1,605 | 63,781 |
| Furniture and home furnishings stores | 509 | 520 | 516 | 514 | 40,914 |
| Electronics and appliance stores | 683 | 700 | 706 | 708 | 51,452 |
| Building material and garden supply dealers | 1,352 | 1,356 | 1,346 | 1,337 | 44,228 |
| Food and beverage stores | 3,039 | 2,951 | 2,884 | 2,819 | 28,324 |
| Health and personal care stores | 1,125 | 1,153 | 1,142 | 1,124 | 37,962 |
| Gasoline stations | 482 | 485 | 492 | 497 | 23,265 |
| Clothing and clothing accessories stores | 914 | 1,006 | 1,014 | 993 | 23,245 |
| Sporting goods, hobby, book, and music stores | 627 | 621 | 589 | 560 | 23,896 |
| General merchandise stores | 2,870 | 2,996 | 3,019 | 3,040 | 28,894 |
| Miscellaneous store retailers | 1,397 | 1,495 | 1,496 | 1,497 | 29,378 |
| Nonstore retailers | 579 | 573 | 560 | 550 | 42,035 |
| Transportation and warehousing | 3,879 | 4,244 | 4,436 | 4,495 | 75,858 |
| Truck transportation | 710 | 748 | 764 | 757 | 66,855 |
| Couriers and messengers | 699 | 771 | 807 | 820 | 48,109 |
| Warehousing and storage | 151 | 161 | 168 | 174 | 67,571 |
| Transportation and warehousing NEC | 2,318 | 2,565 | 2,697 | 2,744 | 87,634 |
| Utilities | 422 | 425 | 421 | 419 | 154,679 |

Appendix B:

Forecast of Jobs in Washtenaw County by Detailed Industry

| | Estimate 2021 | Forecast | | | Average Annual Wage 2020 \$ |
|--|------------------|----------|--------|--------|--------------------------------|
| | | 2022 | 2023 | 2024 | |
| Information | 4,655 | 4,666 | 4,730 | 4,794 | 114,843 |
| Publishing | 1,639 | 1,626 | 1,613 | 1,593 | 101,763 |
| Telecommunications | 481 | 470 | 455 | 441 | 68,628 |
| Data processing, hosting, and related services | 1,117 | 1,108 | 1,148 | 1,191 | 103,372 |
| Information NEC | 1,417 | 1,462 | 1,514 | 1,568 | 155,800 |
| Financial activities | 6,189 | 6,243 | 6,338 | 6,407 | 83,924 |
| Finance and insurance | 3,973 | 4,016 | 4,083 | 4,131 | 101,621 |
| Credit intermediation and related activities | 2,164 | 2,125 | 2,140 | 2,151 | 100,672 |
| Insurance carriers and related activities | 873 | 878 | 884 | 889 | 75,678 |
| Finance and insurance NEC | 936 | 1,013 | 1,060 | 1,091 | 130,150 |
| Real estate and rental and leasing | 2,219 | 2,226 | 2,255 | 2,276 | 55,251 |
| Professional and business services | 27,718 | 28,974 | 30,031 | 30,789 | 88,418 |
| Professional and technical services | 18,241 | 18,895 | 19,378 | 19,766 | 103,055 |
| Legal services | 1,022 | 1,047 | 1,055 | 1,060 | 87,328 |
| Accounting and bookkeeping services | 580 | 588 | 590 | 592 | 71,181 |
| Architectural and engineering services | 4,767 | 4,937 | 5,030 | 5,098 | 120,028 |
| Specialized design services | 243 | 246 | 248 | 251 | 62,878 |
| Computer systems design and related services | 3,225 | 3,438 | 3,635 | 3,811 | 122,471 |
| Management and technical consulting services | 2,534 | 2,614 | 2,663 | 2,712 | 104,261 |
| Scientific research and development services | 4,147 | 4,232 | 4,298 | 4,329 | 96,450 |
| Advertising, PR, and related services | 191 | 198 | 202 | 199 | 78,839 |
| Other professional and technical services | 1,532 | 1,594 | 1,657 | 1,715 | 54,255 |
| Management of companies and enterprises | 1,487 | 1,559 | 1,641 | 1,682 | 179,845 |
| Administrative support and waste management | 8,003 | 8,520 | 9,012 | 9,341 | 41,575 |
| Private education and health services | 27,242 | 27,941 | 28,935 | 29,690 | 56,993 |
| Education services | 2,833 | 2,979 | 3,245 | 3,401 | 41,133 |
| Health care and social assistance | 24,411 | 24,962 | 25,690 | 26,289 | 58,815 |
| Ambulatory health care | 11,403 | 11,844 | 12,215 | 12,551 | 79,836 |
| Offices of physicians | 5,463 | 5,689 | 5,854 | 6,036 | 106,813 |
| Offices of dentists | 1,347 | 1,365 | 1,373 | 1,384 | 57,157 |
| Offices of other health practitioners | 1,019 | 1,075 | 1,118 | 1,153 | 44,223 |
| Home health care services | 1,937 | 2,056 | 2,191 | 2,276 | 46,767 |
| Other Ambulatory Health Care Services | 1,636 | 1,658 | 1,680 | 1,701 | 66,536 |
| Nursing and residential care facilities | 3,541 | 3,604 | 3,768 | 3,926 | 34,778 |
| Health care and social assistance NEC | 9,466 | 9,514 | 9,706 | 9,813 | 45,936 |
| Leisure and hospitality | 13,859 | 15,554 | 16,460 | 17,114 | 22,020 |
| Arts, entertainment, and recreation | 1,781 | 2,075 | 2,205 | 2,299 | 27,449 |
| Accommodation and food services | 12,078 | 13,479 | 14,254 | 14,815 | 21,255 |
| Accommodation | 900 | 1,091 | 1,127 | 1,154 | 28,489 |
| Food services and drinking places | 11,178 | 12,388 | 13,127 | 13,661 | 20,715 |
| Restaurants and other eating places | 9,829 | 10,813 | 11,450 | 11,887 | 20,056 |
| Full-service restaurants | 4,625 | 5,408 | 5,853 | 6,150 | 22,746 |
| Limited-service restaurants | 4,505 | 4,642 | 4,786 | 4,935 | 18,496 |
| Other Restaurants and Other Drinking Places | 699 | 763 | 811 | 802 | 13,970 |
| Special food services | 575 | 695 | 775 | 847 | 27,303 |
| Drinking places, alcoholic beverages | 774 | 880 | 903 | 927 | 23,493 |
| Other services | 4,479 | 4,671 | 4,794 | 4,893 | 38,198 |
| Private unclassified service-providing | 364 | 380 | 388 | 396 | 58,224 |

Addendum

Unemployment Rate

4.2 3.2 2.8 2.7