2022 LABOR MARKET AND ECONOMIC REPORT

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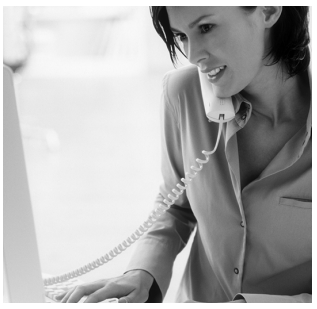
Employment Security Department
WASHINGTON STATE

Data Architecture, Transformation and Analytics

August 2023



2022 Labor Market and Economic Report

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Washington State Employment Security Department

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Further analysis and detailed statistics are available from the Employment Security Department (ESD) upon request. Historical values are subject to revision and may not equal prior report values. To get this report in an alternative format, call the Data Architecture, Transformation and Analytics Division at 833-572-8421.

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Executive summary

U.S. economy and labor market

The U.S. economy continued its recovery from the COVID-19 recession in 2022 and into 2023. Despite recession fears sparked by a decline in Gross Domestic Product for two consecutive quarters, the labor market remained exceptionally strong with worker shortages continuing in a number of industries. Unemployment was low, with the unemployment rate for African Americans and Latinos at or near the lowest mark since the data series began. With fertility rates in the U.S. well below replacement rates, retirees will outnumber new young workers for years to come, increasing the chance of chronic labor shortages going forward.

The year began with inflation at a high rate, due to high energy prices, strong consumer demand based in part on stimulus programs, lingering supply chain issues, a chronic undersupply of housing, and an increase in corporate profits. Price increases abated by the end of the year. Energy prices declined, and supply chain issues that had led to shortages of components for manufacturers eased. Also, most of the stimulus programs that had provided income support to households came to an end. Corporate profits remained high and hit record levels in the first quarter of 2023.

The Federal Reserve Bank raised short-term interest rates rapidly in 2022, hoping to slow down consumer demand (and thus inflation) at the potential cost of raising unemployment and lowering inflation-adjusted wages. The increase in short-term rates led to a rise in mortgage rates, which in turn led to a steep drop in housing starts and a modest decline in home prices.

Wages rose in 2022, but not as fast as inflation for most workers. For most of the year, only lower-wage workers enjoyed inflation-adjusted wage increases, often through switching employers and sometimes the industries in which they worked. As inflation slowed at the end of the year, median wage increases finally started to outpace price increases

Wealth remained extremely unequal in the U.S. with the top 10 percent owning 68% of all assets. The share of the nation's wealth owned by the bottom 50 percent of households increased from 2019 to 2022, as did the share owned by the top 1 percent of households.

Washington's economy and labor market

Washington's labor market continued to recover from the COVID-19 recession in 2022. Unemployment fell to near-historic lows. Job openings were at high levels, hiring was strong, quit rates were high as workers switched jobs, and layoffs were at very low levels. Most major sectors topped their pre-pandemic employment levels by the end of the year. Over the course of the pandemic, job growth was strongest in professional services, corporate offices, information services, warehousing and private educational services. Lagging sectors included accommodations, state educational services, manufacturing (primarily due to cuts in aerospace staffing), arts, entertainment and recreation services, residential nursing facilities, and other services.

Similar to most of the rest of the country, labor was in short supply, particularly for lower-wage jobs. As a result, wages were rising faster than inflation, and faster on the lower end of the pay scale. Telecommuting receded from its peak during the early months of the pandemic, but in 2022, more than a third of the workforce was working at least part of the week at home.

Housing permits were at high levels in 2022, but single-family permits dropped markedly in the second half of the year. As a result, construction employment hiring slowed. A number of large layoffs were announced in the tech sector, but by the end of the year the only noticeable sign was a decline of 1,500 jobs in the prepackaged software industry. Taxable sales for restaurants and accommodations continued to recover but consistent with employment trends, were still below their pre-pandemic peaks.

Seasonal, structural and cyclical industry employment

The purpose of this chapter is to identify the most influential factors affecting employment trends for different industries in Washington state. The results are important for both providing a better understanding of current employment trends and for practical applications such as job placement, unemployment insurance and training programs.

The analysis is based on historical employment data from January 2002 through December 2020, and splits industry employment trends among the following four components:

Seasonality refers to predictable patterns of employment that occur within a calendar year. Natural factors such as weather, administrative factors such as school or budget calendars, and social or cultural factors such as holidays affect the seasonal trends in some industries. This year's analysis identified 17 industries that have a high level of seasonality. Crop production, scenic and sightseeing transportation, and support activities for agriculture and forestry were the most seasonal industries.

Structural (trend) components refer to shifts in long-term employment growth because of fundamental structural changes. Innovation and the adoption of new technology, policy changes, shifting access to resources, and societal changes can affect and be reflected in structural employment changes. There were 12 industries where the structural (trend) component accounted for at least two-thirds of the change in employment. The four industries that were influenced to the greatest extent by structural factors were other information services (a diverse collection of industries that includes personal care services, religious and grantmaking organizations and other services), wholesale electronic markets and agents and brokers, publishing industries (except internet), and ambulatory health care services.

Cyclical factors refer to changes that are attributable to the business cycle or specific events such as the housing bubble bursting in 2007, cyclical variation in aerospace employment, or the COVID-19 pandemic during 2020. For 30 industries, the cyclical component accounted for more than half of the change in employment over time. Support activities for mining, performing arts, spectator sports, and related industries, and amusement, gambling, and recreation industries were most highly influenced by cyclical factors.

Irregular factors refer to random employment changes not picked up by regular seasonal and cyclical components (e.g., non-regular seasonality, weather variation and labor strikes).

Unemployment

This chapter discusses two important indicators of Washington's labor market: unemployment benefits and unemployment rates.

In September 2022, 35,852 people received an unemployment benefit payment.

Disruptions caused by the COVID-19 pandemic recession led to unprecedented demand for unemployment insurance. The number of paid claims peaked at a high of 711,945 in May 2020. Since May 2020, the number of individuals receiving benefits in Washington state has dropped and is currently at 35,852 claimants as of September 2022. The decrease in beneficiaries reflects factors including easing of COVID-19

concerns and restrictions, individual beneficiaries finding jobs, and less people being laid off and needing to apply for benefits.

From October 2021 through September 2022, ESD paid more than $1.19 billion in unemployment benefit payments. This compares to $10.2 billion paid in unemployment benefit payments in the prior 12-month period (October 2020 through September 2021).

Unemployed individuals exhaust their benefits when they have received all regular unemployment benefits available to them. Since September 2020, exhaustions of regular benefits have been decreasing, with September 2022 exhaustions currently at 2,559 claimants. From October 2021 through September 2022, workers in the construction and educational service sectors were most likely to exhaust regular unemployment benefits with an exhaustion-to-employment ratio of 3.3 percent and 2.5 percent respectively. Management and construction and extraction occupations accounted for the largest share of exhaustions between October 2021 and September 2022. Each of these two occupation groups accounted for 13.5 percent of all exhaustions. From October 2021 through September 2022, workers in the Snohomish and Pierce County workforce development areas (WDAs) were most likely to exhaust regular unemployment benefits with an exhaustion-to-employment ratio of 1.1. Seattle-King County accounted for the largest share of exhaustions and employment with an exhaustion-to-employment ratio of 0.5.

The state unemployment rate reached a high in second quarter 2020 of 16.8 percent. By September 2022, the state unemployment rate was at 3.7 percent, while the national unemployment rate was at 3.5 percent, respectively.

Employment projections

Employment projections provide a general outlook for industry and occupational employment in Washington state. They provide job seekers, policymakers and training providers an idea of how much an industry or occupation is projected to change over time and show the future demand for workers.

On an annual basis, ESD produces industry employment projections for two, five and 10 years from a base period. For this annual report, the base period for the two-year (short-term) projections is second quarter 2021. The base period for the five-year (medium-term) and 10-year (long-term) projections is 2020.

The 10-year average annual growth rate for total nonfarm employment in Washington for the 2020 to 2030 period is projected to be 1.70 percent. This is an increase from the 0.40 percent average annual growth rate predicted last year for 2019 to 2029, a result likely due to the sharp recovery in employment from the economic downturn during the COVID-19 pandemic.

The largest increases by share of employment (industry) are expected in the leisure and hospitality and information sectors, and the largest increases by share of employment (occupation) are projected for the food preparation and serving-related occupations and computer and mathematical occupations. The largest decreases by share of employment (industry) are expected for the manufacturing and wholesale trade sectors, and the largest decreases (occupation) are expected for the production occupations and office and administrative support occupations.

Income

This chapter explores measures related to household income and well-being for Washington residents.

In 2021, 78.4 percent of households reported having earnings from a job. Other quantifiable components of income include investment income, public and private retirement benefits, and various types of government assistance.

The portion of households reporting retirement income has increased over time. In 2021, 25.7 percent of households reported having retirement income, compared with 19.1 percent five years earlier.

The median household income in Washington increased by 7.4 percent ($5,797) from 2017 to 2021. Washington household income increased by $857 from 2019 to 2021.

In 2021, the poverty rate for Washington residents was 9.9 percent; essentially unchanged from the 2019 rate, despite the pandemic disruption. The proportion of households receiving welfare payments jumped to 4.1 percent in 2021 with an average monthly payout of $451. Supplemental Nutrition Assistance Program benefits increased to cover 12.3 percent of households by 2021.

From 2019 to 2021, the portion of full-time workers dropped from 61.9 percent to 60.5 percent.

Over the past five years, the proportion of households with $35,000 or less in annual income has steadily decreased. The share of households with incomes exceeding $100,000 per year expanded from about 38 percent in 2017 to nearly 43 percent in 2021.

Wages

The median hourly wage rose from $30.46 in 2020 to $30.83 in 2021, a 1.2 percent increase. Job losses during 2020 were predominantly in lower-wage jobs. In 2021, there was faster than average hiring in many lower-wage industries, and strong growth in many higher-wage industries.

The average hourly wage continued to rise in 2021 and wage inequality widened. The ratio of the best-paying 10 percent of jobs to the lowest-paying 10 percent of jobs increased to 12.6, its highest value since the data series began in 1990.

The number of jobs paying below $14.00 per hour plummeted from 189,000 in 2019 down to 46,500 in 2020, due primarily to the loss of lower-wage jobs during the pandemic. In 2021, the number of jobs paying below $14.00 increased to 77,100 and the state minimum wage surpassed $14.00 in 2022.

Total payroll expanded from $252 billion in 2020 to $268 billion in 2021, an increase of 6.4 percent. The average annual wage rose by 3.3 percent to $83,175. Per capita personal income in Washington state reached $73,775 in 2021, sixth among states. Total transfer payments grew by 34 percent in 2020 and another 7 percent in 2021.

Chapter 1: U.S. economy and labor market

Major developments in the U.S. economy during 2022 include:

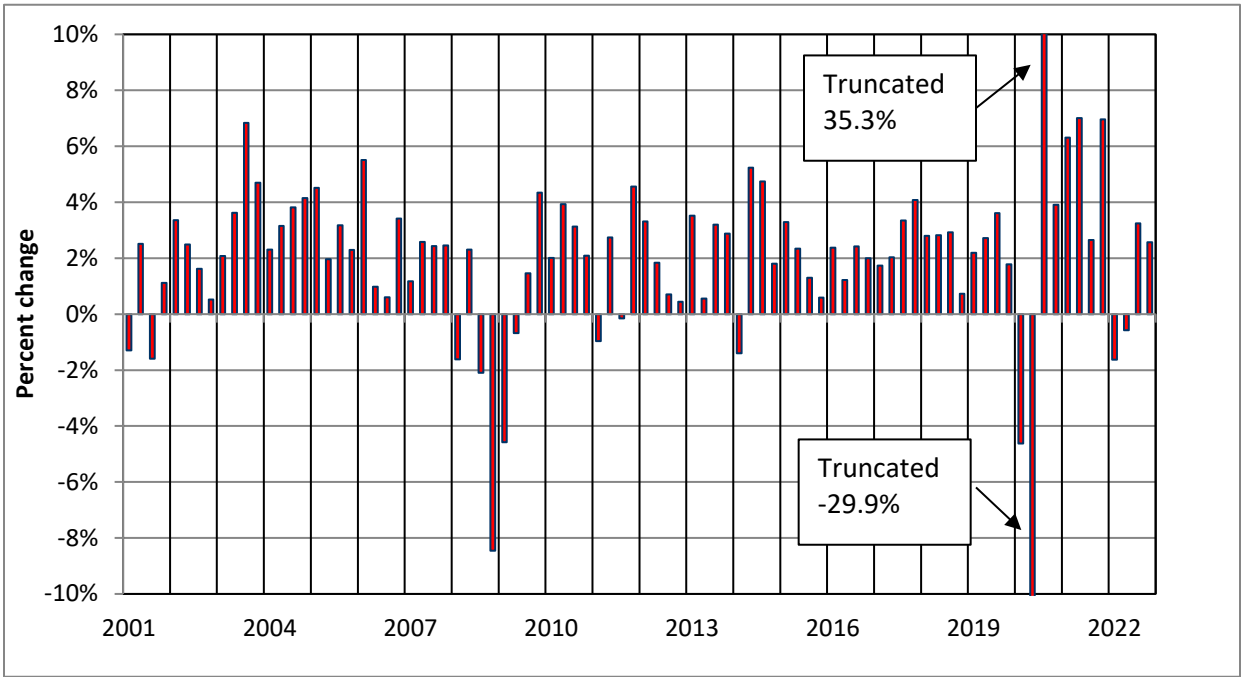
- The economy continued its recovery from the COVID-19 recession.
- Despite recession fears sparked by two consecutive quarters of declining Gross Domestic Product (GDP), the labor market remained exceptionally strong. Unemployment was low, with the unemployment rate for African Americans and Latinos at or near the lowest since the data series began. Worker shortages continued in many industries due to COVID-19, including long-term health impacts and deaths, a higher retirement rate for workers age 65 and older, and a drop in immigration. With fertility rates in the United States well below replacement rates, retirees will outnumber new young workers, increasing the chance of chronic labor shortages going forward.
- Over one-fourth of the workforce was working at home at least part of the week, with the latest data showing little change over the past six months.
- Wages rose, but not as fast as inflation for most workers. Only low-wage workers saw inflation-adjusted wage increases, often through switching employers or industries.
- Supply-chain issues eased considerably during 2022.
- The year began with inflation at a high rate, due to strong consumer demand, lingering supply-chain issues, an undersupply of housing, and an increase in corporate profits. Price increases abated by the end of the year.
- The Federal Reserve Bank raised short-term interest rates rapidly in 2022, hoping to slow down consumer demand (and thus inflation) at the potential cost of raising unemployment and lowering inflation-adjusted wages.
- Rising mortgage rates led to a steep drop in housing starts and a modest decline in home prices.
- Wealth remains extremely unequal in the United States, with the top 10% owning 68% of all assets. The share of the nation's wealth owned by the bottom 50% of households increased from 2019 to 2022, as did the share owned by the top 1% of households.

The economic recovery continued in 2022

Five major factors are used to assess the state of the business cycle: gross domestic product (GDP), industrial production, personal income, retail and food service sales, and nonfarm employment. Normally, these factors move together, although with a lag. In 2022, things were different.

When GDP falls for two consecutive quarters, that is typically an indicator that the economy is in recession because usually when GDP is in a sustained decline, other indicators are also dropping. So it was no surprise that when the first two quarters of 2022 registered negative growth (*Figure 1-1)*, headlines were full of recession calls.

Figure 1-1. Gross domestic product, inflation-adjusted annualized change
United States, first quarter 2001 through fourth quarter 2022
Source: U.S. Bureau of Economic Analysis



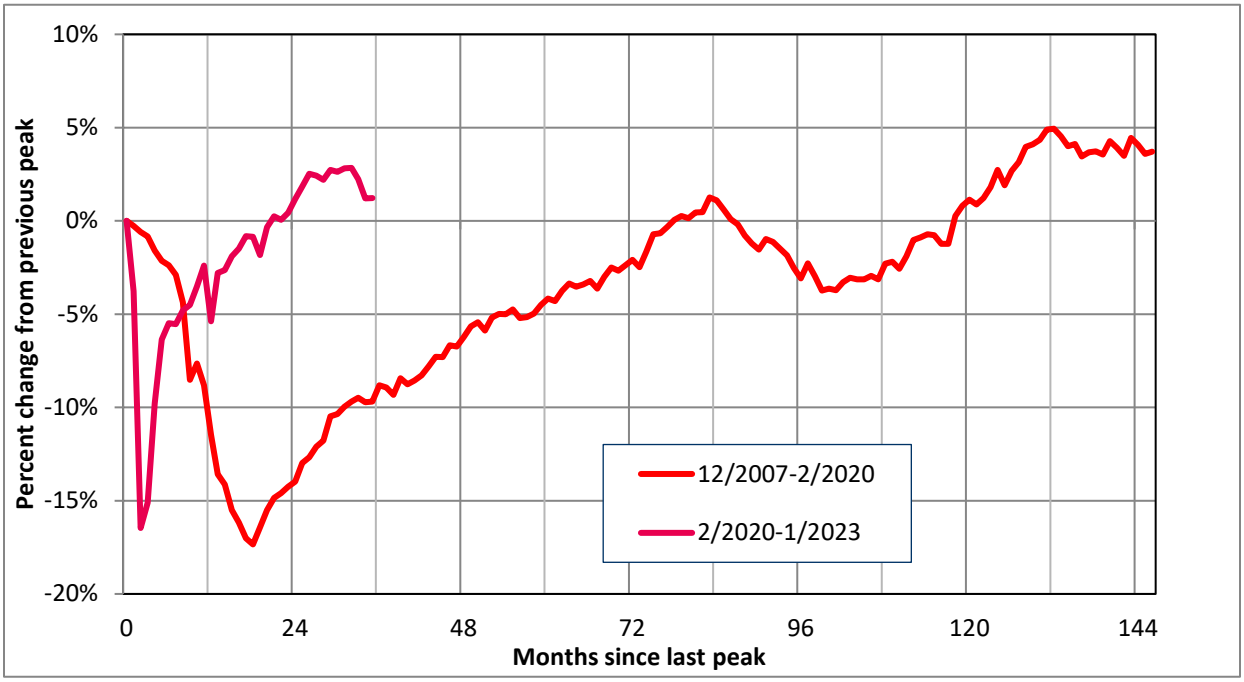
GDP fell steeply in the first quarter of 2020, recovered the next quarter of 2020, took a breather in the first half of 2022, and resumed expansion in the second half of the year.

The COVID economy was different. While GDP dipped, other measures were on the rise or at least holding their own – trends that continued into the last two quarters of 2022 as GDP turned positive, rising by 3.2% and 2.7%, respectively.

- Compared with the Great Recession of 2008, industrial production[1] recovered much faster in the COVID recession. Production increased sharply in the first four months of 2022 and then held steady until November and December, when the manufacturing component of the index dropped sharply (*Figure 1-2)*. About half of the decline in manufacturing was made up in January 2023, making it unclear whether this was a temporary dip or whether industrial production will continue to weaken as part of a general downturn in the economy. Overall, industrial production was still higher in 2022 than it was in 2019 and early 2020.

1 The industrial production index combines mining output (which is mostly oil), energy production, and manufacturing output. The latter makes up the biggest share of the index.

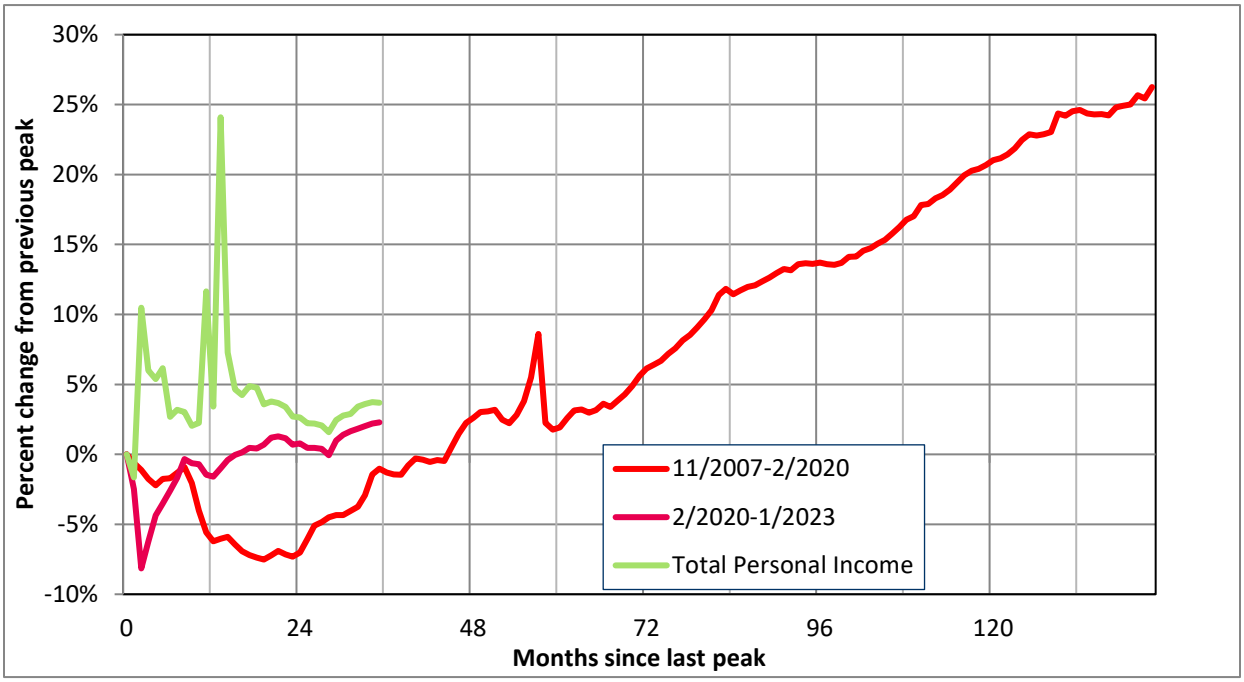
Figure 1-2. Industrial production compared with its previous peak
United States, December 2007 through January 2023
Source: Federal Reserve Bank/Federal Reserve Economic Data (FRED)



Industrial production rose in early 2022, leveled off, and dipped the last two months of the year.

To analyze the income generated by the economy, economists look at total personal income after subtracting transfer payments like Social Security, Medicare and Medicaid, Supplemental Nutrition Assistance Program payments (SNAP, formally known as food stamps) and other income support, unemployment benefits and veterans' benefits. With this in mind, personal income declined slightly during the first half of 2022 before increasing steadily in the second half of the year and into 2023 (*Figure 1-3)*. While this clearly does not suggest a recession, the growth rate was considerably slower than in the years preceding the pandemic.

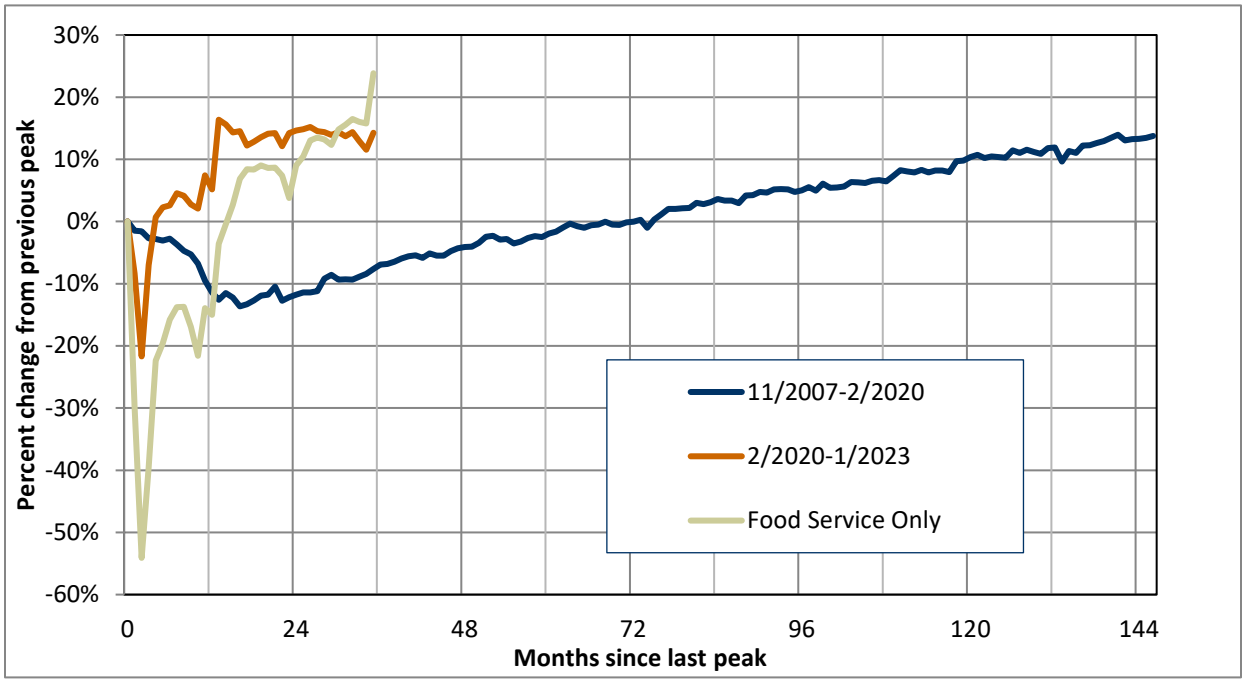
Figure 1-3. Personal income excluding transfer payments, and total personal income, percent change from previous peak
United States, February 2008 through February 2020 (blue line), and February 2020 through January 2023 (orange line), along with total personal income, February 2020 through January 2023
Source: Bureau of Economic Analysis/FRED



Personal income, with and without transfer payments included, increased steadily in the last half of 2022.

- Retail and food service sales were volatile during 2022 and essentially stagnant – not surprising considering the elevated level of sales during the first two years of the pandemic (*Figure 1-4)*. Part of the stagnation was due to the shift from buying things (included in retail sales) to buying services (not included) as consumers shifted to a more "normal" spending pattern. What was surprising was that sales remained at elevated levels, 14% above pre-COVID purchasing, despite most stimulus funding for COVID ending and slow income growth. The food service portion of sales rose dramatically to 14% above pre-COVID levels as people flocked back to restaurants. Again, there's no sign of a recession, considering that dining out is one of the first things that people cut back on if they are worried about their employment prospects.

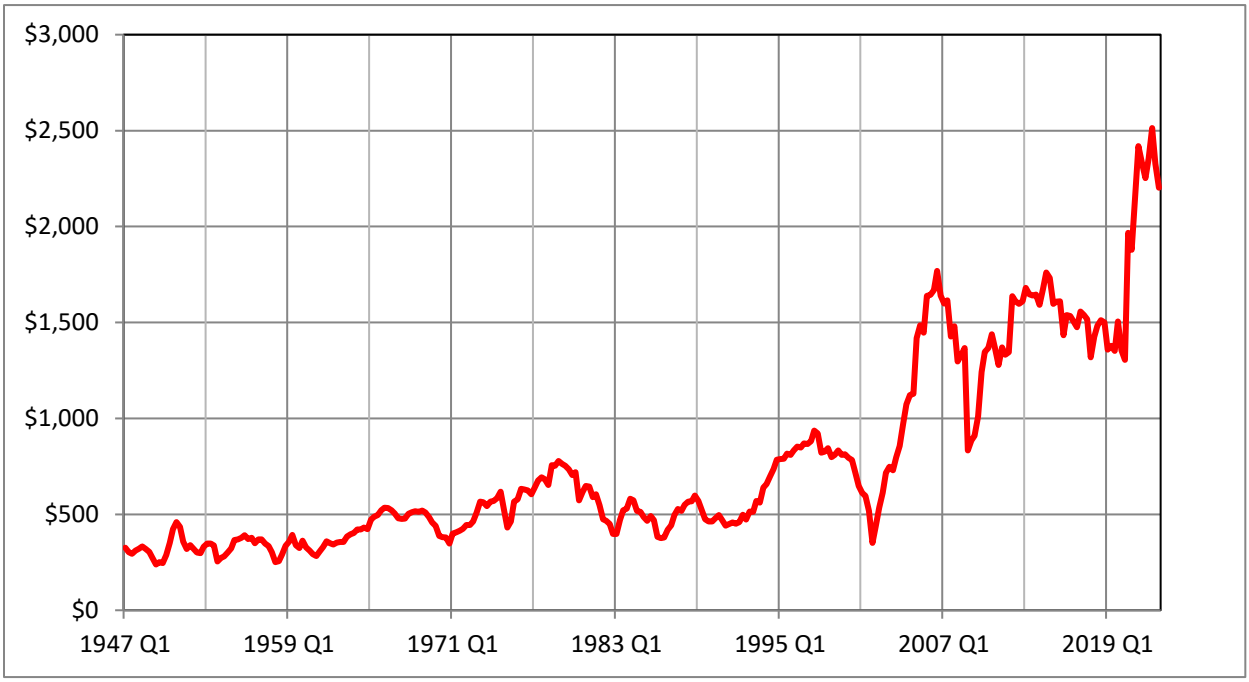
Figure 1-4. Retail and food service sales compared with its previous peak
Adjusted for inflation. Food service sales adjusted using CPI-C for food away from home.
United States, November 2007 through January 2023
Source: U.S. Department of Commerce/FRED



Retail sales leveled off in 2022, as consumers shifted their purchases back to services, while restaurant sales soared.

Before moving on to an analysis of the labor market, one other indicator deserves attention: corporate profits. As *Figure 1-5* shows, after-tax corporate profits dropped sharply in the first two quarters of 2020, but then fully recovered (and then some) in third quarter. In the first two quarters of 2021, profits again increased strongly before fluctuating at unprecedented levels in the latter half of 2021 and in 2022. The high level of corporate profits was another indicator that points away from a current or near-future recession. Should profits drop in 2023, it will be hard to sort out how much of the decline would be a return to a normal level of profits, as opposed to an economic downturn.

Figure 1-5. Nonfinancial corporate business: Profits before tax (without inventory valuation adjustment [IVA] and capital consumption adjustment [CCAdj])
United States, first quarter 2000 through fourth quarter 2022
Billions of dollars, adjusted for inflation to 2022 dollars using the GDP deflator
Source: U.S. Bureau of Economic Analysis/FRED

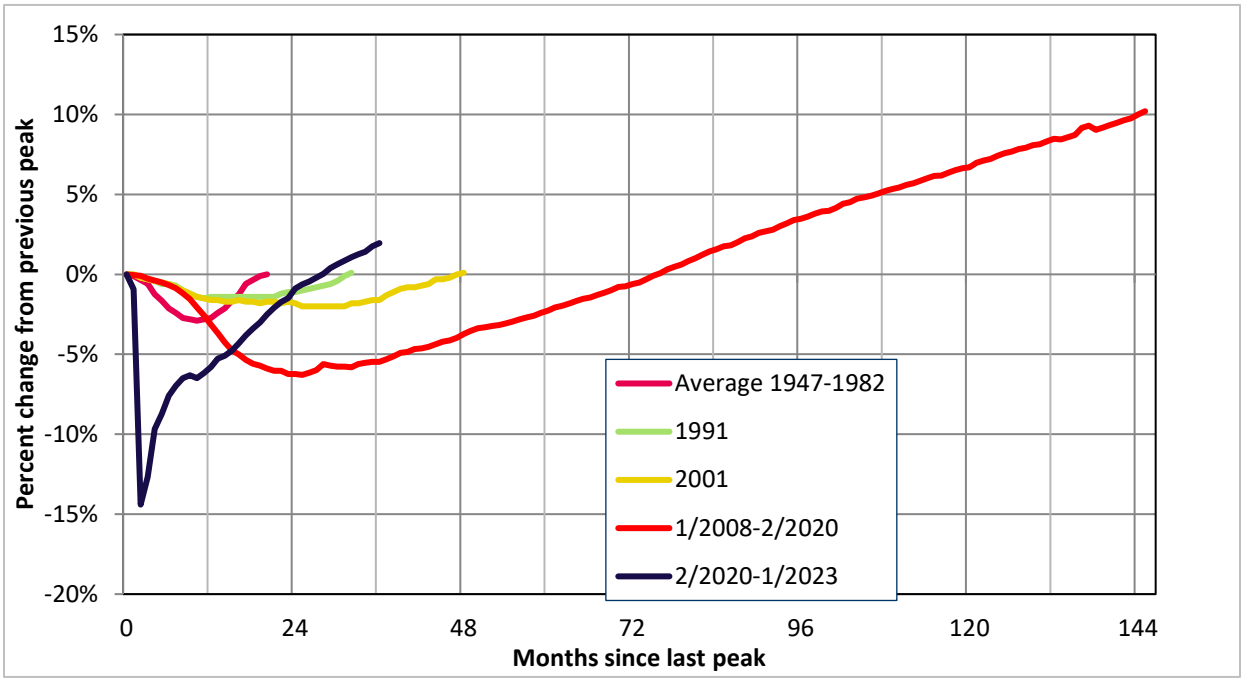


Corporate profits rose to unprecedented levels in 2021 and remained high in 2022.

The labor market powered ahead

The other major factor in assessing the business cycle is nonfarm employment. During 2022, employment grew strongly, capped off by a huge month of hiring in January 2023, followed by another strong month in February. Total employment in February was 2% above pre-COVID levels. As shown in *Figure 1-6*, the recovery has been faster than in the previous three recessions in 1991, 2001 and 2008.

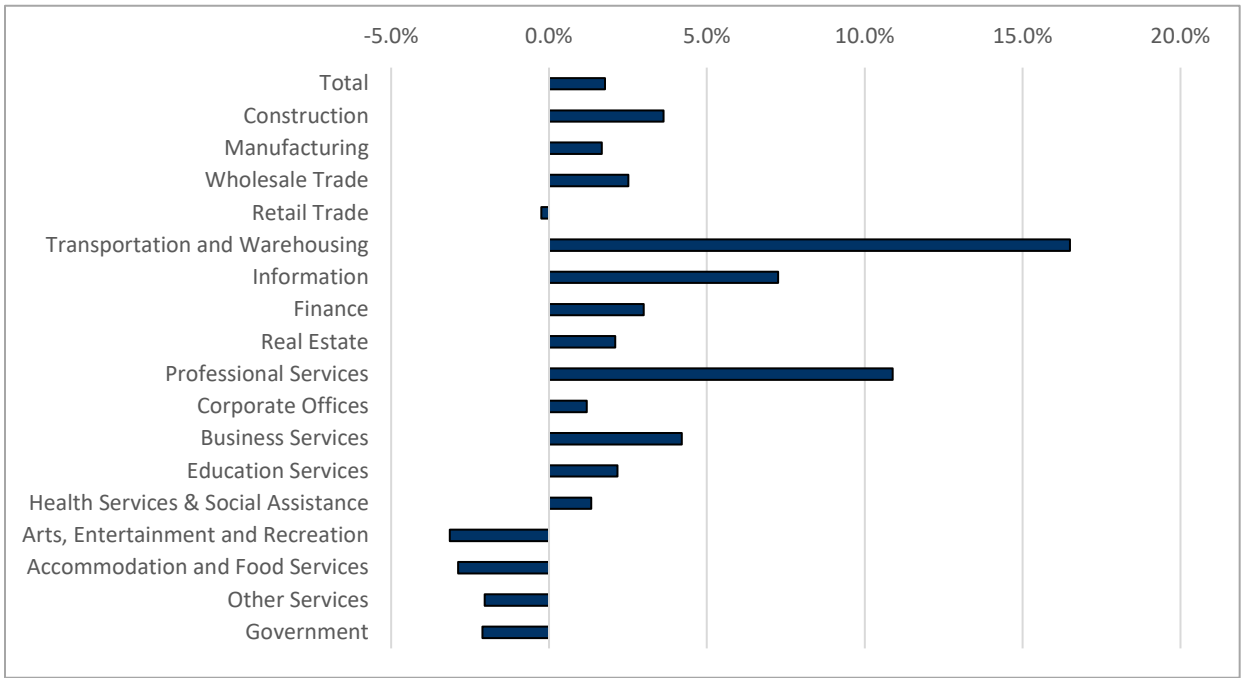
Figure 1-6. Nonfarm employment, percentage change during recessions, seasonally adjusted
United States, postwar recession through COVID recession, February 2020 to February 2023
Source: U.S. Bureau of Labor Statistics, current employment statistics



The recovery has been wildly uneven by industry *(Figure 1-7)*.

- The fastest-growing industry has been transportation and warehousing, which has added over 900,000 jobs (+15.8%), including over 600,000 new jobs in warehousing due to the seismic shift toward online commerce. While trucking employment rose by 5.3% and airline staffing recovered, rail services payrolls declined by 6.4%.
- Professional services added over a million jobs (+11%) across a variety of services, including scientific research and development, management consultants, computer systems design, specialized design services (like interior design), accounting, and engineering.
- Another rapidly growing industry was information services, which added 167,000 jobs (+5.7%) – though it declined three months in a row starting in December 2022. Software publishing and internet services continued to expand, while newspapers, broadcasting and telecom cut payrolls. Movie production, which took a huge hit early in the pandemic, has fully recovered.
- Both construction (+4.2%) and business services (+3.6%) were hiring at an above-average rate.
- Manufacturing, which lost 40,000 jobs in the year before the pandemic, has added almost 200,000 jobs over the past three years, including 70,000 in food processing, 60,000 in chemicals and 58,000 in auto manufacturing.

Figure 1-7. Nonfarm employment, percentage change by industry, seasonally adjusted
United States, February 2020 to January 2023
Source: U.S. Bureau of Labor Statistics, current employment statistics



Most major sectors exceeded their pre-pandemic employment by January 2023.

Four sectors have yet to recover, however.

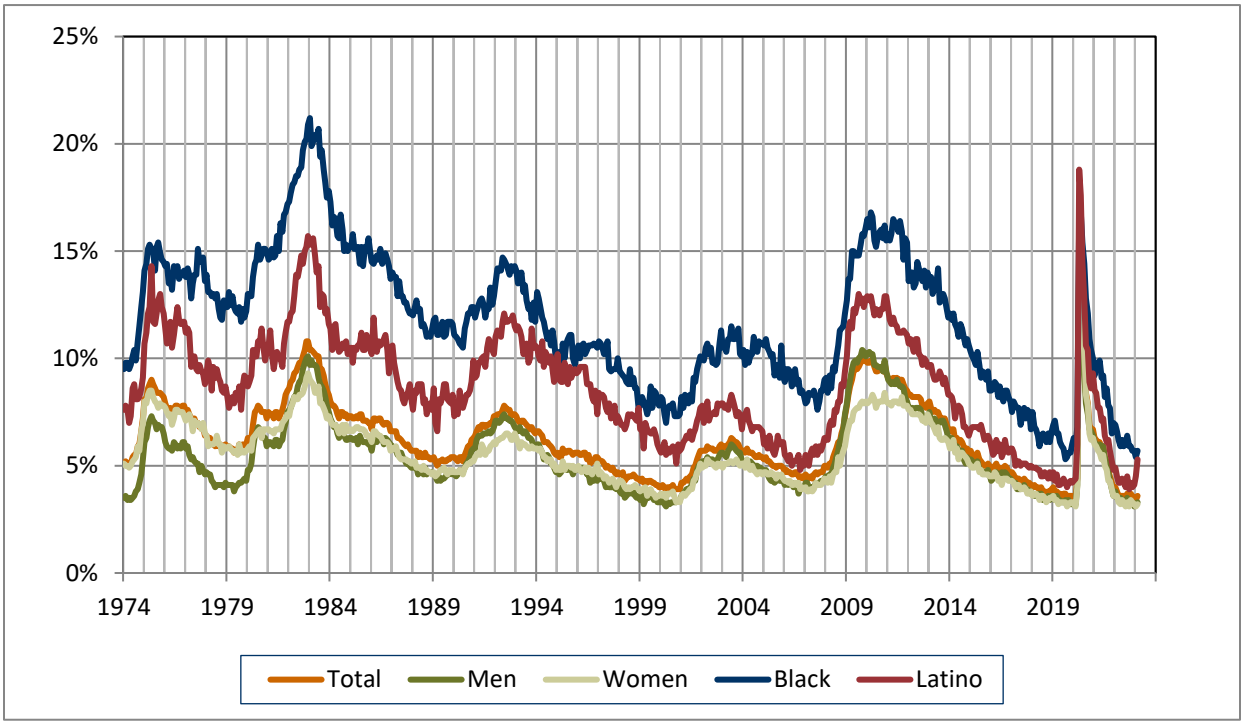
- Arts, entertainment and recreation was the hardest-hit sector during the pandemic and was still 78,000 jobs (-3.1%) below its February 2020 employment level.
- Spectator sports venues, casinos, museums and fitness centers had larger reductions in payrolls. Employment has increased for recreation that requires less personal contact, like golfing and skiing.
- Accommodations and food services, even after a large gain in January 2023, was 416,000 jobs (2.9%) short of its pre-pandemic employment. Hotels and motels were off by a quarter million jobs (11.9%), with casino hotels particularly impacted. As noted above, food service sales have grown tremendously during the pandemic, but industry employment as a whole was still down slightly (166,000 jobs, -1.6%), in large part due to the inability of employers to fill job openings. Some segments fared better than others: employment at coffee shops, snack and juice bars was up 15%, fast-food restaurant jobs were unchanged, while full-service restaurants had over 5% fewer staff.
- Changes in other services (-121,000 jobs, -2.0%) provide another mirror to changing behavior during COVID. Employment at repair and maintenance services was up 3.5% – things still needed to get fixed. Other services like hairstyling, beauty treatments, drycleaning and parking lots had noticeable employment declines. Pet care employment was up 18%. The largest job loss in this sector, however, came in membership associations, which includes religious organizations, business and labor groups, and civic groups.

- One other industry merits our attention: health care and social assistance. Amid multiple reports of overburdened and burned-out medical staff, the latest estimates show outpatient clinic employment increased 5.6% through the pandemic, and hospital staffing was up 0.6% (less than population growth, even without factoring greater demand for treatment of COVID-19 and Respiratory Syncytial Virus (RSV). Nursing homes, which had a staffing shortage before the pandemic, had a further decline of 8.5%. Within social assistance, child care center employment declined by 5.5%.

Unemployment rate: lowest since the 1960s

The labor market tightening, which began in late 2021, continued into 2022. The unemployment rate started the year at a low 4% before falling to 3.5% in July, and slipped to a low of 3.4% in January 2023, the lowest rate since May 1969. The unemployment rate for Latinos reached its all-time low of 3.9% in September 2022, and the rate for Blacks fell to 5.4% in January 2023, only one-tenth of a percent above the record low from August 2019.

Figure 1-8. Unemployment rate, seasonally adjusted
United States, January 1974 to February 2023
Total, Black, Latino (ages 16 and older), Men, and Women (ages 20 and older)
Source: U.S. Bureau of Labor Statistics/Current Population Survey

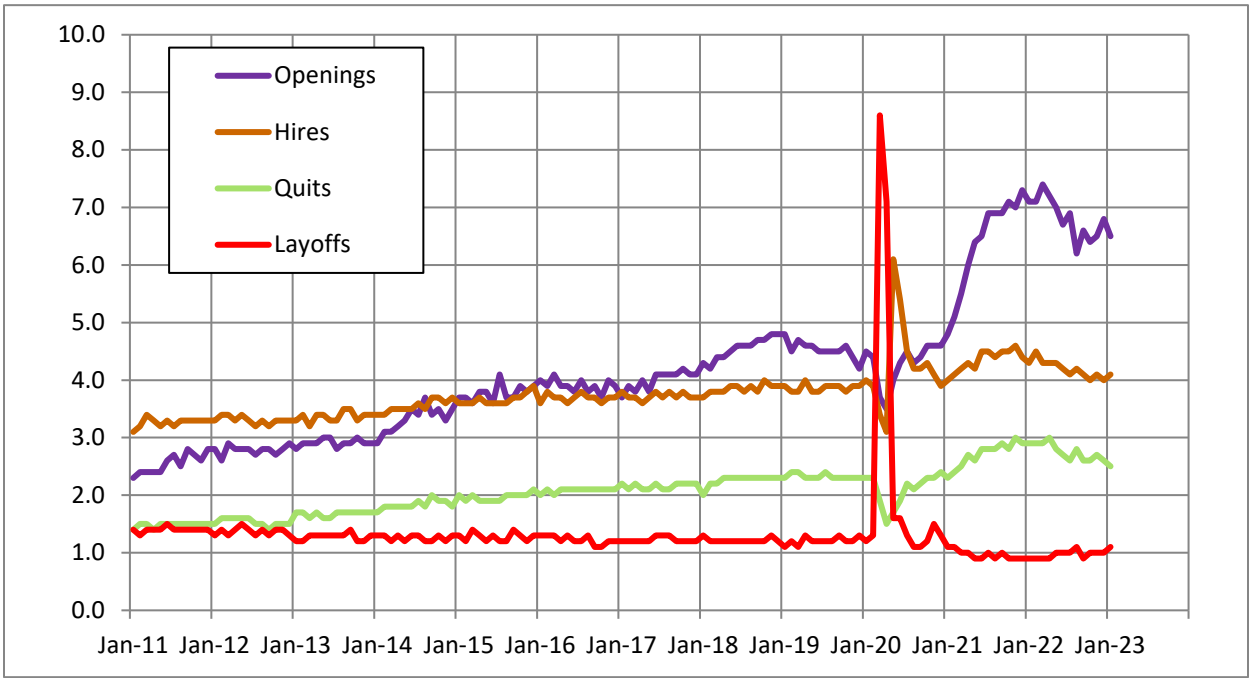


Additional signs of a tight labor market included measures of job openings, hiring, quit and layoff rates (*Figure 1-9*).

- Job openings reached historic heights in early 2022. Though they dipped a bit in the latter half of the year, they were still well above normal levels.
- Hiring eased downward throughout the year from an elevated to a still-strong rate.

- The quit rate peaked in late 2021 but remained high throughout 2022.
- The layoff rate was extremely low for the second year in a row.

Figure 1-9. Job opening, hire, quit and layoff rates, adjusted for seasonal patterns
United States, January 2011 through January 2023
Source: U.S. Bureau of Labor Statistics/Job Openings and Labor Turnover Survey (JOLTS)



Job opening, hiring and quit rates eased downward in 2022 but remained at high levels, while layoffs remained at low levels.

Where did all the workers go?

The labor force participation rate (LFPR) – the percentage of working-age adults who are either employed or looking for work – dipped in the recession and increased in the recovery but was still below its pre-pandemic level. Why were fewer people working, and who were they? Research studies on the subject have come out and undoubtedly more are on the way. These studies highlight different aspects of how the labor force has changed over the past three years. A consensus has yet to emerge, but there is agreement on some factors. A sampling:

- Over a million Americans died due to COVID-19, many of whom would have been in the labor market had they survived. Applying labor force participation rates to COVID-19 deaths by age and sex yields an estimate of roughly 300,000 potential workers lost to the virus.
- There is broad agreement that changing demographics caused part of the decline in the LFPR. Labor force participation decreases sharply above the age of 54, and as baby-boomers have aged, a smaller percentage remained employed. This trend was expected.

- More than half[2] of the decline in the LFPR may have been due to an increase in the retirement rate for workers age 65 and older. Higher retirement rates were concentrated among white and college-educated workers.
- One analysis estimated that as many as 4 million workers have been sidelined by long COVID, while another from the same institute put that number at 420,000.
- Had pre-pandemic immigration trends continued through 2022, about 1.3 million more immigrants would be in the labor force, about half of whom would have had a bachelor's degree or higher. Immigrants are particularly important for the nursing home industry.
- The challenges of availability and cost of child care and elder care may also contribute to labor shortages, but no estimates of their impact are currently available.

Telecommuting was alive and well

According to the U.S. Census Bureau's American Community Survey, 5.9 million Americans worked from home in 2010, 4.3% of all those employed. By 2019, their numbers had increased to just under 9 million/5.7%. In short order, COVID-19 changed all that: in 2021, an average of almost 28 million workers (17.9% of the workforce) reported that they worked from home.

Telecommuting peaked early in the pandemic. According to a special monthly survey from the U.S. Bureau of Labor Statistics, by May 2020, in addition to those who were previously telecommuting, 48.7 million workers – 35.4% of those employed – reported that they worked at home sometime during the month specifically because of the pandemic. COVID-related telecommuting gradually tapered off to 7.1% in July 2022.

More recent and more nuanced data from the Census Pulse survey showed that in the first week of February 2023, 14.4% of the workforce teleworked every day, 5.7% three to four days a week, and 7.6% one to two days a week – a total of 27.8% were on a hybrid schedule or were totally virtual. When compared with late July 2022, there was very little change: a slightly lower percentage were fully working from home, but more were teleworking at least a few days a week.

Demographic differences among telecommuting workers that were reported early in the pandemic continued into 2022. While 27.8% of workers reported at least some work at home, higher percentages of telecommuting were found among:

- Workers age 25-39 (38.8%) and 40-54 (33.4%).
- Men (28.9%) than women (26.6%), reversal of earlier in the pandemic.
- Asian Americans (40.6%) versus white non-Latinos (29.5%), multi-racial workers (28.1%), African American (22.1%) or Latino (21.5%) workers.
- Workers with children under 18 (12.4%) versus those without (7%).
- Those with a bachelor's degree or higher (48.9%), declining by formal education to 24.8% for those with some college, 12.7% of those with a high school diploma only, and 8.8% for those without a high school diploma.

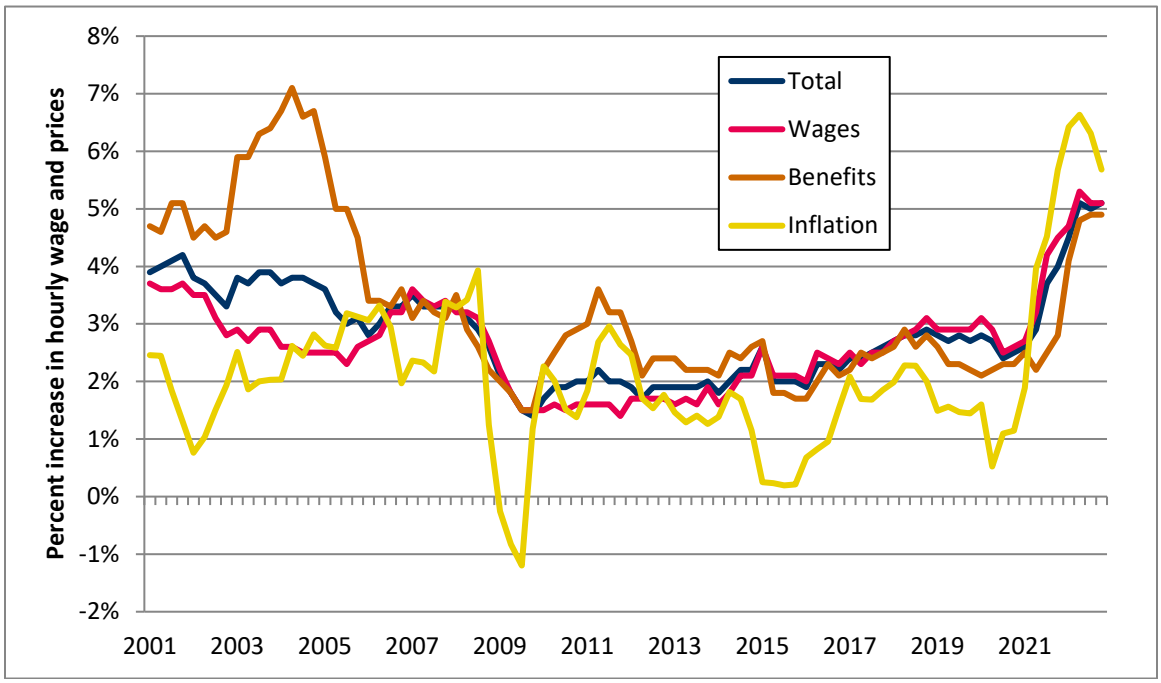
2 "The Great Retirement Boom": The Pandemic-Era Surge in Retirements and Implications for Future Labor Force Participation

Tight labor markets lead to rising nominal wages

The various measures of wages available showed the same trend over the past few years: nominal wages (wages unadjusted for inflation) started rising rapidly in 2021, just after inflation started accelerating. For example, the Employment Compensation Index (*Figure 1-10*), which measures total compensation (wages plus benefits), rose by 2.6% from 2019 Q4 to 2020 Q4. A year later, the growth rate was 4%, and by the end of 2022 compensation was up 5.1%. After adjusting for inflation, total compensation fell by 2.1% from 2020 Q4 to 2022 Q4. Wages and benefits closely tracked total compensation. Similarly, the inflation-adjusted average weekly wage, taken from the monthly Current Population Survey (CPS), declined in most months in 2021 and 2022, falling 2.5% from December 2020 to December 2022.

Figure 1-10. Over the year increase in total compensation, wages, and benefits for all civilian workers, not adjusted for inflation, and the rate of inflation, as measured by the U.S. Personal Consumption Expenditure Implicit Price Deflator, U.S., 2001 Q1 through 2022 Q4

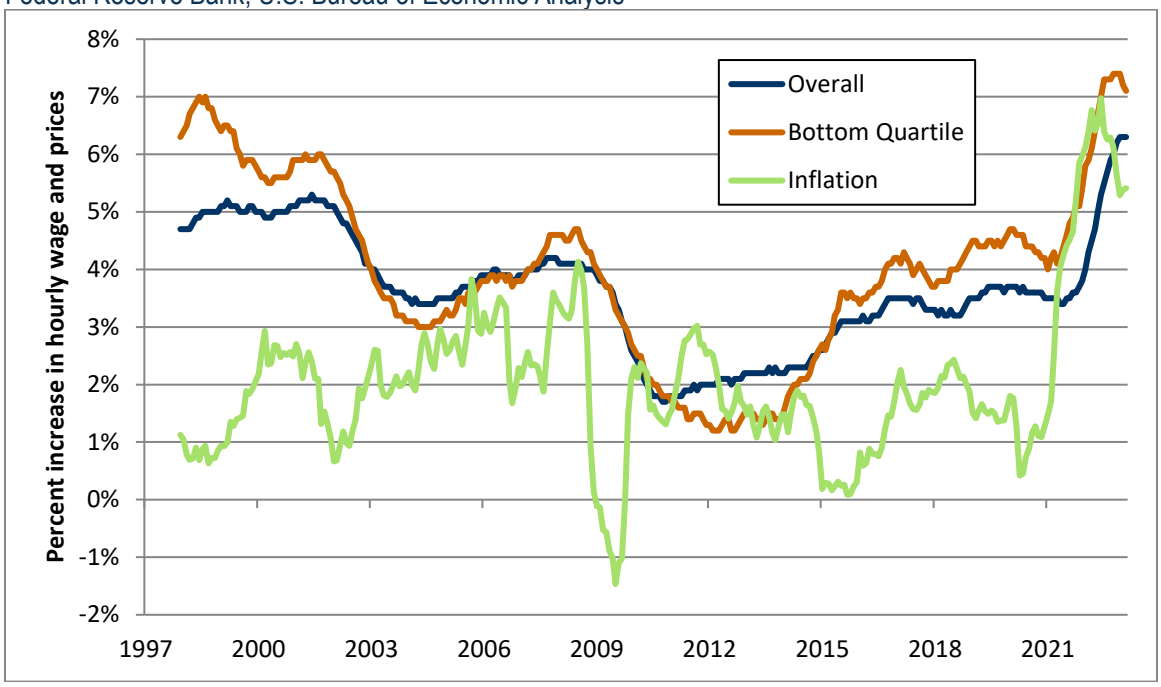
Source: Employment Compensation Index, U.S. Bureau of Labor Statistics



Nominal wages rose rapidly in 2021-2022, but not as fast as inflation.

The Atlanta Fed Wage Tracker, also based on the CPS, tracks the median increase in hourly wages for incumbent workers over a twelve-month period. As *Figure 1-11* shows, looking at all wage earners, hourly wages rose sharply beginning in 2021, but not as fast inflation. Looking at the bottom quartile of wage-earners, their wages were close to matching inflation. In early 2023, hourly wage increases started outpacing inflation.

Figure 1-11. Median year-over-year increase in hourly wage for all workers, and for workers in the bottom quartile of hourly wages, not adjusted for inflation, and the rate of inflation, as measured by the U.S. Personal Consumption Expenditure Implicit Price Deflator
U.S., March 1997 through February 2023
Source: Employment Security Department/DATA DIVISION, Unemployment Insurance Data Warehouse; Atlanta Federal Reserve Bank, U.S. Bureau of Economic Analysis



Increases in wages for full-time workers did not keep up with inflation until the last few months of 2022.

Wage inequality, as measured by the gap between the average wage for the top 10% of wage earners and the bottom 10%, grew substantially from 1980 to 2020. Recent research[3] into CPS data detailed how that wage dispersion had been reversed, turning instead into "wage compression," when wages at the bottom grew faster than wages in the middle and at the top:

- Wage compression began before the pandemic, but only in states that had raised the minimum wage. Other states had no change in wage inequality.
- Compression occurred in all states during the pandemic.
- From January 2020 to September 2022:
  - Inflation-adjusted wages increased by 6.4% at the 10th percentile of wage earners (the bottom 10%).
  - The inflation-adjusted median wage, while rising early in the recession, fell by 5.6%.
  - Wages at the 90th percentile fell by 6.7%.
  - Wages outpaced inflation only for the bottom 20% of wage earners.
  - Workers below age 40 without any college education were the only group to receive higher wages.

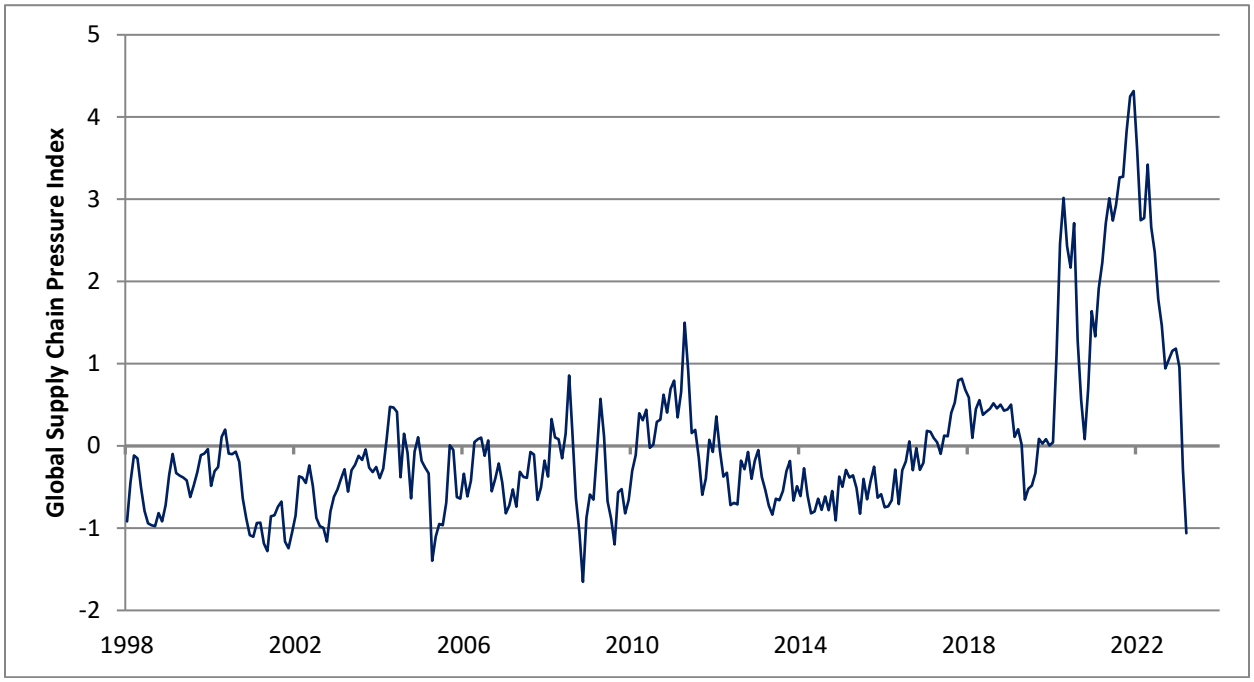
3 Autor, Dube and McGrew, "The Unexpected Compression: Competition at Work in the Low Wage Labor Market", NBER Working Paper 31010.

    - The wage gap between Whites and Blacks and Hispanics closed by 4%. It wasn't clear from the initial research if that was a function of age, education, and occupation or if there was a specific race component.
    - There was no difference in the impact on women versus men.
    - The college wage premium – the increase in earnings for those with a college degree – was reduced.
- Much of the increase in wages was due to lower-wage workers – and specifically, workers under the age of 40 without any college education – changing jobs. The tight labor market coupled with the disruption of the pandemic (in which many lower-wage workers became unemployed) allowed these workers to find new employment at higher-paying employers, often in a different industry.

Global supply chain woes ease in 2022

The pandemic led to a host of supply chain issues in 2020 that persisted into early 2022. Manufacturers sometimes had trouble obtaining key components, leading to shortages in products like new cars. Shipping costs rose, and at some ports, there were huge bottlenecks in offloading containers and getting them loaded onto trucks for delivery. Beginning in May 2022, supply chain pressures eased. The Global Supply Chain Pressure Index, developed by the Federal Reserve Bank of New York, dropped below average in February 2023, meaning that manufacturers had fewer issues with shortages and shipping costs were lower than the historic average. According to the Federal Reserve Bank of New York, a drop in the Global Supply Chain Pressure Index is associated with a decline in the rate of inflation.

Figure 1-12. Global Supply Chain Pressure Index, January 1998 to March 2023
An index value of 0 is the historical average. A value of 1 means that supply chain pressure is one standard deviation higher than average.
Source: Federal Reserve Bank of New York



Global supply chain issues eased considerably after April 2022 and were well below average in early 2023.

Inflation moderates at the end of 2022

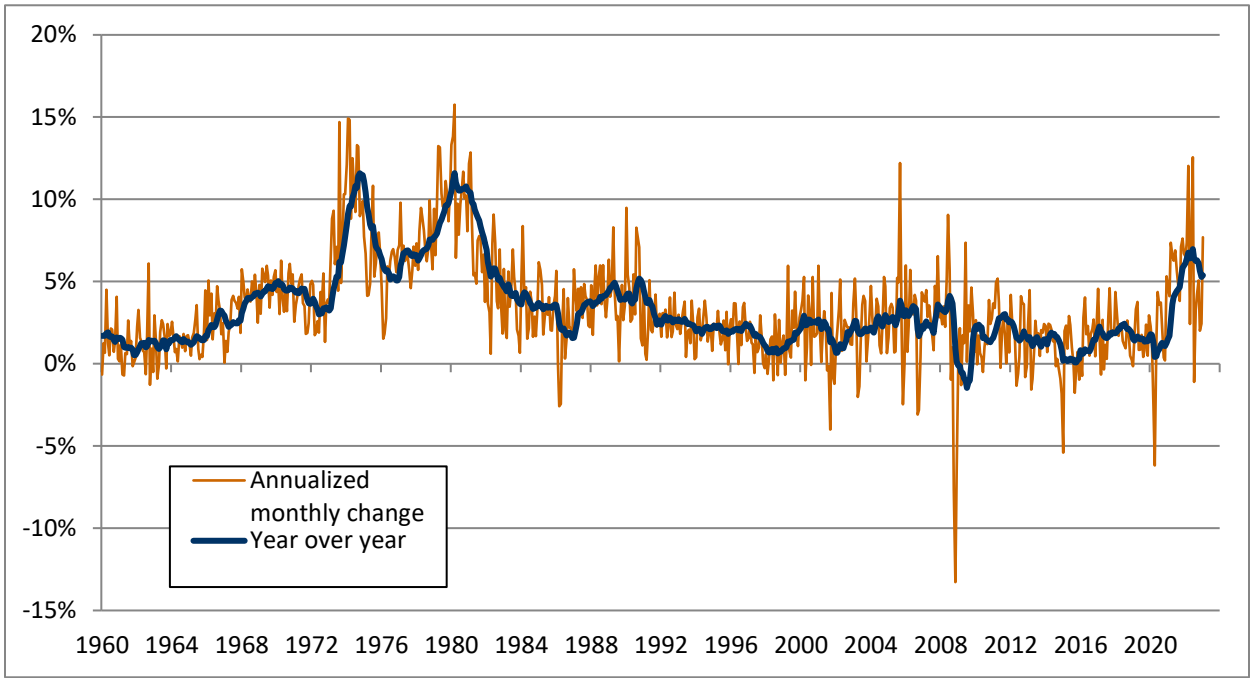
Inflation began rising rapidly in early 2021. It is likely that the initial impetus for price increases came from a combination of increased consumer demand and the inability of some producers to respond due to supply chain issues. In addition, energy prices, and gas prices in particular, skyrocketed. At their peak in June 2022, gas prices were 75% above pre-pandemic levels, and energy prices overall were up 50%. The increase in housing prices for both homeowners and renters, in large part due to chronic undersupply, was also a big source of the increase in the Consumer Price Index. Corporate profits jumped by 50% in late 2020 and early 2021 (*Figure 1-6 above*). Several studies showed that larger profits were responsible for at least half of the rate of inflation in 2021.[4] While wages have not kept up with inflation except for the lowest-paid workers, one study indicated that higher nominal wages in late 2022 accounted for 2.3 percentage points, less than a third of total inflation.[5]

While the COVID-19 stimulus programs may have helped initiate inflation, government spending declined for five quarters in a row beginning in the second quarter of 2021. Spending increased moderately in the second half of 2022.

4 See Glover, Mustre-del-Rio and Ende-Becker, Kansas City Federal Reserve Bank, "How Much Have Record Corporate Profits Contributed to Recent Inflation?"; Bivens, Economic Policy Institute, "Corporate profits have contributed disproportionately to inflation. How should policymakers respond?"; and Stoller, BIG Newsletter, "Corporate Profits Drive 60% of Inflation Increases."
5 Autor, Dube and McGrew, "The Unexpected Compression: Competition at Work in the Low Wage Labor Market", NBER Working Paper 31010.

Figure 1-13. Month-over-month and year-over-year rate of inflation, personal consumption expenditures, seasonally adjusted, United States, January 1960 to January 2023

Source: U.S. Department of Commerce, Bureau of Economic Analysis



Inflation slowed at the end of 2022.

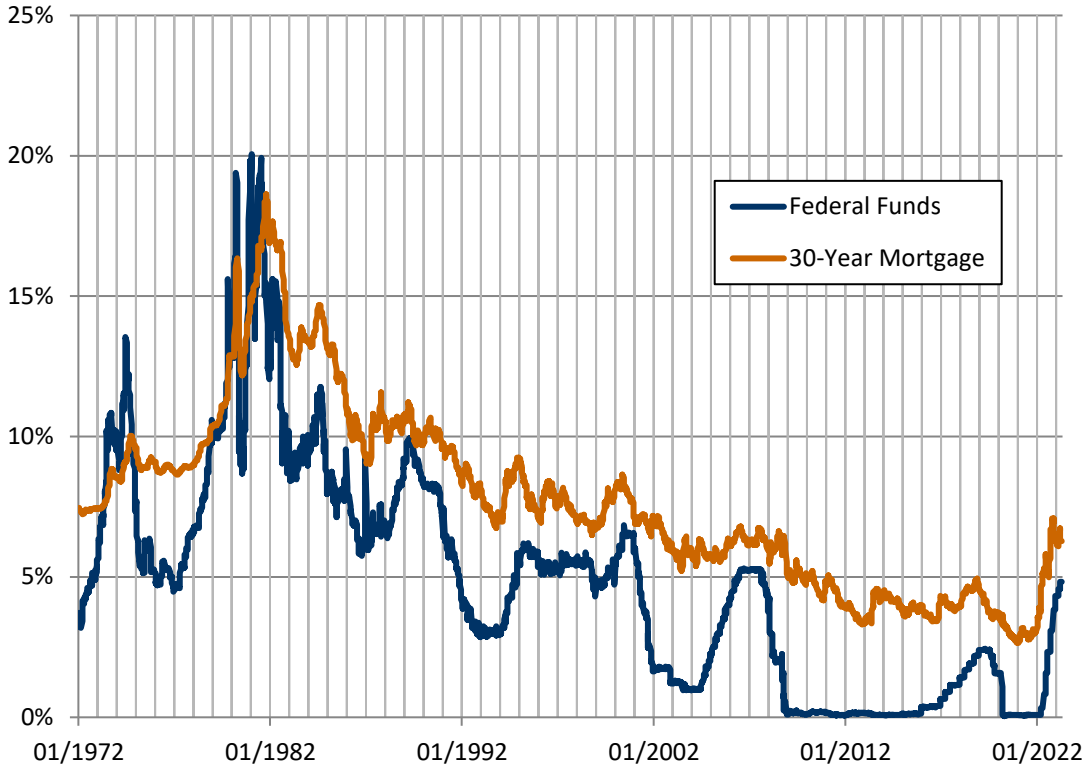
In the second half of 2022, inflation slowed as each of the factors cited above (except wage increases) abated. Stimulus programs winded down, supply chain issues mostly resolved, gas prices dropped, and corporate profits remained high but were not increasing.

The Fed raised interest rates

Early in the pandemic, the Federal Reserve Bank (also known as the "Fed") pledged to enact policies that supported its dual mandates of price stability and full employment. By 2022, with inflation running high, the Fed focused solely on bringing inflation down to its 2% target rate by quickly raising short-term interest rates and publicly stating that unemployment needed to increase and wage growth needed to slow

Figure 1-14. Weekly interest rates, federal funds rate and 30-year mortgage rate, United States, January 1972 to April 2023

Source: Federal Reserve Bank, Freddie Mac/FRED



The Fed raised short-term interest rates rapidly in 2022. Longer-term mortgage rates also rose.

Short-term interest rates rose rapidly, and mortgage rates climbed as well, from a low of 2.8% to 6.4% at the end of the year. As a result, housing starts fell by 25% over the course of the year. Home values, as measured by the Case-Shiller Home Price Index, declined by 3% over the second half of the year after rising by 46% over the previous three years.

Income and wealth

Data on income is based on annual Census Bureau surveys, while wealth is assessed once every three years by the Federal Reserve Bank. Quarterly estimates, based on the tri-annual survey, are also available.

Census Bureau reports on income and poverty are available for 2021. After declining by an inflation-adjusted 2.9% in 2020, median household income slipped by another 0.6% in 2021 to $70,784, a change that was not statistically significant. The median for different racial and ethnic groups also did not change significantly, which meant that income disparities remained intact: median income for Black households was $48,297, 68% of the median for all households, and the median for Latino households was $57,981 (81%). The median income for Asian American households ($101,418) and

the median for White non-Hispanic households ($77,999) were 43% and 10% higher, respectively, than the median for all households.

The distribution of income, when incomes were adjusted for the number of members in the household, was also unchanged. The official poverty rate was essentially unchanged at 11.6%, and the rate for most demographic groups was not significantly different from 2020. The exceptions included Asian Americans (+1.2 percentage points to 9.3%), older Americans (+1.4 percentage points to 10.3%) and children and youth (-0.7 percentage points to 15.3%). The latter dropped in large part to the child tax credit, which expired at the end of 2021; unofficial estimates show child poverty increasing by 3 percentage points in 2022.[6] Disparities in poverty rates continued for Native Americans (24.3%), African Americans (19.5%) and Latinos (19.5%).

During the pandemic, the Census Bureau implemented the Household Pulse Survey to gather more timely data on a monthly basis. Some new measures of interest, which are still regarded as experimental:

- Financial insecurity, based on how difficult it is for respondents to pay usual household expenses. In September 2020, about 32% of adults reported living with financial insecurity. This rose to 38% in December (when COVID led to a second round of business closures), fell to 27% in August 2021, before rising to between 39% to 40% over the last six months of 2022.
- Food insecurity peaked at almost 14% of adults in late 2020. During 2022, between 10% and 12% of adults reported some level of food insecurity.

Federal Reserve estimates of wealth in fourth quarter 2022 showed that over the course of the pandemic, wealth increased, and the distribution of wealth became slightly less unequal at the bottom but more unequal at the top. Comparing 2019 Q4 with 2022 Q4:

- Total wealth increased by $13.2 trillion (10.6%). Most of the increase was due to rising home values (+$9.1 trillion), increased value of non-corporate businesses (+$3.2 trillion) and savings ($2.7 trillion). Debt increased by $0.6 trillion (3.3%), mostly in the form of home mortgages. Average household wealth grew by 8.5% to $1.04 million.
- The bottom 50% of households saw their wealth grow by $1.7 trillion, a 70% increase in average household wealth. Average household net worth reached $62,140. Almost all the gain came through higher property values. Their share of total national wealth rose from 1.1% to 3%. This was still a smaller share than the peak of 4.3% in the early 1990s.
- The net worth of the top 1% of households increased by $4.8 trillion, or 12.7%. Average household net worth climbed by 32.5% to $32.5 million. For the top one-tenth of 1%, average household wealth was up 12.4% to $131.5 million. The share of national wealth for the top 1% dropped from 69.1% to 68.2%, while the share owned by the top one-tenth of 1 percent eased up from 30.5% to 31.1%.
- Average household wealth rose faster than average for African Americans (+16% to $335,885), Latinos (+32% to $322,244), and other races (+12% to $887,157). The average for non-Hispanic Whites increased by 8% to $1,342,757.

6 Columbia University, Center on Policy & Social Policy, Monthly Poverty Data.

- By the end of 2022, the top 10% of households owned 89% of the value of stocks and mutual funds, 87% of the equity in noncorporate businesses, 78% of government bonds and municipal securities, 78% of corporate bonds and commercial paper, and were entitled to over half the value of pension funds.

Chapter 2: Washington's economy and labor market

Washington's labor market continued to recover from the COVID-19 recession in 2022. Unemployment fell to near-historic lows. Job openings were at high levels, hiring was strong, quit rates were high as workers switched jobs, and layoffs were at very low levels. Most major sectors had topped their pre-pandemic employment levels by the end of the year. Over the course of the pandemic, job growth was strongest in professional services, corporate offices, information services, warehousing and private educational services. Lagging sectors included accommodations, state educational services, manufacturing (primarily due to cuts in aerospace staffing), arts, entertainment and recreation services, residential nursing facilities, and other services.

Similar to most of the rest of the country, labor was in short supply, particularly for lower-wage jobs. As a result, wages rose faster than inflation, and faster on the lower end of the pay scale. Telecommuting receded from its peak during the early months of the pandemic, but in 2022, more than a third of the workforce was working at least part of the week at home.

Housing permits were at high levels in 2022, but single-family permits dropped markedly in the second half of the year. As a result, construction employment hiring slowed. A number of large layoffs were announced in the tech sector, but by the end of the year the only noticeable sign was a decline of 1,500 jobs in the prepackaged software industry. Taxable sales for restaurants and accommodations continued to recover but, consistent with employment trends, were still below pre-pandemic peaks.

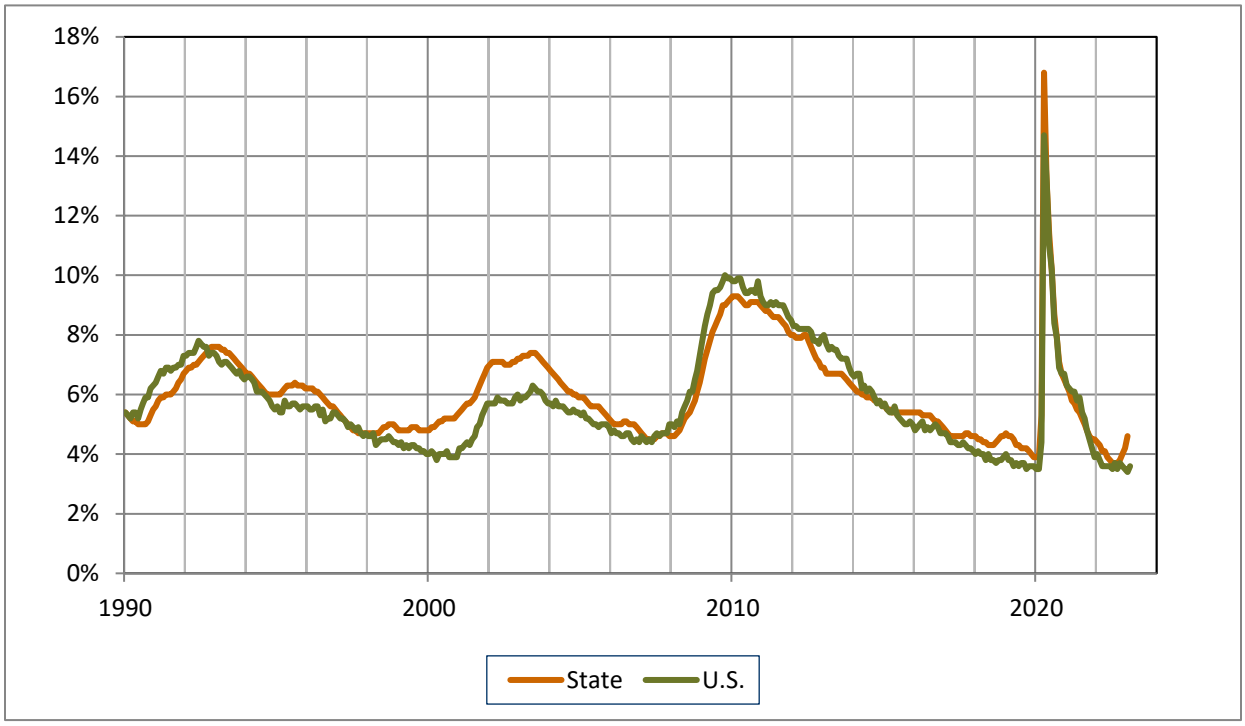
Unemployment hits historic lows

Washington's unemployment rate dropped throughout 2022 until it reached 3.7% in July, August, and September, the lowest rate going back to 1990. The rate turned up at the end of the year, increasing to 4.6% in January 2023.

The unemployment rate averaged 4.4% in 2022. It was higher for:

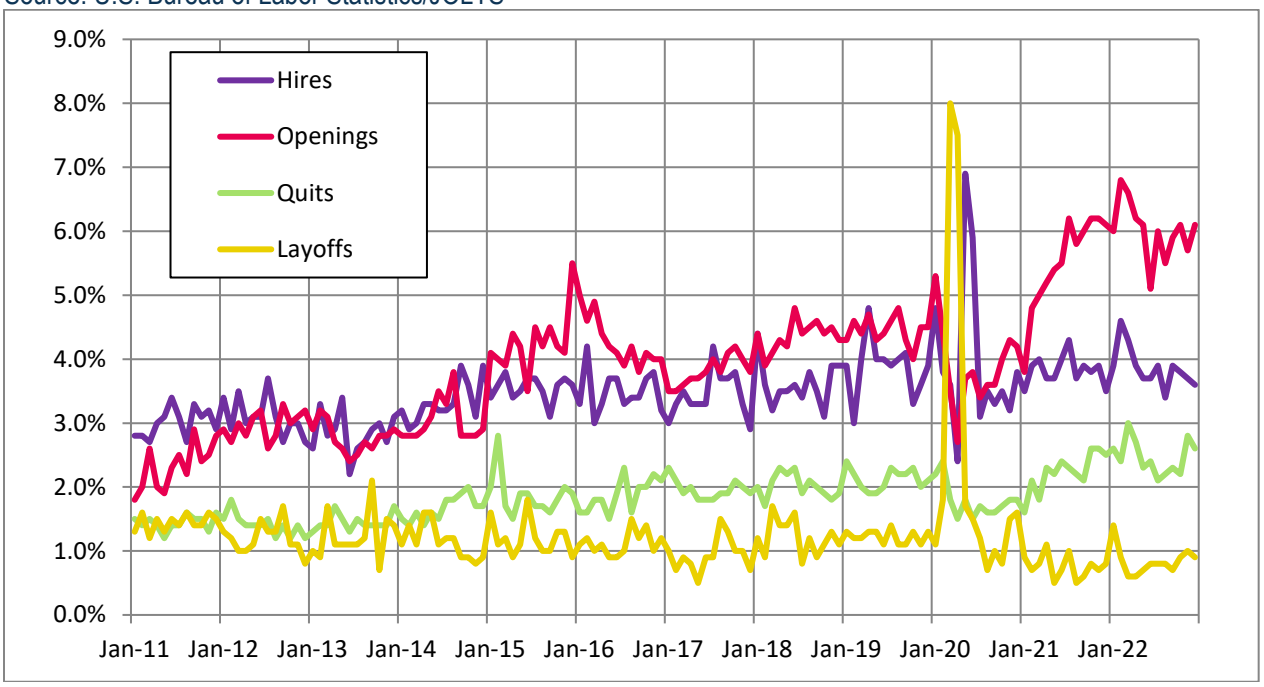
- Teenagers aged 16-19 (15.1%)
- African Americans (7.7%)
- Latinos/Hispanics (5.9%)

Figure 2-1. Unemployment rate, seasonally adjusted, Washington state and the United States, January 1990 to January/February 2023
Source: Washington Employment Security Department/DATA Division, U.S. Bureau of Labor Statistics/Current Population Survey



The Job Opening and Labor Turnover Survey (JOLTS) also showed that the state labor market was tight (*Figure 2*-2). Job openings remained at a historically high level throughout the year, while hiring rates were only down slightly from 2021. The quit rate, on average, increased, while layoffs were at a lower level than the previous year.

Figure 2-2. Job opening, hire, quit and layoff rates, adjusted for seasonal patterns, Washington state, January 2011 through December 2022 (U.S.)
Source: U.S. Bureau of Labor Statistics/JOLTS[7]



Employment growth outpaced the nation

Seasonally adjusted employment fell by 11,300 jobs in January 2022 putting the total job count at 3,455,800, 1.6% below February 2020 and slightly behind the U.S. average. Job growth surged by 4.1% over the next 12 months, faster than the nation's 3.3%. By December 2022, employment was 2.2% above the pre-COVID level. However, prominent employers made several announcements of large pending layoffs in the waning months of the year. With the exception of pre-packaged software, those layoffs have not shown up in significant numbers in 2022.

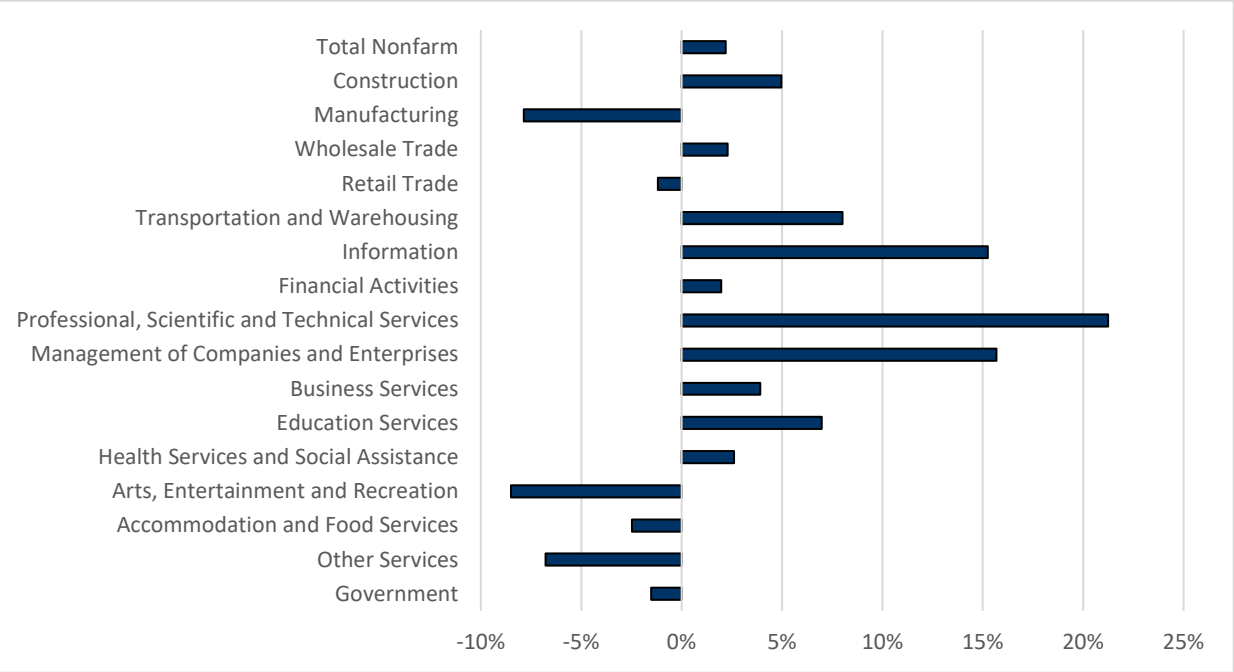
Most major sectors had exceeded their pre-pandemic employment by December 2022 (*Figure 2-3*).

- Construction employment rose by 2.8% over the year, but most of that expansion came in the first half of the year. Employment declined slightly in the last quarter of the year, likely in part due to increase in mortgage rates and the decline in single-family home construction.
- Manufacturing jobs increased steadily through the year, adding 5,400 jobs (2%). Gains came mainly in aerospace (5,200) and food processing (900) and machinery (500). Manufacturing was still well below pre-pandemic levels, due primarily to cuts in aerospace (16,500).
- Wholesale trade added 4,300 jobs, growing faster than the average for all industries at 3.2%.
- Retail trade lost about 1,000 jobs in 2022 but gained about 5,000 over the course of the pandemic.[8] There were some substantial shifts in retail employment over the past three years: building materials

7 Job opening rates are defined as the number of openings divided by the sum of openings and current employment. Other rates are calculated by the number (of hires, for example) divided by current employment.
8 Retail employment was adjusted for "non-economic code changes"—employers that were shifted from retail trade to other industries at the beginning of 2022.

and grocery stores gained employment, while staffing was reduced at car dealerships and parts stores, furniture and home furnishing stores, and clothing and accessory stores.

Figure 2-3. Nonfarm employment, percentage change by industry, seasonally adjusted, Washington state, February 2020 to December 2022
Source: Washington Employment Security Department/DATA Division, Current Employment Statistics



Most major sectors exceeded their pre-pandemic employment by December 2022.

- Transportation & warehousing, a hot industry in 2021, cooled to +1,000 jobs/+0.7% in 2022. One industry that stood out: airlines, which lost 20% of their employment base with the drop in passenger air traffic when COVID hit, and only recovered in May 2022. By the end of the year, airlines employed 18,800, up 2,800 jobs over the year (+18%) and 1,800 jobs more than pre-COVID.
- The rapid growth in information services came to a screeching halt in August 2022. After gaining 9,600 jobs in the first eight months of the year, this sector declined by 1,700 in the last four months. Almost all of the cutbacks were in prepackaged software. Employers have announced more layoffs in 2023.
- Financial services grew at a modest 1.9% rate in 2022. Banking and insurance both lost jobs, while real estate added jobs early in the year before leveling off in the last half, as the housing market cooled.
- Professional services has been one of the driving engines of job growth over the past three years, and did not slow down in 2022. Employment increased by 24,200 jobs, a 10% gain. Hiring has been especially robust in accounting, engineering and computer systems design.

- Management of companies – more colloquially, corporate headquarters and regional offices – added about 1,000 jobs in 2022, higher by roughly 1%.[9]
- Business services employment rose by 3,000 jobs, a 1.6% gain. The key development – cuts in staffing services employment.
- Private educational services was one of the fastest-growing industries in the state in 2022, expanding by 6,400 jobs, or 10%. Much of the increase was not in schools per se, but in ancillary services like tutoring and test-taking, sports instruction and other support services.
- Health services and social assistance, while adding jobs over the year, remained a center of employee stress due to staffing issues. Total sector employment increased by 12,300 (+2.8%). More than a third of new hires were in outpatient services, while hospital employment was unchanged over the year. Residential nursing care added 2,000 employees, but remained 5,300 jobs below its pre-COVID level, when the industry was already short-staffed. Demand for these services has only increased as the general population has aged, and the result has at times led to a bottleneck as hospitals have not been able to shift patients from intensive care beds to nursing facilities. Social assistance grew at a faster pace – 4.6% – with all segments adding jobs. Especially important, child care centers added over 2,000 jobs and finally exceeded their pre-COVID employment at the end of 2022.
- Arts, entertainment and recreation services was, percentagewise, the sector most impacted by COVID. Despite a 10% job gain in 2022, the industry was still 4,700 jobs (8.5%) below its February 2020 staffing. Museums, gambling establishments and fitness centers continue to have lower employment than before the pandemic.
- Accommodations (+11.9%) and food services (+6.8%) both grew rapidly in 2022, but both were still below their pre-COVID employment levels, the latter by less than 1%, the former by a hefty 13%. Taxable sales at restaurants in 2022 were running slightly below their pre-pandemic peak, while accommodations were about 4% below peak.
- Employment in other services – repair and maintenance services, personal and laundry services, and membership organizations – grew by 5.5% in 2022, but was still 7% below pre-COVID levels. While repair and maintenance has largely recovered, the other two categories were lagging.
- Public sector employment rose by 3.5% over the year. While federal jobs declined slightly, state and local government expanded staffing levels. While local government, including K-12 education, had almost recovered, state educational services remained 8,900 jobs (11%) below pre-COVID levels, as fall enrollment in public higher education dropped 17% from 2019 to 2022.[10]

Telecommuting exceeded the national average

In 2019, according to the Census Bureau's American Community Survey, over 240,000 Washingtonians worked at home. They made up 6.3% of the workforce, a bit higher than the nation's 5.7%. The pandemic pushed those numbers up: in 2021, an average of almost 900,000 workers – 24.2% of the state workforce – were working at home, significantly more than the 17.9% reported nationally. Given the state's high concentration of workers in office-based industries like software, streaming, web services and corporate offices, this is not surprising.

9 Employment in this sector was also adjusted for "non-economic code changes" – employers that were shifted from retail trade to other industries at the beginning of 2022.
10 Office of Financial Management, available at https://ofm.wa.gov/washington-data-research/statewide-data/washington-trends/budget-drivers/public-higher-education-enrollment.

More recent data from the Census Pulse survey showed that in the first week of February 2023, 19.0% of the state's workforce teleworked every day (more than the 14.4% nationally), 8.5% three to four days a week, and 8.1% 1 to 2 days a week—a total of 35.7% were on a hybrid schedule or were totally virtual, well above the national average of 27.8%. When compared with late July 2022, the same percentage were working totally from home, and slightly higher numbers were on a hybrid schedule.

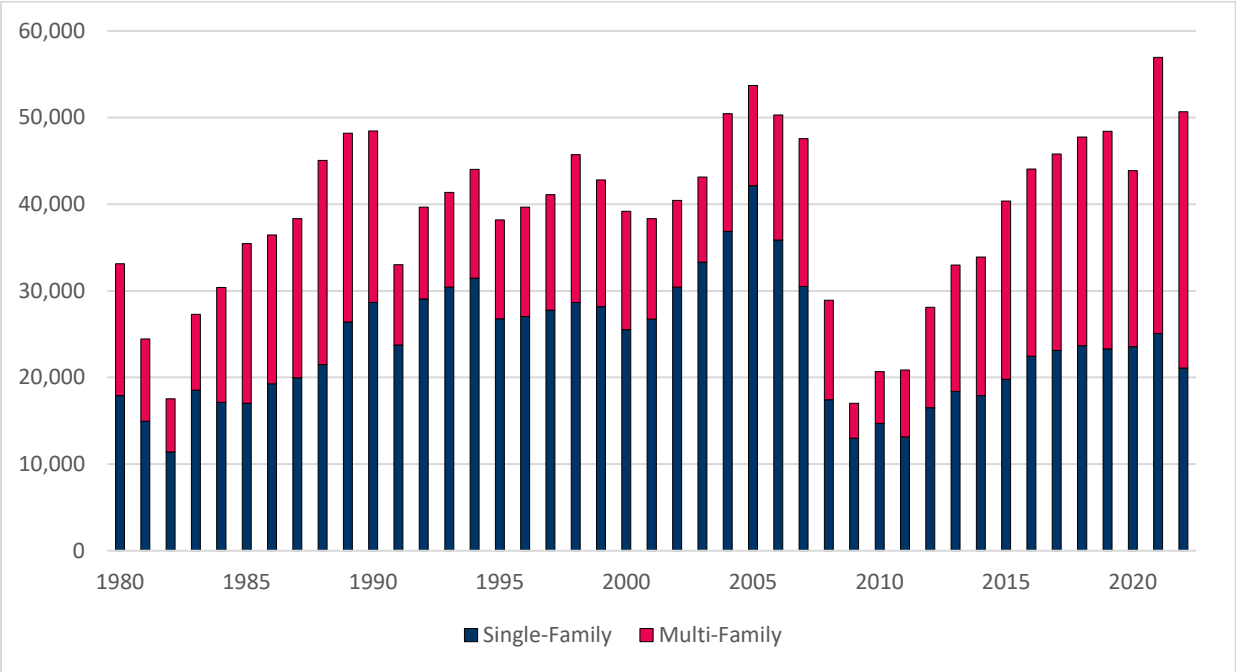
Demographic differences among telecommuting workers that were reported early in the pandemic continued into 2022. While 35.7% of workers reported at least some work at home, higher percentages of telecommuting were found among:

- Workers aged 25-39 (43.5%) and 40-54 (43.1%).
- Men (36.6%), slightly more than the share of women (34.7%).
- Asian Americans (49.9%) versus white non-Latinos (36.2%), multi-racial workers (34.1%), African American (31.9%) or Latino (25.8%) workers. Percentages were higher than the national average for all racial and ethnic groups.
- Those with a bachelor's or higher degree (56.1%), declining by formal education to 29.9% for those with some college, 18.9% of those with a high school diploma only, and 10.4% for those without a high school diploma.

Housing permits decline from 2021's record high

Washington had a record year for housing permits in 2021, with almost 57,000 housing units approved for construction. In 2022, preliminary data show an 11% decline in permits issued. That would still be the third-highest total on record, with multi-family permits coming in at an all-time high. Higher mortgage rates put a dent in single-family housing plans midway through the year, with the average monthly permits dropping from just over 1,900 homes in the first eight months of the year to under 1,200 over the last four months.

Figure 2-4. Housing permits, Washington state,1980 to 2022, 2022 data preliminary, adjusted upward based on historical ratio of preliminary to final
Source: U.S. Housing and Urban Development Department



Housing permits declined by 11% in 2022, but the total was still the third-highest ever.

Despite rapid growth in homebuilding, the state has a substantial shortage of housing. Using methodology developed by Freddie Mac, which compares historical household formation by age with population, the state was short almost 270,000 housing units in 2022, compared with the actual housing stock of 3.2 million units.[11]

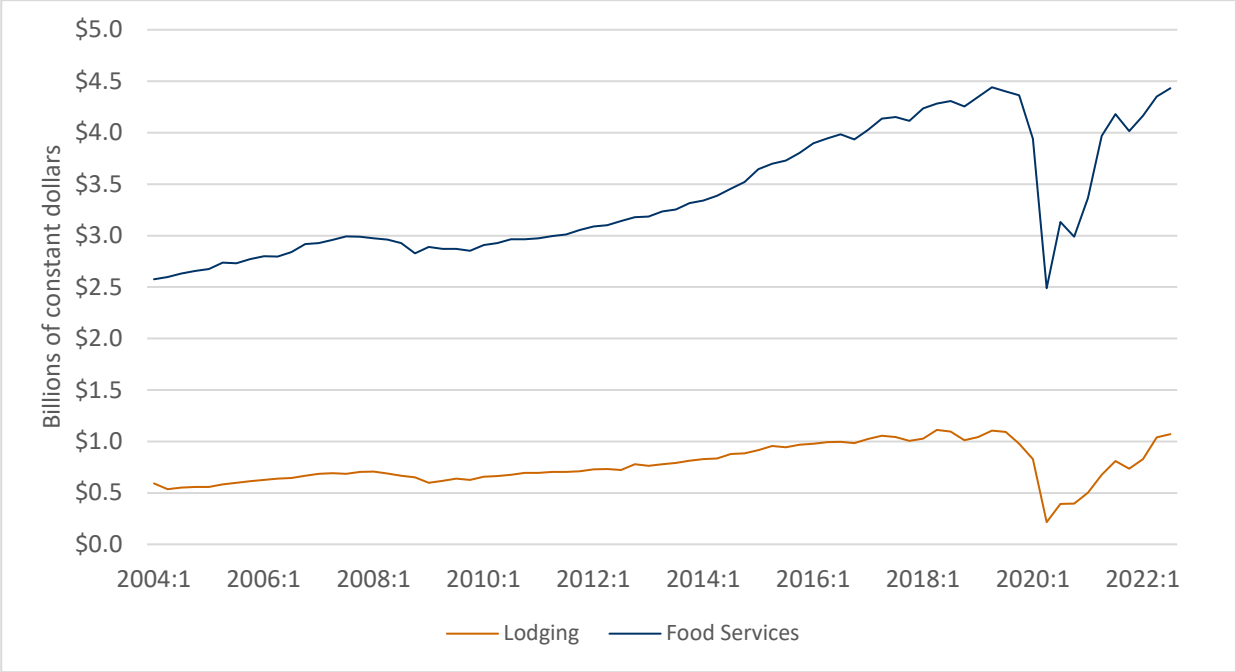
Taxable sales drop at retail outlets, climb at restaurants, lodging

During the first year of the COVID outbreak, consumer spending patterns changed markedly. People bought fewer services, and bought more goods. As a result, taxable sales at retail outlets (and including online purchases), after falling during the first two quarters of COVID, rose faster than incomes over the next four quarters. As COVID abated, beginning in 2021 Q3, taxable sales declined, returning to their previous trendline in late 2023.

Taxable sales at restaurants and hotels/motels followed a similar pattern: a deep dive followed by a more gradual recovery. Both were still a bit below their previous peak in the third quarter of 2022.

11 Building Industry Association of Washington, https://www.biaw.com/wp-content/uploads/2022/05/Housing-Supply-Shortage-2022.pdf.

Figure 2-5. Taxable sales, adjusted for inflation and seasonality, lodging and food services industry, Washington state, 2004 Q1 to 2022 Q3
Source: Washington Department of Revenue, adjustments by Employment Security Department/DATA Division



Taxable sales at restaurants had almost recovered by 2022 Q3, while hotel/motel sales were still 4% below their previous peak.

Chapter 3: Seasonal, structural and cyclical industry employment

The purpose of this chapter is to identify the most influential factors affecting employment trends for different industries in Washington state, based on administrative data. The results are important for both providing a better understanding of current employment trends and for practical applications such as job placement, unemployment insurance and training programs. Annually, for instance, industries with high levels of seasonality experience significant variation in monthly employment. With this monthly variation, short-term high job demand follows upon employment declines. For industries with high cyclical variation, periods of booming employment can be followed by periods of decline. Training programs should be developed in anticipation of such employment variation.

We also analyzed the relationships between industry and total state employment (*Appendix 2*). The results of this analysis can help create a better understanding of the key components of state employment trends.

Our analysis is based on historical employment data from January 2002 through December 2020.[12] The analysis splits industry employment trends among the following four components:

1. Seasonal: regular and predictable employment changes that recur each calendar year, caused by seasonal factors, which can include natural factors (changes in weather), administrative measures (starting and ending of the school year) and social, cultural or religious traditions (fixed holidays such as New Year's Day).
2. Trend: shifts in long-term employment growth trends driven by fundamental structural change and productivity trends in industries, rather than the cyclical fluctuations in employment. Structural changes in employment can be initiated by productivity improvement, policy changes or permanent changes in resources, technology or society. Technological innovation has introduced entirely new industries and caused other industries to decline. In addition, it has reshaped the entire labor market through increased efficiencies, such as automated manufacturing, data collection and analysis and communications.
3. Cyclical: employment changes attributed to the business cycle in general or specific events such as the housing bubble bursting in 2007, cyclical variation in aerospace employment or the economic impact from the COVID-19 pandemic during 2020.
4. Irregular: random employment changes not picked up by regular seasonal and cyclical components (e.g., non-regular seasonality, weather variation and labor strikes).

Seasonal industries

The analysis this year showed that of 95 industries in Washington state, 17 have high levels of seasonality with a seasonal factor[13] over 4 percent. Crop production, scenic and sightseeing transportation, and support activities for agriculture and forestry were the most seasonal industries (*Figure 3-1*).

[12] Historical data for employment covered by the unemployment insurance system was categorized by NAICS (North American Industrial Classification System) code, at the three-digit code level. Altogether, the historical time series data included 95 industries and one series for total employment.

[13] See *Appendix 2* for seasonal factor definition.

Figure 3-1. Industries with high levels of seasonality
Washington state, 2002 to 2021
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

NAICS	Industry	Seasonal factor
111	Crop production	30.52%
487	Scenic and sightseeing transportation	20.47%
115	Support activities for agriculture and forestry	17.06%
525	Funds, trusts, and other financial vehicles	14.35%
213	Support activities for mining	11.24%
711	Performing arts, spectator sports, and related industries	9.97%
237	Heavy and civil engineering construction	7.18%
814	Private households	5.82%
114	Fishing, hunting and trapping	5.75%
492	Couriers and messengers	5.45%
721	Accommodation	5.27%
312	Beverage and tobacco product manufacturing	5.10%
448	Clothing and clothing accessories stores	4.83%
519	Other information services	4.80%
316	Leather and allied product manufacturing	4.65%
713	Amusement, gambling, and recreation industries	4.28%
311	Food manufacturing	4.20%

Crop production, scenic and sightseeing transportation and support activities for agriculture and forestry have historically been the industries with the highest degree of seasonality in Washington state.

Structural and cyclical industries

Annual totals of seasonal, irregular and cyclical components represent a statistically insignificant share of employment. Cyclical is balanced between years, while seasonal and irregular are balanced within a year. For annual trends, the combination of the trend and cycle components represents virtually all total employment changes.

For total covered employment, the trend component accounts for 57.25 percent of employment changes (*Appendix figure A2-2*). There were 12 industries where the structural (trend) component accounted for at least two-thirds of the change in employment (*Figure 3-2*). Other information services, wholesale electronic markets and agents and brokers, publishing industries (except internet), and ambulatory health care services were most highly influenced by the trend factor, and consequently influenced less by the cyclical factor. The trend component contributed relatively more to these four industries than to employment changes in total nonfarm employment. The remaining industries have lower trend contributions than total nonfarm employment.

Figure 3-2. Industries most influenced by structural factors
Washington state, 2002 to 2021
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

NAICS	Industry	Structural factor
519	Other information services	79.49%
425	Wholesale electronic markets and agents and brokers	77.29%
511	Publishing industries (except Internet)	76.75%
621	Ambulatory health care services	74.79%
454	Nonstore retailers	71.55%
238	Specialty trade contractors	70.96%
236	Construction of buildings	69.58%
541	Professional, scientific and technical services	69.09%
444	Building material and garden equipment and supplies dealers	67.11%
492	Couriers and messengers	66.95%
623	Nursing and residential care facilities	66.94%
237	Heavy and civil engineering construction	66.24%
519	Other information services	79.49%
425	Wholesale electronic markets and agents and brokers	77.29%

These Washington industries have been most influenced by structural factors such as technology changes, policy changes and changing demographics.

For 30 industries, the cyclical component accounted for more than half of the change in employment in the indicated industries (*Figure 3-3*). For total covered employment, the cyclical component accounted for 42.75 percent of total employment change. Support activities for mining, performing arts, spectator sports, and related industries, and amusement, gambling, and recreation industries were most highly influenced by the cyclical factor, and consequently less by the structural (trend) factors.

Figure 3-3. Industries most influenced by cyclical factors
Washington state, 2002 to 2021
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

NAICS	Industry	Cyclical factor
213	Support activities for mining	69.37%
711	Performing arts, spectator sports and related industries	64.31%
713	Amusement, gambling and recreation industries	63.25%
512	Motion picture and sound recording industries	62.64%
211	Oil and gas extraction	60.38%
486	Pipeline transportation	59.19%
443	Electronics and appliance stores	58.73%
813	Religious, grantmaking, civic, professional and similar organizations	58.48%
721	Accommodation	58.06%
487	Scenic and sightseeing transportation	56.92%
485	Transit and ground passenger transportation	56.84%
491	Postal service	56.79%
316	Leather and allied product manufacturing	55.52%
525	Funds, trusts, and other financial vehicles	55.45%
451	Sporting goods, hobby, musical instrument and book stores	55.15%
712	Museums, historical sites and similar institutions	54.87%
315	Apparel manufacturing	54.56%
901	Federal government (other)	54.53%
324	Petroleum and coal products manufacturing	54.01%
722	Food services and drinking places	53.32%
442	Furniture and home furnishings stores	53.20%
811	Repair and maintenance	52.00%
483	Water transportation	51.99%
482	Rail transportation	51.78%
447	Gasoline stations	51.34%
446	Health and personal care stores	51.15%
114	Fishing, hunting and trapping	51.06%
332	Fabricated metal product manufacturing	50.95%
331	Primary metal manufacturing	50.40%
453	Miscellaneous store retailers	50.05%

These Washington industries have been most sensitive to cyclical-factor movements and have exhibited shifts of relatively rapid employment growth and decline.

See *Appendix 2* for a description of the statistical methodology used to categorize and measure the major factors behind employment change by industries, and *Appendix figures A2-2* and *A2-3* with the full results of these analyses.

In summary, training providers and other planners should be aware that not every upswing in employment is an indication of an increase in demand. The upswing may simply be annual seasonal or cyclical fluctuations.

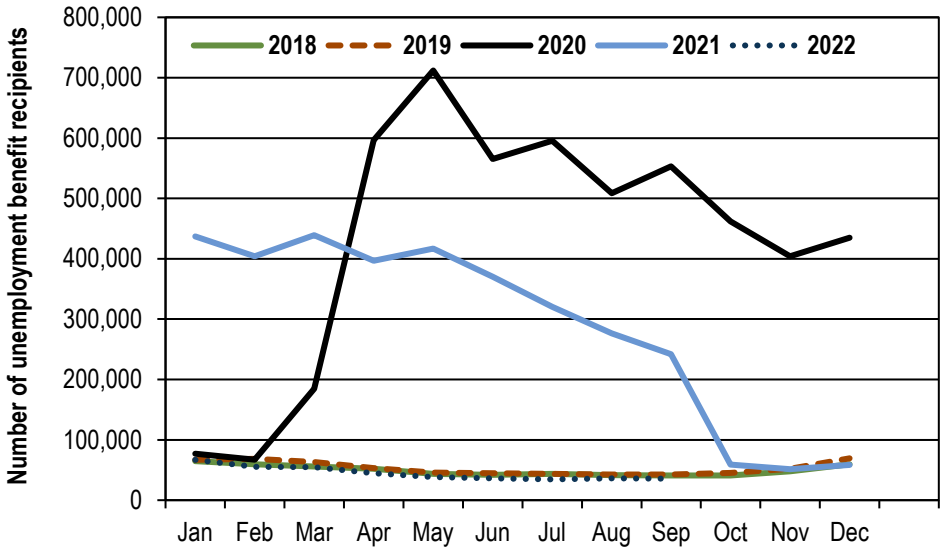
Chapter 4: Unemployment

This chapter discusses two important indicators of Washington's labor market: unemployment benefits and unemployment rates.

Unemployment insurance benefit recipients

In September 2022, 35,852 people received an unemployment benefit payment. *Figure 4-1* shows the number of monthly beneficiaries in Washington state from 2018 through September of 2022 that received at least one payment of unemployment insurance benefits under regular unemployment compensation, pandemic unemployment assistance (PUA), pandemic emergency unemployment compensation (PEUC), and the extended benefits program (EB). With the onset of the COVID-19 pandemic unemployment insurance beneficiaries increased significantly starting in March 2020, with the number of paid claims increasing by nearly three times the number of paid claims in April 2020. Since April 2020, benefit payments have been decreasing with the number of beneficiaries dropping significantly starting in October of 2021, with the EB program ending in March 2021, and the PEUC program ending September 4, 2021. The number of paid claims peaked at a high of 711,945 in May 2020. Since May 2020, the number of individuals receiving benefits in Washington state has dropped and is currently at 35,852 claimants as of September 2022. The decrease in beneficiaries reflects factors including easing of COVID-19 concerns and restrictions, individual beneficiaries finding jobs, and less people being laid off and needing to apply for benefits.

Figure 4-1. Unemployment benefit recipients by month, all benefit entitlements[14]
Washington state, January 2018 through September 2022
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



The number of Washingtonians receiving unemployment benefits as of September 2022 was 35,852.

[3] All benefit entitlement programs include regular unemployment compensation, pandemic emergency unemployment compensation (PEUC), pandemic unemployment assistance (PUA) and extended benefits (EB).

Unemployment insurance benefit payments

Unemployment benefits provide claimants with temporary income when they lose their job through no fault of their own. The money partly replaces their lost earnings and helps them pay expenses while looking for new work. The benefits are not based on financial need, but on prior earnings.

Typically, workers covered by unemployment insurance can receive up to 26 weeks of regular unemployment benefits in a 52-week benefit year. The 52-week benefit year begins when an individual applies for unemployment benefits. The claimant cannot file a new claim in Washington until their benefit year expires, even though they may have received all of their allotted benefits.

Most claims receive between 13 and 26 weeks of benefits. In addition to being laid off through no fault of their own, they also must meet the following criteria to be eligible for unemployment insurance benefits in Washington state:

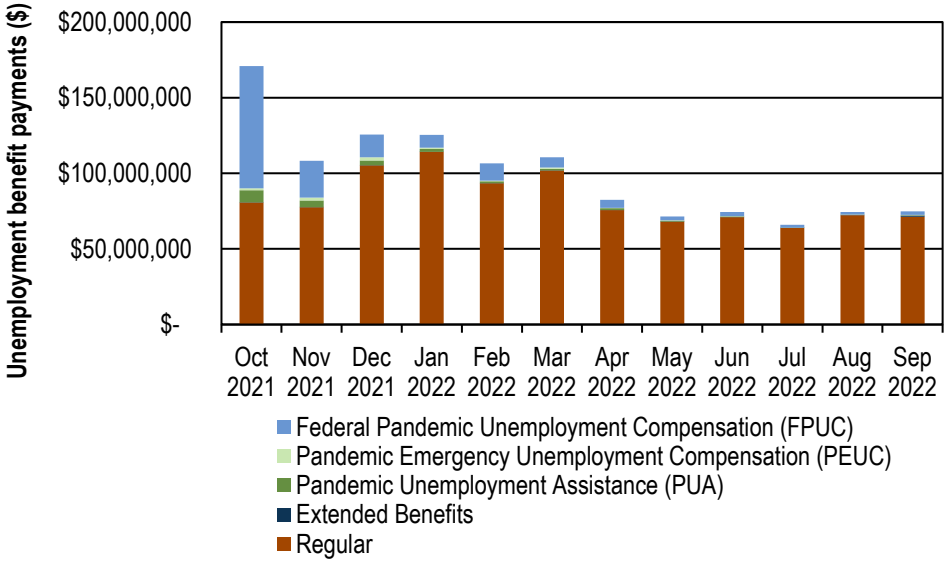
- They must have worked at least 680 hours in their base year.
- At least some wages must have been earned in Washington, unless they recently left the military and are currently located in Washington state.

In Washington state, a claimant's weekly unemployment insurance benefit amount is calculated by adding together the gross wages from the two-highest quarters of wages in their base year and dividing by two. This amount is then multiplied by .00385 to arrive at the weekly benefit amount. If the calculated weekly benefit amount is more than Washington's official maximum weekly benefit amount, they get the maximum. If the amount calculated is lower than the minimum weekly benefit amount, they get the minimum amount, rounded down to the nearest dollar.

Figure 4-2 shows the monthly unemployment insurance benefit payouts from October of 2021 through September of 2022 for a*ll benefits payments*, which includes regular benefits, federal pandemic unemployment compensation (FPUC), PUA, PEUC and EB benefits.

From October 2021 through September 2022, ESD has paid more than $1.19 billion in unemployment benefit payments. This compares to $10.2 billion paid in unemployment benefit payments in the prior 12-month period (October 2020 through September 2021).

Figure 4-2. Unemployment benefit payments by month, all benefit payments[15]
Washington state, October 2021 through September 2022
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

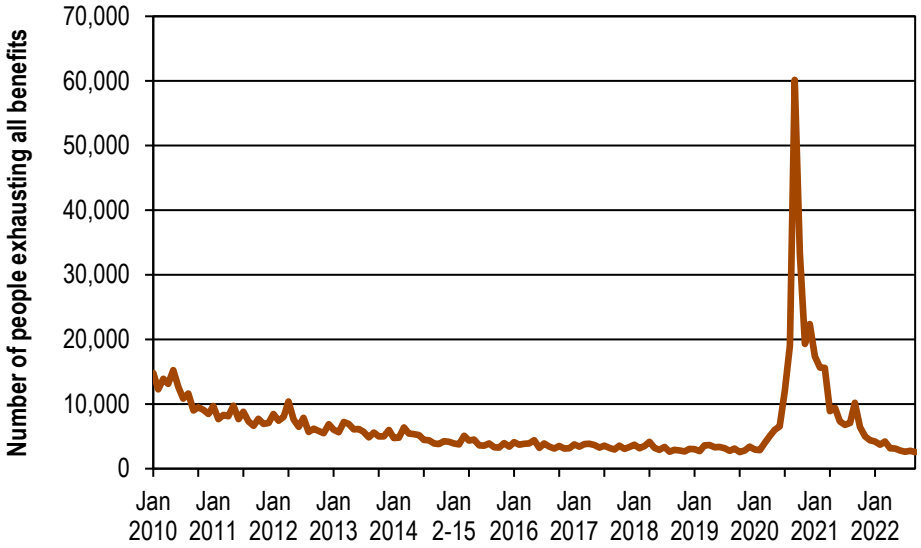


Monthly benefits payments for all entitlement programs were at $74.8 million as of September 2022.Benefit exhaustions have been decreasing

Unemployed individuals exhaust their benefits when they have received all regular unemployment benefits, (PUA), (PEUC), and (EB) available to them. The following exhaustion analysis will focus on claimants that have exhausted regular benefits between October 2021 and September 2022. *Figure 4-3* shows the monthly exhaustions for Washington's regular unemployment benefits. The level of exhaustions of regular claims increased steadily since March 2020, with the peak of regular benefit exhaustions occurring in September 2020 (60,158 regular benefit exhaustions). Since September 2020, exhaustions of regular benefits have been decreasing, with September 2022 exhaustions currently at 2,559 claimants.

[19] All benefit payments include regular unemployment compensation, pandemic emergency unemployment compensation (PEUC), pandemic unemployment assistance (PUA), federal pandemic unemployment compensation (FPUC) and extended benefits (EB).

Figure 4-3. Number of people exhausting regular unemployment benefits
Washington state, January 2010 through September 2022
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



In September 2022, 2,559 people exhausted their regular unemployment benefits.

Benefit exhaustions by industry, occupation and area

Higher levels of benefit exhaustions are generally associated with long-term unemployment. The following figures detail patterns of benefit exhaustions by industry, occupation and location.

Exhaustions by industry

Figure 4-4 presents exhaustions by industry for the 12-month period ending in September 2022. To provide further context, the figure also includes each industry's percent of total nonfarm employment and exhaustion-to-employment ratio. The exhaustion-to-employment ratio can be used to identify industries that are characterized by long-term unemployment and that continue to struggle in their recovery from the last recession. The larger the exhaustion-to-employment ratio, the more likely workers were to exhaust.

From October 2021 through September 2022, workers in the construction and educational service sectors were most likely to exhaust regular unemployment benefits with an exhaustion-to-employment ratio of 3.3 percent and 2.5 percent respectively. This statistic is presented in column six of *Figure 4-4*.

The construction sector accounted for the greatest portion of regular benefit exhaustions at 15.4 percent. This statistic is presented in column four of *Figure 4-4*. The construction and manufacturing industry's share of total covered employment was 6.3 percent and 7.7 percent, respectively; the exhaustion-to-employment ratio for those sectors was 3.3 and 2.0, respectively. Health care and social assistance represented 10 percent of all exhaustions.

Figure 4-4. Unemployment benefit exhaustions by industry
Washington state, October 2021 through September 2022
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

NAICS	Industry sector	Annual exhaustions, regular benefits	Percent of all exhaustions	Industry share of nonfarm employment	Exhaustions-to-employment ratio	QCEW 2021 average annual employment
23	Construction	6,923	15.4%	6.3%	3.3%	210,289
31 - 33	Manufacturing	5,056	11.3%	7.7%	2.0%	256,371
62	Health care and social assistance	4,493	10.0%	13.0%	1.0%	434,088
44 - 45	Trade	3,917	8.7%	11.9%	1.0%	398,227
56	Administrative and support and waste management and remediation services	3,391	7.5%	5.1%	2.0%	171,112
72	Accommodation and food services	3,204	7.1%	7.1%	1.3%	237,697
54	Professional, scientific and technical services	2,349	5.2%	6.7%	1.0%	225,512
11	Agriculture, forestry, fishing and hunting	2,159	4.8%	2.9%	2.2%	96,995
	Unknown	2,096	4.7%	N/A	N/A	N/A
42	Wholesale trade	1,782	4.0%	3.9%	1.4%	129,162
48 - 49	Transportation and warehousing	1,778	4.0%	3.2%	1.6%	108,536
51	Information	1,387	3.1%	4.7%	0.9%	156,366
81	Other Services	1,291	2.9%	2.7%	1.4%	91,271
GOV	Government	1,205	2.7%	16.3%	0.2%	547,166
61	Educational services	1,077	2.4%	1.3%	2.5%	43,230
52	Finance and insurance	944	2.1%	2.9%	1.0%	96,499
53	Real estate, rental and leasing	823	1.8%	1.6%	1.5%	54,152
71	Arts, entertainment and recreation	788	1.8%	1.2%	2.0%	40,200
22	Utilities	119	0.3%	0.2%	2.2%	5,322
55	Management of companies and enterprises	93	0.2%	1.3%	0.2%	43,202
21	Mining	50	0.1%	0.1%	2.4%	2,113
	Total	**44,925**	**100.0%**	**100.0%**	**1.3%**	**3,347,509**

N/A = Not Available. Nonfarm employment does not include farmworkers, private households or non-profit organization employees. Exhaustion totals were not comparable to nonfarm employment totals. The majority of workers in "unknown" industries were a product of out-of-state employers. Washington State Employment Security Department is unable to identify industries where the primary employer is out of state.

Construction workers were most likely to exhaust unemployment benefits from October 2021 through September 2022 (3.3 percent) exhaustion-to-employment ratio.

Exhaustions by occupation

Figure 4-5 examines unemployment benefit exhaustions by occupational group. Management and construction and extraction occupations accounted for the largest share of exhaustions between October 2021 and September 2022. Each of these two occupation groups accounted for 13.5 percent of all exhaustions. Since total covered employment is reported only by industry and not by occupation, each occupation's percent of total covered employment and exhaustion-to-employment ratio were not available to be included in *Figure 4-5*.

Figure 4-5. Unemployment benefit exhaustions by major occupational groups
Washington state, October 2021 through September 2022
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

SOC	Major occupation group	Annual exhaustions, regular benefits	Percent of all exhaustions
11	Management occupations	6,072	13.5%
47	Construction and extraction occupations	6,068	13.5%
	Unknown	6,012	13.4%
43	Office and administrative support occupations	3,883	8.6%
51	Production occupations	2,714	6.0%
53	Transportation and material moving occupations	2,609	5.8%
41	Sales and related occupations	2,139	4.8%
35	Food preparation and serving related occupations	1,906	4.2%
45	Farming, fishing and forestry occupations	1,788	4.0%
13	Business and financial operations occupations	1,520	3.4%
15	Computer and mathematical occupations	1,246	2.8%
31	Health care support occupations	1,238	2.8%
49	Installation, maintenance and repair occupations	1,228	2.7%
39	Personal care and service occupations	1,002	2.2%
37	Building and grounds cleaning and maintenance occupations	971	2.2%
17	Architecture and engineering occupations	841	1.9%
29	Health care practitioners and technical occupations	763	1.7%
33	Protective service occupations	650	1.4%
27	Arts, design, entertainment, sports and media occupations	553	1.2%
21	Community and social services occupations	529	1.2%
25	Education, training and library occupations	447	1.0%
19	Life, physical and social science occupations	415	0.9%
23	Legal occupations	195	0.4%
55	Military specific occupations	136	0.3%
	Total	**44,925**	**100.0%**

Management and construction and extraction occupations accounted for 27 percent of all individuals to exhaust regular unemployment benefits from October 2021 through September 2022. The Acronym SOC stands for Standard Occupational Classification and is a federal statistical standard used to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data.

Exhaustions by workforce development area

Figure 4-6 presents exhaustions by workforce development area (WDA) for October 2021 through September 2022. To provide further context, the figure also includes each industry's percent of total nonfarm employment[16] and exhaustion-to-employment ratio.

From October 2021 through September 2022, workers in the Snohomish and Pierce County WDAs were most likely to exhaust regular unemployment benefits with an exhaustion-to-employment ratio of 1.1.

Seattle-King County accounted for more than one-fifth of exhaustions at 21.7 percent of all benefit exhaustions, with a 2021 industry share of over 40.9 percent of nonfarm employment. Seattle-King and Pierce County's share of total covered employment was 21.7 percent and 10.5 percent, respectively; the exhaustion-to-employment ratio for those counties was 0.5 and 1.1, respectively.

Seattle-King County accounted for the largest share of exhaustions and employment with an exhaustion-to-employment ratio of 0.5.

Figure 4-6. Unemployment benefit exhaustions by workforce development area
Washington state, October 2021 through September 2022
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Workforce development area	Annual exhaustions, regular benefits	Percent of exhaustions	2021 industry share of nonfarm employment	Exhaustions-to-employment ratio
Out of state/unknown	10,163	22.6%	N/A	N/A
Seattle-King County	9,745	21.7%	40.9%	0.5
Pierce County	4,727	10.5%	9.3%	1.1
Snohomish County	3,921	8.7%	8.1%	1.1
South Central WA	2,489	5.5%	5.5%	1.0
Pacific Mountain	2,459	5.5%	5.5%	1.0
Southwest WA	2,152	4.8%	6.1%	0.8
Spokane County	2,062	4.6%	6.8%	0.7
Northwest WA	1,899	4.2%	4.7%	0.9
Benton-Franklin	1,671	3.7%	3.7%	1.0
North Central WA	1,589	3.5%	3.5%	1.0
Olympic	1,329	3.0%	3.6%	0.8
Eastern WA	719	1.6%	2.2%	0.7
Total	**44,925**	**100.0%**	**100.0%**	

Snohomish and Pierce counties accounted for the largest share of exhaustions and employment and had an exhaustion-to-employment ratio of 1.1.

[16] Nonfarm employment does not include farmworkers, private households or non-profit organization employees. Exhaustion totals were not comparable to nonfarm employment totals.

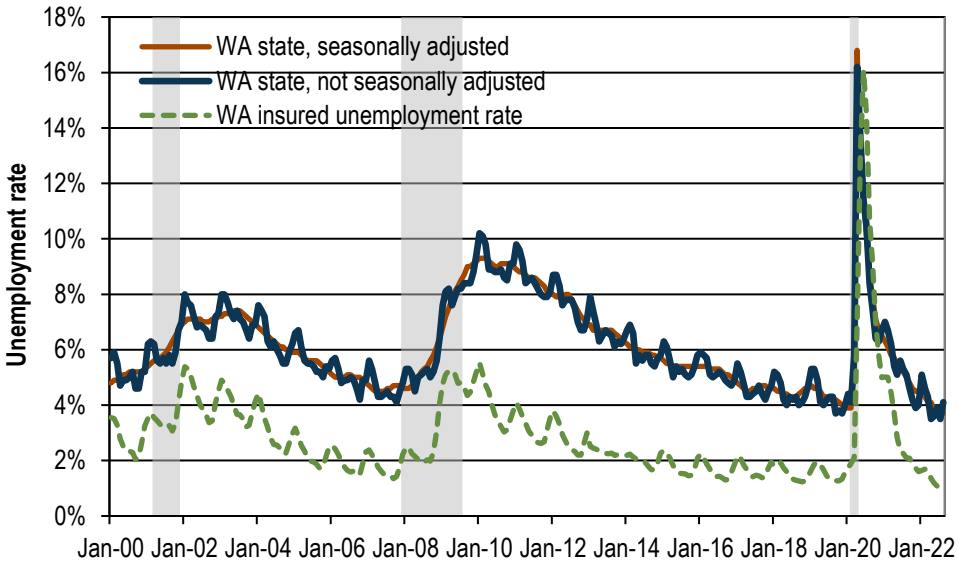
Unemployment rate

The overall unemployment rate is a ratio of the estimated number of unemployed individuals looking for work divided by the civilian labor force. The labor force is made up of individuals who are employed or who are actively seeking work. This is the most familiar unemployment rate and includes both workers covered by unemployment insurance and those who are not.[17]

Particularly in the context of a discussion about unemployment benefits, the insured unemployment rate can be useful. The insured unemployment rate is a ratio of the number of insured unemployed (those drawing unemployment benefits) divided by the total number of individuals (working and not working) covered by unemployment insurance.

Figure 4-7 compares the overall and insured unemployment rates for Washington. The rates have basically moved in tandem, with the insured rate historically about half of the overall unemployment rate. In late 2008, both measures of unemployment began a dramatic rise, with rates peaking during first quarter 2010. However, since the onset of the COVID-19 pandemic, the gap between the overall and insured unemployment rates has narrowed. This means there were increasing numbers of unemployed workers eligible for unemployment benefits.

Figure 4-7. Overall unemployment rate, seasonally and not seasonally adjusted, and insured unemployment rate
Washington state, January 2000 through August 2022
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics



Shaded areas are U.S. recession periods.

The gap between unemployed workers who are eligible for unemployment benefits and those who are narrowed following the most recent recession.

The overall unemployment rate

The overall unemployment rate is widely used in economic analysis as a lagging indicator of the direction of the economy. As noted previously, the unemployment rate is a ratio of the estimated number of

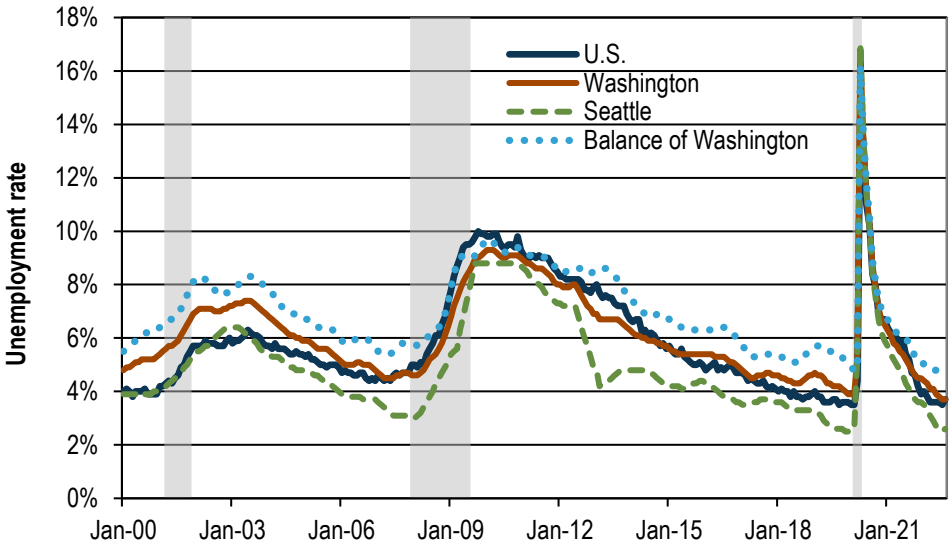
[17] Workers covered by unemployment insurance are unemployed through no fault of their own, as determined by state law. In order to qualify for this benefit program, they must have worked at least 680 hours in covered employment during the past 12 to 18 months. At least some of these hours must have been earned in Washington state. They must also be able to work and be available for work each week that they are collecting benefits.

unemployed who are seeking work, divided by the labor force. The labor force is limited to individuals who are employed or seeking work.

As shown in *Figure 4-8*, the state unemployment rate reached a high in second quarter 2020 of 16.8 percent. During most of 2010, 2011 and 2012, the unemployment rate for Washington state remained higher than the national rate. Starting in August 2012, the state unemployment rate fell below the national rate and remained below the national rate through September 2014 before rising above the nation in September 2014 at 5.8 percent. For September 2014 through June 2020, the state unemployment rate remained above the national rate. In April 2020 both the national and state unemployment rate saw increases in the unemployment rate of over 10 percent with the state increasing from 5.3 percent in March 2020 to 16.8 percent in April 2020. The national unemployment rate increased from 4.4 percent in March 2020 to 14.7 percent in April 2020. By August 2020, both the state and national unemployment rates dropped below 10 percent. By September 2022, the state unemployment rate was at a 3.7 percent, while the national unemployment rate was at 3.5 percent, respectively.

The Seattle-Bellevue-Everett Metropolitan Division (MD) has reported a lower unemployment rate than the rest of Washington and the nation since 2004. However, during April 2020 the Seattle MD experience a higher unemployment rate than nation and the state. The unemployment rate in the Seattle MD increased from 5.5 percent in March 2020 to 17 percent by April of 2020. For comparison, the national unemployment rate increased from 4.4 percent in March 2020 to 14.7 percent in April of 2020. By September 2022, the Seattle-Bellevue-Everett Metropolitan Division unemployment rate was at 2.6 percent.

Figure 4-8. Historical U-3 unemployment rates, seasonally adjusted
United States and Washington state, January 2000 through August 2022
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics; National Bureau of Economic Research



Shaded areas are U.S. recession periods.

National and state unemployment rates tracked closely during the pandemic. From May 2020 through September 2022, the Seattle unemployment rate declined more rapidly than both the Washington state and U.S. unemployment rates.

Other measures of unemployment

Other measures of unemployment include alternative unemployment rates and the labor force participation rate.

Alternative unemployment rates

The U.S. Bureau of Labor Statistics (BLS) reports six alternative measures of labor underutilization, or unemployment. The commonly used definition of the unemployment rate, shown in *Figure 4-8*, is a ratio of the estimated number of unemployed who are seeking work, divided by the labor force. This is equivalent to what the BLS calls "U-3."

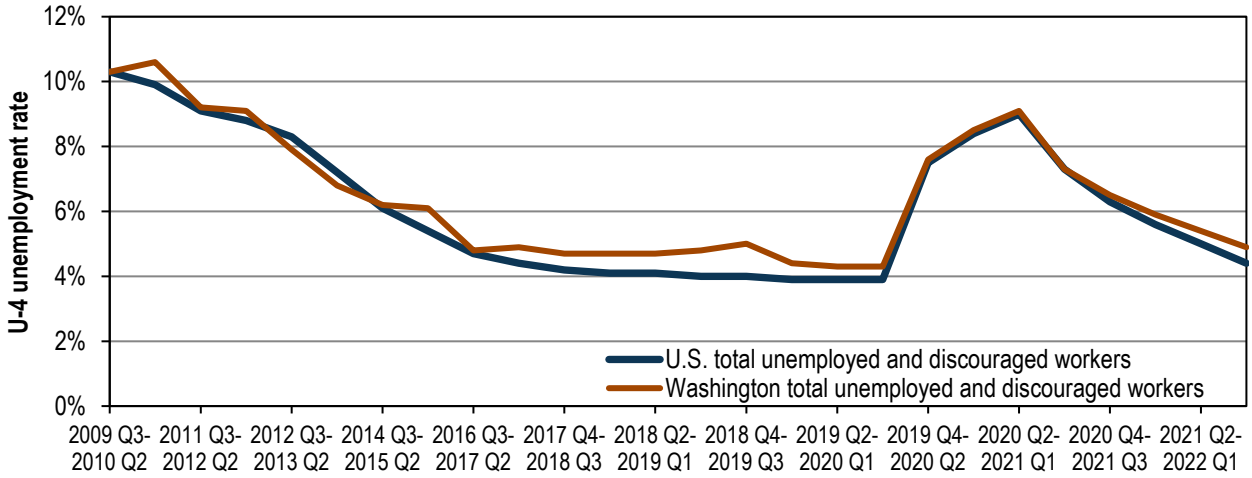
A common criticism of the standard measurement of unemployment is that it is too narrow – for instance, it excludes individuals who are not working and would like to work, but have given up looking for work.

In response to criticism, the BLS has made available alternative measurements that are progressively more inclusive than the commonly reported unemployment rate. The standard measurement (U-3), along with two of the six alternative measurements, are defined as:

- U-3 – Unemployed as a percent of the labor force.
- U-4 – Unemployed plus discouraged workers, as a percent of the labor force plus discouraged workers.
- U-6 – Unemployed plus all marginally attached workers and employees working part time for economic reasons, all as a percent of the labor force plus all marginally attached workers.

The U-4 measure followed a similar pattern of decline in Washington state and the country as a whole coming out of the great recession (*Figure 4-9*). The moving average for third quarter 2009 through second quarter 2010 had Washington state and the nation both at 10.3 percent. From second quarter of 2010 through the second quarter of 2020, the Washington state U-4 unemployment rate decreased to 4.3 percent while the nation's rate decreased to 3.9 percent. With the onset of the COVID-19 pandemic, the U-4 unemployment measure for both the state and nation increased significantly peaking at 9 percent for the nation and 9.1 percent for the state, for the four-quarter period ending the first quarter of 2021. Since the peak both the state and nation's U-4 rate has declined. The U-4 rate for Washington state, for the third quarter 2021 through the second quarter 2022, was 4.9 percent, while the nation's rate was 4.4 over the same period.

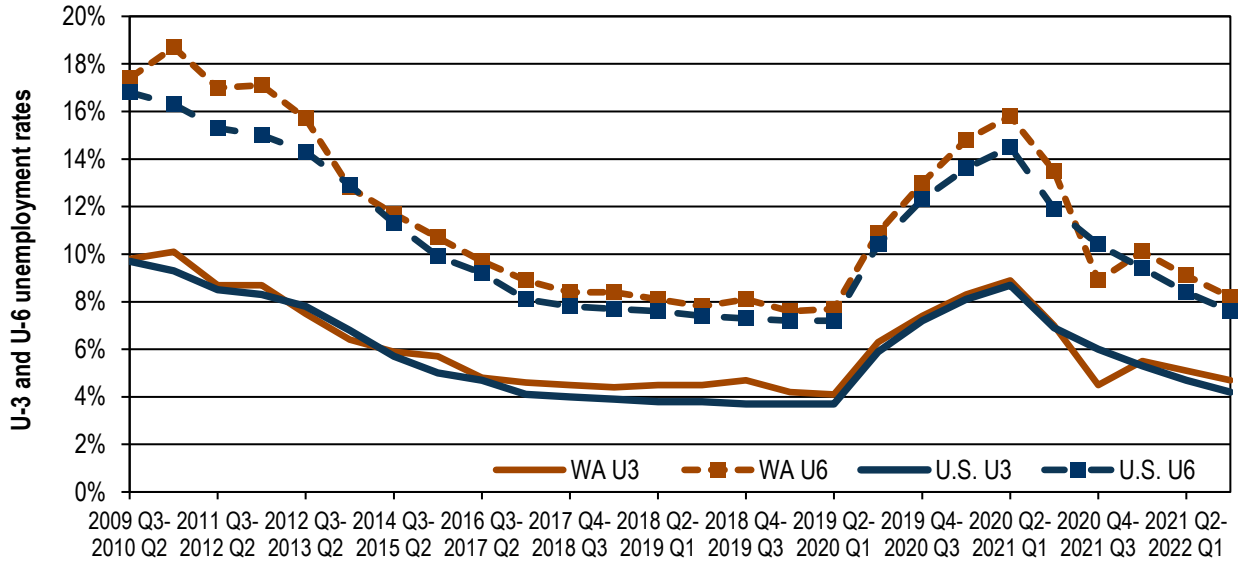
Figure 4-9. U-4 unemployment rate (includes discouraged workers), four-quarter moving average
United States and Washington state, third quarter 2009 through second quarter 2022
Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics



The U-4 measure of unemployment increased with the onset of the COVID-19 pandemic. As of June 2021, both the U.S. and Washington's U-4 rate are at 7.3 percent.

U-6 is the broadest measure of unemployment. The gap between the U-6 and U-3 rates has for both the state and the nation increased with the onset of the COVID-19 pandemic. This demonstrates the increase in the ranks of discouraged workers, marginally attached workers and those working part time involuntarily (*Figure 4-10*). This holds true for the state of Washington, where many underutilized workers are in the employed part time for economic reasons category. Washington's U-6 four-quarter moving average unemployment rate has remained higher than the nations since 2014. Most recently, Washington's U-6 rate remains 0.5 percentage points above the national rolling average from third quarter 2021 through second quarter 2022 at 4.9 percent and 4.4 percent respectively.

Figure 4-10. U-3 (standard) and U-6 (includes marginally attached workers and those working part time involuntarily) unemployment rates, four-quarter moving average
United States and Washington state, third quarter 2009 through second quarter 2022
Source: U.S. Bureau of Labor Statistics, Current Population Survey, Local Area Unemployment Statistics



The most broadly defined U-6 measure of unemployment for Washington remains above the national rolling average.

Chapter 5: Employment projections

About the employment, industry and occupational projections

Employment projections provide a general outlook for industry and occupational employment in Washington state. They provide job seekers, policymakers and training providers an idea of how much an industry or occupation is projected to change over time and show the future demand for workers.

On an annual basis, the Employment Security Department (ESD) produces industry employment projections for two, five and 10 years from a base period. For this annual report, the base period for the two-year (short-term) projections is second quarter 2021. The base period for the five-year (medium-term) and 10-year (long-term) projections is 2020.

Staffing patterns show proportional compositions of occupations within industries and are used to convert industry projections into occupational projections.

Industry classifications are based on the North American Industry Classification System (NAICS). However, they have been modified to match industry definitions used by the U.S. Bureau of Labor Statistics' (BLS) Occupational Employment and Wage Statistics (OEWS) program. These modified industry definitions are called Industry Control Totals (ICTs). The Standard Occupational Classification (SOC) system is used to group occupations. *Appendix 6* contains frequently asked questions relating to projections. *Appendix 7* provides a glossary of terms.

Data sets used to develop projections

The following data sets are used to produce projections:

1. Historical employment time series, consisting of U.S. Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW) data.
2. Employment not covered by the unemployment insurance system from the U.S. Bureau of Labor Statistics' Current Employment Statistics (CES) program.
3. Occupational employment by industries (staffing patterns) based on an OEWS survey.
4. National data for self-employed ratios, change factors, etc.
5. Independent variables (predictive indicators), which help to project the future direction of the economy, from IHS Global Insight's national forecast.

Use of employment projections

Employment projections are intended for career development over time, not as the basis for budget or revenue projections, or for immediate corrective actions within the labor market.

Employment projections are the basis of the Occupations in Demand (OID) list covering Washington's 12 workforce development areas (WDAs) and the state as a whole. This list is used to determine eligibility for a variety of training and support programs but was created to support the unemployment insurance Training Benefits Program. *Appendix 4* contains a technical description of the OID list.

The full OID list is accessible through the "Learn about an occupation" tool located at: https://esd.wa.gov/labormarketinfo/learn-about-an-occupation#/search

This chapter highlights findings on specific aspects of Washington's employment outlook. In the first section, industry projections results, we describe changes in employment by industry from 2020 to 2030. In the next section, occupational projections results, we look at:

- Major occupational groups
- Specific occupations

Detailed information on the projected demand for industry and occupational employment is available in the Employment Projections data files at: https://esd.wa.gov/labormarketinfo/projections

In addition, detailed skill projections information is available in *Appendix 5* of this report.

The formal description of industry and occupational projection processes is presented in the 2019 Employment Projections Technical Report. The technical report can be found at the data files link above.

Key findings

The 10-year average annual growth rate for total nonfarm employment for the 2020 to 2030 period is projected to be 1.70 percent. This is an increase from the 0.40 percent average annual growth rate predicted last year for 2019 to 2029, a result likely due to the sharp recovery in employment from the economic downturn during the COVID-19 pandemic.

Industry projections

- The largest increases by share of employment are projected for the leisure and hospitality sector and information sector.
- The largest decreases by shares of employment are projected for the manufacturing sector and wholesale trade sector.

Occupational projections

- The largest increases by shares of employment are projected for the food preparation and serving-related occupations and computer and mathematical occupations.
- The largest decreases by shares of employment are projected for the production occupations and office and administrative support occupations.
- The largest projected employment shares in 2030, from largest to smallest, are projected for the office and administrative support occupations, sales and related occupations and food preparation and serving-related occupations. As was the case in last year's projections report, the first two occupational groups are projected to have declining employment shares.

Two approaches to occupational job openings

A *separations* approach is based on BLS national rates. An *alternative* approach is based on job opening rates specific to Washington state. The *separations* method does not track job openings created by turnover when workers stay within an occupation, but change employers, while the *alternative* method does track these openings.

The *separations* and *alternative* data are available in the Occupational Projections data files at: https://esd.wa.gov/labormarketinfo/projections.

Information about the *separations* methodology is available at: https://www.bls.gov/opub/mlr/2018/article/occupational-separations-a-new-method-for-projecting-workforce-needs.htm. Information about the *alternative* methodology is available on our projections landing page at: https://esd.wa.gov/labormarketinfo/projections.

- For the *separations* method, fast food and counter workers occupations are projected to have the largest number of average annual total openings.
- For the *alternative* method, fast food and counter workers occupations are projected to have the largest number of average annual total openings.
- For both *separations* and *alternative* occupations, no growth openings exceeded turnover openings.

2022 industry projections results

Figure 5-1 presents 2020 estimated employment, and 2020, 2025 and 2030 employment shares, as well as changes in employment shares from 2020 to 2025, 2025 to 2030 and 2020 to 2030 by industry for Washington state.

Through 2030, the three industry sectors with the largest increases in employment shares are projected to be leisure and hospitality, information and professional and business services.[18]

For this same time period, the industry sector with the largest decrease in employment shares is manufacturing. The second and third-largest decreases are wholesale trade and state and local government other.

Figure 5-1. Base and projected nonfarm industry employment
Washington state, 2020, 2025 and 2030
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

[18] All tables contain values that are calculated and then rounded. As a result, details might not always add up to totals.

Industry sector*	Est. empl. 2020	Est. empl. shares 2020	Est. empl. shares 2025	Est. empl. shares 2030	Percentage point change in empl. shares 2020-2025	Percentage point change in empl. shares 2025-2030	Percentage point change in empl. shares 2020-2030
Natural resources and mining	5,600	0.17%	0.15%	0.1%	-0.02%	-0.01%	-0.03%
Construction	215,200	6.45%	6.52%	6.5%	0.07%	0.02%	0.09%
Manufacturing	292,000	8.76%	7.26%	6.9%	-1.50%	-0.31%	-1.81%
Wholesale trade	133,500	4.00%	3.70%	3.5%	-0.31%	-0.18%	-0.49%
Retail trade	389,900	11.69%	11.80%	11.9%	0.11%	0.08%	0.18%
Transportation, warehousing and utilities	113,600	3.41%	3.35%	3.3%	-0.06%	-0.05%	-0.11%
Utilities	6,100	0.18%	0.16%	0.1%	-0.03%	-0.01%	-0.03%
Information	149,600	4.49%	4.99%	5.5%	0.50%	0.48%	0.98%
Financial activities	161,100	4.83%	4.55%	4.4%	-0.28%	-0.11%	-0.39%
Professional and business services	430,500	12.91%	13.34%	13.6%	0.43%	0.30%	0.73%
Education and health services	492,600	14.77%	14.97%	15.5%	0.19%	0.53%	0.72%
Leisure and hospitality	264,900	7.94%	9.41%	9.2%	1.47%	-0.24%	1.23%
Other services	120,000	3.60%	3.64%	3.6%	0.04%	-0.07%	-0.03%
Federal government	78,700	2.36%	2.14%	2.0%	-0.22%	-0.11%	-0.33%
State and local government other	251,100	7.53%	7.22%	7.1%	-0.31%	-0.13%	-0.45%

*The sectors presented in the table are based on CES definitions.

The largest growth sectors for the state are projected for leisure and hospitality, information and professional and business services.

Historical and projected growth rates

Figure 5-2 shows the historical and projected growth rates for the state and Washington's 12 WDAs. Figure data are sorted on the projected growth rate 2020-2030 column.

Seven of the 12 WDAs have projected growth rates greater than the previous 10 years, and five have projected growth less than the previous 10 years. The Southwest WDA has the highest projected growth rate of 1.88 percent with Seattle-King County coming in second at 1.82 percent. The statewide projected growth rate is 1.70 percent, 0.12 percentage points greater than the statewide historical growth rate.

The seven WDAs with projected growth greater than the preceding 10-year period are: North Central, Spokane, Northwest, Pacific Mountain, South Central, Eastern and Olympic.

The largest positive difference between historical growth rates and projected growth rates is in the Northwest WDA. For this area, the difference between the historical and projected rates is 0.54 percentage points. Olympic WDA came in second place with a positive difference of 0.53 percentage points.

Snohomish WDA has the largest negative difference between projected and historical rates, of all WDAs and the state, with a difference of -0.52 percentage points. Additionally, this area has the lowest projected growth rate of 1.03 percent.

The last column in *Figure 5-2* represents the long-term growth rate on the historical linear trend line on all available history. Variances between long-term trend line rates and projected growth rates show the effects of the most recent changes in local employment trends. These variances may reflect differences in cyclical behavior.

Figure 5-2. Historical and projected total nonfarm employment growth
Washington state and workforce development areas, 1990 to 2020 and 2020 to 2030
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Workforce development area[1]	Historical growth[2] rate 2010-2020	Projected growth rate 2020-2030	Historical trend growth[3] 1990-2020
Southwest	2.33%	1.88%	1.92%
Seattle-King County	2.22%	1.82%	1.46%
North Central	1.76%	1.80%	1.44%
Tacoma-Pierce	1.93%	1.79%	1.82%
Benton-Franklin	1.79%	1.71%	2.35%
Spokane	1.35%	1.70%	1.31%
Washington state	**1.86%**	**1.70%**	**1.58%**
Northwest	1.11%	1.65%	1.73%
Pacific Mountain	1.45%	1.64%	1.37%
South Central	1.17%	1.51%	0.94%
Eastern	0.98%	1.45%	1.01%
Olympic	0.76%	1.29%	1.15%
Snohomish	1.55%	1.03%	2.16%

[1]Workforce development areas are regions within Washington state with economic and geographic similarities.
[2]Historical growth is based only on covered employment.
[3]The Historical trend growth is defined as the growth rate of the linear trend line.

Seven of the 12 WDAs have projected growth rates greater than the previous 10 years.

2022 occupational projections results

Figure 5-3 shows major occupational group employment estimates and employment shares for Washington state.

At the state level, 10 occupational groups are projected to receive increases in employment shares from 2020 to 2030. Of these 10, food preparation and serving-related occupations are projected to increase the most regarding employment shares by 0.95 percentage points. The next highest increase in employment shares is projected for computer and mathematical occupations, with an increase of 0.72 percentage points.

The three largest projected decreases in employment shares by 2030 at the state level are: production, 0.75 percentage points, office and administrative support, 0.46 percentage points, and farming, fishing and forestry, 0.32 percentage points.

By 2030, the top three state occupational groups for shares of employment are projected to be:

1. Office and administrative support occupations (10.25 percent)
2. Sales and related occupations (9.22 percent)
3. Food preparation and serving related-occupations (7.51percent)

By 2030 combined, these three major groups are projected to represent approximately 27 percent of total employment shares for the state.

Figure 5-3. Base and projected occupational employment
Washington state, 2020 to 2030
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Occupational Employment and Wage Statistics

2-digit SOC	Major occupational group	Est. empl. 2020	Est. empl. shares 2020	Est. empl. shares 2025	Est. empl. shares 2030	Percentage point change in empl. shares 2020-2025	Percentage point change in empl. shares 2025-2030
11-0000	Management	203,841	5.36%	5.41%	5.52%	0.05%	0.11%
13-0000	Business and financial operations	274,679	7.22%	7.19%	7.41%	-0.03%	0.21%
15-0000	Computer and mathematical	217,841	5.73%	6.10%	6.44%	0.37%	0.35%
17-0000	Architecture and engineering	82,850	2.18%	1.93%	1.88%	-0.25%	-0.05%
19-0000	Life, physical and social science	58,670	1.54%	1.54%	1.53%	-0.01%	0.00%
21-0000	Community and social service	84,915	2.23%	2.20%	2.23%	-0.03%	0.03%
23-0000	Legal	29,895	0.79%	0.76%	0.74%	-0.03%	-0.02%
25-0000	Educational instruction and library	198,176	5.21%	5.24%	5.19%	0.03%	-0.05%
27-0000	Arts, design, entertain. sports and media	73,512	1.93%	1.99%	2.02%	0.06%	0.03%
29-0000	Health care practitioners and technical	186,370	4.90%	4.91%	4.99%	0.01%	0.08%
31-0000	Health care support	153,627	4.04%	4.09%	4.28%	0.05%	0.19%
33-0000	Protective service	66,526	1.75%	1.70%	1.69%	-0.04%	-0.01%
35-0000	Food preparation and serving related	249,516	6.56%	7.61%	7.51%	1.05%	-0.10%
37-0000	Bldg. and grounds cleaning and maint.	115,650	3.04%	3.09%	3.08%	0.04%	-0.01%

2-digit SOC	Major occupational group	Est. empl. 2020	Est. empl. shares 2020	Est. empl. shares 2025	Est. empl. shares 2030	Percentage point change in empl. shares 2020-2025	Percentage point change in empl. shares 2025-2030
39-0000	Personal care and service	91,723	2.41%	2.60%	2.59%	0.19%	-0.01%
41-0000	Sales and related	359,706	9.46%	9.38%	9.22%	-0.08%	-0.16%
43-0000	Office and administrative support	407,295	10.71%	10.43%	10.25%	-0.28%	-0.17%
45-0000	Farming, fishing and forestry	105,775	2.78%	2.53%	2.46%	-0.25%	-0.08%
47-0000	Construction and extraction	236,037	6.21%	6.23%	6.23%	0.02%	0.00%
49-0000	Installation, maintenance and repair	145,669	3.83%	3.64%	3.55%	-0.20%	-0.09%
51-0000	Production	183,921	4.84%	4.25%	4.09%	-0.59%	-0.16%
53-0000	Transportation and material moving	276,198	7.26%	7.18%	7.09%	-0.09%	-0.09%

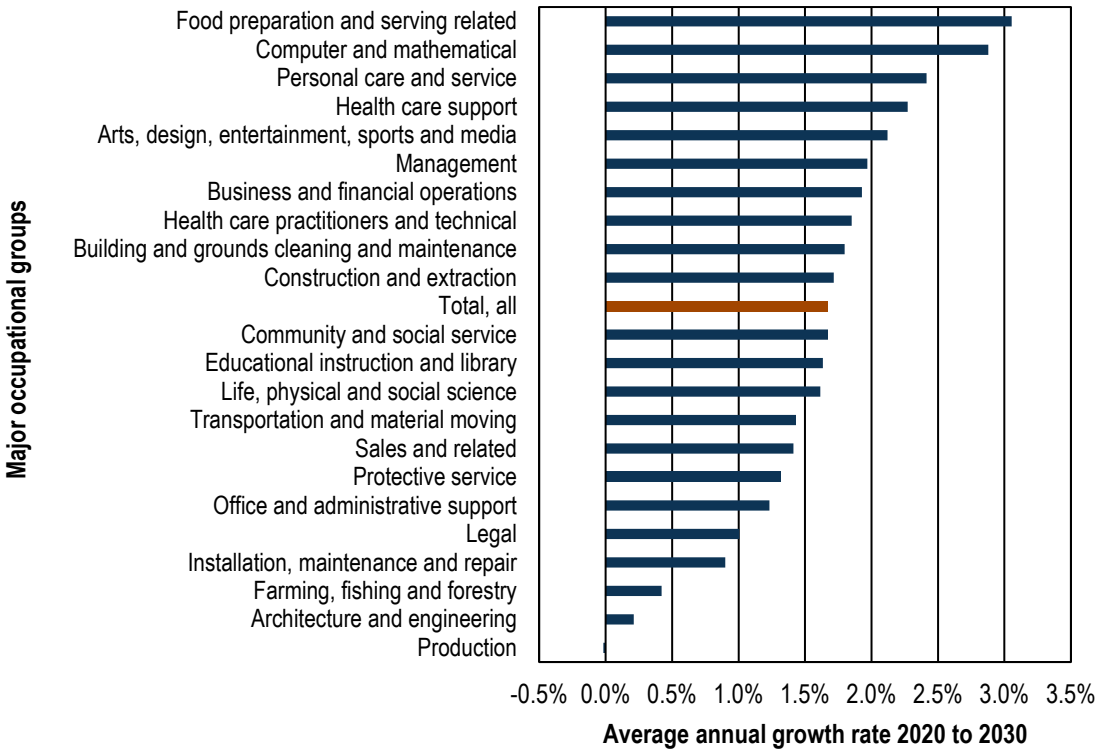
At the state level, 10 occupational groups are projected to receive increases in employment shares from 2020 to 2030.

The projected average annual growth rates for the major occupational groups in Washington state are presented in *Figure 5-4.* Food preparation and serving-related occupations (3.05 percent), computer and mathematical occupations (2.88 percent), and personal care and service occupations (2.41 percent) are projected to grow faster than other occupational groups from 2020 to 2030.

In the long term, four occupational groups are projected to fall below a 1.00 percent average annual growth rate: installation, maintenance, and repair occupations (0.90 percent), farming, fishing and forestry occupations (0.42 percent), architecture and engineering occupations (0.21 percent), and production occupations (0.02 percent).

Figure 5-4. Projected average annual growth rates for major occupational groups
Washington state, 2020 to 2030

Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Occupational Employment and Wage Statistics



Food preparation and serving related, computer and mathematical and personal care and service occupations are projected to experience the largest growth rates from 2020 to 2030 (3.05, 2.88 and 2.41 percent, respectively).

Separations and alternative job openings

The Bureau of Labor Statistics (BLS) *separations* method measures job openings created by workers who leave occupations and need to be replaced by new entrants. In this method, workers who exit the labor force or transfer to an occupation with a different Standard Occupational Classification (SOC) are identified as generating separation openings at the national level. This method does not track turnover within occupations. Turnovers within occupations occur when workers stay in occupations, but change employers. This also means that under the BLS method, jobs filled by interstate movement when workers stay within occupations, are not identified as new jobs.

Beginning with the 2017 projections cycle, ESD created a new Washington state specific *alternative* occupational method to the BLS *separations* method. The objective was to track job openings that occur when workers transfer within occupations. For simplicity, we refer to this method as the *alternative* method and to the rates as the *alternative* rates. While the *alternative* method can be used for any states that have useable wage files, the *alternative* results are based on Washington state wage records, making them specific to Washington state.

The *alternative* rates track openings created by turnover within occupations (i.e., workers stay within occupations but transfer to different companies) and when workers leave one occupation for another or leave the workforce.

The method consists of three major steps:

1. Estimating the total number of annual industry transfers that include:

a. Transfers between industries
b. Transfers inside industries
c. New individuals in Washington state wage records (wage file)
d. Exits or individuals who are no longer in the wage file

2. Converting industry transfers to occupational transfers using occupation-to-industry staffing patterns (shares of occupations for each industry).
3. Calculating *alternative* rates as total transfers, minus growth or decline, divided by estimated occupational employment for a base period.

Information about the *separations* methodology is available at: https://www.bls.gov/opub/mlr/2018/article/occupational-separations-a-new-method-for-projecting-workforce-needs.htm and information about the *alternative* methodology is available at: https://esd.wa.gov/labormarketinfo/projections.

For a complete list of *separations* and *alternative* projected employment, see: https://esd.wa.gov/labormarketinfo/projections.

Figure 5-5 presents a comparison between *separations* and *alternative* methodologies. Average annual total openings are compared at the two-digit SOC level. *Alternative* openings are on average almost two and a half times larger than *separations* openings. The *alternative* method increase makes sense since it measures openings not tracked by BLS. The *alternative* method measures turnover within occupations, while the BLS method does not. Also, BLS labor force exits measure national exits, but do not track exits from states.

The average ratio for *alternative to separations* is 2.46. A ratio above this average indicates that a worker is more likely to change jobs within a given occupation than to transfer to another occupation.

In *Figure 5-5,* the three largest *alternative-to-separations* ratios are for health care practitioners and technical (3.26), construction and extraction (3.25) and legal (2.98) occupations.

Figure 5-5. Comparison of *alternative* and *separations* methodologies on total openings
Washington state, 2020 and 2030
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

2-digit SOC	Major occupational group	Est. empl. 2020	Est. empl. 2030	Alternative average annual total openings 2020-2030	Separations average annual total openings 2020-2030	Ratio alternative to separations
11-0000	Management	203,841	247,709	77,845	26,308	2.96
13-0000	Business and financial operations	274,679	332,493	97,732	38,198	2.56
15-0000	Computer and mathematical	217,841	289,339	84,213	32,336	2.60
17-0000	Architecture and engineering	82,850	84,611	18,522	6,210	2.98
19-0000	Life, physical, and social science	58,670	68,863	16,853	7,446	2.26
21-0000	Community and social service	84,915	100,232	26,382	12,026	2.19
23-0000	Legal	29,895	33,044	8,056	2,700	2.98
25-0000	Education, training and library	198,176	233,031	50,257	26,119	1.92
27-0000	Arts, design, entertainment, sports and media	73,512	90,677	29,918	11,783	2.54
29-0000	Health care practitioners and technical	186,370	223,904	60,352	18,538	3.26
31-0000	Health care support	153,627	192,308	64,427	28,456	2.26
33-0000	Protective service	66,526	75,863	20,657	10,164	2.03
35-0000	Food preparation and serving related	249,516	337,084	144,259	72,541	1.99
37-0000	Building and grounds cleaning and maintenance	115,650	138,207	52,284	21,100	2.48
39-0000	Personal care and service	91,723	116,432	44,176	19,444	2.27
41-0000	Sales and related	359,706	413,883	141,877	59,933	2.37
43-0000	Office and administrative support	407,295	460,352	140,230	58,492	2.40
45-0000	Farming, fishing and forestry	105,775	110,314	48,540	17,501	2.77
47-0000	Construction and extraction	236,037	279,809	108,785	33,504	3.25
49-0000	Installation, maintenance and repair	145,669	159,342	47,530	17,208	2.76
51-0000	Production	183,921	183,595	49,043	19,893	2.47
53-0000	Transportation and material moving	276,198	318,403	111,281	46,471	2.39
00-0000	**Totals**	**3,802,392**	**4,489,495**	**1,443,213**	**586,366**	**2.46**

On average, alternative openings are 3.14 times larger than separations openings.

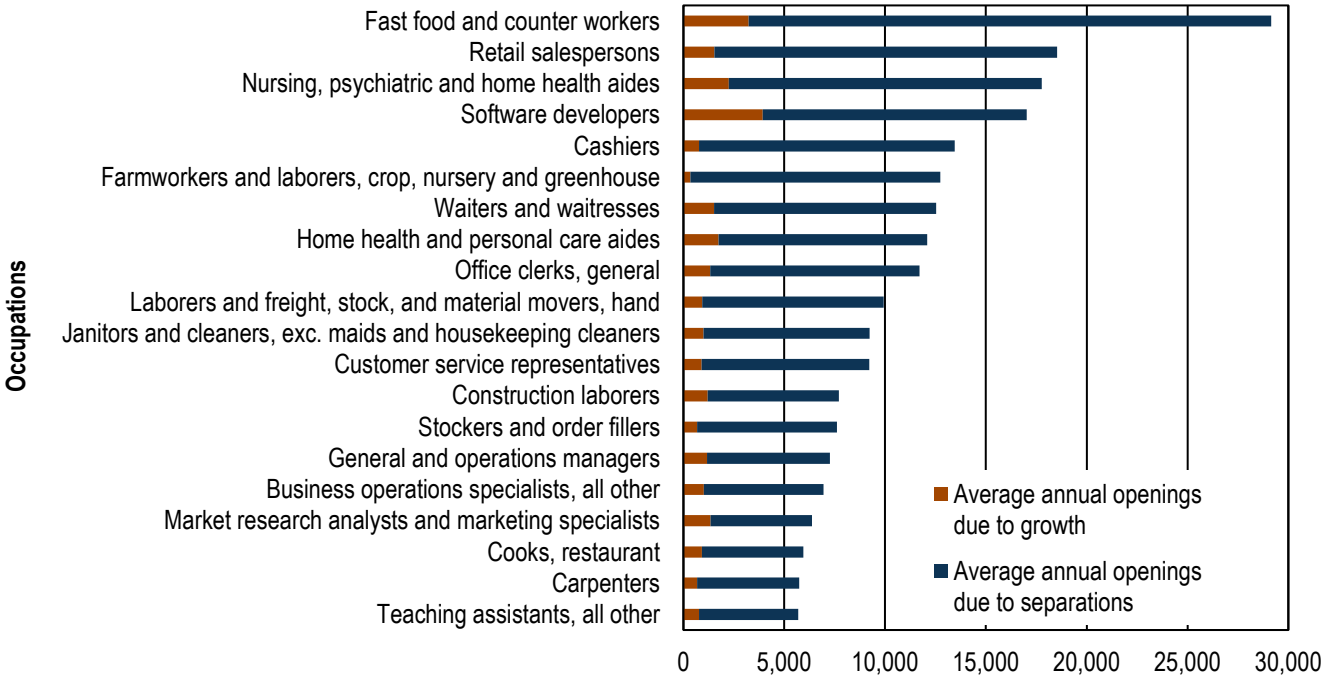
Specific occupations

Figure 5-6 shows the top 20 specific occupations by total openings based on the *separations* methodology. *Figure 5-7* shows the top 20 specific occupations by total openings based on the *alternative* methodology.

The number of openings due to **job growth** did not exceed openings due to *separations* or *alternative* **job turnover** in any of the top 20 occupations.

For both the *separations* and *alternative* methodologies, the fast food and counter workers occupation is projected to have the largest number of total openings. Seventeen of the top 20 specific occupations are the same in both methods.

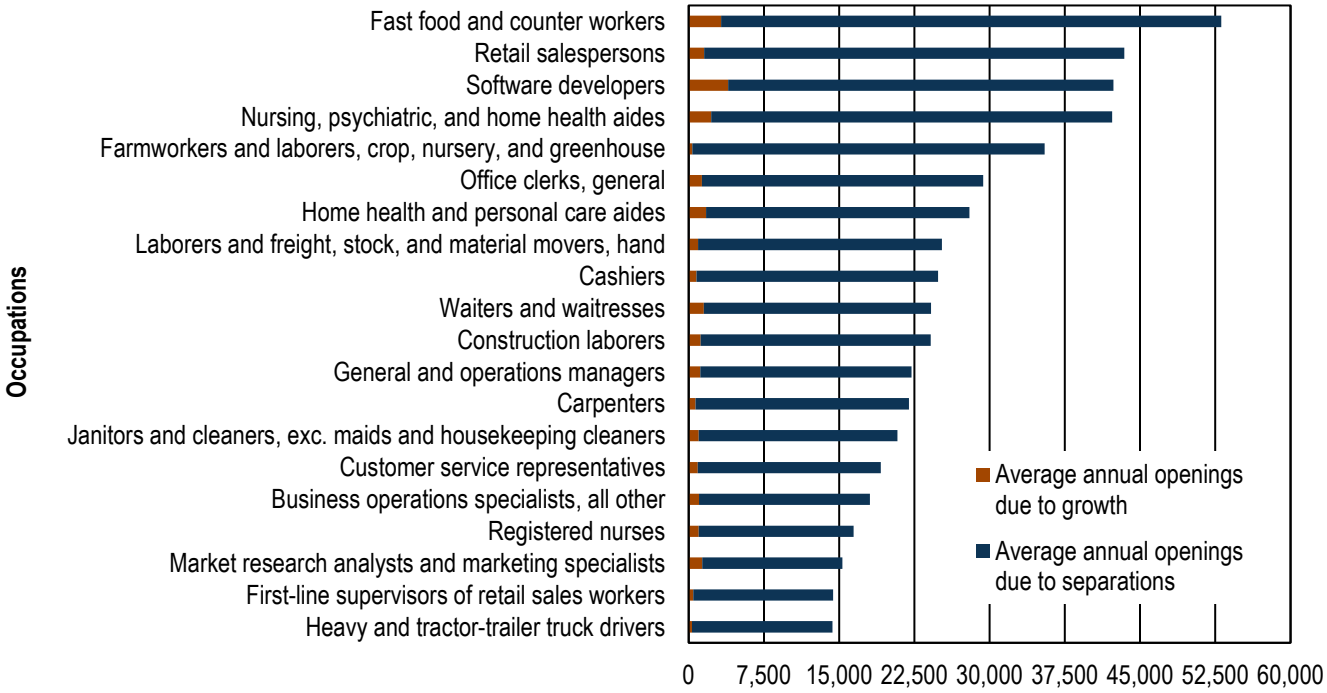
Figure 5-6. Top 20 specific occupations by average annual total openings, *separations* methodology
Washington state, 2020 to 2030
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Occupational Employment and Wage Statistics



In the separations methodology, the number of openings due to job growth did not exceed openings due to job turnover in any occupations.

Figure 5-7. Top 20 specific occupations by average annual total openings, alternative methodology

Washington state, 2020 to 2030
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Occupational Employment and Wage Statistics



In the alternative methodology, the number of openings due to job growth did not exceed openings due to job turnover in any occupations.

Chapter 6: Income

Over the past several years, many of the aggregated datasets that inform us about income and wages in Washington have told a story of rising prosperity. Median household income and wages have risen over time. Taking a more intentional and broad-based approach, however, reveals a more nuanced story. This chapter explores measures related to household income and well-being for Washington residents.

Summary

- Although wages are an important component of income for most households, it is not the only mechanism through which individuals and families access resources. In 2021, 78.4 percent of households reported having earnings from a job. Other quantifiable components of income include investment income, public and private retirement benefits and various types of government assistance.
- The portion of households reporting retirement income has increased over time, as the Baby Boomer generation enters retirement. In 2021, 25.7 percent of households reported having retirement income, compared with 19.1 percent five years earlier.
- Household income increased by 7.4 percent from 2017 to 2021, but this doesn't necessarily mean that people are better off. In 2021, nearly 50 percent of renters were paying more than 30 percent of their household income on housing.

Household[19] and family income

In this year's report, an obvious omission is clear; 2020 is missing. One of the many challenges brought forth by the COVID-19 pandemic was a significant disruption in data collection. This disruption left a one-year gap in the U.S. Census Bureau's American Community Survey (ACS) – the data product that informs this chapter. As a result, the narrative in this chapter compares "pre-pandemic" data (2019 and earlier) with current or "post-pandemic" (2021) data. As a result, exploration of impacts is limited to how well we collectively made it through to the other side of a once-in-a-lifetime crisis, without actually being able to examine the tumult of an unprecedented year. The omission of 2020 data, however, also allows us to view the disruption in a broader temporal context. From this perspective, impacts of the disruption become the focus, rather than the disruption itself.

2020 was a unique year for a number of reasons, including a complex policy environment that directly affected household income. Faced with a public health emergency, several public and private policies were swiftly put into place that were intended to curb the spread of COVID-19.[20] Policies that mandated physical distancing disproportionately impacted businesses that rely on face-to-face contact, and disproportionately impacted the workers who, in many cases, were already the most vulnerable to economic shocks.

Policy measures such as required physical distancing, ushered in another set of programs intended to minimize economic damages, and shield the most vulnerable from crisis in a once-in-a-lifetime event. Federal programs were quickly put into place that, among other things, provided direct household stimulus,[21] extended unemployment insurance (UI) benefits to more workers and increased UI benefit

[19] The U.S. Census Bureau divides households into two types. A family household contains at least two people, and at least one other person in the household is related to the householder by birth, marriage or adoption. A non-family household may contain only one person or additional people that are not related to the householder.

[20] See governor.wa.gov for full documentation of executive policies specific to Washington state. Policies were also put in place by businesses.

[21] Internal Revenue Service

payments,[22] provided forgivable loans to businesses to keep employees on payroll,[23] expanded food assistance for families,[24] and provided pre-paid child tax credits.[25]

This chapter describes trends in household income as published by the ACS. When reading ACS reports, it is important to consider the following:

1. Income is not limited to earnings from wages. Household income, as defined by the Census Bureau, is derived from five sources: earnings from wages, earnings from self-employment, investment income, transfer payments such as Social Security, and private retirement payments.
2. Each annual observation represents a statistical snapshot of a place in a moment of time. Language about increasing income means that the annual income of a region increased, but this does not address the mechanisms underlying that change. That is, rising income could reflect year-to-year pay raises; it could also reflect wealthy neighbors moving into the neighborhood.
3. The pandemic disrupted data collection, resulting in a loss of state- and county-level statistics for 2020.

The decade between the Great Recession and the COVID-19 pandemic was characterized by employment growth as well as household income growth. According to the U.S. Census Bureau, the real[26] median household income in Washington state remained more-or-less flat from 2010 to 2012 and began to increase in 2013. Median household income increased almost every year until reaching a pre-pandemic peak of $83,390 in 2019 *(Figure 6-1)*.

The median household income in Washington increased by 7.4 percent ($5,797) from 2017 to 2021. By comparison, the median household income for the United States was 4.5 percent ($3,030) over the same period.

While a number of different explanations contribute to this finding, it is worth pointing out that that some of the highest employment growth rates, both before and during the COVID-19 pandemic, have been observed in high-wage industries including information services, professional and business services, and online retail trade.

The impact of the pandemic on household income differed for family households[27] compared to nonfamily households.[28] Median household income for both household types increased each year from 2017 to 2019. Over the three-year period leading up to the 2020 pandemic, the median income for family households increased by $6,871 or 7.3 percent; the nonfamily median increased by $4,169 or 8.5 percent.

Despite relatively strong and consistent income growth leading up to 2020, the economic disruptions caused by the COVID-19 pandemic essentially put the brakes on household income growth, especially for nonfamily households. At a national level, the median household added $78 dollars from 2019 to 2021. Washington household income increased by $857 over the two-year period (1 percent growth over two years). Within that, the median income for family households increased by $1,808 or 1.8 percent while nonfamily household income dropped by $981 or 1.8 percent from 2019 to 2021.

[26] CARES Act

[23] Payroll Protection Program (PPP loans)

[24] Pandemic Electronic Benefit Transfer (EBT)

[25] Internal Revenue Service

[26] Adjusted for inflation using the PCE deflator (2005 to 2016); adjusted for inflation by the U.S. Census Bureau (2017 to 2021).

[27] According to the U.S. Census Bureau, "A family includes a householder and one or more people living in the same household who are related to the householder by birth, marriage, or adoption. All people in a household who are related to the householder are regarded as members of his or her family." [28]

A nonfamily household consists of a householder living alone (a one-person household) or where the householder shares the home only with people to whom they are not related (e.g., a roommate).

Figure 6-1. Median household income in 2021 dollars
United States and Washington state, 2017 through 2021
Source: U.S. Census Bureau, American Community Survey

Household type	2017	2018	2019	2020	2021	Change, 2017 to 2021
All households, U.S.	**$66,687**	**$66,828**	**$69,639**	**x**	**$69,717**	**4.5%**
All households, Washington	**$78,450**	**$79,922**	**$83,390**	**x**	**$84,247**	**7.4%**
Family households	$93,499	$94,573	$100,370	x	$102,178	9.3%
Non-family households	$48,867	$50,487	$53,036	x	$52,055	6.5%

Real median household income increased by 7.4 percent in Washington state from 2017 to 2021.

The following section describes a selection of income-related statistics pertaining to Washington households according to the ACS. Supporting data are found in *Figure 6-2*.

Poverty

During and immediately after the Great Recession, the poverty rate[29] for Washington individuals increased from 11.3 percent in 2008 to 14.1 percent in 2013. The poverty rate steadily decreased from 2013 to 2019, when the rate fell to 9.8 percent. The single "post-pandemic" observation that we have currently is for 2021. In 2021, the poverty rate for Washington residents was 9.9 percent; essentially unchanged from the 2019 rate, despite the pandemic disruption.

Children tend to have higher poverty rates than the general population. In 2019, 12 percent of children residing in Washington were living beneath the poverty threshold. The peak rate of childhood poverty over the past decade was 18.8 percent in 2013. Similarly, to the adult poverty rate, the poverty rate for children was unchanged from 2019 to 2021.

The relative stability of the poverty rate and the child poverty rate is likely a reflection of pandemic-specific policies including but not limited to expanded unemployment insurance eligibility, economic stimulus, child tax credit advances, and expanded access to Pandemic Electronic Benefit Transfer (EBT) for families that needed the additional supports.

Household earnings

The Great Recession had lasting effects on the share of households reporting earnings from wage employment. The share of households reporting earnings from wage employment dropped from 81.3 percent in 2008 to 78.5 percent in 2013. The portion of households reporting wage income in 2019 remained relatively low at 78.8 percent.

The sudden large-scale episode of job loss experienced during the pandemic-induced recession of 2020 likely created a temporary drop in the portion of households reporting earnings, however, the loss of 2020 data obscures this likely scenario. By 2021, the portion of households reporting earnings was 78.4 percent; slightly below the reading from 2019, and below the portion of households reporting earnings prior to the Great Recession. This measure has not changed much over time, but has exhibited a consistent downward trend. The relative stability and consistent change over time suggests that the gradual retirement of the Baby Boomer Generation is probably the largest contributing factor.

[29] Following the Office of Management and Budget's (OMB's) Directive 14, The Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is in poverty. If the total income for a family falls below the relevant poverty threshold, then the family (and every individual in the family) is considered to be in poverty.

Despite the relative drop in the portion of households reporting earnings from a job, average household earnings from a job have increased steadily over time. As of 2019, the average household earnings from a job were $113,418. From 2019 to 2021, average earnings jumped to $118,602; a 4.6 percent increase over two years.

Households can, and often do, include multiple wage earners that contribute income. It is also worth pointing out that average household earnings from a job actually exceed the median household income. While the median indicates the midpoint of statistical values, average household income can be significantly influenced by high-wage households.

Full time/part-time work

For the most part, responses to the ACS are consistent in that the share of workers reporting full-time employment exceeds the share of workers reporting part-time employment. Of course, the opportunities to work decrease during recessions and increase during times of economic expansion. During the Great Recession, the portion of workers reporting full-time employment (35 or more hours per week) dropped from 61.6 percent in 2007 to 55.7 percent by 2011. By 2019, the portion of workers reporting full-time employment returned to pre-recession levels.

From 2019 to 2021, the portion of full-time workers dropped from 61.9 percent to 60.5 percent. The proportional drop was relatively low when compared against the Great Recession, however the impact of 2020 job losses still appears to have a lingering effect on this front. Fewer workers were working full time.

During times of economic distress, it is not uncommon to see an increase in the portion of workers in part-time employment. Individuals reporting part-time work (fewer than 35 hours per week) increased during the Great Recession, as full-time work became less available. During times of economic expansion, many jobs shifted from part time to full-time hours. In 2019, the portion of workers reporting part-time employment was 17.9 percent. If the COVID-19 pandemic recession followed the expected pattern, we could expect to see an increase in the portion of part-time workers; instead, the portion of workers reporting part-time employment in 2021 dropped to 17.4 percent.

Together, a drop in the portion of the part time and full-time workforce reinforces the observation that the size of the workforce itself has dropped. A smaller portion of the population was working in 2021 relative to 2019.

Earnings from a job or self-employment

According to the Census Bureau, inflation-adjusted median earnings increased every year since 2017 (with the possible exception of 2020). From 2019 to 2021, median earnings increased from $44,229 to $46,951, an increase of $2,722 or 6.2 percent. The median earnings for full-time/year-round workers increased by $4,504 or 7.2 percent over the year, from $62,606 to $67,110.

Comparing median earnings for male versus female full-time/year-round workers reveals a persistent earnings gap.[30] Women's median earnings ($57,567 in 2021) were 78 percent of men's median earnings ($74,068). From 2019 to 2021, the median earnings for both female and male full-time workers increased.

[30] According to the U.S. Census Bureau American Community Survey. The gap in earnings by gender is also covered in *Chapter 7,* referencing a different data resource.

Women's median earnings increased by $3,930 (7.3 percent) while men's median earnings increased by $6,256 (9.2 percent). The earnings gap decreased by approximately one percentage point. Despite proliferation of employment-related apps such as ride sharing, the proportion of people reporting self-employment has remained more-or-less unchanged over the past several years, however the Census Bureau noted that there was a statistically significant decrease in the portion of self-employed Washingtonians when comparing 2018 against 2021. In 2021, 5.6 percent of workers reported that they were employed in their own non-incorporated business.[31]

The one-year lag in the data being used for this report is important to acknowledge. In 2022, inflation has increased. This report could read very differently one year from now.

Income other than from earnings

Income includes several components, one of which is earnings. This section describes trends in transfer payments and retirement income.

Baby Boomers (a particularly large generation) are reaching retirement age. The proportion of households reporting Social Security and pension payments has increased gradually over the past several years. However, between 2019 and 2021 the proportion of households reporting Social Security payments decreased. As of 2021, 28.7 percent of Washington households received Social Security payments, and 24 percent received private pension payments. For perspective, the comparable figures for 2019 were 29.7 percent and 25 percent, respectively.

The average annual payout for households collecting private pensions in 2021 was $31,927, or an average monthly payment of $2,661. In 2019, the monthly amount was $2,744.

Supplemental Security Income (SSI) is a federal program that pays benefits to disabled adults and children who have limited income and resources, and to people 65 years and older without disabilities who meet financial requirements. In 2021, 4.5 percent of all Washington households received SSI during the year. This proportion has decreased slightly since 2017. The average monthly payment for households receiving SSI was $891 in 2021.

The proportion of households collecting welfare cash payments increased rapidly during the Great Recession, reaching a peak of 4.6 percent in 2010. By 2019, that proportion had dropped to 2.5 percent. The COVID-19 pandemic also had a substantial impact on welfare receipt. According to U.S. Census data, although 2020 is not directly noted in this document, the proportion of households receiving welfare payments jumped to 4.1 percent in 2021. The average monthly payout for welfare recipients in 2021 was $451.

The Supplemental Nutrition Assistance Payment (SNAP) is a type of non-cash transfer payment for households that fall beneath certain income thresholds. It is often referred to as food stamps. Over the past 10 years, SNAP benefits have represented a portion of household income for at least 10 percent of households. In 2012, 15.1 percent of households received SNAP food benefits. The proportion of SNAP recipients decreased each year until 2019. The COVID-19 pandemic brought increased need for food security. SNAP benefits increased to cover 12.3 percent of households by 2021. During the pandemic, the U.S. Congress created a temporary extension of Pandemic-EBT (P-EBT) aid to ensure that children who lost access to free and reduced-price school meals would not lose food security at home. This at least partially explains the increased proportion of households receiving food stamps.

[31] Self-employment is difficult to measure accurately. Estimates from different data sources (e.g., household surveys versus tax filings) can differ substantially.

Health insurance

Prior to the introduction of the Affordable Care Act (ACA, commonly called "Obamacare"), the portion of Washington residents reporting no health coverage hovered around 14 percent. In 2014, the proportion of uninsured households dropped from 14 percent to 9.2 percent. By 2016, the proportion had dropped to 6 percent; it rose slightly over the next three years. In 2021, 6.4 percent of Washington residents (488,053 people) reported that they were uninsured.

For the most part, Washington residents with health insurance are covered in the private market – usually through their employers. The proportion of households reporting private coverage has remained steady since this question has been asked of respondents. During the Great Recession, responses dropped from 71 percent in 2008 to 68.5 percent in 2012. As of 2021, 70.5 percent of Washington residents were covered by private insurance. On the flip side, residents relying solely on public health insurance jumped from 17.2 percent in 2013 to 20.1 percent in 2014. In 2021, 20.7 percent of Washington residents relied solely on the public market for health insurance.

Homeownership and rent

The homeownership rate in Washington state decreased from 66.1 percent in 2007 to 61.7 percent in 2014, reflecting the housing bubble that preceded the Great Recession. The rate has increased every year to 2019, when it reached 63.1 percent. In 2021 it was estimated at 64 percent – still below observed rates prior to the Great Recession but increasing over time.

The cost of living can vary substantially from one place to another, making income levels an inadequate measure when trying to assess local conditions. For example, the same level of household income can imply very different standards of living depending on whether a family resides in Bellevue or Yakima. One way to measure economic stress, regardless of geographic variation, is to compare the cost of housing relative to household income. Thirty percent is a federally defined threshold for indicating economic duress.

The percent of Washington households in economic distress due to high housing costs rose in 2008 and 2009, but then declined through the foreclosure process as a large number of homeowners transitioned to renters. The percentage of renters exceeding that threshold increased during the recession, reaching 48.4 percent in 2010. By 2017, the proportion of economically distressed renters decreased to 45.2 percent. In 2018, the downward trend reversed. In 2018 and 2019, 47.7 percent of renters were reported to have paid more than 30 percent of household income on housing-related costs.

Homeowners with a mortgage paying more than 30 percent of their income toward housing rose in the lead-up to the recession, exceeding 40 percent from 2007 to 2010. Over the course of the recovery, that proportion decreased, in part due to an overall decline of homeownership. By 2021, the proportion of economically distressed homeowners with a mortgage was 28.8 percent, unchanged from 2019, and well below pre-recession levels. On the surface, this appears to be a positive statistic. Note, however, that the data represent snapshots in time. Many economically distressed households of the past became renters.

Figure 6-2. Selected household statistics
Washington state, 2017 through 2021
Source: U.S. Census Bureau, American Community Survey

Household statistic	2017	2018	2019	2020	2021	Change, 2017 - 2021
Median household income*	$78,450	$79,922	$83,390	x	$84,247	7.4%
Median family income*	$93,499	$94,573	$100,370	x	$102,178	9.3%
Poverty rate, all individuals	11.0%	10.3%	9.8%	x	9.9%	-10.0%
Poverty rate, children under 18	14.3%	12.5%	12.0%	x	12.0%	-16.1%
Households with earnings from a job**	79.1%	79.0%	78.8%	x	78.4%	-0.9%
Average household earnings from a job****	$106,013	$109,374	$113,418	x	$118,602	11.9%
Full-time workers****	60.5%	63.9%	61.9%	x	60.5%	0.0%
Part-time workers	18.5%	18.5%	17.9%	x	17.4%	-5.9%
Median earnings for all workers*	$42,483	$43,467	$44,229	x	$46,951	10.5%
Median earnings for full-time, year-round workers*	$60,057	$59,970	$62,606	x	$67,110	11.7%
Median earnings for male full-time, year-round workers*	$67,303	$66,535	$67,812	x	$74,068	10.1%
Median earnings for female full-time, year-round workers*	$52,700	$52,552	$53,637	x	$57,567	9.2%
Percent of workers self-employed in own not incorporated business	5.7%	6.0%	5.7%	x	5.6%	-1.8%
Households receiving Social Security	29.4%	29.7%	29.7%	x	28.7%	-2.4%
Households with retirement income	19.1%	19.6%	25.0%	x	24.0%	25.7%
Avg. mo. payout for households receiving private retirement income*	$2,727	$2,718	$2,744	x	$2,661	-2.4%
Households receiving Supplemental Security Income (SSI)**	4.8%	4.6%	4.5%	x	4.5%	-6.3%
Average monthly payout for those receiving SSI*	$1,011	$1,000	$905	x	$891	-11.9%
Households receiving welfare cash payments**	3.0%	2.9%	2.5%	x	4.1%	36.7%
Average monthly payout for welfare recipients*	$224	$242	$272	x	$451	101.1%
Households receiving food assistance**	12.3%	11.1%	10.6%	x	12.3%	0.0%
Percent of residents without health insurance	6.1%	6.4%	6.6%	x	6.4%	4.9%
Number of residents without health insurance	446,106	477,284	496,047	x	488,053	9.4%
Residents with private health insurance	70.8%	70.6%	71.1%	x	70.5%	-0.4%
Residents relying solely on public health insurance	20.7%	20.7%	20.1%	x	20.7%	0.0%
Homeownership rate	62.8%	62.8%	63.1%	x	64.0%	1.9%
Renters paying more than 30 percent of income for housing	45.2%	47.7%	47.7%	x	49.0%	8.4%
Homeowners with a mortgage paying more than 30 percent of income for housing	28.8%	29.1%	28.8%	x	28.8%	0.0%

*In 2021 dollars
** Households may fall into more than one of these categories.
*** Includes earnings from all members in the household.
**** *Full-time workers usually worked at least 35 hours per week (but may not be year-round workers).*

Census data was largely unavailable for 2020. Most readings for 2021 track closely with pre-pandemic metrics.

Income inequality

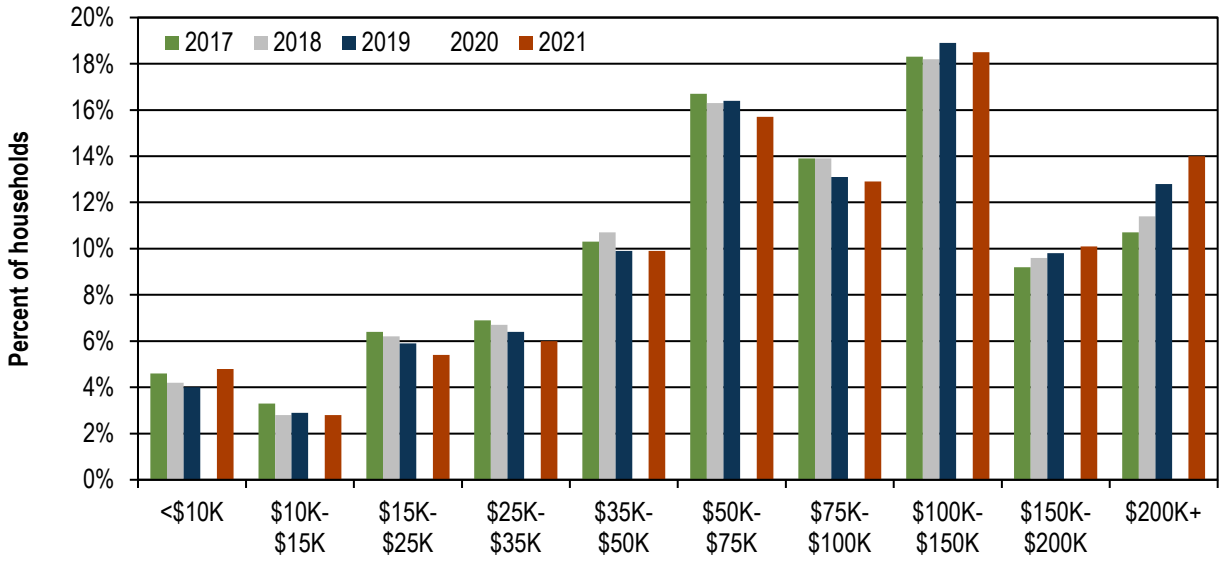
One of the challenges of working with aggregated data, is that nuanced stories and trends can get lost beneath the surface. *Figure 6-3* illustrates the share of households that fell within certain income ranges in 2021 dollars. Examining household income ranges allows for a more nuanced view of how the economic recovery has varied across socioeconomic groups.

Over the past five years, the proportion of households with $35,000 or less in annual income has steadily decreased. Households with income ranges less than $35,000 accounted for about 21 percent of all households in 2017. By 2021, the share was 19 percent. This suggests poverty rates fell during the recovery.

The share of households with incomes between $35,000 and $100,000 have also declined slightly over time or remained more-or-less unchanged from 2019 to 2021.

Meanwhile, upper and upper-middle income households increased as a share of total Washington households over the past five years. Households earning more than $100,000 per year increased as a share of total households each year from 2017 through 2019, and then again in 2021. Over that time, the share of households with incomes exceeding $100,000 per year expanded from about 38 percent in 2017 to nearly 43 percent in 2021.

Figure 6-3. Percent of households by income range, 2021 dollars
Washington state, 2017 through 2021
Source: U.S. Census Bureau, American Community Survey



Note: As a reminder, 2020 is missing. One of the many challenges brought forth by the COVID-19 pandemic was a significant disruption in data collection. This disruption left a one-year gap in the U.S. Census Bureau's ACS – the data product that informs this chapter.

The share of households in upper income brackets continued to rise in 2021, while the proportion of lower and middle income households decreased proportionally.

Chapter 7: Wages

Summary

- The median hourly wage rose from $30.46 in 2020 to $30.83 in 2021, a 1.2 percent increase. Job losses during 2020 were predominantly in lower-wage jobs. In 2021, there was faster than average hiring in many (but not all) lower-wage industries, and also strong growth in many higher-wage industries. The latter was a bit stronger, pushing the median wage higher.
- The average hourly wage continued to rise in 2021, and wage inequality widened. The ratio of the best-paying 10 percent of jobs to the lowest-paying 10 percent of jobs increased to 12.6, its highest value since the data series began in 1990 – when the ratio was 7.7.
- Wage inequities among different demographic groups have persisted for decades and continued in 2021. The average monthly wage for African American workers was 76 percent of the average for all workers, lower than it was in 1992 (84 percent). Earnings for Indigenous workers were 67 percent below average, while Pacific Islanders earned 69 percent of the average and Latino/Hispanic worker were at 68 percent. The average for women was 78 percent of the all-job average, and 64 percent of the average for men, slightly lower than in 1992.
- The distribution of wages by industry continued to vary widely. In 2021, for example, the median wage for child care services was $17.53 per hour, while the median for pre-packaged software was $106.87. In accommodations (hotels, motels etc.), 62 percent of the jobs paid below $20.00 per hour, while in computer systems design, only 3.2 percent paid that low.
- The number of jobs paying below $14.00 per hour plummeted from 189,000 in 2019 down to 46,500 in 2020, due primarily to the loss of lower-wage jobs during the pandemic. In 2021, the number of jobs in that pay range increased to 77,100. This was due to lower-wage industries recovering. In addition, the minimum wage did not keep up with inflation. In general merchandise stores, for example, total employment increased by almost 3,400 jobs in 2021 (on a full-time equivalency [FTE] basis). The number of jobs in this industry paying below $14.00 per hour rose by 4,600 in 2021, while the number paying $14.00 or higher fell by 1,200.
- Workers that did keep their job did well. The median increase in the hourly wage – unadjusted for inflation – reached 8 percent in early 2022, higher than a comparable national figure of 3.5 percent. Wages in Washington for incumbent workers kept ahead of inflation in 2021, while those nationally did not. This was especially true for lower-wage full-time workers.

Introduction to the data

Much of the analysis in this chapter is based on the state's quarterly wage files. Each record in these files includes an employee ID, and employer ID, wages earned in the quarter, and hours worked, for every non-federal employee in the state covered by unemployment insurance. Data is available for every quarter (three-month period) going back to 1990.[32] In the first quarter of 2021, when the economy was still far from a full recovery, there were almost 3.6 million jobs; by the third quarter, there were just shy of 4.0 million records. The quarterly wage files allow us to determine the hourly wage for each job, and from there to calculate the median and average hourly wage, average wage by decile (e.g., the average wage for the lowest-paid 10

[32] In addition, employment at private households (NAICS 814) and state-reimbursed home health care (part of NAICS 624120) were excluded due to data quality issues.

percent of jobs), and the number of jobs in different wage ranges (e.g., below $14.00 per hour). Data is available by county and industry, but there is no information on the demographics of workers in the quarterly files. All data below has been adjusted for inflation to 2021 dollars.

Note that almost 50,000 corporate officers (usually the highest-paid employees in large corporations) are not included in the data, as they have opted out of the system. Also, benefits and tips are not included as wages.

A quarterly analysis means we'll lose some of the nuance of monthly changes. However, we'll gain some insight into the total hours worked – when workers might not have lost their job, but had their hours cut, for example, or worked intermittently (e.g., one week on, one week off).

Quarterly employment from the wage files will be reported on a FTE basis, with 40 hours per week – usually 520 hours per quarter – considered as one FTE job. Two half-time jobs are equal to one FTE job. This is different from the monthly employment published in the Quarterly Census of Employment and Wages (QCEW) data series, in which a part-time job and a full-time job are both considered to be one job. These two datasets will be compared below to shed more light on the difference between the number of jobs and the number of hours worked in 2020 and 2021.

In addition, we'll make use of another quarterly database, the Local Employment Dynamics (LED) database, a partnership of the Census Bureau and the states. The LED provides an average wage for each quarter going back to 1990 by county, industry, and demographics like gender, age, race, ethnicity and education.

The COVID-19 recovery: employment up, payrolls up, average wages up, median wage up

We'll start by looking at the broader labor market from the employer perspective. The recovery of the labor market from COVID-19, which proceeded in fits and starts after May 2020, began in earnest in February of 2021, the first of 15 consecutive months of job gains. Job openings soared, and the rate at which workers were quitting their jobs picked up. Many businesses struggled to find workers. All of these factors exerted an upward pressure on wages.

In 2021, the number of jobs covered by unemployment insurance (QCEW jobs, with the exclusions noted above) averaged 3.22 million a month, an increase of 3 percent from the previous year. Again, this measure is based on average monthly counts of jobs, with full- and part-time work getting equal weight. When jobs were weighted by the number of hours worked, there were 2.68 million FTE jobs – 2.4 percent more than in 2020. When employment increases more than hours worked, that means that a disproportionate number of part-time and/or seasonal jobs were created (as opposed to full-time, year-round jobs). These tend to be lower-wage jobs. Industries that fit this description, like retail trade, arts, entertainment and recreation, and leisure and hospitality, all had faster than average job growth in 2021, as they recovered from horrendous losses in 2020.

Total payroll expanded from $252 billion in 2020 to $268 billion in 2021, an increase of 6.4 percent. With payrolls growing faster than employment, the average annual wage rose by 3.3 percent to $83,175. Five sectors were above the average in job growth, payroll growth, and average wage growth, as shown in *Figure 7-1*.

Figure 7-1. Sectors with faster than average growth in jobs, payroll and average wage
Washington state, 2020 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

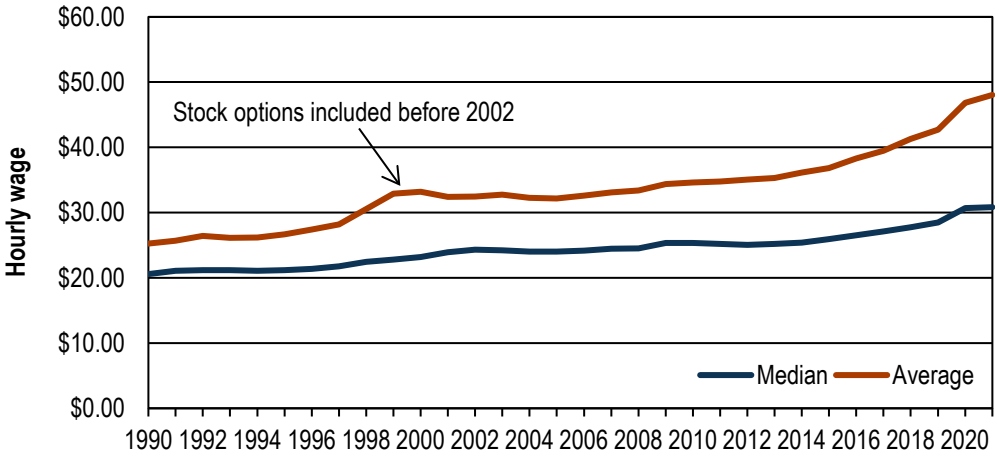
Sector	NAICS	Jobs, 2021	Job growth, 2020-2021	Payroll 2021 (billions)	Payroll growth, 2020-2021	Average annual wage, 2021	Change in average annual wage, 2020-2021
All industries		3,347,509	2.8%	$2,762	6.2%	$82,513	3.3%
Information services	51	156,366	5.5%	$420	12.6%	$268,502	6.7%
Real estate, rental and leasing	53	54,152	2.9%	$38	10.4%	$70,601	7.3%
Professional services	54	225,512	7.1%	$284	15.6%	$125,748	7.9%
Business services	56	171,112	6.3%	$105	10.2%	$61,561	3.7%
Accommodation and food services	72	237,697	7.6%	$67	18.2%	$28,256	9.8%

The growth of higher-wage jobs outweighed the recovery of lower-wage jobs, leading to an increase in the state median hourly wage of 1.2 percent from 2020 to 2021 – from $30.46 to $30.83 per hour. The 2021 median was a very substantial 8 percent above the 2019 median.

While many lower-wage industries had faster than average employment growth in 2021, a number of higher-wage industries expanded as well, and some had an increase in average wages above the average. These included services such as "all other retail" (a combination of furniture stores and electronic and other non-store retailers), prepackaged software, data processing, hosting and related services, internet publishing and web search portals, banking, securities brokerages, financial advisory firms, real estate brokerages, and computer systems design. As a result, the average hourly wage went up in 2021, from $46.80 in 2020 to $48.04 in 2021, a 2.6 percent increase. The average was up 12.4 percent relative to 2019.

Again, these data do not include corporate officers. Nationally, the average wage for CEOs at the largest corporations was $18.3 million in 2021, an 11.1 percent increase over 2020, according to one report.

Figure 7-2. Median hourly wage and average hourly wage
Federal employment, NAICS 814 and DSHS/COPES employment excluded, adjusted for inflation
Washington State, 1990 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

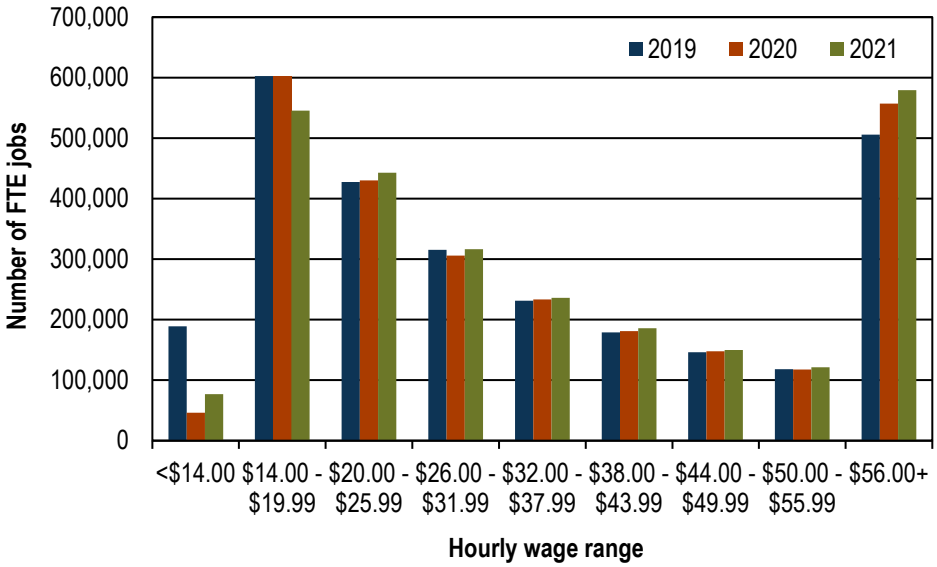


The average hourly wages rose by 2.2 percent in 2021 and median hourly wage increased by 1.2 percent.

More higher-wage jobs, fewer lower-wage jobs

Figure 7-3 shows how hourly wages shifted from 2019 to 2021. There were four notable differences between the two years. First, there were more than 59,600 fewer jobs in 2021 than in 2019. Second, there were almost 112,000 fewer jobs paying below $14.00 per hour. The overall decline had two major causes: in 2020, there were major COVID-19-related job losses in lower-wage industries. Secondly, the increase in the minimum wage in 2020 from $12.00 to $13.50 helped push jobs into the next higher ($14.00+) wage range. As noted in last year's report, there was no evidence that the increase in the minimum wage led to job losses. Then in 2021, the nominal minimum wage increased to $13.69. After adjustment for inflation, the minimum wage rose by $1.51 per hour (11.3 percent) in 2020, and fell by $0.38 cent per hour in 2021, a 2.5 percent decline. The inflation-adjusted decline in the minimum wage would explain the small increase in jobs paying below $14.00 per hour in 2021 compared to 2020.

Figure 7-3. Employment by hourly wage ranges
Federal employment, NAICS 814 and DSHS/COPES employment excluded, adjusted for inflation
Washington state, 2019, 2020 and 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



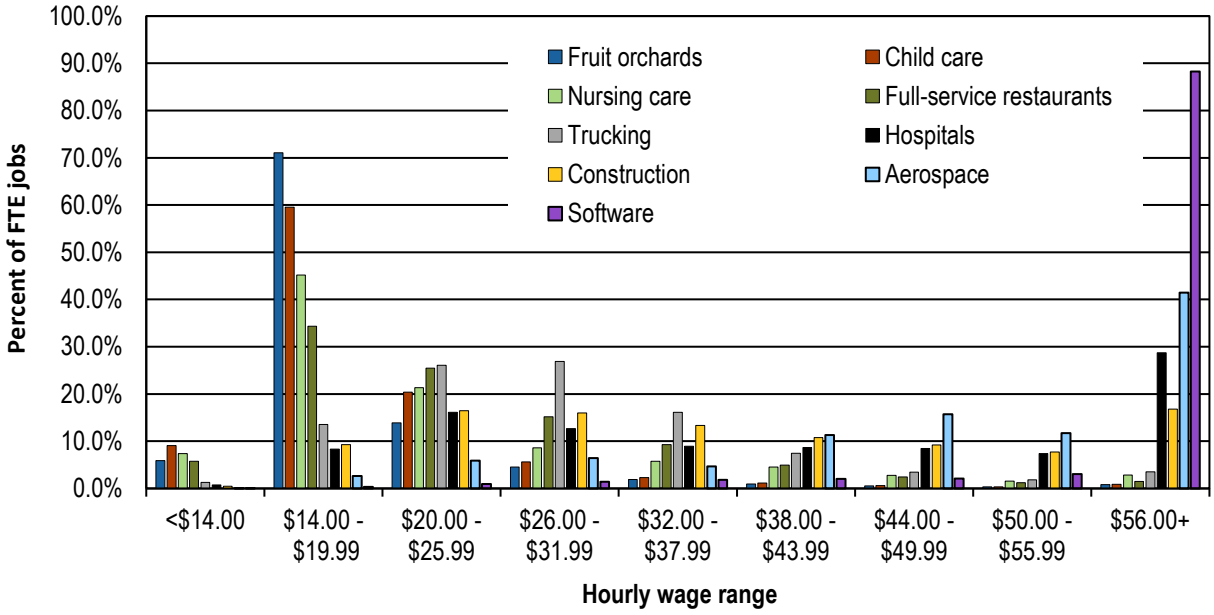
Job losses in the COVID-19 recession were disproportionately low-wage jobs, while higher-wage jobs increased in both 2020 and 2021.

The third difference between 2019 and 2021: there were almost 74,000 more jobs paying $56.00 or more per hour (an increase of 15 percent) – despite a drop of over 10,000 high-wage aerospace jobs. Fourth, between 2019 and 2021, there was a 10 percent decline in jobs paying $14.00 to $19.99 per hour, along with a 4 percent increase in jobs paying $20.00 to $26.00. This "bracket-creep" shift reflects the ongoing increase in wages that has been the rule for the state's labor market over the past 20 years.

Wages by industry

Figure 7-4 compares the 2021 wage distribution of several lower-wage industries, along with some middle- and high-wage industries. The descriptions below will make use of both average monthly employment from the QCEW, and FTE employment and hourly wages based on the quarterly wage files. Along with general wage trends, we'll look at the wages offered to new hires, to see how employers have been responding to a tightening labor market.

Figure 7-4. Employment by hourly wage ranges, selected private sector industries
Fruit orchards (NAICS 1113), child care (NAICS 6244), nursing and residential care (NAICS 623), full-service restaurants (NAICS 722511), trucking (NAICS 484), hospitals (NAICS 622), construction (NAICS 23), aerospace (NAICS 3364), pre-packaged software (NAICS 5112)
Washington state, 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



Wage profiles vary greatly by industry.

Fruits and nuts (NAICS 1113)

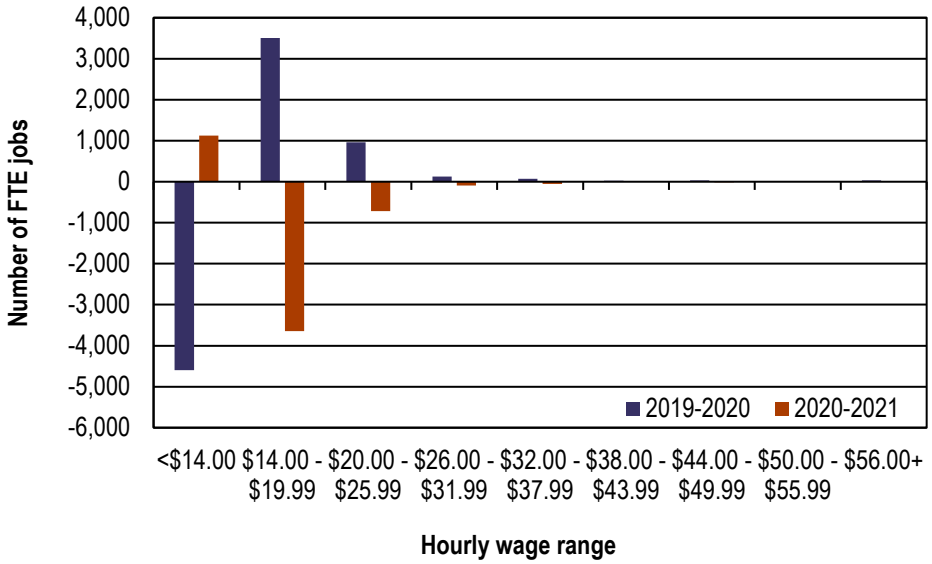
The cultivation of fruits and nuts employed an average of 35,200 workers in 2021, with employment ranging as high as 53,000 in July. A third of the jobs were in Yakima County, and almost half were in five other counties. Employment dropped by 7 percent in 2020 and was little changed in 2021.

Those employment numbers are based on monthly job counts. When we look at hours worked, the trend was different. Employment on a FTE basis rose slightly in 2020 from 2019, meaning total hours worked was higher. If hours worked increased while monthly job counts decreased, that would mean the average worker worked more hours. FTE employment then dropped by 11 percent in 2021 – average hours per worked reverted to pre-pandemic levels. In that year, just under 6 percent of jobs, on an FTE basis, paid below $14.00, while 72 percent paid between $14.00 and $19.99 per hour. The median hourly wage was $16.91 in 2021, slightly below the 2020 median of $16.96 but well above the 2019 figure of $16.21.

Figure 7-5 shows that in 2020, wages in the industry shifted upward, in large part due to the increase in the minimum wage. The median hourly wage increased from $16.29 in 2019 to $17.07 in 2020. In 2021, jobs were lost primarily in the $14.00 to $19.99 hourly wage range. At the bottom end of the pay scale, the minimum wage didn't keep up with inflation, resulting in an increase in the number of jobs paying below $14.00 per hour.

The median wage for new hires was $16.47 in the second quarter of 2021 and $16.90 in the third quarter – the two big quarters for seasonal hiring. These wages were 8 to 9 percent higher than in 2018, and about 5 percent higher than in 2019, roughly tracking the increase in the median wage. That would seem to indicate that employers did not offer higher wages to attract more workers.

Figure 7-5. Change in FTE employment by hourly wage ranges, fruit and nut cultivation (NAICS 1133)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



Wages in fruit and nut cultivation shifted upward in wages in 2020, but regressed with job losses in 2021.

Child care services[33] (NAICS 6244)

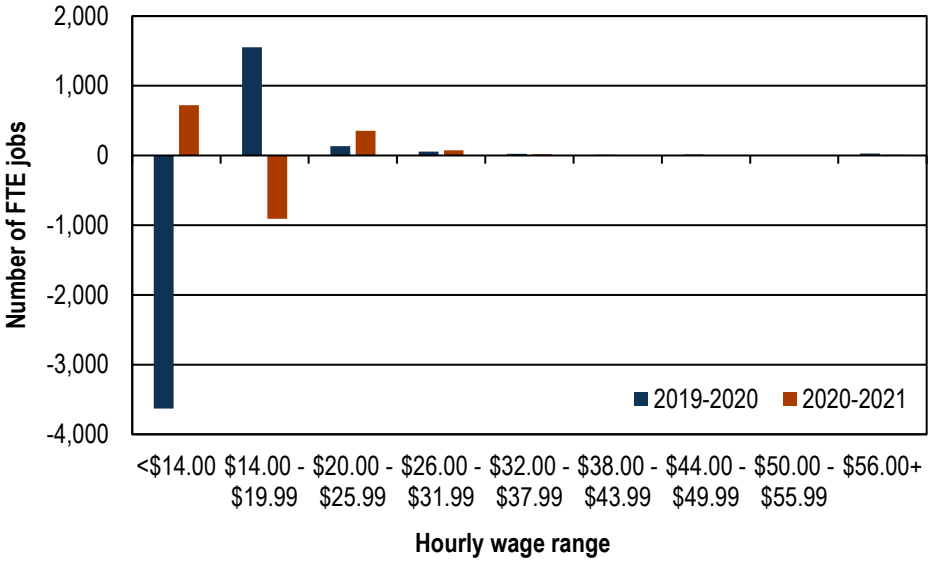
In 2021, monthly employment in child care services averaged 18,200 jobs – 4 percent more than in 2020, but 11 percent less than the 2019 average. This deficit persisted into early 2022 (and roughly matches the national trend). FTE employment followed a similar path.

In 2021, over 9 percent of jobs in the child care industry paid below $14.00 per hour, and another 60 percent paid between $14.00 and $19.99 per hour (the median hourly wage was $17.53). *Figure 7-6* shows that in the midst of substantial job loss in the first year of COVID-19, wages shifted up, again in large part due to the increase in the minimum wage. In 2021, employment grew modestly, but wages did not keep up with inflation at the lower end of the pay scale. However, the median wage increased by 2.5 percent from 2020.

Wages for new hires generally showed a moderate increase, with two exceptions: in the second quarter of 2020, when hiring was depressed due to the onset of COVID-19, the median wage spiked to $17.38 per hour, above the median for all jobs in the industry. In subsequent quarters the median new hire wage was closer to $16.50 per hour. The same kind of spike happened in the fourth quarter of 2021; it's too soon to know if that higher wage will stick.

[33] Child care services here include any service provider with employees covered by unemployment insurance. There are also sole proprietors providing this service, along with informal providers such as relatives and neighbors, not included here.

Figure 7-6. Change in FTE employment by hourly wage ranges, child care services (NAICS 6244)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



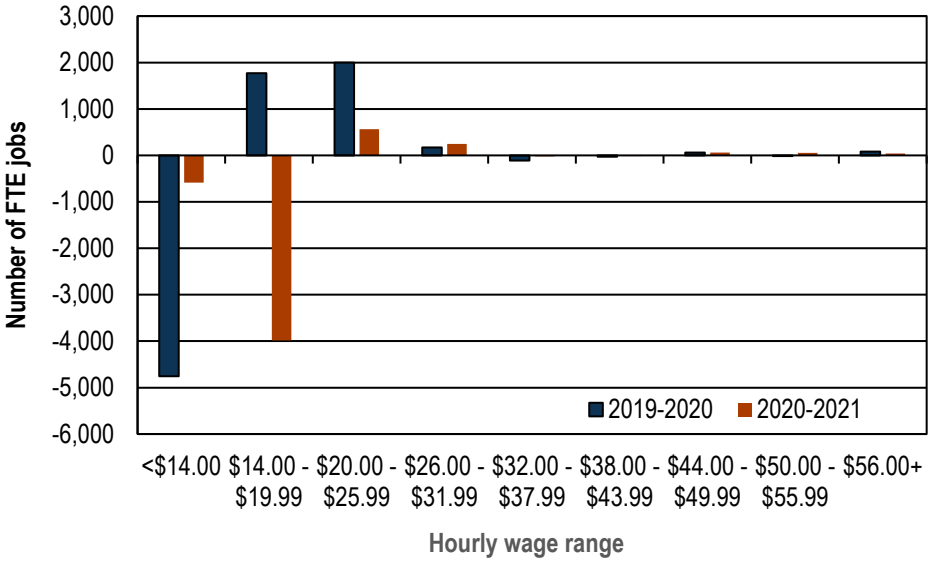
Child care services FTE employment declined by 12.4 percent in 2020, mostly at the lower end of the wage scale, and then rose by only 2.1 percent in 2021.

Nursing and residential care facilities (NAICS 623)

This industry includes both skilled nursing facilities along with care facilities for mental health and substance abuse treatment, elderly care, and other support. Average monthly employment at these facilities fell from 62,600 in 2019 to 57,000 in 2021. FTE employment fell by similar percentages in each year.

The wage distribution at residential care facilities was a bit higher than in child care. In 2021, over 7 percent of FTE jobs paid below $14.00 per hour, and another 45 percent paid between $14.00 and $19.99 per hour (the median hourly wage was $17.53). *Figure 7-7* shows that in 2020, there was a modest (2 percent) job loss. Mostly there was an upward shift (again, the minimum wage increase figures in) from below $14.00 per hour to the $14.00 to $19.99 range. The median hourly wage increased strongly in both 2020 and 2021, climbing from $17.86 in 2019 to $18.78 in 2020 and again to $19.58 in 2021. The latter increase was due in part to the loss of lower-wage jobs.

Figure 7-7. Change in FTE employment by hourly wage ranges, nursing and residential care facilities (NAICS 623) Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

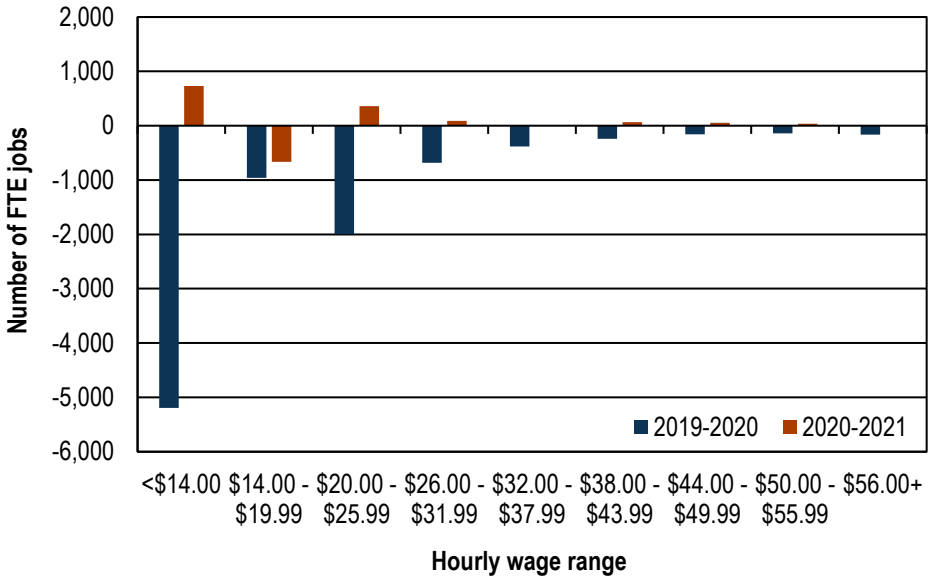


Nursing and residential care facilities FTE employment declined by 2 percent in 2020, and a larger 7 percent in 2021.

The median hourly wage of new hires has been equal to or greater than the median pay for all jobs in the industry for several years. For example, in fourth quarter 2021, new hires earned an average of $20.93 per hour, well above the 2021 median for all jobs of $19.58.Accommodations (NAICS 721)

Like the previous industries, hotels and motels have been slow to recover from the COVID-19 recession. Average monthly employment dropped by 34 percent in 2020, and grew by only 2 percent in 2021 – falling from 36,800 in 2019 down to 24,300 in 2020 before inching up to 24,900 in 2021. The loss in FTE employment was somewhat worse in 2020, a decrease by 37 percent, indicating that both the average work week and jobs may have been cut. *Figure 7-8* shows that, unlike the industries above, there was no upward bump in jobs paying $14.00 to $19.99 from a higher minimum wage. Instead, cuts happened across the wage spectrum. Again, unlike other industries, the median hourly wage actually declined in 2020, indicating that cuts in jobs and hours fell disproportionately on higher-wage jobs.

Figure 7-8. Change in FTE employment by hourly wage ranges, accommodations (NAICS 721)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



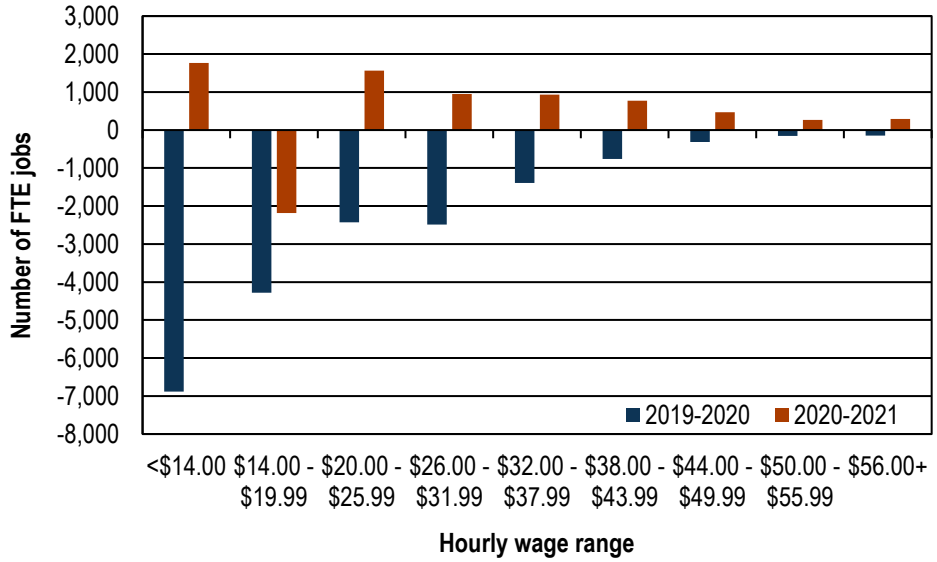
Accommodations FTE employment declined by 37 percent in 2020, with only a 4 percent increase in 2021.

Hourly wages for new hires showed little change from pre-pandemic levels until the final quarter of 2021, when they jumped to $17.59 per hour, almost 9 percent higher than the previous two years.Full-service restaurants (NAICS 722511)

In 2021, full-service restaurants[34] had a higher median wage ($21.91 per hour, still well below the overall median for all industries of $30.83 per hour), fewer lower-wage jobs, and more jobs in the $20.00 to $25.99 range than the industries covered above. Just under 6 percent of jobs had an hourly wage below $14.00, and just over a third paid between $14.00 and $19.99 per hour. This industry was one of the hardest hit by COVID-19, and one of the slowest to recover. Monthly average job counts dropped 31 percent in 2020, from 112,200 in 2019 down to 77,700, before bouncing back to 87,200 in 2021.

[34] Tips are not included in ESD's wage data.

Figure 7-9. Change in FTE employment by hourly wage ranges, full-service restaurants (NAICS 722511)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

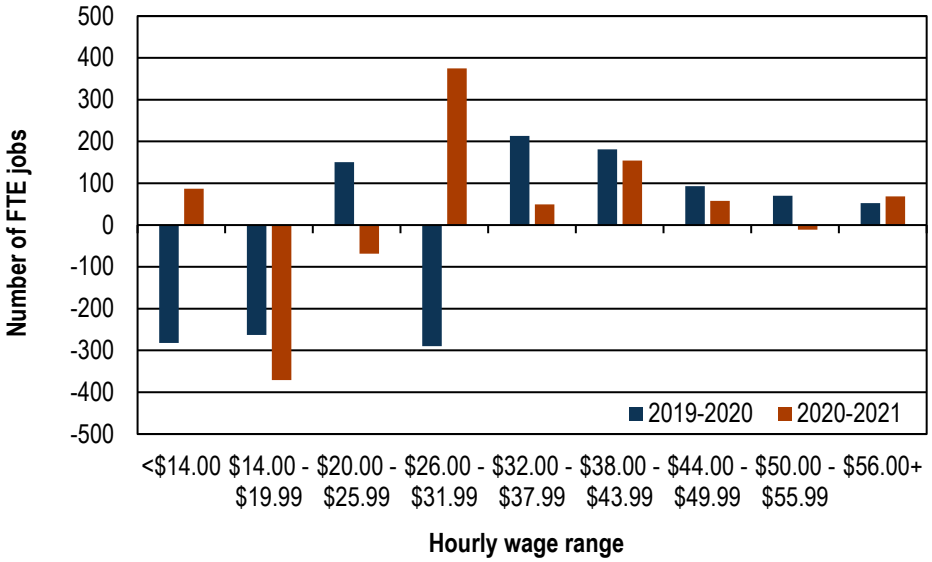


Full-service restaurants lost jobs across the board in 2020, and had a mixed pattern of change in 2021.
In 2020, job losses occurred across the wage spectrum, as shown in *Figure 7-9*. The median hourly wage did increase by 3.4 percent, which meant that losses were disproportionately at the lower end of the pay scale. Wages increased in 2021 – the median wage rose by 5 percent – except at the very bottom of the scale, where the minimum wage did not keep up with inflation. Finally, the median wage for new hires in fourth quarter 2021 was $18.69 per hour, only 1.4 percent higher than the median for fourth quarter 2019. Whatever labor shortage was being experienced then, it did not lead to a significant improvement in wages being offered to new employees.

Trucking (NAICS 484)

The next two industries may be considered to be "middle-wage," based on their median hourly wages. Nationally, the long-standing labor shortage in the trucking industry reached crisis proportions during COVID-19, contributing to supply chain issues that fueled rising inflation. When looking at top-level numbers, there was relatively little change in industry employment through the pandemic. Average monthly employment declined relatively slightly in 2020 (a reduction in the number of jobs by 2.4 percent), in part due to minimal face-to-face contact in the job. The year 2021 brought a modest recovery (an increase in the number of jobs by 3.9 percent).

Figure 7-10. Change in FTE employment by hourly wage ranges, trucking (NAICS 484)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



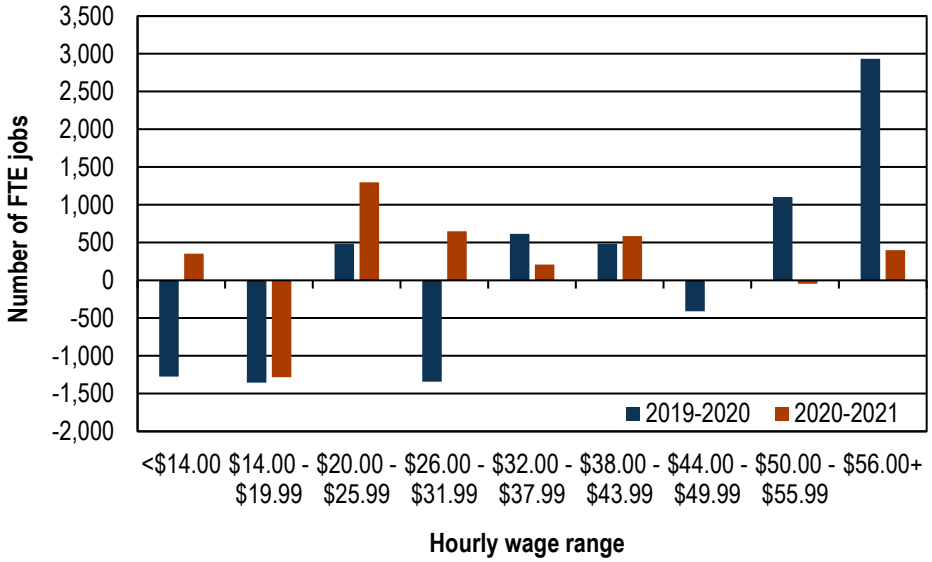
The trucking industry gained middle-wage jobs and lost lower-wage jobs from 2019 to 2021.

Underneath the hood, there was a substantial upward shift in wages, as shown in *Figure 7-10*. When compared with 2019, the industry in 2021 had over 800 fewer jobs that paid below $20.00 per hour, while adding 1,100 jobs that paid more than $20.00 per hour, including many in the $32.00 to $43.99 per hour range. The median hourly wage rose from $27.03 per hour to $27.80. The median hourly wage for new hires in 2020 and 2021 showed little change when compared to 2019.

Construction (NAICS 23)

When measured by average monthly numbers, construction employment fell by 2 percent in 2020 before a 5 percent recovery in 2021. Total hours work, however, increased in both years, by 0.7 percent and 1.2 percent, respectively. The median hourly wage rose 2.9 percent in 2020 before slipping by 0.4 percent to $35.26 in 2021. Similar to other industries, the number of construction jobs paying below $14.00 per hour dropped sharply in 2020 before rising slightly in 2021 (*Figure 7-11*). In 2021, there were fewer jobs paying between $14.00 and $19.99 per hour, and more paying over $50.00 per hour, compared with 2019, but the shifts were relatively small compared with total industry employment of over 175,000 FTE jobs.

Figure 7-11. Change in FTE employment by hourly wage ranges, construction (NAICS 23)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

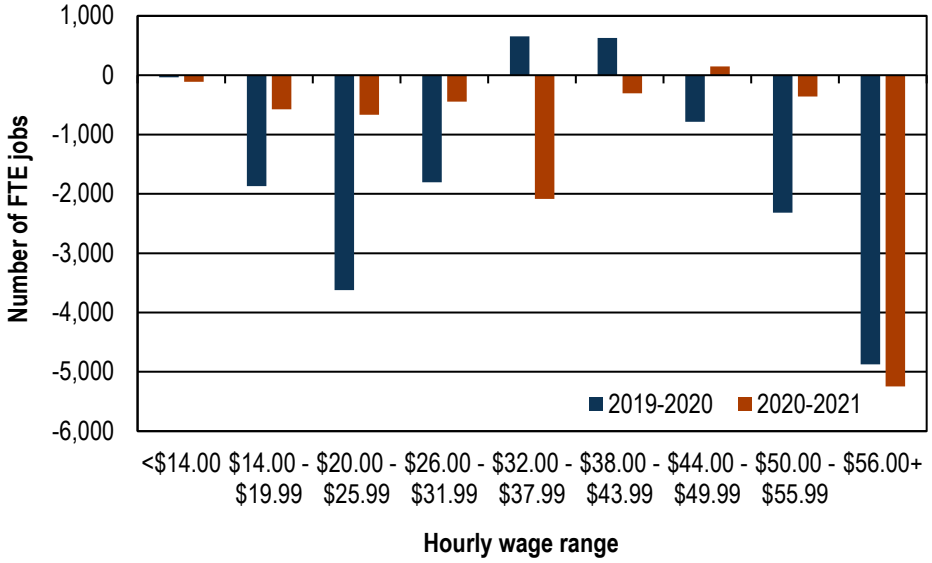


Construction wages shifted upward, but in an industry with over 175,000 FTE jobs, the changes were not large.

Aerospace (NAICS 364)

The aerospace industry in Washington had a couple of tough years, with average monthly employment declining by 8.5 percent in 2020 and 16 percent in 2021. Hours worked fell even more deeply – drops of 15.8 percent in 2020 and another 12.9 percent in 2021. Losses were somewhat smaller in numbers but higher in terms of percentage for jobs paying below $32.00 per hour. From 2019 to 2021, the number of jobs in this pay range fell by 10,600 jobs; a 45 percent loss as opposed to a 27 percent overall decline. Jobs paying $50.00 per hour and above dropped by 12,800 or 26.9 percent over the two-year period, as shown in *Figure 7-12*.

Figure 7-12. Change in FTE employment by hourly wage ranges, aerospace (NAICS 3364)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

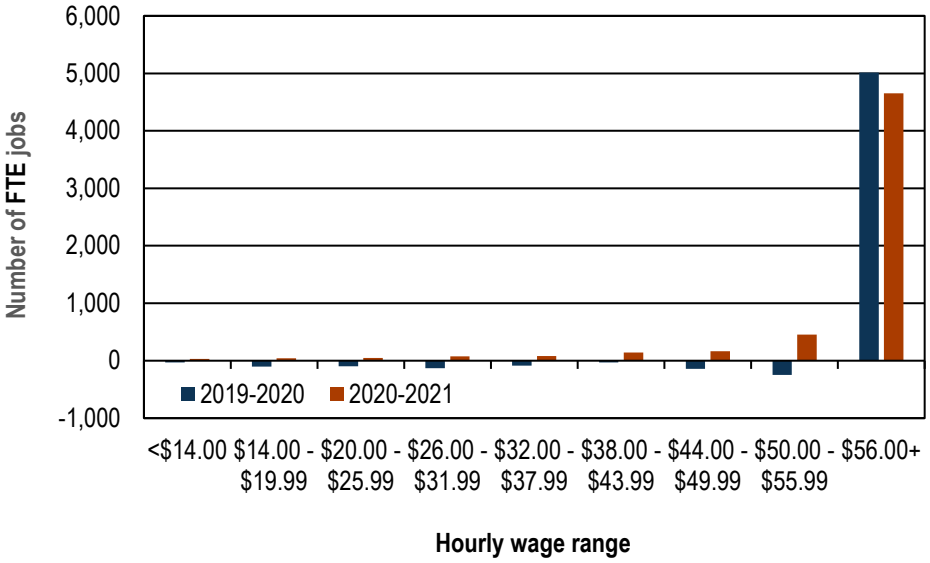


Aerospace had heavy job losses in 2020 and 2021, concentrated in high-wage jobs.

Prepackaged software (NAICS 5512)

The prepackaged software, in contrast, grew steadily in both 2020 and 2021, adding a total of 9,600 jobs between 2019 and 2021 (an increase in 13.7 percent). Gains were almost entirely high-wage jobs paying $56.00 or more, as shown in *Figure 7-13*.

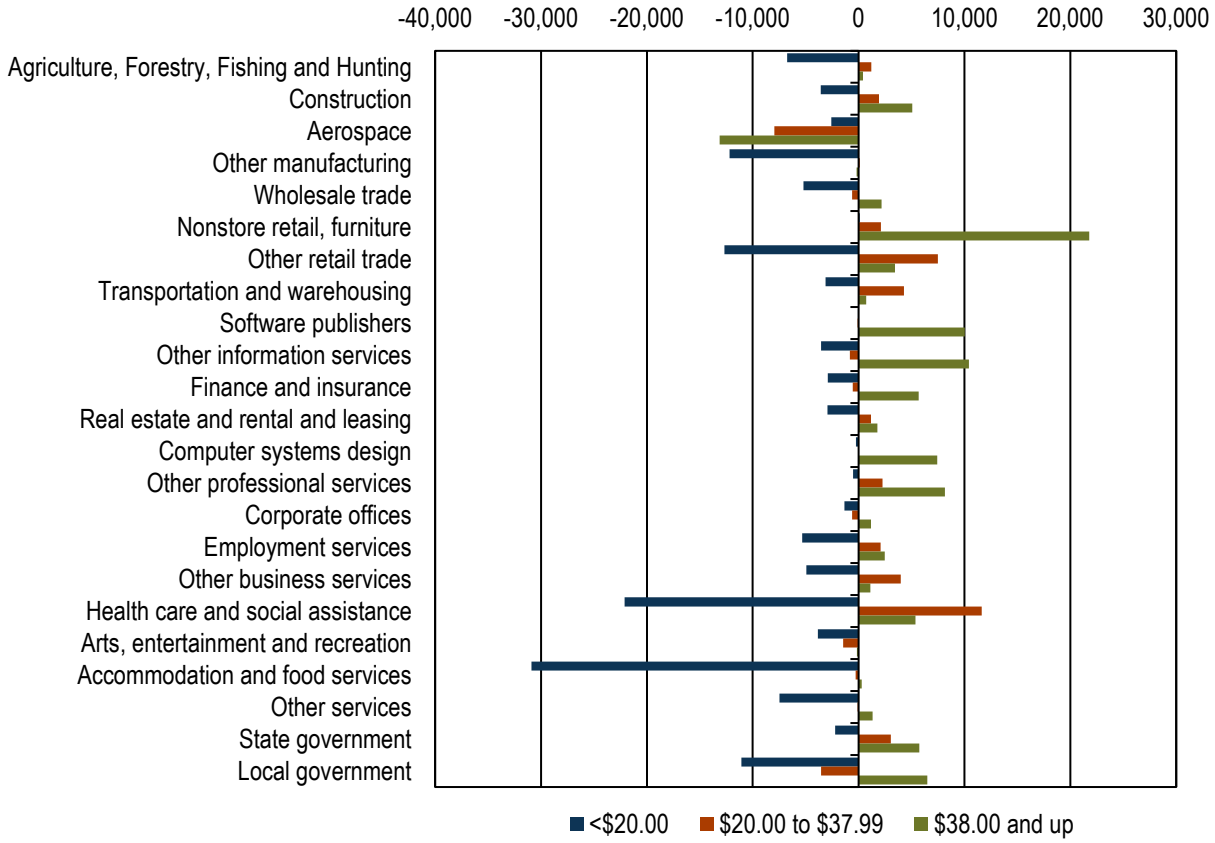
Figure 7-13. Change in FTE employment by hourly wage ranges, prepackaged software (NAICS 5512)
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



Employment in prepackaged software grew throughout the pandemic, especially at the higher end of the wage spectrum. *Figure 7-14* provides a recap of the change in the number of FTE jobs between 2019 and 2021 by sector, in three broad wage categories – below $20.00 per hour, $20.00 to $37.99 per hour, and $38.00 hour and above. A few final comments:

- Agriculture, an essential activity, saw increased employment and wages (mostly in crops and support activities like fruit packing) in 2020, but suffered job losses in 2021, for a net loss in jobs, mostly at the lower end of the pay scale.
- Information services, finance and insurance and professional services all have high potential for working remotely, and all added high-wage jobs.

Figure 7-14. Change in FTE employment by hourly wage ranges, by sector and selected industries
Washington state, 2019 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse



Job losses in the COVID-19 recession were disproportionately low-wage jobs but varied widely by sector.

Incumbent workers fared well

It's important to remember that when we're comparing what employers pay at different time periods, we're talking about a different set of workers in each time period. Some workers from an earlier time period will have withdrawn from the state work force for a variety of reasons – retirement, caring for family members, moving out of state, pandemics, etc., – while for similar reasons, the later time period will contain workers not in the earlier period. So, it's a different question to ask what happened to the average individual worker over the past two years.

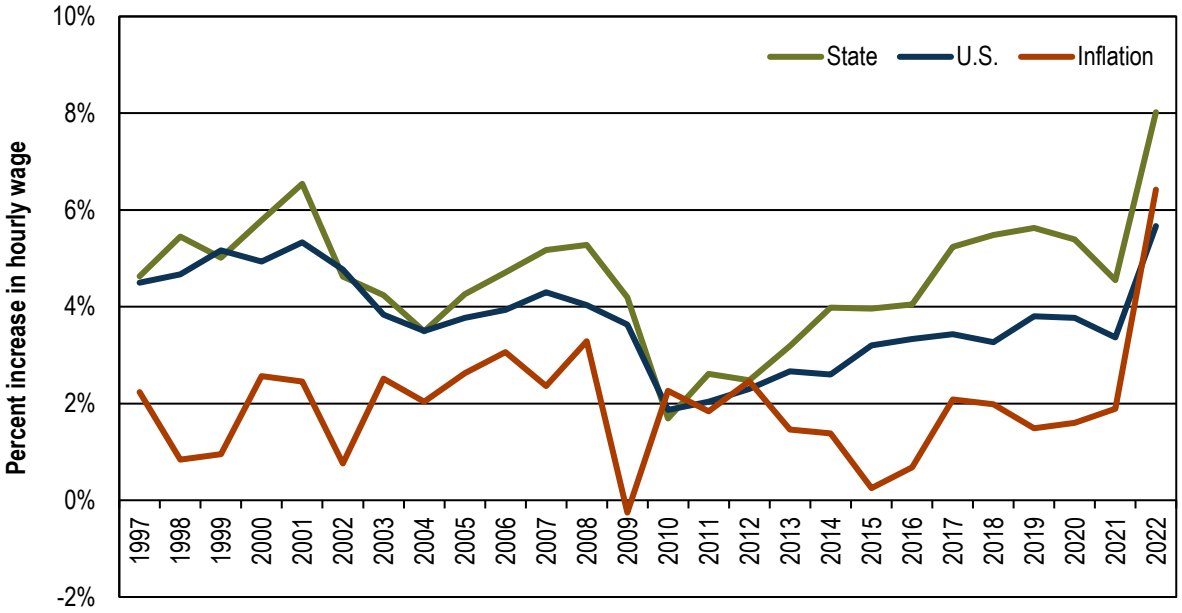
The Federal Reserve Bank of Atlanta's Wage Growth Tracker[35] measures the median over-the-year change in hourly wages for individuals who worked in the current month as well as the same month a year earlier. According to their analysis, the median over-the-year increase for individual full-time workers' wages from 2018 to 2019 hovered around 3.8 percent. The median over-the-year increase was slightly lower in second quarter 2021 before rising dramatically to 6.6 percent in third quarter 2022 – not adjusted for inflation. That

[35] www.frbatlanta.org/chcs/wage-growth-tracker

was the highest *nominal* wage increase since the series began in 1997. However, once inflation is factored in, median over-the-year wage increases have been declining since first quarter 2021.

A Washington state equivalent of the wage-growth tracker was constructed using a similar set of workers.[36] As shown in *Figure 7-15*, median over-the-year wage increases for incumbent workers in Washington have been substantially higher than the nation since 2010 (*Figure 7-15).* In first quarter 2022, the nominal median wage increase was 8 percent. After adjustment for inflation, the increase was only 1.6 percent. Inflation-adjusted increases in Washington averaged close to 4 percent in 2019. As the Atlanta Fed notes, the individuals in their national dataset were somewhat older, more educated, and more likely to work as a professional than the general population, due to the requirement for continuous employment; those same characteristics were likely true for the comparable state dataset.

Figure 7-15. Median year-over-year increase in hourly wage for full-time workers, not adjusted for inflation, and the rate of inflation, as measured by the U.S. Personal Consumption Expenditure Implicit Price Deflator
U.S. and Washington state, 1997 through 2022 Q3 (U.S.) 2022 Q1 (state)
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse; Atlanta Federal Reserve Bank, U.S. Bureau of Economic Analysis

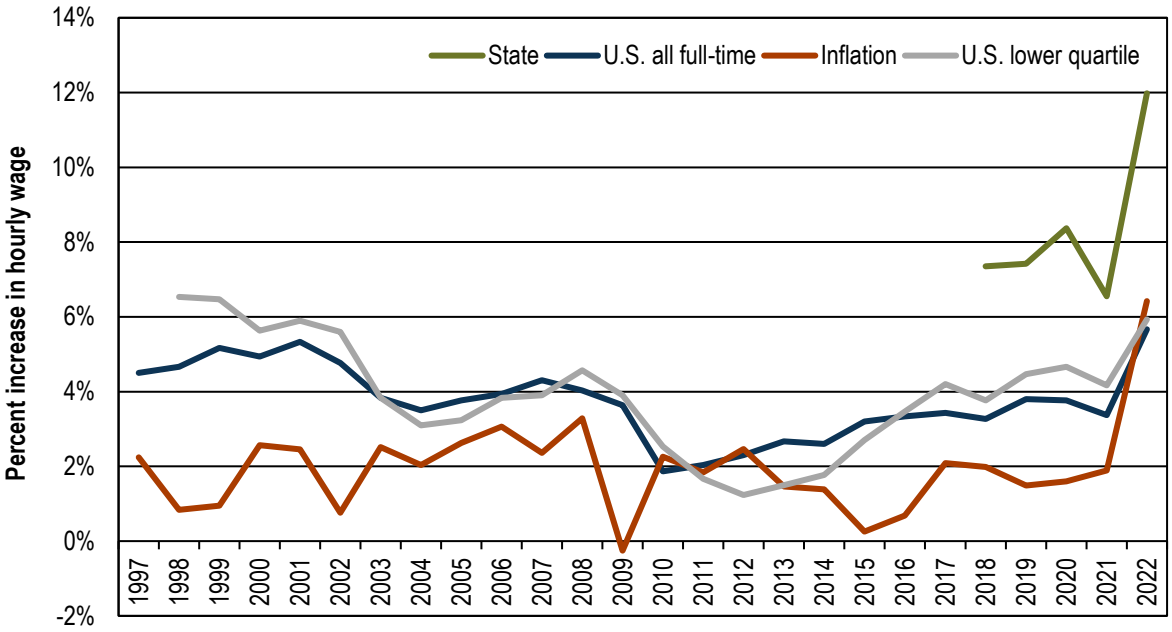


Incumbent Washington workers have usually enjoyed larger increases in hourly wages than their counterparts around the nation.

The Atlanta Fed also calculates the median hourly wage increase for quartiles of workers – the bottom quarter of workers by wage, the next quarter, the next quarter, and the best-paid quarter. Those workers in that lowest quartile sometimes enjoy a higher percentage wage increase over time, as shown in *Figure 7-16*, because of smaller base pay. For a similar dataset of workers at the state level, increases were much larger relative to the increases at the national level.

[36] For the state, this included Individuals who worked at least 455 hours in each quarter (the equivalent of working 35 hours per week), in a nonagricultural industry.

Figure 7-16. Median year-over-year increase in hourly wage for the lowest-paid quarter of workers, not adjusted for inflation, and the rate of inflation, as measured by the U.S. Personal Consumption Expenditure Implicit Price Deflator
National data is 12-month average, state data is for full-time workers
U.S. and Washington state, 1997 through 2022 Q3 (U.S.) 2022 Q1 (state)
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse; Atlanta Federal Reserve Bank, U.S. Bureau of Economic Analysis



Incumbent Washington workers in the lower quartile of hourly wages had substantially larger increases in hourly wages over a year than their counterparts around the nation.

The bottom line: wage inequality continued to increase

A common way to measure wage inequality is to compare wage levels at the top with wages at the bottom. We can divide jobs into 10 equal groups, starting with the 10 percent of jobs with the lowest hourly wage, then the next 10 percent, and so on until we get to the top 10 percent. The mathematical term for each group is a *decile*. To track wage inequality, we can calculate the *90/10 ratio*, defined as the ratio of the average hourly wage for the top 10 percent of jobs with the average hourly wage for the bottom 10 percent of jobs.

In 1990, the average pay for the top 10 percent of wage earners was $66.68 per hour, 7.7 times the average for the bottom 10 percent, which was $8.65 per hour. By 2009, the ratio was 9.7. Since that year, the 90/10 ratio has increased steadily, taking a big jump in 2020, and a smaller but still substantial rise in 2021. By 2021, the top 10 percent averaged 12.6 times that of the bottom 10 percent ($180.18 versus $14.40) – despite Washington having the highest minimum wage among the 50 states in 2021. Annualized, the 2021 comparison is $30,200 for the bottom 10 percent versus $380,800 for the top 10 percent.

To add a bit more nuance, the gap between the average wage for the top 10 percent and the median hourly wage increased to its highest level on record (5.9), while the distance between the median and the average for the bottom 10 percent stayed at 2.1. The latter has trended down from 2.4 over the last decade. The

average job in the top 10 percent paid almost six times the median hourly wage, while the average in the bottom 10 percent paid about half the median wage.

Figure 7-17 summarizes the increase in wage inequality over the past 20 years. It shows that while both the median and average hourly wages have been trending upward over the past two decades, the gap between the two has widened considerably. In 1990, the median was 81 percent of the average, dropping to 74percent in 2001; by 2021 it was only 64 percent. Note that during the 1998 to 2002 period, stock options were included as part of wages and heavily influenced the average hourly wage.

Figure 7-17. Measuring the wage gap, 2021 dollars
Washington state, selected years, 2001 to 2021
Source: Employment Security Department/DATA, Unemployment Insurance Data Warehouse

Wages	2001	2007	2018	2019	2020	2021	Percent change, 2020-2021
Median hourly wage	$23.96	$24.46	$27.77	$28.54	$30.46	$30.83	0.1%
Average hourly wage for:							
All jobs	$32.41	$33.10	$41.31	$42.75	$46.80	$48.04	2.5%
Lowest-paid 10 percent of jobs	$10.37	$10.59	$12.80	$13.26	$14.41	$14.40	-0.1%
Second-lowest 10 percent of jobs	$13.19	$13.20	$15.72	$16.33	$17.34	$17.60	1.5%
Third-lowest-paid 10 percent of jobs	$16.00	$16.08	$18.32	$18.88	$20.13	$20.46	1.6%
Fourth-lowest-paid 10 percent of jobs	$18.99	$19.21	$21.49	$22.08	$23.57	$23.95	1.6%
Fifth-lowest-paid 10 percent of jobs	$22.22	$22.61	$25.49	$26.18	$27.91	$28.29	1.4%
Fifth-highest 10 percent of jobs	$25.90	$26.60	$30.51	$31.39	$33.45	$33.89	1.3%
Fourth-highest 10 percent of jobs	$30.52	$31.85	$37.27	$38.42	$40.87	$41.42	1.4%
Third-highest 10 percent of jobs	$36.86	$39.23	$46.69	$48.21	$51.25	$51.94	1.3%
Second-highest 10 percent of jobs	$45.97	$50.14	$61.31	$63.62	$67.86	$68.95	1.6%
Highest-paid 10 percent of jobs	$104.55*	$101.75	$143.63	$148.86	$172.59	$180.18	5.0%
Ratio of highest 10 to lowest 10	10.1	9.6	11.2	11.2	12.0	12.6	NA
Ratio of highest 10 to median	4.4	4.2	5.2	5.2	5.7	5.9	NA
Ratio of median to lowest 10	2.3	2.3	2.2	2.2	2.1	2.1	NA

*Boosted by stock options. Without stock options, the average would have been about $85.00.

The gap between the highest- and lowest-paid jobs increased again from 2020 to 2021.

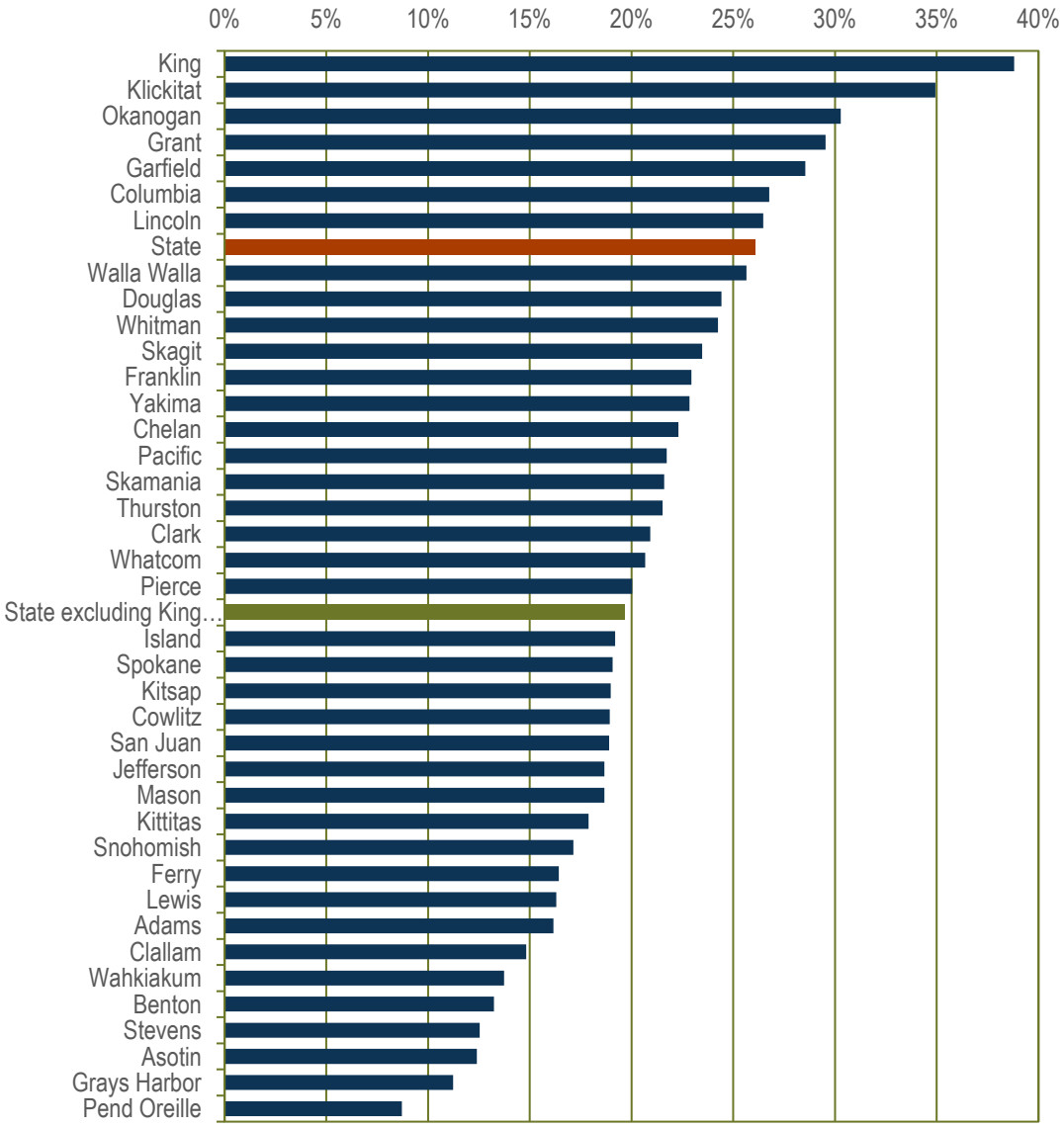
Wage inequality across the state

Not surprisingly, wage levels vary widely across the state. The median hourly wage by county in 2021 varied from $40.80 in King County to $19.45 in Okanogan County. Wages at the county level will be determined in large part by the industries present, the occupational pattern of employment in those industries, and the cost of living (the biggest difference from county to county being housing costs).

Figure 7-18 shows the inflation-adjusted change in the median hourly wage for each county, from 2007 to 2021. While King County took the top spot, most of the counties with more rapid growth in the median were east of the Cascades: Klickitat, Okanogan, Grant, Garfield, Columbia, and Lincoln. It should be noted

that these counties still lagged the state median of $30.83 by at least $5 per hour, and one of them, Okanogan, had the lowest median in the state, at $19.45.

Figure 7-18. Change in median hourly wage, 2021 dollars
Washington state and its counties, 2007 to 2021
Source: Employment Security Department/DATA; Unemployment Insurance Data Warehouse



The median hourly wage increased in every county from 2007 to 2021, but with great variation. Seven counties exceeded the state's gain of 26.1 percent, led by King County at 38.8 percent.

Average monthly wages by worker demographics

The Longitudinal Employment-Household Dynamics (LEHD) program is a partnership between the U.S. Census Bureau and states in which Census adds demographic detail to state employment databases. One of the program's products is the Local Employment Dynamics (LED) database, which provides employment data and average monthly wage by industry and county with three demographic breakouts:

- Eight different age groups, by gender (although only male and female are available);
- Four different levels of education by gender, for those aged 25 and above; and
- Race by ethnicity (Hispanic/non-Hispanic).

LED data is based on the quarterly wage files, and so does not correspond exactly to monthly employment estimates from the QCEW. Calculating an average wage is problematic on a quarterly basis because the number of hours worked by a particular worker with a particular employer can vary tremendously, from as little as one hour, up to 520 hours (equivalent to working eight hours a day, five days a week) or more depending upon overtime. LED addresses this challenge in part by identifying "full-quarter" jobs – jobs which exist not only in the quarter being analyzed, but in the previous and subsequent quarters as well. The presumption is that the job provided steady work (whether part-time or full-time) throughout the quarter, and so an average monthly wage – total quarterly earnings divided by three – would be representative. Note that because shorter-term jobs, which generally are lower paid, are not included, the averages shown are significantly higher than the average wage for all jobs.

As shown in *Figure 7-19*, for the latest available four quarters of data from fourth quarter 2020 to third quarter 2021:

- The average monthly wage for full-quarter jobs held by women ($5,565) was 77.9 percent of the average for all jobs. The ratio of the average monthly wage for women versus the average monthly wage for men was 64.4 percent. This was lower than the 66.9 percent from 1992.
- The average monthly wage for jobs held by African American, Indigenous, Pacific Islander, and multi-racial workers was significantly below the average for all jobs. Wages for African American and Indigenous workers have grown slower than the average for all workers. Indigenous workers had the lowest average wage in 2020 to 2021.
- The average for jobs held by Asian American workers was substantially higher than the average for all jobs. It should be noted that this racial group, like all others, is very diverse, with some members whose families have been here for many generations to some who have only recently arrived in this country. There is likely a more unequal distribution of wages within this group than any other.
- The average for Latino/Hispanic workers was the second-lowest for any racial/ethnic group.
- The peak age for earnings was the 45 to 54 age group. Average wages increase with age, before dropping somewhat above the age of 54, probably because higher-wage workers can afford to retire earlier. The average for workers aged 65 and older has grown rapidly, possibly because more are working a full-time schedule.
- The wage premium for graduating with a four-year degree (or more) has increased since 1992, but has changed little since 2006.

Figure 7-19. Demographic wage gaps, 2021 dollars
Washington state, 1992, 2006 and the average for fourth quarter 2020 to third quarter 2021
Source: Local Employment Dynamics database/Census Bureau, states. Calculations by ESD/DATA

Wages	1992	Percent of average for all jobs	2006	Percent of average for all jobs	2020 Q4 – 2021 Q3	Percent of average for all jobs
All jobs	$4,160	100.0%	$4,897	100.0%	$7,148	100.0%
By gender:						
Male	$4,938	118.7%	$5,960	121.7%	$8,639	120.9%
Female	$3,303	79.4%	$3,785	77.3%	$5,565	77.9%
By race:						
African American	$3,478	83.6%	$3,915	79.9%	$5,434	76.0%
Indigenous	$3,052	73.4%	$3,601	73.5%	$4,814	67.3%
Asian American	$3,561	85.6%	$4,895	100.0%	$9,964	139.4%
Pacific Islander	$3,003	72.2%	$3,527	72.0%	$4,933	69.0%
Multi-racial	$3,275	78.7%	$3,964	80.9%	$5,783	80.9%
White	$4,246	102.1%	$4,999	102.1%	$6,966	97.5%
By ethnicity:						
Latino/Hispanic	$2,739	65.8%	$3,357	68.6%	$4,873	68.2%
Non-Latino/Hispanic	$4,307	103.5%	$5,125	104.7%	$7,267	101.7%
By age:						
14-18	$742	17.8%	$944	19.3%	$1,274	17.8%
19-21	$1,572	37.8%	$1,738	35.5%	$2,225	31.1%
22-24	$3,143	75.6%	$2,666	54.4%	$3,720	52.0%
25-34	$3,700	88.9%	$4,258	87.0%	$6,312	88.3%
35-44	$4,928	118.5%	$5,632	115.0%	$8,293	116.0%
45-54	$5,039	121.1%	$5,892	120.3%	$8,839	123.7%
55-64	$4,764	114.5%	$5,540	113.1%	$7,623	106.6%
65+	$2,356	56.6%	$3,155	64.4%	$5,266	73.7%
By educational attainment (aged 25 and older):						
Did not finish high school	$2,951	70.9%	$3,123	63.8%	$5,409	75.7%
High school diploma/GED	$3,569	85.8%	$3,959	80.8%	$5,941	83.1%
Some college/AA	$4,197	100.9%	$4,711	96.2%	$6,610	92.5%
Bachelor's or higher	$5,867	141.0%	$7,210	147.2%	$10,547	147.6%

Data for full-quarter jobs show that there are significant differences between the average wage for workers by gender, race, ethnicity, age and education, many of which have persisted for decades.

Personal and per capita income[37]

Personal income is the sum of earned income (from owning a business or holding a job), investment income (from owning stocks, bonds, property, etc.) and transfer payments (chiefly from government programs such as Social Security, Medicare and Medicaid, Temporary Assistance to Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP), Supplemental Security Income (SSI) and unemployment benefits. Per capita personal income is the total personal income of an area divided by the population of the area. Since per capita income is an average, it is influenced by factors such as relative concentration of high-income households, family size and the number of retirees in an area.

Per capita personal income in Washington state, as shown in *Figure 7-20*, reached $73,775 in 2021, sixth among states. Income increased for the eleventh straight year, and the rate of growth that year – 3.8 percent – was the tenth fastest in the country. Historically, the state's per capita personal income has been 5 to 8 percent above the U.S., but the margin has widened over the past decade from 3.5 percent in 2011 to 15 percent in 2021.

Total personal income was estimated at $571 billion in 2021, up 4 percent from 2020. Changes in income over the past few years can be clarified by disaggregating income into its three major components.

First, total ***earned income***, which makes up almost two thirds of total income, rose by 3.1 percent in 2020 and 4.8 percent in 2021, the eighth year in a row of strong growth. Earned income accounted for 70 percent of total personal income in 2000, but since then its share has declined to 62 percent. It will likely continue to ebb over the next decade due in large part to the aging population.

Investment income correlates strongly with the stock market and secondarily with interest rates. It usually drops sharply in recessions (as it did in 2009 and 2010) and then stages strong recoveries before moderating during economic expansions. Thus, there was double-digit growth in 2011 and 2012, a slight decline in 2013, boom years in 2014 and 2015, and moderation the next three years. After booming again in 2019, investment income fell by 1.2 percent in 2020 and by 0.7 percent in 2021. Investment income is highly concentrated in upper income households.[38]

From 1982 to 2007, total ***transfer payments*** grew along with the economy, consistently comprising about 13 percent of personal income. That share rose to 18 percent during the depths of the 2008 to 2009 recession, as income maintenance payments and unemployment benefits increased, fell to 15 percent during the recovery, and was 14 percent in 2019. However, there were huge increases because of the COVID-19 programs to boost the economy, like the "stimulus checks" from the American Rescue Plan Act of 2021 and expanded unemployment insurance benefits. Total transfer payments grew by 34 percent in 2020 and another 7 percent in 2021 (and a sharp decline will be apparent in 2022).

Figures 7-20 and 7-21 show how transfer payments have changed over the last three decades, with the large changes during the pandemic highlighted in yellow. First, even if the last two years aren't counted, transfer payments have grown significantly faster than total personal income. Second, this has primarily been due to the increase in medical benefits – Medicare and Medicaid comprised 27 percent of transfer payments in 1990, and 42 percent in 2019, more than Social Security's 34 percent. Third, both unemployment insurance benefits and Temporary Assistance for Needy Families (TANF) payments have declined over time on a per capita basis until the pandemic years.

[37] All data on personal and per capita income are produced by the U.S. Bureau of Economic Analysis; inflation adjustment provided by Employment Security Department/DATA.

[38] According to the Federal Reserve Bank's 2016 Survey of Consumer Finances, the top 10 percent of families own two-thirds of the financial assets controlled by families, and the bottom 60 percent own less than 10 percent.

Figure 7-20. Personal income including transfer payments, in 2021 dollars
Washington state, selected years, 1990 to 2021
Source: Employment Security Department/DATA; U.S. Bureau of Economic Analysis
Large changes related to COVID-19 economic support programs in bold and italics.

Type of income	1990	2001	2007	2016	2017	2018	2019	2020	2021
Total personal income (billions)	**$181.30**	**$287.44**	**$349.18**	**$446.03**	**$464.91**	**$485.24**	**$515.69**	**$548.83**	**$570.92**
Earned income	$120.13	$196.53	$229.91	$280.49	$294.67	$312.25	$327.16	$337.32	$353.34
Investment income	$39.88	$54.45	$75.11	$99.04	$103.10	$104.18	$116.24	$114.89	$114.05
Transfer payments	$21.30	$36.46	$44.16	$66.50	$67.14	$68.81	$72.28	$96.61	$103.52
Social Security	$8.48	$12.24	$15.16	$22.34	$22.84	$23.65	$24.84	$25.86	$25.86
Other selected retirement and disability*	$2.18	$2.25	$2.58	$2.76	$2.71	$2.45	$2.47	$2.72	$2.50
Medical benefits	$5.70	$13.13	$17.07	$27.05	$27.69	$28.81	$30.15	$30.98	$34.93
Medicare	$3.07	$5.64	$9.02	$13.48	$13.95	$14.59	$15.51	$16.00	$16.69
Medicaid	$2.39	$7.16	$7.48	$12.93	$13.09	$13.56	$13.93	$14.18	$17.40
Other medical	$0.24	$0.32	$0.56	$0.64	$0.66	$0.66	$0.70	$0.80	$0.83
Income Maintenance	$1.89	$2.82	$4.37	$5.69	$5.26	$4.96	$5.32	$6.03	$8.98
Supplemental Security Income (SSI)	$0.38	$0.76	$0.89	$1.13	$1.11	$1.10	$1.10	$1.10	$1.04
Earned Income Tax Credit	$0.16	$0.63	$0.79	$1.14	$1.11	$1.05	$1.00	$0.98	$0.98
Supplemental Nutrition Assist. (food stamps)	$0.36	$0.39	$0.77	$1.58	$1.46	$1.33	$1.24	$2.04	$3.35
Family assistance (AFDC/TANF)	$0.82	$0.63	$0.50	$0.42	$0.42	$0.38	$0.68	$0.70	$0.68
Other income assistance	$0.18	$0.41	$1.41	$1.41	$1.15	$1.10	$1.29	$1.21	$2.93
Unemployment benefits	$0.83	$2.04	$0.98	$1.15	$1.16	$1.12	$1.16	$12.82	$8.32
Veterans' benefits	$0.73	$1.17	$1.55	$3.04	$3.42	$3.60	$3.83	$4.16	$4.10
All other transfer payments	$1.48	$2.81	$2.46	$4.47	$4.06	$4.23	$4.52	$14.04	$18.82
Per capita personal income (dollars)	**$36,977**	**$48,022**	**$54,040**	**$60,968**	**$62,431**	**$64,282**	**$67,510**	**$71,103**	**$73,775**
Earned income	$24,501	$32,833	$35,581	$38,340	$39,570	$41,366	$42,830	$43,701	$45,659
Investment income	$8,133	$9,097	$11,624	$13,538	$13,845	$13,801	$15,218	$14,885	$14,738
Transfer payments	$4,343	$6,091	$6,835	$9,089	$9,016	$9,115	$9,463	$12,517	$13,378
Social Security	$1,729	$2,044	$2,346	$3,054	$3,068	$3,133	$3,252	$3,350	$3,341
Other selected retirement and disability*	$444	$376	$399	$378	$364	$324	$324	$352	$323
Medical benefits	$1,163	$2,193	$2,641	$3,697	$3,718	$3,816	$3,946	$4,014	$4,514
Medicare	$627	$942	$1,396	$1,842	$1,873	$1,933	$2,031	$2,073	$2,157
Medicaid	$487	$1,196	$1,158	$1,767	$1,757	$1,796	$1,824	$1,837	$2,249
Other medical	$49	$54	$87	$88	$88	$88	$92	$103	$108
Income maintenance	$386	$471	$676	$777	$706	$657	$696	$781	$1,160
Supplemental Security Income (SSI)	$78	$127	$138	$155	$149	$146	$145	$142	$135
Earned Income Tax Credit	$32	$105	$122	$156	$149	$139	$131	$127	$126
Supplemental Nutrition Assist. (food stamps)	$73	$66	$120	$216	$197	$177	$162	$265	$432
Family assistance (AFDC/TANF)	$166	$105	$78	$58	$57	$50	$89	$91	$88
Other income assistance	$36	$68	$219	$192	$154	$146	$168	$157	$379
Unemployment benefits	$170	$341	$152	$157	$155	$149	$151	$1,661	$1,076
Veterans' benefits	$149	$196	$240	$415	$459	$477	$502	$539	$530
All other transfer payments	$303	$470	$381	$610	$546	$560	$591	***$1,818***	***$2,433***

* Includes railroad retirement and disability benefits, workers' compensation benefits, and other government retirement and disability benefits. Does not include private pension benefits. Yellow indicates the impact of COVID-19 stimulus programs.

Earned income expanded during the pandemic, while investment income declined. Transfer payments jumped strongly due to the COVID-19 stimulus programs passed by Congress.

Figure 7-21. Per capita transfer payments in 2021 constant dollars, and components as a percent of total
Washington state, 2000, 2019, 2020 and 2021
Source: U.S. Bureau of Economic Analysis; inflation adjustment by Employment Security Department/DATA

Type of transfer payment	2000	2019	2020	2021	2000	2019	2020	2021
Total transfer payments (in billions)	$5.8	$56.7	$56.7	$65.8	-	-	-	-
Percent of total personal income	8%	17%	17%	14%	-	-	-	-
Total per capita transfer payments	$1,741	$8,409	$8,409	$8,738	100%	100%	100%	100%
Social Security	$709	$2,461	$2,461	$2,940	35%	34%	27%	25%
Other retirement and disability*	$134	$388	$388	$324	7%	3%	3%	2%
Medical benefits	$285	$2,795	$2,795	$3,577	34%	42%	32%	34%
Medicare	$165	$1,495	$1,495	$1,807	16%	21%	17%	16%
Medicaid	$0	$1,195	$1,195	$1,685	18%	19%	15%	17%
Other medical	$119	$105	$105	$85	1%	1%	1%	1%
Income maintenance	$182	$979	$979	$809	8%	7%	6%	9%
Supplemental Security Income (SSI)	$52	$148	$148	$137	2%	2%	1%	1%
Earned Income Tax Credit	$0	$148	$148	$133	2%	1%	1%	1%
Supplemental Nutrition Assistance (food stamps)	$14	$242	$242	$163	1%	2%	2%	3%
Family assistance (AFDC/TANF)	$91	$149	$149	$52	2%	1%	1%	1%
Other income assistance	$25	$293	$293	$324	2%	2%	1%	3%
Unemployment benefits	$96	$723	$723	$137	4%	2%	13%	8%
Veterans' benefits	$196	$282	$282	$412	3%	5%	4%	4%
All other transfer payments	$140	$780	$780	$540	8%	6%	15%	18%

*Includes railroad retirement and disability benefits, workers' compensation benefits, and other government retirement and disability benefits. Does not include private pension benefits.

Over the past 49 years, the dollar amount and share of transfer payments going to medical benefits has exploded, while the share going to Social Security, family assistance, unemployment insurance benefits and veterans' benefits has declined, until the pandemic.

Appendix 1: Washington's workforce development areas

Appendix figure A1-1: Washington workforce development areas (WDAs)

Appendix 2: Seasonal, structural and cyclical industry employment

Theoretical base for employment decomposition

We used R's advanced decomposition models for time series.

Decomposition of employment for each point in time (months, in our case) is:

Employment = (trend + cycle) + seasonal + irregular

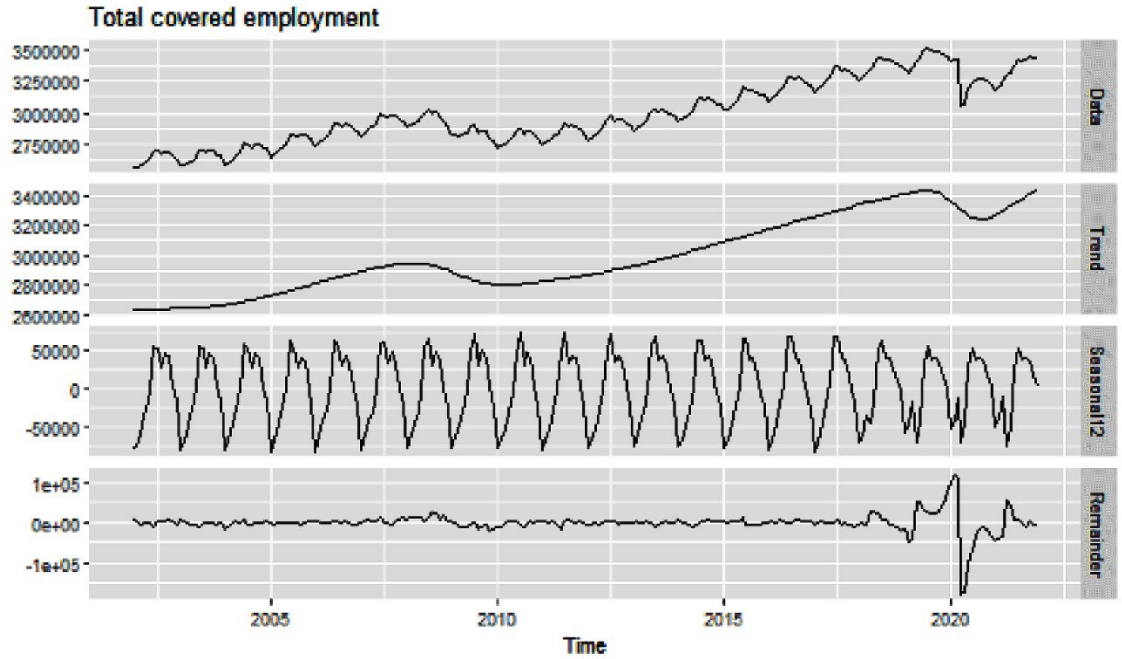
Within the decomposed employment components, trends are a result of structural changes.

There are two steps in the process of time series decomposition:

1. We split the series between; combined trend (which includes trend + cycle), seasonal and irregular (remainder) components.
2. We split the combined trend (trend + cycle) into trend and cyclical components.

Appendix figure A2-1 represents the main components of decomposition for total nonfarm employment. The trend component in the figure is the result of the first step of decomposition and represents the combination of trend plus cycle. The trend plus cycle component is used in further sequential processing steps later in the decomposition process.

Appendix figure A2-1. Total employment time series and its main components
Washington state, 2002 to 2021
Source: Employment Security Department/DATA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)



We used a state space model with auto selection of model variations (types of error, trend and seasonality). Model variations can be additive, multiplicative, none, etc. The software also includes the choice of 30 exponential smoothing variations. The main advantage of this type of approach is that the types of models are not predefined and thus can vary for different series. In standard U.S. Census Bureau ARIMA models, parameters are estimated for each series, but models are predefined and remain the same for all series.

The software selects the model that minimizes the Akaike's Information Criteria (AIC).

The state space approach allows for the optimized selection of models for each individual series. This entails the selection of the best model and then parameters are subject to change as time periods change. This is a major difference from classical regression (one level models). In addition, under this approach, regardless of the selection of seasonal or irregular models (additive or multiplicative), the sum of decomposition components (combined trend, seasonal and irregular) remains equal to the initial series for each month.

In step two, we used the combined trend series from step one for our analyses of the contributions of structural and cyclical components to growth. To accomplish this, we used the Hodrick-Prescott (HP) filter. This filter is a smoothing method that is widely used among macroeconomists to obtain a smooth estimate of the long-term trend component of a series.

Technically, the HP filter is a two-sided linear filter that computes the smoothed series *s* of *y* by minimizing the variance of *y* around *s*, subject to a penalty that constrains the second difference of *s*. That is, the HP filter chooses *s* to minimize:

$$\sum_{t=1}^{T}(y_t - s_t)^2 + \lambda * \sum_{t=2}^{T-1}[((s_{t+1} - s_t) - (s_t - s_{t-1})]^2$$

The penalty parameter λ controls the smoothness of the series *s*. The larger the λ, the smoother the *s*. As $\lambda=\infty$, *s* approaches a linear trend.

We used default value λ=14,400 for monthly frequencies. This default value was defined by dividing the number of months per year by four raised to a power (default value 2)[39] and multiplying by 1,600. For our purpose, for all series regardless of the model selected, the HP filter chooses *s* to minimize:

$$\sum_{t=1}^{T}(y_t - s_t)^2 + 14{,}400 * \sum_{t=2}^{T-1}[((s_{t+1} - s_t) - (s_t - s_{t-1})]^2$$

Industry seasonality levels

The level of employment seasonality for an industry is defined as an average of absolute values of the seasonal component divided by the initial series (mean (|seasonal| /employment)). The levels are presented in column three of *Appendix figure A2-2*. A larger level value indicates a larger seasonality value for the industry. To interpret the seasonal factors, arbitrary thresholds were established. Industries with a seasonal factor value of up to 1 percent were identified as not seasonal. Industries with a factor value greater than 1.0 and up to 2 percent were identified as having low levels of seasonality. Industries with a factor value greater than 2 and up through 4 percent were identified as having moderate levels of seasonality, while industries with a factor value greater than 4 percent were considered to have high levels of seasonality. The results are listed in column four of *Appendix figure A2-2*.

[39] We stayed with the power of two for this analysis, but the other possibility is to use the power of four.

Structural and cyclical contributions to industry employment changes

Relative contributions to monthly employment change are calculated as the average for all months of absolute differences (one-month difference) for specific factors (presented in columns five and six of the table in *Appendix figure A2-2*). The percentages of relative contributions for trend (structural) and cycle components are presented in columns seven and eight. The industry that had the lowest cyclical component contribution (20.51 percent) was other information services, while support activities for mining had the highest cyclical component contribution (69.37 percent). The structural component (trend) accounted for the dominant share of change in total employment (57.25 percent), while the cyclical component accounted for the residual (42.75 percent).

Appendix figure A2-2. Employment decomposition components
Washington state, 2002 to 2021
Source: Employment Security Department/DATA; Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

NAICS	Industry	Seasonal factor	Level of seasonality	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)
000	**Total covered employment**	**1.32%**	**Low**	**3,886**	**2,902**	**57.25%**	**42.75%**
111	Crop production	30.52%	High	135	133	50.38%	49.62%
112	Animal production and aquaculture	2.20%	Moderate	6	5	57.39%	42.61%
113	Forestry and logging	2.29%	Moderate	15	8	64.97%	35.03%
114	Fishing, hunting and trapping	5.75%	High	5	5	48.94%	51.06%
115	Support activities for agriculture and forestry	17.06%	High	61	57	51.68%	48.32%
212	Mining (except oil and gas)	3.27%	Moderate	10	6	62.68%	37.32%
213	Support activities for mining	11.24%	High	1	3	30.63%	69.37%
221	Utilities	0.64%	Not seasonal	6	5	54.87%	45.13%
236	Construction of buildings	2.39%	Moderate	215	94	69.58%	30.42%
237	Heavy and civil engineering construction	7.18%	High	60	31	66.24%	33.76%
238	Specialty trade contractors	3.01%	Moderate	517	212	70.96%	29.04%
311	Food manufacturing	4.20%	High	29	27	51.82%	48.18%
312	Beverage and tobacco product manufacturing	5.10%	High	28	20	58.76%	41.24%
313	Textile mills	1.77%	Low	1	1	50.13%	49.87%
314	Textile product mills	1.04%	Low	5	5	50.00%	50.00%
315	Apparel manufacturing	1.63%	Low	6	8	45.44%	54.56%
316	Leather and allied product manufacturing	4.65%	High	1	2	44.48%	55.52%
321	Wood product manufacturing	1.03%	Low	46	30	60.16%	39.84%
322	Paper manufacturing	0.58%	Not seasonal	25	14	63.59%	36.41%
323	Printing and related support activities	0.78%	Not seasonal	20	14	58.29%	41.71%
324	Petroleum and coal products manufacturing	1.70%	Low	5	6	45.99%	54.01%
325	Chemical manufacturing	0.56%	Not seasonal	14	11	55.45%	44.55%
326	Plastics and rubber products manufacturing	0.79%	Not seasonal	20	17	55.27%	44.73%
327	Nonmetallic mineral product manufacturing	1.93%	Low	25	17	59.26%	40.74%
331	Primary metal manufacturing	0.73%	Not seasonal	20	20	49.60%	50.40%

NAICS	Industry	Seasonal factor	Level of seasonality	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)
332	Fabricated metal product manufacturing	0.76%	Not seasonal	44	46	49.05%	50.95%
333	Machinery manufacturing	0.76%	Not seasonal	44	42	50.82%	49.18%
334	Computer and electronic product manufacturing	0.33%	Not seasonal	42	33	55.66%	44.34%
335	Electrical equipment, appliance, and component manufacturing	0.50%	Not seasonal	9	8	54.49%	45.51%
336	Transportation equipment manufacturing	0.57%	Not seasonal	289	250	53.61%	46.39%
337	Furniture and related product manufacturing	1.04%	Low	27	15	64.94%	35.06%
339	Miscellaneous manufacturing	0.85%	Not seasonal	16	14	54.08%	45.92%
423	Merchant wholesalers, durable goods	0.45%	Not seasonal	102	84	54.65%	45.35%
424	Merchant wholesalers, nondurable goods	1.27%	Low	39	37	51.04%	48.96%
425	Wholesale electronic markets and agents and brokers	1.22%	Low	107	31	77.29%	22.71%
441	Motor vehicle and parts dealers	1.10%	Low	83	57	59.04%	40.96%
442	Furniture and home furnishings stores	2.07%	Moderate	21	24	46.80%	53.20%
443	Electronics and appliance stores	2.57%	Moderate	22	31	41.27%	58.73%
444	Building material and garden equipment and supplies dealers	3.52%	Moderate	67	33	67.11%	32.89%
445	Food and beverage stores	1.31%	Low	62	52	54.65%	45.35%
446	Health and personal care stores	1.19%	Low	18	19	48.85%	51.15%
447	Gasoline stations	1.55%	Low	10	10	48.66%	51.34%
448	Clothing and clothing accessories stores	4.83%	High	87	81	51.63%	48.37%
451	Sporting goods, hobby, musical instrument, and book stores	3.51%	Moderate	25	31	44.85%	55.15%
452	General merchandise stores	3.04%	Moderate	125	67	65.05%	34.95%
453	Miscellaneous store retailers	2.04%	Moderate	41	41	49.95%	50.05%
454	Nonstore retailers	1.70%	Low	291	116	71.55%	28.45%
481	Air transportation	0.67%	Not seasonal	39	29	56.98%	43.02%
483	Water transportation	2.89%	Moderate	9	10	48.01%	51.99%
484	Truck transportation	2.04%	Moderate	35	28	55.44%	44.56%
485	Transit and ground passenger transportation	2.29%	Moderate	14	18	43.16%	56.84%
486	Pipeline transportation	1.29%	Low	1	1	40.81%	59.19%
487	Scenic and sightseeing transportation	20.47%	High	4	5	43.08%	56.92%
488	Support activities for transportation	1.05%	Low	48	36	57.00%	43.00%
491	Postal service	3.73%	Moderate	1	1	43.21%	56.79%
492	Couriers and messengers	5.45%	High	53	26	66.95%	33.05%
493	Warehousing and storage	2.18%	Moderate	67	57	54.33%	45.67%
511	Publishing industries (except internet)	0.96%	Not seasonal	163	49	76.75%	23.25%
512	Motion picture and sound recording industries	3.97%	Moderate	18	30	37.36%	62.64%
515	Broadcasting (except internet)	0.79%	Not seasonal	8	6	57.37%	42.63%
517	Telecommunications	0.40%	Not seasonal	54	29	64.95%	35.05%

NAICS	Industry	Seasonal factor	Level of seasonality	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)
518	Data processing, hosting, and related services	1.41%	Low	55	32	62.95%	37.05%
519	Other information services	4.80%	High	147	38	79.49%	20.51%
521	Monetary authorities-central bank	0.77%	Not seasonal	1	0	62.51%	37.49%
522	Credit intermediation and related activities	0.21%	Not seasonal	108	56	65.87%	34.13%
523	Securities, commodity contracts, and other financial investments and related activities	0.34%	Not seasonal	20	15	56.88%	43.12%
524	Insurance carriers and related activities	0.34%	Not seasonal	35	25	58.66%	41.34%
525	Funds, trusts, and other financial vehicles	14.35%	High	3	4	44.55%	55.45%
531	Real estate	1.18%	Low	73	40	64.41%	35.59%
532	Rental and leasing services	2.91%	Moderate	36	25	58.73%	41.27%
533	Lessors of nonfinancial intangible assets (except copyrighted works)	3.83%	Moderate	4	3	58.11%	41.89%
541	Professional, scientific, and technical services	0.41%	Not seasonal	419	187	69.09%	30.91%
551	Management of companies and enterprises	0.36%	Not seasonal	83	48	63.52%	36.48%
561	Administrative and support services	2.89%	Moderate	348	250	58.19%	41.81%
562	Waste management and remediation services	0.81%	Not seasonal	31	29	51.84%	48.16%
611	Educational services	3.39%	Moderate	77	63	55.03%	44.97%
621	Ambulatory health care services	0.40%	Not seasonal	247	83	74.79%	25.21%
622	Hospitals	0.34%	Not seasonal	125	65	65.75%	34.25%
623	Nursing and residential care facilities	0.27%	Not seasonal	75	37	66.94%	33.06%
624	Social assistance	1.31%	Low	361	307	54.03%	45.97%
711	Performing arts, spectator sports, and related industries	9.97%	High	29	51	35.69%	64.31%
712	Museums, historical sites, and similar institutions	3.76%	Moderate	9	11	45.13%	54.87%
713	Amusement, gambling, and recreation industries	4.28%	High	80	137	36.75%	63.25%
721	Accommodation	5.27%	High	93	129	41.94%	58.06%
722	Food services and drinking places	2.02%	Moderate	506	577	46.68%	53.32%
811	Repair and maintenance	0.90%	Not seasonal	32	34	48.00%	52.00%
812	Personal and laundry services	1.18%	Low	70	60	54.00%	46.00%
813	Religious, grantmaking, civic, professional, and similar organizations	2.14%	Moderate	41	57	41.52%	58.48%
814	Private households	5.82%	High	310	281	52.41%	47.59%
901	Federal government (other)	1.01%	Low	57	68	45.47%	54.53%
902	State government (other)	1.57%	Low	77	57	57.34%	42.66%
903	Local government (other)	1.58%	Low	322	269	54.44%	45.56%

Theoretical base to identify relations between industry and total employment

The Granger causality test is a technique for determining whether one time series is useful in forecasting another. Put another way: this test answers the question of whether a time series "X" causes time series "Y." Also, it tests to see how much of the current "Y" values can be explained by past values of the same series, and then to see whether adding lagged values of "X" can improve the explanation.

In our case, the question is whether employment in specific industries "Granger-causes" total employment.

The results of Granger causality are not always clear enough to be able to state that a series "X" Granger-causes series "Y," but not the other way around. In such cases, we can find that neither series Granger-causes the other, or that each Granger-causes the other.

Moreover, Granger causality does not imply true causality. If both series "X" and "Y" are driven by a common third process (variable, series), but with different lags, there would be Granger causality. However, the changes in one series would not have a significant effect on the other. To address this issue, we estimated Granger causality in both directions. We estimated specific industry on total employment and total employment on specific industry employment.

Results of industry and total employment analysis

The last five columns of *Appendix figure A2-3* represent an attempt to connect employment time series for specific industries with employment time series of total covered employment. The first of these five columns represents correlations of series of monthly employment between industries and total employment, while the second of these columns represents correlations of the first differences (monthly changes) for the same series.

The third of these five columns represents an attempt to identify the industries for which monthly employment could help in predicting the next month's total employment. F-statistics from the Granger causality test for time series, with a lag of one month, are presented in this column. The value of "F" indicates the significance of the impact of employment in the industry on the next month's total employment. Larger values indicate effects that were more significant. Probabilities for the rejection of the hypotheses of significance, associated with F-statistics, are listed in the next to last column. A lower probability indicates higher confidence that the effect is significant. To address the issue of possible mutual causality we also tested inverse causality of total employment on specific industries. As previously noted, if both direct and inverse causality are significant, it means that an industry employment series might not be a good indicator for the next month's total employment. The last column of *Appendix figure A2-3* indicates if significant direct causality of industry on total employment without significant inverse causality exists (indicator "yes"). All other cases have an indicator of "no". The cutoff for such definitions was the following: p-value for direct test is not more than 0.01, but for inverse test not less than 0.1. Last year nine industries had the indicator "yes." This year, nine industries have an indicator of "yes."

The combination of predictive abilities (indicator "yes") and correlation with total employment and total employment growth can be used to identify the main industries used as coincidental and leading (i.e., one step ahead) economic indicators. In addition, this combination can be used for the one-step-ahead prediction of employment changes. The industries identified by this process are miscellaneous manufacturing, motor vehicle and parts dealers, truck transportation, social assistance, and state government (other).

Appendix figure A2-3. Relationships between industry and total employment
Washington state, 2002 to 2021
Source: Employment Security Department/DATA; Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

NAICS	Industry	Correlation with total employment	Correlations of first differences	F-statistic Granger test (one-month lag)	Probability	Significant one-way impact
000	**Total covered employment**	**100.0%**	**100.0%**	**NA**	**NA**	**NA**
111	Crop production	74.5%	1.4%	2.05	0.15	No
112	Animal production and aquaculture	91.8%	17.7%	6.53	0.01	No
113	Forestry and logging	-77.2%	42.7%	4.79	0.03	No
114	Fishing, hunting and trapping	-91.7%	7.3%	3.19	0.08	No
115	Support activities for agriculture and forestry	97.2%	28.4%	0.00	0.95	No
211	Oil and gas extraction	80.1%	6.6%	4.76	0.03	No
212	Mining (except oil and gas)	-57.6%	47.7%	3.60	0.06	No
213	Support activities for mining	60.6%	18.4%	8.57	0.00	No
221	Utilities	73.7%	11.3%	38.45	0.00	No
236	Construction of buildings	68.8%	72.3%	0.56	0.45	No
237	Heavy and civil engineering construction	28.5%	56.9%	0.07	0.79	No
238	Specialty trade contractors	79.1%	71.8%	1.51	0.22	No
311	Food manufacturing	91.4%	76.8%	1.26	0.26	No
312	Beverage and tobacco product manufacturing	96.7%	83.4%	2.07	0.15	No
313	Textile mills	-44.7%	39.4%	0.95	0.33	No
314	Textile product mills	-41.5%	47.5%	10.07	0.00	Yes
315	Apparel manufacturing	-65.3%	31.8%	0.91	0.34	No
316	Leather and allied product manufacturing	-51.3%	9.0%	38.98	0.00	Yes
321	Wood product manufacturing	-61.4%	48.5%	4.48	0.04	No
322	Paper manufacturing	-83.2%	33.9%	0.30	0.58	No
323	Printing and related support activities	-76.4%	70.3%	0.11	0.74	No
324	Petroleum and coal products manufacturing	71.3%	27.1%	0.47	0.49	No
325	Chemical manufacturing	95.8%	50.8%	1.37	0.24	No
326	Plastics and rubber products manufacturing	-41.2%	66.2%	4.27	0.04	No
327	Nonmetallic mineral product manufacturing	21.1%	76.6%	0.36	0.55	No
331	Primary metal manufacturing	-33.9%	47.8%	0.39	0.54	No
332	Fabricated metal product manufacturing	81.6%	76.4%	2.89	0.09	No
333	Machinery manufacturing	68.2%	67.8%	5.33	0.02	No
334	Computer and electronic product manufacturing	-67.9%	50.6%	2.23	0.14	No
335	Electrical equipment, appliance, and component manufacturing	93.4%	23.9%	110.56	0.00	No
336	Transportation equipment manufacturing	34.1%	36.0%	3.56	0.06	No
337	Furniture and related product manufacturing	-43.0%	66.6%	0.79	0.38	No
339	Miscellaneous manufacturing	31.5%	62.3%	15.21	0.00	Yes

NAICS	Industry	Correlation with total employment	Correlations of first differences	F-statistic Granger test (one-month lag)	Probability	Significant one-way impact
423	Merchant wholesalers, durable goods	62.3%	84.1%	5.89	0.02	No
424	Merchant wholesalers, nondurable goods	87.6%	84.2%	0.03	0.86	No
425	Wholesale electronic markets and agents and brokers	56.1%	-11.4%	4.54	0.03	No
441	Motor vehicle and parts dealers	56.2%	80.6%	8.02	0.01	Yes
442	Furniture and home furnishings stores	-43.5%	76.5%	7.09	0.01	Yes
443	Electronics and appliance stores	30.9%	56.4%	17.20	0.00	No
444	Building material and garden equipment and supplies dealers	88.2%	32.4%	4.17	0.04	No
445	Food and beverage stores	89.7%	3.6%	9.69	0.00	No
446	Health and personal care stores	88.7%	56.3%	33.84	0.00	No
447	Gasoline stations	-69.3%	31.3%	1.81	0.18	No
448	Clothing and clothing accessories stores	-47.0%	77.8%	0.03	0.85	No
451	Sporting goods, hobby, musical instrument, and book stores	-71.5%	77.1%	7.80	0.01	No
452	General merchandise stores	76.7%	-9.4%	5.84	0.02	No
453	Miscellaneous store retailers	81.7%	85.8%	5.12	0.02	No
454	Nonstore retailers	92.1%	-13.1%	0.00	0.97	No
481	Air transportation	69.9%	69.5%	1.54	0.22	No
482	Rail transportation	-10.4%	-31.8%	1.27	0.26	No
483	Water transportation	26.7%	73.4%	0.63	0.43	No
484	Truck transportation	67.5%	66.7%	13.58	0.00	Yes
485	Transit and ground passenger transportation	61.5%	75.1%	9.74	0.00	No
486	Pipeline transportation	87.2%	17.3%	28.64	0.00	No
487	Scenic and sightseeing transportation	21.4%	66.1%	8.30	0.00	No
488	Support activities for transportation	91.4%	81.6%	3.52	0.06	No
491	Postal service	44.7%	-1.2%	0.00	0.97	No
492	Couriers and messengers	76.0%	-13.3%	0.00	0.97	No
493	Warehousing and storage	85.3%	35.4%	1.23	0.27	No
511	Publishing industries (except internet)	90.9%	16.4%	8.87	0.00	No
512	Motion picture and sound recording industries	30.7%	83.3%	1.67	0.20	No
515	Broadcasting (except internet)	-85.3%	59.4%	0.03	0.87	No
517	Telecommunications	-90.0%	22.7%	13.05	0.00	Yes
518	Data processing, hosting, and related services	91.3%	32.5%	0.22	0.64	No
519	Other information services	91.6%	19.5%	0.48	0.49	No
521	Monetary authorities-central bank	-56.6%	40.3%	2.44	0.12	No
522	Credit intermediation and related activities	-57.0%	27.2%	0.09	0.77	No
523	Securities, commodity contracts, and other financial investments and related activities	92.9%	43.8%	0.19	0.66	No
524	Insurance carriers and related activities	57.4%	39.8%	2.40	0.12	No
525	Funds, trusts, and other financial vehicles	-75.4%	23.7%	1.99	0.16	No

NAICS	Industry	Correlation with total employment	Correlations of first differences	F-statistic Granger test (one-month lag)	Probability	Significant one-way impact
531	Real estate	97.3%	81.1%	0.61	0.44	No
532	Rental and leasing services	-58.7%	83.9%	5.77	0.02	No
533	Lessors of nonfinancial intangible assets (except copyrighted works)	-14.1%	53.1%	6.59	0.01	No
541	Professional, scientific, and technical services	95.8%	68.7%	0.04	0.84	No
551	Management of companies and enterprises	96.5%	65.7%	21.27	0.00	No
561	Administrative and support services	96.1%	84.7%	66.92	0.00	No
562	Waste management and remediation services	74.6%	0.7%	10.94	0.00	No
611	Educational services	96.1%	85.3%	0.95	0.33	No
621	Ambulatory health care services	95.9%	66.4%	0.05	0.82	No
622	Hospitals	93.8%	20.9%	4.65	0.03	No
623	Nursing and residential care facilities	72.7%	3.2%	2.04	0.15	No
624	Social assistance	94.8%	19.5%	7.50	0.01	Yes
711	Performing arts, spectator sports, and related industries	44.7%	81.5%	0.60	0.44	No
712	Museums, historical sites, and similar institutions	82.5%	80.5%	5.20	0.02	No
713	Amusement, gambling, and recreation industries	37.5%	85.9%	0.00	0.96	No
721	Accommodation	47.2%	87.6%	1.45	0.23	No
722	Food services and drinking places	90.7%	91.1%	5.54	0.02	No
811	Repair and maintenance	21.4%	92.6%	1.91	0.17	No
812	Personal and laundry services	89.2%	84.9%	0.00	0.97	No
813	Religious, grantmaking, civic, professional and similar organizations	95.5%	80.1%	32.42	0.00	No
814	Private households	-86.4%	-27.0%	6.02	0.01	No
901	Federal government (other)	74.5%	-66.3%	10.82	0.00	No
902	State government (other)	87.9%	7.0%	45.25	0.00	Yes
903	Local government (other)	96.3%	81.5%	59.38	0.00	No

Significant, direct causality of industry on total employment, displays a "Yes" indicator in the last column.

Appendix 3: Use and misuse of employment projections

Employment Projections are intended for career development over time, not as the basis for budget or revenue projections, or for immediate corrective actions within the labor market.

Employment projections provide a general outlook for industries and occupations in Washington state. Occupational projections show how many job openings are projected due to occupational employment growth and replacement needs (*separations* and *alternative*).[40] For technical details see: 2019 Employment Projections Technical Report.

For the *separations* method, replacement includes openings created by retirements and occupational separations. It does not measure turnover within occupations, i.e., when workers stay within the same occupation, but change employers. For the *alternative* method, replacement includes normal turnover as workers go from one employer to another while staying in the same occupation. *Separations* total openings from occupational projections do not represent total demand, but can be used as an indicator of demand. *Alternative* total openings for occupational projections do represent total demand. Total demand may be filled by new entrants to the state market. New entrants can be workers from other states or nations, and new entrants can also be graduates from this state, other states or nations. In addition, occupations can be filled by workers already within the market, within a given occupation or from another occupation. Available job openings cannot be reserved for any of these categories since the majority of jobs are open and competitive.

Occupational details for employment (with at least 10 jobs) are presented for the state and all workforce development areas in our employment projections data files available online at https://esd.wa.gov/labormarketinfo/projections.

Observed and predicted extremes in employment growth and other indicators, such as fastest-growing occupations and shortage of skills, can be used for placement and short-term training decisions. However, these should be limited for use when developing long-term education programs. There are two main reasons for this limitation:

1. First, with more education targeting occupations with skills shortages, there is a higher probability that this will cause an oversupply in those occupations and skills sets.[41]
2. Second, the general development of transferable skills is much more productive than trying to catch up with a skills shortage.

The U.S. Bureau of Labor Statistics cautions on using Office of Management and Budget (OMB) classifications: "The 2018 SOC was designed solely for statistical purposes. Although it is likely that the 2018 SOC also will be used for various non-statistical purposes (e.g., for administrative, regulatory, or taxation functions), the requirements of government agencies or private users that choose to use the 2018 SOC for non-statistical purposes have played no role in its development, nor will OMB modify the classification to meet the requirements of any non-statistical program.

[40] This is discussed in the 2019 Employment Projections Technical Report at: https://esd.wa.gov/labormarketinfo/projections. Due to the non-additive for calculating total openings, in this round of projections we calculated total openings for aggregated occupations as a total for detailed occupations. As a result, the aggregated level of total openings might not equal the total of growth plus replacement.

[41] Occupational projections are the basis of the Occupations in Demand list. This list is used for determining eligibility for a retraining program (Training Benefits), as well as other education and training programs. See: https://esd.wa.gov/labormarketinfo/LAAO.

Consequently, the 2018 SOC is not to be used in any administrative, regulatory, or tax program unless the head of the agency administering that program has first determined that the use of such occupational definitions is appropriate to the implementation of the program's objectives."[42]

Different programs use different SOC coding systems. Combining the employment projections with other data sources generally requires a case-by-case analysis; an understanding of the differences of each program should be clearly explained and properly handled.

[42] See: https://www.bls.gov/soc/2018/soc_2018_user_guide.pdf, page 24.

Appendix 4: Occupations in Demand (OID) methodology

Employment projections are the basis of the Occupations in Demand (OID) list covering Washington's 12 workforce development areas and the state as a whole. This list is used to determine eligibility for a variety of training and support programs, but was initially created to support the unemployment insurance Training Benefits Program.

The full OID list is accessible through the "Learn about an occupation" tool located at: https://esd.wa.gov/labormarketinfo/LAAO.

All occupations in the list have demand indication definitions. The definitions come in three forms; **in demand**, **not in demand** or **balanced**. These definitions indicate the probability of a job seeker gaining employment in a given occupation. The term **in demand** indicates a greater probability of gaining employment. The term **not in demand** indicates a lesser probability and **balanced** indicates an uncertain probability between success and failure in gaining employment.

The definitions are created through a four-step process.

The data sources for the OID list:

The 2021 list is based on projections with state specific *alternative* rates used for turnover openings:

- Five-year projections for 2020 to 2025, using average annual growth rates and total job openings.
- Ten-year projections for 2020 to 2030, using average annual growth rates and total job openings.
- A combination of two-year (second quarter 2021 to second quarter 2023) and ten-year (2020 to 2030) projections, using average annual growth rates and total job openings.

All of these time frames use unsuppressed occupations with employment in a base year (2020), consisting of 50 or more employees, for the state and WDAs.

In addition to projections, the OID list uses supply and demand data:

- Supply data: annual counts of unemployment claimants for WDAs for the period June 2021 to May 2022.
- Demand data: annual counts of job announcements from Help Wanted OnLine (HWOL) mid-monthly time series for the period June 2021 to May 2022.

Step one: Identifying initial "in demand" and "not in demand" categories for each period.

- For each time frame, occupations with average annual growth rates of at least 90 percent of their respective geographic area's (statewide or WDA), total average annual growth rates *and* a share of total openings of at least 0.08 percent are defined as **in demand**.
- Occupations with average annual growth rates less than 70 percent of their respective geographic area's total growth rates *and* a share of total openings of less than 1 percent are defined as **not in demand**.

Step two: Identifying provisional occupational categories.

- If within any of the three projection time frames (five-year, 10-year and two-/10-years combined), an occupation is categorized as being **in demand**, it receives the first provisional identification as **in demand**.

- If within any of the three projection time frames, an occupation is categorized as **not in demand**, it receives a second provisional identification of **not in demand**.

Step three: Create final projections definitions.

- If an occupation has only one provisional definition, it equals the final projections definition.
- If an occupation has two provisional definitions of **in demand** and **not in demand**, it gets identified as **balanced**.
- All other occupations, without provisional definitions (i.e., not meeting the thresholds from step one), are identified as **balanced**.

Step four: Create final adjustment definitions.

The projections definitions are now put through an adjustment process, using current labor market supply/demand data which compares online job announcements to information on unemployment insurance (UI) claimants.

Adjustments are applied when current supply/demand data significantly contradicts the model-based projections definitions.

The adjustment methodology

- Supply/demand data are used for adjustments if they are significant. Significant supply-demand data are those data where the share of the largest value between UI claimants and online job announcements are more than 1 percent of openings, *and* where the largest values between announcements and UI claimants more than 10, *or* the largest values between UI and announcements not less than five, for the period 2020 to 2030.
- If the projections definition is **in demand** or **balanced** but the ratio of supply to demand is more than 2.5, then the adjusted definition is **not in demand**.
- If the projections definition is **in demand** and the ratio of supply to demand is not larger than 2.5, but more than 1.5, then the adjusted definition is **balanced**.
- If the projections definition is **not in demand** or **balanced**, but the ratio of supply to demand is less than 0.4, then the adjusted definition is **in demand**.
- If the projections definition is **not in demand** and the ratio is at least 0.4, but less than 0.6, then the adjusted definition is **balanced**.

The final list: Local adjustments

The Employment Security Department's Data Architecture, Transformation and Analytics (DATA) Division uses the methodology outlined above to prepare the initial lists for the state as a whole and by WDA. Those lists are then given to local workforce development boards to review, adjust and approve based on their local experience and knowledge.

Appendix 5: Skill projections

In order to project skills, occupational projections are converted into skill projections. To project skills, we rely on the content of employers' job postings rather than predefined, general O*NET skills.

Data sources

The main source for this analysis was a download of hard skills for each detailed (six-digit SOC) occupation for Washington state from The Conference Board, Help Wanted OnLine job announcements. The downloaded files represent extracted hard skills for each occupation from online job announcements, posted in the last three years (from July 2020 to June 2022).[43] Each skill is displayed with the number of job announcements from which it was extracted. A skill drawn from a greater number of job announcements is relatively more important. The number of job announcements is summed for each occupation. Some occupations contain very few, if any listed skill components, and thus the summation value for a given occupation can be very small or nonexistent and are removed in later processes.

For creating skills-to-occupations matrices, we included occupations that satisfy the following conditions only:

1. Total skill counts are not less than five.
2. Total skill counts are not less than 2 percent of base year employment.
3. Estimated employment for second quarter 2021 are not less than five.

Each occupational vector of skill numbers was normalized (i.e., scaled) to totals of one.

By combining these vectors, we created skills-to-occupations matrices. These matrices were used to convert occupational estimations and projections into comparable numbers expressed as hard skills.

The skills-to-occupations matrices are similar in structure and function to normalized matrices used for occupational/industries staffing patterns. The skills-to-occupations matrices were based on statewide data and were used to convert occupational projections for the state and all WDAs into skills projections.

After conversion, we deleted all records where estimated or projected employment numbers were less than five. We consider estimations below five as unreliable. As a result of excluding missing skill/occupation vectors and removing results below five, only a portion of the occupational employment estimates were converted into skills.

A uniform skill to occupation staffing matrix is applied to all areas. Due to differences in occupational employment in each area, and the exclusion of employment below five, available skill counts in each area vary. As a result, the largest number of detailed skills were 550 for Washington state, followed by Seattle-King County WDA with 548 and followed by the Tacoma-Pierce County WDA with 537. The lowest number was for Eastern Washington at 449 skills.

Some results

Detailed skills from online job postings for Washington state were grouped into 26 distinct skill categories and ranked on combined average annual openings and growth rates for 2020 to 2030. These skill categories are presented in *Appendix figure A5-1*.

[43] In last year's projections report we used a sample for the period July 2017 to June 2019.

The top six skill categories ranked by combined average annual openings and growth rates for the state are: information technology (IT), food preparation and service, business support, health care, maintenance and repair and sales and marketing. These combined top six skill categories represent 57.33 percent of total projected skill employment for the state.

Appendix figure A5-1. Skill categories ranked by combined average annual openings and growth
Washington state, 2020 to 2030
Source: Employment Security Department/DATA; The Conference Board, Help Wanted Online job announcements

Combined rank	Skill category	Estimated skill employment 2020	Projected skill employment 2030	Average annual growth rate 2020-2030	Total average annual openings
1	IT	221,939	291,031	2.75%	84,458
2	Food preparation and service	98,630	132,123	2.97%	55,238
3	Business support	417,897	502,969	1.87%	175,824
4	Health care	241,709	292,404	1.92%	83,343
5	Maintenance and repair	213,132	256,567	1.87%	93,257
6	Sales and marketing	294,119	347,312	1.68%	119,582
7	Media	15,291	20,382	2.92%	6,713
7	Management	151,181	180,272	1.78%	56,772
7	Administrative support	286,865	337,217	1.63%	110,095
10	Construction	138,494	163,838	1.69%	63,431
11	Human resources	17,836	22,227	2.23%	7,512
11	Personal care and services	45,549	54,965	1.90%	20,819
13	Education and training	97,518	115,792	1.73%	26,622
14	General labor	34,656	41,669	1.86%	15,736
15	Arts and entertainment	2,560	3,199	2.25%	992
15	Research and science	8,746	10,796	2.13%	2,886
15	Protective service	12,777	15,432	1.91%	5,589
15	Finance, insurance and real estate	84,036	98,569	1.61%	29,145
19	Transportation and logistics	71,665	81,095	1.24%	28,809
20	Accounting, auditing & bookkeeping	61,403	70,315	1.36%	21,686
21	Social	20,544	24,283	1.69%	6,134
21	Production	41,767	48,303	1.46%	17,135
23	Quality control, lean	31,380	34,387	0.92%	9,408
24	Legal	18,384	20,534	1.11%	5,210
25	Engineering	12,224	12,530	0.25%	2,774
26	Telecommunications	784	858	0.91%	167

The IT-related skill category ranked number one in the list of top ranks for openings and growth.

Information technology

IT skills naturally dominate shares in computer-related occupations, but also have a very high share in occupations whose primary occupational focus is not computers. The occupations with high computer skill requirements based on IT shares, are presented in *Appendix figure A5-2*. Industrial engineers, designers, all other and engineers, all other hold the highest shares of IT related detailed skills with shares of 0.801, 0.781 and 0.761 respectively.

Appendix figure A5-2. Occupations, not primarily computer related, with the largest shares of computer skill requirements Washington state, 2020 second quarter occupational estimations (June 2018 to June 2020 sample, skills/occupations matrices) Source: Employment Security Department/DATA; The Conference Board, Help Wanted OnLine job announcements

SOC	Occupation	Share of skills that are IT
172112	Industrial engineers	0.801
271029	Designers, all other	0.781
172199	Engineers, all other	0.761
271024	Graphic designers	0.726
113021	Computer and information systems managers	0.326
119041	Architectural and engineering managers	0.308
271021	Commercial and industrial designers	0.265
173029	Engineering technologists and technicians, except drafters, all other	0.197
131111	Management analysts	0.174
273031	Public relations specialists	0.154
131161	Market research analysts and marketing specialists	0.131
119141	Property, real estate and community association managers	0.118
419022	Real estate sales agents	0.091
172051	Civil engineers	0.088
492022	Telecommunications equipment installers and repairers, except line installers	0.082

Industrial engineers, designers, all other and engineers, all other hold the highest shares of IT related skills.

Skill based related occupations

Skills-to-occupations matrices allow us to create a tool for defining related occupations, based on common skills. To achieve this, we calculated a matrix of correlations based on skills between occupations. The results are presented in the macro-enabled file, related_occ_skills_2022.xlsm. The matrix in the file's "main" tab is symmetric around the main diagonal. The main diagonal has all 1s in it. There are two ways of using the file's data when opened with the enabled-macros feature:

1. You can select an occupational title of interest, from a column heading, in the "main" tab and then sort the numbers below the title of interest from largest to smallest. Starting from row three in column B you would see the sorted list of related occupations (row two will be the same occupation as selected). To restore the original sort-configuration, sort the key-column (column A) from smallest to largest.

2. You can select an occupation of interest, from a column heading, in the "main" tab and then click the **Ctrl** and **A** keys simultaneously. This will execute a macro. The macro opens a table in a "table" tab. In the table, you will find a list of the top 15 occupations related to your occupation of interest.

An example of a list for software developers, applications is in *Appendix figure A5-3*.

Appendix figure A5-3. Top 15 occupations related to software developers
Washington state, 2022
Source: Employment Security Department/DATA; The Conference Board, Help Wanted OnLine job announcements

SOC	Occupation	151252-Software Developers
151251	Computer programmers	0.803
151299	Computer occupations, all other	0.729
172199	Engineers, all other	0.682
172112	Industrial engineers	0.586
151254	Web developers	0.510
119041	Architectural and engineering managers	0.377
151242	Database administrators	0.322
152031	Operations research analysts	0.316
151212	Information security analysts	0.303
151221	Computer and information research scientists	0.246
151211	Computer systems analysts	0.208
152051	Data scientists	0.184
173029	Engineering technicians, except drafters, all other	0.184
113021	Computer and information systems managers	0.180
151241	Computer network architects	0.094

Numbers in the table represent coefficients of correlations for normalized vectors of skill shares.

The related occupations tool may be useful for job seekers. The results are specific for Washington state since the skills come from job announcements in this state.

Conclusions

Our view is that it is more important to connect education and training programs with real world skill requirements than with generic occupational skills definitions.

While primary fields are relatively stable and well defined, IT skill sets are constantly changing. IT skills are concentrated mainly in software, algorithms, some hardware and in web applications. In the long run, giving priority to foundational academic subjects such as math and formal logic, multidimensional design, and foundational concepts in programming is salient. In other words, foundational abilities to learn, develop and implement new knowledge and technology should take priority for career preparation.

Appendix 6: Frequently asked questions

Q: What are the steps in industry projections?

A: There are two major steps in industry projections. The first step is developing aggregated statewide industry projections using Global Insight national forecasts. The second step produces detailed industry projections. The principal data source for industry projections is a detailed covered employment time series of four-digit NAICS data for all Washington counties, specifically, the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW).

Q: Why are the detailed industry projections not comparable with U.S. Bureau of Labor Statistics, Current Employment Statistics (CES) definitions?

A: Industry projections are classified according to U.S. Bureau of Labor Statistics, Occupational Employment and Wage Statistics (OEWS) definitions, which are somewhat different from CES.

Q: What is the source for occupational/industry ratios?

A: The primary source for occupational/industry ratios is the OES survey. However, this survey uses different area designations than the state's workforce development areas (WDAs) and has limited industry coverage (agriculture, non-covered employment, private households and self-employment are excluded) necessitating the use of other staffing patterns as well.

Q: Why can the ratio for industry and occupational projections differ from the OEWS survey outputs?

A: We use raw sample and limited numbers of imputations while standard OEWS processing using significant share of imputations. We also use extra information from WEB job announcements. In cases when sample is weak or missing, we use substituted area (state staffing patterns) or combined areas (King and Snohomish counties).

Q: Why can occupational/industry ratios differ between the base year and projected years?

A: This is due to the use of change factors, which predict changes in the occupational shares for each industry over time.

Q: Why can't occupational projections be benchmarked or verified?

A: There are no administrative records for employment by occupation; therefore, the data cannot be reliably benchmarked or verified by non-survey means.

Q: How are occupational projections used?

A: Occupational projections are the only data source for statewide and WDA-specific occupational outlooks. Projections are also the foundation for developing the Occupations in Demand list, which is used to determine eligibility for a variety of training and support programs, but was created to support the unemployment insurance Training Benefits Program.

Q: How are industry projections used?

A: Industry projections can be used by policymakers, job seekers, job counselors and economic analysts. For any policy decisions, the projections should be supplemented with other available data sources (e.g., unemployment insurance claims, educational data, job announcements, etc.).

Q: Which occupational codes are used?

A: The 2010 Standard Occupational Classification (SOC) system was used for this round of projections.

Q: Can the SOC be used for administrative purposes?

A: According to BLS, the 2018 SOC was designed solely for statistical purposes. To use SOC for administrative programs, the head of an agency considering using SOC must first determine if the use of SOC definitions is appropriate for a program's objectives.

Q: Why don't the occupational totals by WDA equal the state total?

A: The totals are not additive due to the use of local staffing patterns for projections by WDA, which differ from the statewide staffing pattern.

Q: What is the difference between the Bureau of Labor Statistics *separations* rate and *alternative* state-specific rate methodologies?

A: The *separations* method measures job openings created by workers who leave occupations and need to be replaced by new entrants. In this method, workers who exit the labor force or transfer to an occupation with a different Standard Occupational Classification (SOC) are identified as generating separations openings at the national level**.** This means that jobs filled by workers within the same occupations, are not identified as new jobs.

The *alternative* rates track openings created by turnover within occupations (i.e., workers stay within occupations but transfer to different companies) and when workers leave one occupation for another or leave the workforce. In contrast to *separation* methodology, *alternative* openings represent total job openings and are specific for Washington state.

Appendix 7: Glossary of terms

Industries

A classification of business establishments based on similar production processes.

North American Industry Classification System (NAICS)

North American Industry Classification System (NAICS) is the system used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing and publishing statistical data related to the U.S. business economy. NAICS was developed under the authority of the U.S. Office of Management and Budget.

Occupation

A job or profession, a category of jobs that are similar with respect to the work performed and the skills possessed by the workers.

Occupational projections

Industry projections converted to occupations, based on occupational/industry ratios.

Standard Occupational Codes (SOC)

Standard Occupational Classification (SOC) is the system used by federal statistical agencies in classifying workers into occupational categories for the purpose of collecting, calculating or disseminating data. All workers are classified into their occupational definitions which are structured at four levels of aggregation. SOC was developed under the authority of the U.S. Office of Management and Budget.

Total occupational estimations and projections

Total occupational estimations and projections are calculated to describe employment in base years and future time periods.